

**PROJECT BRIEF FOR THE DANUBE
REGIONAL PROJECT (Phase 1)**

**Strengthening the
Implementation Capacities for
Nutrient Reduction and
Transboundary Cooperation in
the Danube River Basin**

March 2001



**International Commission for the
Protection of the Danube River**



UNDP/GEF Assistance

Cover Note

Project Title: “Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin” (Phase 1)

Date: March 2001

	Work Programme Inclusion	Reference/Note:
1. Country Ownership		
• Country Eligibility		Cover page
• Country Drivenness	Clear description of project’s fit within: <ul style="list-style-type: none"> National reports/communications to Conventions National or sector development plans Recommendations of appropriate regional intergovernmental meetings or agreements. 	<ul style="list-style-type: none"> Chapter 1.1 Chapter 1.6 Chapter 1.7; 4
• Endorsement	• Endorsement by national operational focal point.	• Annex 13
2. Programme & Policy Conformity		
• Programme Designation & Conformity	• Describe how project objectives are consistent with Operational Programme objectives or operational criteria.	<ul style="list-style-type: none"> Chapter 1.1 Chapter 4; Annex 1 Annex 9
• Project Design	Describe: <ul style="list-style-type: none"> Sector issues, root causes, threats, barriers, etc, affecting global environment. Project logical framework, including a consistent strategy, goals, objectives, outputs, inputs/activities, measurable performance indicators, risks and assumptions. Detailed description of goals, objectives, outputs, and related assumptions, risks and performance indicators. Brief description of proposed project activities, including an explanation how the activities would result in project outputs, Global environmental benefits of project. 	<ul style="list-style-type: none"> Chapter 1.1 – 1.5; 1.7 Annex 2 Chapter 2, Chapter 3, Annex 2 Chapter 3; Chapter 8; Annex 1

	Work Programme Inclusion	Reference/Note:
	<ul style="list-style-type: none"> Incremental Cost Estimation based on the project logical framework. <ul style="list-style-type: none"> Describe project outputs (and related activities and costs) that result in global/regional environmental benefits Describe project outputs (and related activities and costs) that result in joint global and national environmental benefits. Describe project outputs (and related activities and costs) that result in national environmental benefits. Describe the process used to jointly estimate incremental cost with in-country project partner. Present the incremental cost estimate. If presented as a range, then a brief explanation of challenges and constraints and how these would be addressed by the time of CEO endorsement. 	<ul style="list-style-type: none"> Annex 1
<ul style="list-style-type: none"> Sustainability (including financial sustainability) 	Describe proposed approach to address factors influencing sustainability, within and/or outside the project to deal with these factors.	<ul style="list-style-type: none"> Chapter 4
<ul style="list-style-type: none"> Replicability 	Describe the proposed approach to replication (for e.g., dissemination of lessons, training workshops, information exchange, national and regional forum, etc) (could be within project description).	<ul style="list-style-type: none"> Chapter 2 Chapter 3.2 (vi) Chapter 3.3
<ul style="list-style-type: none"> Stakeholder Involvement 	<ul style="list-style-type: none"> Describe how stakeholders have been involved in project development. Describe the approach for stakeholder involvement in further project development and implementation. 	<ul style="list-style-type: none"> Chapter 4 Chapter 10.1
<ul style="list-style-type: none"> Monitoring & Evaluation 	<ul style="list-style-type: none"> Describe how the project design has incorporated lessons from similar projects in the past. Describe approach for project M&E system, based on the project logical framework, including the following elements: <ul style="list-style-type: none"> Specification of indicators for objectives and outputs, including intermediate benchmarks, and means of measurement. Outline organizational arrangement for implementing M&E. Indicative total cost of M&E (maybe reflected in total project cost). 	<ul style="list-style-type: none"> Chapter 5 Chapter 10; Annex 2 <ul style="list-style-type: none"> Annex 2 Chapter 10 included in total project costs

	Work Programme Inclusion	Reference/Note:
3. Financing		
<ul style="list-style-type: none"> • Financing Plan 	<ul style="list-style-type: none"> • Estimate total GEF project cost : • Estimate contribution by financing partners : • Baseline Contributions : • Propose type of financing instrument 	<ul style="list-style-type: none"> • Chapter 6.1; Annex 4 • Chapter 6.2 • Chapter 6.3-6.7 • The ICPDR shall coordinate donor support and assist to mobilize funds for implementation of investment programmes for pollution reduction under the DRPC.
<ul style="list-style-type: none"> • Implementing Agency Fees 	<ul style="list-style-type: none"> • Propose IA fee 	
<ul style="list-style-type: none"> • Cost-effectiveness 	<ul style="list-style-type: none"> • Estimate cost effectiveness, if feasible. • Describe alternate project approaches considered and discarded. 	<ul style="list-style-type: none"> • Chapter 8 • The present developed approach promises to be the most effective way to reach the project objectives, considering the implementation of the Pollution Reduction Programme, the ICPDR Joint Action Programme (Investment Programme) and the development of policies and legislation for nutrient reduction within the institutional and operational frame of the ICPDR.
4. Institutional Coordination & Support		
<ul style="list-style-type: none"> • IA Coordination and Support • Core commitments & Linkages 	<p>Describe how the proposed project is located within the IA's:</p> <ul style="list-style-type: none"> • Country/regional/global/sector programmes. • GEF activities with potential influence on the proposed project (design and implementation). 	<ul style="list-style-type: none"> • Chapter 10.1 • UNDP/GEF, UNEP and the World Bank (Strategic Partnership Programme) will participate in the ICPDR together with other interested bilateral donors and international organizations to assure efficient project implementation and evaluation of results.

	Work Programme Inclusion	Reference/Note:
<ul style="list-style-type: none"> • Consultation, Coordination and Collaboration between IAs, and IAs and EAs, if appropriate. 	<ul style="list-style-type: none"> • Describe how the proposed project relates to activities of other IAs in the country/region. 	<ul style="list-style-type: none"> • The “Strategic Partnership” developed by UNDP, UNEP, WB and GEF indicates the cooperating mechanisms between the World Bank (WB-GEF Partnership Investment Facility for Nutrient Reduction), the International Commission for the Protection of the Black Sea and the International Commission for the Protection of the Danube River.
	<ul style="list-style-type: none"> • Describe planned/agreed coordination, collaboration between IAs in project implementation. 	<ul style="list-style-type: none"> • In the frame of the ICPDR all activities related to protection of international waters will be coordinated with particular attention to the EU approximation process and the development of policies and legislation in line with international and EU Directives.
5. Response to Reviews		
Council	Respond to Council Comments at pipeline entry.	None; N/A
Convention Secretariat	Respond to comments from Convention Secretariats .	N/A
GEF Secretariat	Respond to comments from GEFSEC on draft project brief.	None; GEFSEC fully supports
Other IAs and 4 RDBs	Respond to comments from other IAs, 4RDBs on draft project brief.	UNEP is co-implementing; World Bank sent comments supporting the project and emphasizing coordination with the Partnership Investment Facility for Nutrient Reduction.
STAP	Respond to comments by STAP at work programme inclusion	None; N/A
Review by expert from STAP Roster	Respond to review by expert from STAP roster. ¹	Review and Response: Annex 3

¹ STAP Roster Review, and IA response, is a required annex of the project brief.

PROJECT BRIEF

1. IDENTIFIERS

Project Number

Project Name

**Strengthening the Implementation Capacities for
Nutrient Reduction and Transboundary Cooperation
in the Danube River Basin (Phase 1)**

Duration

2 years (July 2001 – June 2003)

Implementing Agency

UNDP

Executing Agency

UNOPS / ICPDR

Requesting Countries

Czech Republic, Slovakia, Hungary, Slovenia, Croatia,
Bosnia & Herzegovina, Yugoslavia, Bulgaria, Romania,
Moldova, Ukraine

Eligibility

Eligible under para. 9(b) of GEF Instrument

Participating Countries

Germany and Austria

GEF Focal Area

International Waters

GEF Programming Framework

GEF Operational Strategy for International Waters /
Waterbody-Based Operational Programme (#8)

2. SUMMARY

The long-term development objective of the proposed Regional Project is to contribute to sustainable human development in the DRB through reinforcing the capacities of the participating countries in developing effective mechanisms for regional cooperation and coordination in order to ensure protection of international waters, sustainable management of natural resources and biodiversity.

In this context, the proposed GEF Regional Project, being subdivided into two Phases, should support the ICPDR, its structures and the participating countries in order to ensure an integrated and coherent implementation of the Strategic Action Plan 1994 (SAP 1994), the ICPDR Joint Action Programme and the related investment programmes in line with the objectives of the DRPC.

The overall objective of the Danube Regional Project is to complement the activities of the ICPDR required to provide a regional approach and global significance to the development of national policies and legislation and the definition of priority actions for nutrient reduction and pollution control with particular attention to achieving sustainable transboundary ecological effects within the DRB and the Black Sea area.

The Danube Regional Project, in its Phases 1 and 2, shall facilitate implementation of the Danube River Protection Convention in providing a framework for coordination, dissemination and replication of successful demonstration that will be developed through investment projects (World Bank-GEF Partnership Investment Facility for Nutrient Reduction, EBRD, EU programmes for accession countries etc.).

The specific objective of Phase 1, July 2001 – June 2003, is to prepare and initiate basin-wide capacity-building activities, which will be consolidated in the second phase of the Project. This second Phase will be implemented from July 2003 – June 2006, building up on the results archived in the first Phase. During the first Phase, altogether 20 project components with 80 activities will be carried out and thus establishing a solid base for the implementation of Phase 2.

Taking into account the basic orientations of the Danube/Black Sea Basin Strategic Partnership, the following project components can be designed to respond to the overall development objective:

- (1) Creation of sustainable ecological conditions for land use and water management;
- (2) Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin;
- (3) Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems;
- (4) Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances.

3. COSTS AND FINANCING (USD)

GEF	- Project	4,629,630 USD
	[administrative cost]	370,370 USD
	- PDF	350,000 USD
	<i>Subtotal GEF</i>	5,350,000 USD
Co-Financing	Government / ICPDR	6,600,000 USD
	<i>Subtotal Co-financing</i>	6,600,000 USD
Total Project Cost		11,950,000 USD

4. ASSOCIATED FINANCING

- Government	186,000,000 USD
- UNDP	1,069,000 USD
- Bilateral, EU and NGO	166,375,000 USD
Total Baseline Costs:	353,431,000 USD

5. GEF OPERATIONAL FOCAL POINT ENDORSEMENTS (ANNEX 13)

Czech Republic	15 September, 2000
Slovakia	31 August, 2000
Hungary	30 August, 2000
Slovenia	29 August, 2000
Croatia	29 August, 2000
Bosnia & Herzegovina	1 September, 2000
Federal Republic of Yugoslavia	13 September, 2000
Bulgaria	1 September, 2000
Romania	30 August, 2000
Moldova	30 August, 2000
Ukraine	7 September, 2000
ICPDR President	13 September, 2000

6. IMPLEMENTING AGENCY CONTACT

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List of Abbreviations

AEPWS/EG	Accident Emergency Prevention and Warning System Expert Group
APR	Annual Project/Programme Report
AQC	Analytical Quality Control
BAT	Best Available Technology
BEP	Best Environmental Practices
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
DBAM	Danube Basin Alarm Model
DEF	Danube Environmental Forum
DEPA	Danish Environmental Protection Agency
DANUBIS	Danube Information System
DPRP	Danube Pollution Reduction Programme
DRB	Danube River Basin
DRBM/EG	Danube River Basin Management Expert Group
DRP	Danube Regional Project
DRPC	Danube River Protection Convention
DWQM	Danube Water Quality Model
€	Euro
Ad-hoc ECO/EG	Ad-hoc Ecology Expert Group
EMIS/EG	Emission Expert Group
EPDRB	Environmental Programme for the Danube River Basin
GEF	Global Environment Facility
GDP	Gross Domestic Product
GPA	Global Programme of Action
IAA	Implementing Agency Agreement
ICPDR	International Commission for the Protection of the Danube River
ICPBS	International Commission for the Protection of the Black Sea
IFI	International Financing Institution
IW	International Waters
JAP	Joint Action Programme
MLIM/EG	Monitoring Laboratory and Information Management Expert Group
MONERIS	Modeling Nutrient Emission in River System
M&E	Monitoring and Evaluation
MSP	Medium Sized Project
NGOs	Non Government Organizations
PIR	Project Implementation Review
PRP	Pollution Reduction Programme
REC	Regional Environmental Center
S/EG	Strategic Expert Group
SAP	Strategic Action Plan
SIA	Significant Impact Area
STAP	Scientific and Technical Advisory Panel
TAR	Transboundary Analysis Report
UNDP	United Nations Development Programme
UNIDO-TEST	United Nations Industrial Development Office - Transfer of Environmentally Sound Technology to Reduce Transboundary Pollution in the Danube River Basin
UNOPS	United Nations Office for Project Services
USAID	United State Agency for International Development
USD	United States Dollar
WPPCM	Water Pollution Prevention and Control Model

1 Background Information

1.1 Context of the Proposed Danube Regional Project

In the frame of the Environmental Programme for the Danube River Basin (EPDRB) international support was provided to facilitate the development and the implementation of the Danube River Protection Convention (DRPC). Since 1992 the European Community has supported, in particular through its Phare and Tacis programmes and the UNDP/GEF, in particular through its Pollution Reduction Programme (June 1997 to June 1999), the efforts of the Danube countries and of the Interim Commission for the Protection of the Danube River to develop the necessary mechanisms for effective implementation of the Convention. These mechanisms relate in particular to the development of a regional Strategic Action Plan (SAP) based on national contributions, the elaboration of a Transboundary Analysis to define causes and effects of transboundary pollution within the Danube River Basin and on the Black Sea. In the frame of the Danube Pollution Reduction Programme, based on the results of the Transboundary Analysis, an investment portfolio has been developed with particular attention to nutrient reduction. All the measures, projects and programmes proposed to reduce emissions from both point and non-point sources of pollution will improve water quality, considering a reduction of 50 % in Chemical Oxygen Demand (COD) emissions and 70 % in Biological Oxygen Demand (BOD) emissions and other toxic elements and thus reduce transboundary effects within the Danube River Basin. Once implemented, these measures will further substantially contribute to reducing nutrient transport (Phosphorus by 27 % and Nitrogen by 14 %) to the Black Sea to improve, over time, environmental status indicators of Black Sea ecosystems of the western shelf.

Since 1992/1993, donor investments in the frame of the Environmental Programme for the Danube River Basin (EPDRB) have been in the order of 27.2 million USD for the Phare and Tacis Programmes (ending October 2000) and of 12.4 million USD for the UNDP/GEF assistance.

The International Commission for the Protection of the Danube River Basin (ICPDR) has recently developed a first Joint Action Programme (JAP) for the years 2001 - 2005, which was adopted at the ICPDR Plenary Session in November 2000. The JAP will deal i.a. with pollution from point and non-point sources, wetland and floodplain restoration, priority substances, water quality standards, prevention of accidental pollution, floods and river basin management.

In order to ensure efficient implementation of the Common Platform for Development of National Policies and Actions for Pollution Reduction under the DRPC (Common Platform), the Pollution Reduction Programme and the JAP and to reinforce the appropriate development and application of policies, strategies and legislation for transboundary pollution reduction at the national level, a new phase of GEF assistance shall complement the activities of the ICPDR and the Black Sea PIU.

The new GEF assistance is planned within the frame of the Danube/Black Sea Basin Strategic Partnership (Annex 9) for the Danube and the Black Sea Basin. The Danube–Black Sea programme is composed of three complementary parts:

- (i) a series of country-related investment projects executed through the World Bank-GEF Partnership Investment Facility for Nutrient Reduction with GEF financial support;
- (ii) two Regional Projects for the Danube River Basin and the Black Sea respectively which are subdivided into two Phases (July 2001- June 2003 and July 2003- June 2006);
- (iii) other GEF and donor interventions in the basin targeting reduction of nutrients and toxic pollutants.

The GEF regional Danube/Black Sea basin Strategic Partnership shall provide assistance to the ICPDR and the Black Sea PIU to reinforce their activities in terms of policy/legislative reforms and enforcement of environmental regulations (with particular attention to the reduction of nutrients and toxic substances). The regional projects, in their respective sphere of intervention and jointly, shall also assure a coherent and coordinated approach and global significance of policy and legislative measures introduced at the national level of the participating countries. Further, the GEF regional

components of the Danube/Black Sea Basin Strategic Partnership shall facilitate project implementation in providing a framework for dissemination and replication of successful demonstration that will be developed through the implementation of investment projects through the World Bank-GEF Partnership Investment Facility for Nutrient Reduction.

In this context, the proposed Danube Regional Project (DRP), which is split in two implementation Phases, has to be seen as an integral part of the Danube/Black Sea Basin Strategic Partnership and a logical continuation of the GEF support for capacity building provided for a period of five years to the countries of the DRB.

During the 1st Phase of the Project (July 2001 – June 2003) all but one of the project components and activities will be introduced and will have a logical follow-up in the 2nd Project Phase (July 2003 – June 2006) securing efficient achieving of final results. For the reason of continuity and utmost utilization of available expertise, the Danube Regional Project has to take into account and build on the existing mechanisms and structures, including:

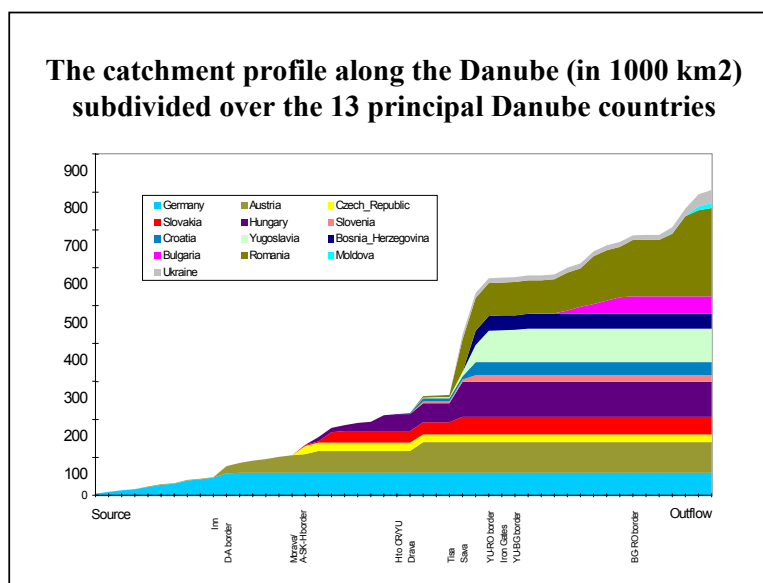
- ⇒ the Common Platform (revised SAP), focusing on policies and strategies for water quality control and pollution reduction with particular attention to transboundary issues and reduction of nutrient transport to the Black Sea; regional policies and strategies have to be coordinated with the development of national policies and legislation and implemented through national investment programmes;
- ⇒ the Transboundary Analysis Report (TAR) identifies causes and effects of pollution with particular attention to transboundary issues and nutrient transport to the Black Sea; the TAR defines priorities for control and management strategies at the regional and national levels;
- ⇒ The Danube Pollution Reduction Programme (DPRP), is the actual investment programme of the ICPDR. It is the operational basis for the promotion and monitoring of pollution reduction measures in the DRB. A total of 421 projects for 5.66 billion USD, primarily addressing hot spots have been identified for municipal, industrial and agricultural projects which, once implemented, would decrease phosphorus and nitrogen loads to the Danube and downstream to the Black Sea by 27 and 14 % respectively;
- ⇒ the ICPDR, its Permanent Secretariat and its Expert Groups are responsible for the implementation of the DRPC with particular attention to emission control (EMIS/EG), monitoring of water quality (MLIM/EG), warning and prevention of accidental pollution (AEPWS/EG), river basin management and implementation of EU Water Framework Directive (RMB/EG), ecological status (Ad-hoc ECO/EG) and strategic/administrative issues (S/EG). The Danube Regional Project shall make use of these structures and instruments to pursue its objectives and organize its activities;
- ⇒ the Joint Action Programme 2001-2005, prepared by the EMIS EG has been approved by the ICPDR at the Plenary Session in November 2000. The projects and strategic measures contained in the Joint Action Programme are in most cases coherent with the projects in the Five Year Nutrient Reduction Action Plan, where the total amount of investment for point sources reduction is 4.4 billion € out of which 3.54 billion € are earmarked as national contributions.

1.2 The Danube River Basin

The Danube River is with a length of 2 780 km the second largest river in Europe and drains an area of 817 000 square km. This includes: all of Hungary, nearly all parts of Austria, Romania, Slovenia, Slovakia and FR Yugoslavia, significant parts of Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Moldova and small parts of Germany and Ukraine.

The Danube River discharges into the Black Sea through a delta, which is the second largest natural wetland in Europe. The catchment profile along the Danube is presented in the attached figure.

The Basin, with a total of about 817 000 km² is characterized by an aquatic ecosystem with numerous important wetlands and floodplains. It is of high environmental as well as economic and social value. It supports drinking water supply, agriculture, industry, fishing, tourism and recreation, etc. A large number of dams, dikes, navigation locks and other hydraulic structures have been built throughout the region. (Annex 7 - Maps: Major Hydraulic Structures in the Danube River Basin).



Utilizing water resources for important economic activities and the release of waste water without adequate treatment has resulted in changes in the hydrological systems. Problems of water quality and quantity have been created, including significant environmental damage, with resulting impairment of public health and quality of life.

Central and eastern European countries in particular, during the period of centralized planning system, failed to develop adequate environmental protection policies and subsequent measures to fully respond to water pollution and degradation of river ecosystems. The economic situation of the countries in transition, most of which are considered as accession countries to the European Union, does not allow them to fully respond to the needs for environmental protection and the implementation of pollution control measures.

Appropriate water management concerns must be better integrated into municipal, industrial and agricultural policies and legislation to assure sustainable human development and promotion of economic activities. The Danube/Black Sea Basin Strategic Partnership shall in particular assist the countries in transition to respond to the regional and global environmental concerns with particular attention to nutrient reduction and elimination of other toxic substances in the water bodies.

1.3 Political, Demographic and Economic Issues

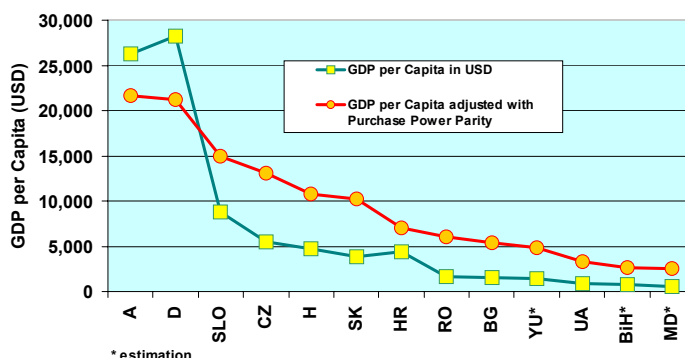
The present population of the Danube River Basin is about 83 million inhabitants (16 % of the population in Europe). Nearly 57 % of this population lives in increasingly growing urban areas. The share of the population connected to public water supply varies from 29% in Moldova to 98 % in Germany, yielding an average of 74%. The share of population branched to public sewer system varies from 14% in Moldova to 89% in Germany – an average of 52%. Based on the national projection figures, the population of the Danube River Basin can be expected to remain at its present level by the year 2020.

The analysis of economic disparities shows a clear trend of a west – east decline of the GDP from the upstream

countries such as Germany and Austria, with about 25,000 USD per capita and year (in 1997), to the downstream countries among which Ukraine accounts for less than 1,000 USD per capita and year.

The middle and downstream Danube countries in transition are facing serious economic and financial problems in responding to the objectives of the Danube River Protection Convention and implementing measures for pollution reduction and for environmental protection as required for the accession to the European Union. This analysis also shows the need to assist the countries in transition and makes evident the responsibilities of the international community to respond to the regional and global concerns of environmental protection.

**The Danube Countries:
GDP per Capita in USD (1998)
and GDP adjusted for Purchasing Power Parity**



In general terms, the 13 DRB countries can be categorized and characterized as follows:

(i) Germany and Austria

These two countries are members of the European Union and are located at the upper part of the DRB. Compared to all other DRB countries, Germany and Austria have significantly higher economic development levels, represented by a per capita income of about 25 000 USD per annum. In terms of pollution reduction (COD, BOD, N and P) they have achieved high standards of emission reduction and water pollution control. From 1990 to 1999 both countries have invested important amounts for the installation of third stages and for the upgrading of municipal waste water treatment plants.

In 1997 and 1998 (2 years) Germany invested more than 2.4 billion USD for pollution reduction measures to respond to EU Water Directives and in particular to Nitrate Directive. Current investment in the water sector in the German part of the Danube River Basin is at the level of about 1.5 billion USD per year of which 1.2 billion USD is spent for communal waste water treatment facilities (including 3rd stage for nutrient removal). From 1993 to 1999 Austria invested about 9 billion ATS (780 million USD) per year for municipal waste water treatment including nutrient removal facilities.

Concerning the ongoing projects indicated in the Nutrient Reduction Plan, further investments of 234 million USD for Germany and 264 million USD for Austria are foreseen for the period from 2000 to 2005.

Austria and Germany together hold around 17% of territory and 21 % of the population of the Danube watershed. In terms of water flow of the Danube to the Black Sea Austria alone contributes to more than 20%. Based on the DWQM, Germany and Austria contribute to nutrient load reaching the Black Sea by 26.2% of Nitrogen and 15.3% of Phosphorus. Apart from the waste water purification programme, Austria is implementing a large programme for environmentally friendly agriculture named ÖPUL. Essentially it is aiming at extensive agricultural practices and reduction of nutrients load. Since 1995 this programme is running comprising around 90% of Austria's agricultural area and backed yearly by financial means in the order of 9 Billion ATS (650 million €). In spite of these efforts in the agricultural sector neither country has yet met the European emission standards (EU Nitrate Directive). However, one must bear in mind that changes in agricultural practices and land management will – due to delay in runoff - take five or more years before producing obvious effects in terms of nutrient reduction.

(ii) Czech Republic, Slovakia, Hungary, Slovenia and Croatia

These countries are located in the central part of the DRB. They have to a great extent overcome the former central state planning systems and have reached medium economic development levels reflected in their annual GDP of between USD 4,000 and USD 9,000 per capita. The economic transition process has caused significant reduction of industrial and agricultural production, thus temporarily reducing production-related pollution loads. This has created an opportunity to establish and integrate environmental objectives into industrial and agricultural policies and legislation in line with EU guidelines. All these countries are interested in joining the EU as soon as possible; Hungary, the Czech Republic and Slovenia are obviously the priority candidates. In the process of fulfilling the basic accession criteria, these countries as well as Slovakia will receive special financial and technical support from the European Commission (ISPA funds) to help them develop an infrastructure and meet environmental standards. The present Regional Project shall in its two Phases assist these countries to develop adequate policies and legislation for emission control with particular attention to nutrient reduction.

(iii) FR Yugoslavia and Bosnia and Herzegovina

These two countries, also located in the central Danube River Basin, are still in the critical phase, struggling to overcome the aftermath of the war. In the forthcoming period, their main task will be to re-organize their political, legal, administrative and socio-economic structures in order to comply with the requirements of the commencing process of economic liberalization and privatization as well as of international normalization. With annual per-capita GDP of USD 1,100 (BiH) and USD 1,500 (Yugoslavia), both countries are presently well below their pre-war levels.

(iv) Romania, Bulgaria, Moldova and Ukraine

These countries are located in the lower Danube River Basin. Romania, Bulgaria and Ukraine are also Black Sea countries and contribute substantially to the degradation of the Black Sea ecosystems. These countries are both polluters and victims of pollution to the Black Sea. All four countries face serious economic problems and are in a difficult phase of political and social transition. Whereas environmental concerns are of high importance, the financial means for investments are very limited. Particularly critical is also the fact, that their legal and administrative framework is still to a certain extent determined by the former central planning structures and therefore not yet in compliance with the requirements of the commencing process of economic liberalization and privatization. This is particularly true for the two former Soviet Union countries Moldova and Ukraine and to a lesser extent for the two potential EU-Accession countries Bulgaria and Romania. The lower economic status of the four downstream Danube River countries is clearly documented by per capita GDP between USD 900 and 1,500 per annum.

It is obvious from this broad description of the DRB countries that there is a clear distinction in terms of political, administrative and economic capability from the wealthy countries in the upper DRB, the mid-income countries in the central DRB, down to the poorer countries in the lower part of the DRB.

1.4 Accidental Pollution in the Danube and the Tisza and Siret Sub-River Basins

Since the DRPC entered into force, first concerns about contamination of ground and surface waters were raised during the NATO intervention against Yugoslavia from March to June 1999. The bombing and destruction of petrochemical plants and refineries led to contamination of channels and tributaries emptying into the Danube River. Sampling and analysis have shown high levels of contamination with heavy metals, in particular mercury, oil and petroleum products, volatile organic substances, PCBs, PAHs, etc. However, one must bear in mind that the accumulation of toxic substances is not the effect of the recent bombing of industrial installations only but also the result of years of inefficient treatment and careless handling of wastes from industrial and mining activities.

In the beginning of the year 2000 two accidents occurred with disastrous environmental effects in the upper Tisza Sub-River Basin where mining activities are carried out. Waste water containing cyanide and heavy metals was accidentally discharged into receiving waters. Ecosystems were affected and large fish kills of several hundred tons were reported. Drinking water supply for urban centers at the riverbanks and fishing activities had to be suspended. Important economic losses were reported in tourism and fisheries. The effects of the cyanide wave were reported over a stretch of 900 to 1000 km from the Tisza River to the Danube and dangerous cyanide concentrations were still measured even downstream of the Iron Gate dam.

In January 2001 a new pollution accident was reported from the upper Siret Sub-River Basin where waste water containing cyanide was leaking from a chemical factory. This accident caused tons of killed fish and transboundary pollution and dozens of people, in particular children, got hospitalized from eating contaminated fish.

There are actually serious concerns over the possible accumulation of toxic substances in the sediments and biota of the Iron Gate reservoirs. Preventive management programmes have to be developed and implemented in order to gradually clean up the sediments and assure the rehabilitation of ecosystems in the central and lower part of the Danube River basin.

1.5 Institutional and Legal Mechanisms and Investment Programmes for Nutrient Reduction in the Danube Countries

In the frame of the present project preparation (PDF-Block B activities), specific subjects concerning the institutional, legal and policy frame as well as national investment programmes for nutrient reduction have been studied and analyzed.

(i) Inter –ministerial coordination mechanisms

In the frame of the PDF-Block B activities, inter-ministerial mechanism at the national level and concepts of cooperation for pollution reduction, in particular nutrient reduction, have been analyzed. The diversity of views and proposals for the implementation of EU Directives in the frame of the accession process create an encouraging environment for the countries to create new inter-ministerial mechanism or improve the existing structures with nutrient reduction and control responsibilities. Based on the finding of the national contributions, the Danube countries can be classified in three groups.

The first group is made up of EU member countries, Germany and Austria, in which the existing national inter-ministerial structures allow an effective performance of nutrient reduction and control tasks. In Germany, the inter-ministerial cooperation takes place on both federal and state levels, covering legislative procedures, implementation of EU-directives, and development of minimum requirements for point sources for municipalities as well as for industrial branches. In Austria, the recently restructured Ministry of Agriculture, Forestry, Environment and Water Management provides the necessary structure to adequately implement nutrient control and reduction measures.

The second group, made up of the Czech Republic, Hungary, Romania and Bulgaria includes countries where specific mechanisms or inter-ministerial structures for nutrient reduction do not yet exist. However, there are several relevant national inter-ministerial bodies with responsibilities for water pollution abatement and environmental protection. Most of these structures also deal with diffuse sources of pollution, the implementation of pollution reduction measures or approval of new investments in the water sector.

Finally, in the remaining Danube countries, the nutrient reduction and control issues do not yet represent a high priority for the policy makers.

All countries have developed proposals for the improvement/creation of inter-ministerial mechanisms capable of responding to nutrient reduction concerns. These proposals refer to both legal and institutional frameworks and include:

- (i) the implementation of nutrient-related legislation based on EU Directives and ratified International Conventions,
- (ii) the development of instruments for diffuse pollution characterization and control,
- (iii) the elaboration of rules for good farming practices and good practices in drinking water protection zones,
- (iv) the application of an integrated approach to the management of water resources on the river basin level.

The Danube countries believe that cooperation between governments, local communities and Non-Governmental Organizations (NGOs) in relation to the nutrient reduction is very important. Nutrient reduction issues are included directly or indirectly in the mandate and the responsibilities of the local authorities, farm enterprises, industrial plants and environmental NGOs. In the frame of river basin organizations the majority of the countries sets good examples of cooperation between the government, inter-ministerial bodies, local communities and NGOs.

The activities of the PDF-Block B investigation have raised awareness and provided important legitimacy to the concept of inter-ministerial mechanism for nutrient reduction and helped move it into the mainstream of policy debate for its implementation. The forthcoming Danube Regional Project with its two Phases will reinforce national initiatives and contribute towards the setting up of adequate nutrient reduction mechanisms at the national and regional levels.

(ii) Policies and legislation relating to nutrient control and reduction

After a critical period of transition, all DRB countries have in the meantime developed a comprehensive hierarchic system of short, medium and long-term environmental policy objectives, strategies and principles which usually reflect the key country-specific environmental problems and the sector priorities on national and regional levels.

Despite the diversity of problems, interests and priorities across the DRB, the Danube countries share certain values and principles relating to the environment, conservation of natural resources and nutrient control and reduction. The most essential and commonly accepted principles are:

- the precautionary principle;
- best available technology (BAT) - best environmental practice (BEP);
- control of pollution at the source;
- the "polluter pays" principle and the related "user pays" principle;
- the principle of integrated approach (e.g. River Basin Management approach);
- the principle of shared responsibilities, respectively the principle of subsidiarity;
- the implementation of EU Directive 76/464/EEC on pollution caused by certain dangerous substances.

None of the DRB countries currently has an explicitly formulated nutrient reduction programme. Measures and activities with relevance to nutrient reduction are usually sub-components of or are substantially incorporated in other programmes.

While Germany and Austria have legislation in compliance with “highest environmental standards” on nutrients (e.g. EU Nitrate Directive), they have not yet fully implemented / enforced these legislation. The adequacy of the legal framework for sound environmental management of water resources of the other countries has to be viewed against the political, economic, administrative and social changes that have taken place in the particular DRB countries during the previous years of transition.

Thus, the relevant legislation is in most DRB countries currently undergoing substantial reform and modernization. Given the complexity of the task, the reform can be expected to take several years before the relevant legislation has reached an acceptable level of compliance with the international requirements.

Except for the two EC member states, Germany and Austria, all other DRB countries consider the harmonization of national environment and water-related legislation with EU legislation as the most essential prerequisite for long-term sustainable nutrient control and reduction in their countries. In the Czech Republic, Hungary and Bulgaria, this harmonization is incorporated in an ongoing programme and considered as a short-term task.

In Romania, Slovakia and Slovenia, the harmonization of relevant national laws with EU legislation or standards is expected to be achieved in the short, respectively medium term. For the final implementation of the Urban Waste Water Treatment Directive, an adjustment period of approximately 10 to 20 years is considered to be necessary.

In other countries - Moldova, Ukraine and the war-impacted countries Croatia, Bosnia-Herzegovina and Yugoslavia - the status of the water sector legislation is still unsatisfactory.

From the point of view of nutrients, the most essential issue is the substantial transposition of:

- the new Council Directive 2000/60 of 22 December 2000 concerning water policy which aims at a good status for all surface and groundwater within (often transboundary) river basin districts (RBD). By December 2015, river basin management plans must be prepared for each RBD; already by December 2012, all polluting discharges must be controlled under a combined approach of best available techniques and emission limit values, as well as by best environmental practice for diffuse pollution;
- the Council Directive 91/271/EEC of May 1991 concerning urban waste-water treatment;
- the Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources.

Regarding the particular issue of control, respectively the out-phasing of phosphate-containing detergents, the current situation in the particular DRB countries indicates that there is a substantial potential for phosphorus reduction in most DRB countries, which should be followed up on.

(iii) Nutrient reduction programmes 2000 – 2005 and related investments

Within the frame of further development of Five Nutrient Reduction Action Plan, both structural/investment and legal/policy reforms projects that address nutrient reduction will be introduced.

(a) Point Source Projects and anticipated nutrient reduction

Within the elaboration of the PDF-B project all 13 DRB countries have provided a draft national lists of priority projects that are supposed to be ready for implementation in the coming 5-year period and can be considered as a reasonable basis for the elaboration of comprehensive Nutrient Reduction Action Plans as part of the ICPDR Joint Action Programme.

According to the available data, the total investment required for the 245 priority point source projects for all 13 DRB countries amounts to about 4,404 million €.

The structure of the identified investment requirements by sector is as follows (2001 – 2005):

	Municipal	Industrial	Agricultural	Wetlands	Total
No of Projects	157	44	21	23	245
Million €	3,702	267	113	323	4,404
(%)-Structure	84%	6%	3%	7%	100

The structure of the identified investment requirements by countries is as follows:

	GER	A	CZ	SK	HUN	SLO	CRO	B&H	YUG	BUL	RO	MOL	UA	TOT
No of Proj.	11	4	12	20	24	24	11	12	40	21	25	31	10	245
Mill. €	231	264	147	118	687	384	433	176	785	125	493	493	67	4,404
(%)	5	6	3	3	16	9	10	4	18	3	11	11	1	100

The anticipated composition of the funding of the identified priority projects across the DRB countries is as follows:

Funding component	Million €	(%) – Structure
National funding contribution	1,716	39 (%)
International loans:	1,163	26 (%)
International grants:	663	15 (%)
Not secured funding components:	862	20 (%)
Total:	4,404	100 (%)

According to the available data provided by the national reports, total pollution reduction as a result of the implementation of the proposed priority point source projects including waste water from urban areas, which are not connected to WWTP, is anticipated to be in the following ranges:

	Municipal	Industrial	Agricultural	Wetlands	Total
No of Projects	157	44	21	23	245
N (t/y)	33 300	3 400	6 700	15 100	58 500
P (t/y)	5 500	3 700	1 100	1 800	12 100
BOD (t/y)	221 000	39 700	9 500	5 900	276 100
COD (t/y)	398 900	78 700	15 000	32 400	525 000

(b) Nutrient reduction from agricultural non point sources of pollution

Based on the available data, the assessment of the anticipated nutrients reduction from agricultural non point sources of pollution shows values ranging between 10 and 25 % for nitrogen and between 3 and 25 % for phosphorus.

To ensure significant nutrient loads reduction from diffuse sources of pollution, the Danube countries have identified measures that primarily address:

- (i) policy and legislation-related actions: the improvement of national policies and legislation regarding the utilization of fertilizers and livestock waste and approximation of national legislation to relevant EU legislation and standards;
- (ii) institutional strengthening and capacity building: the elaboration and enforcement of guidance on the application of the agro-environmental schemes and best environmental practice;
- (iii) raising public awareness and strengthening public participation in nutrient reduction initiatives: the development of pilot projects for the implementation of alternative methods.

The estimates of the nitrogen and phosphorus reduction for point sources and non point sources as presented in the national contributions are summarized below:

Country	Nutrient loads (DWQM 1994/98)		Anticipated national emission reductions				Expected national load reduction	
			Point Sources		Non Point Sources*			
	N (t/y)	P (t/y)	N (%)	P (%)	N (%)	P (%)	N (t/y)	P (t/y)
Germany	68,000	3,700	6.0	2.0	10.0	3.0	10,891	185
Austria	77,000	3,800	5.1	10.6	10.0	3.0	11,650	518
Czech Republic	15,000	1,100	7.3	5.6	10.0	3.0	2,591	95
Slovakia	30,000	1,700	8.6	8.6	15.0	10.0	7,074	318
Hungary	31,000	3,800	21.6	40.1	15.0	10.0	11,358	1,902
Slovenia	20,000	1,300	26.2	62.6	15.0	10.0	8,233	944
Croatia	23,000	2,200	6.6	10.9	15.0	10.0	4,959	459
Bosnia-Herzegovina	36,000	2,200	13.1	38.8	10.0	10.0	8,300	1,073
Yugoslavia	72,000	7,000	9.4	69.5	10.0	10.0	13,993	5,563
Bulgaria	23,000	4,000	11.7	15.0	10.0	10.0	4,983	999
Romania	121,000	12,700	9.8	12.5	10.0	10.0	23,960	2,861
Moldova	8,000	1,400	86.3	64.6	5.0	5.0	7,298	975
Ukraine	28,000	4,000	1.7	1.6	10.0	5.0	3,286	265
Total	552,000	48,900	10.3	23.8	10.9	8.2	118,576	16,156

* Percentage for expected reduction of nutrient emissions from non-point sources for groups of countries has been estimated, based on available information and data for expected emission reduction following the implementation of new policies and legislation in line with EU Directives.

The results in the table indicate that with the implementation of structural (projects) and non-structural measures (policies and legislation), the total annual nutrient reduction will be about 119,000 tons for nitrogen (22%) and 16,000 tons for phosphorus (33%). It can be further assumed that about half of the nitrogen reduction will come from the rehabilitation of point sources (waste water treatment) and the other part from nutrient reduction from diffuse sources, in particular from change of agricultural practices.

The GEF Regional Project with its two Phases will provide the necessary support to the ICPDR and the participating countries to realize these goals and to contribute essentially to achieving the goal of holding the Nitrogen and Phosphorus loads to the Black Sea at the 1997 level respectively further reducing them to meet the objectives of the Memorandum of Understanding between the ICPDR and ICPBS.

1.6 Mechanisms for Regional Cooperation for the Protection of Water and Ecological Resources in the Danube River Basin

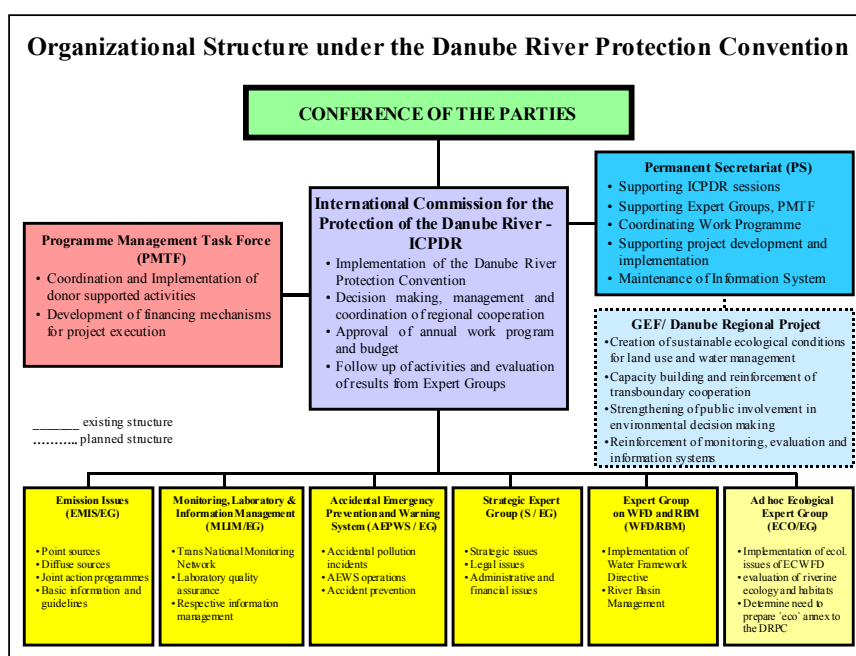
(i) The Danube River Protection Convention

The Danube River Protection Convention is a legally binding instrument, which provides a substantial framework and a legal basis for cooperation between the contracting parties, including enforcement. The main objective is the protection and sustainable use of ground and surface waters and ecological resources, directed at basin-wide and sub-basin-wide cooperation with transboundary relevance. Joint activities and actions are focused on coordination and enhancement of policies and strategies, while the implementation of measures lies mainly with the executive tools at the national level. The Strategic Action Plan provides guidance concerning policies and strategies in developing and supporting the implementation measures for pollution reduction and sustainable management of water resources enhancing the enforcement of the Danube River Protection Convention.

Eleven of the 13 DRB countries eligible to join the Convention have signed with the European Commission the Danube River Protection Convention (DRPC), which came into force in October 1998, and most have ratified it.

(ii) The International Commission for the Protection of the Danube River (ICPDR)

Recognizing individually and responding in common to the obligations of the DRPC, the Danube countries have established the International Commission for the Protection of the Danube River to strengthen regional cooperation. It is the institutional frame not only for pollution control and the protection of water bodies but it also sets a common platform for sustainable use of ecological resources and coherent and integrated river basin management. The Commission has created several Expert Groups to strengthen the proactive participation of all Contracting Parties and associated countries in the design and implementation of joint measures for pollution reduction, including nutrients, and water management.



1.7 Cooperation between the ICPDR and the International Commission for the Protection of the Black Sea (ICPBS)

(i) Findings of the Joint Ad-hoc Technical Working Group of the ICPDR and the ICPBS

In 1998, the ICPDR and the ICPBS established a joint Working Group, which analyzed the causes and the effects of eutrophication in the Black Sea. In its findings, the Working Group indicated that the loads entering the Black Sea from the Danube had fallen in recent years due to the collapse of the economy of many transition countries formerly attached to the Soviet Block, the measures undertaken to reduce nutrient discharges in the upper Danube countries, in particular Germany and Austria, and a decline in the use of phosphate in detergent.

The Working Group concluded that in spite of the evidence of recovery in the Black Sea ecosystems, there were still concerns that the nutrient discharges to the Black Sea – in line with the expected economic growth – were likely to rise again unless action was taken to implement nutrient discharge control measures as part of economic development strategies. The Working Group went on to define the possible objectives and strategies, which are presently included in the Memorandum of Understanding between the ICPDR and the ICPBS, as follows:

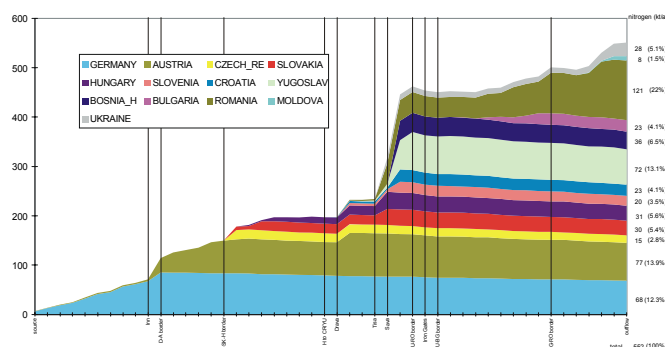
- ⇒ the long-term goal is defined as a recovery of the Black Sea ecosystems to conditions similar to those in 1960;
- ⇒ as a mid-term goal, measures should be taken to prevent discharges of nutrients and hazardous substances from exceeding the levels of 1997;
- ⇒ inputs of nutrients and hazardous substances should be assessed, monitoring and sampling procedures should be determined, and the results should be reported.

(ii) Analysis of Point Sources and Non-Point Sources of Pollution with Particular Attention to Nutrient Transport to the Black Sea

In the frame of the Pollution Reduction Programme, over 500 hot spots were identified for the municipal, industrial and agricultural sectors. The geographical distribution of hot spots in the Danube River Basin indicates a clear concentration of municipal and agricultural hot spots in the upper Drava and Sava Sub-river Basins, in the Lower Tisza and around Belgrade and in the central part of Bosnia-Herzegovina. In the Carpathian Mountains of the upper Tisza and Prut Sub-river Basins, important mining and industrial hot spots have been identified, from which recent accidents - the cyanide spill of Baia Mare and the sludge containing heavy metals from Baia Borsa - have been reported. (Annex 7 – Maps: Distribution of Hot Spots in the Danube Sub-River Basins).

Applying the Danube Water Quality Model (DWQM), the total nutrient transport from point and non-point sources, to the Black Sea was analyzed, indicating a total of 552 kilotons of nitrogen and 48.9 kilotons of phosphorus reaching annually the Black Sea. Studies undertaken in the frame of the Danube Environmental Programme suggest that about half of the nutrient discharged internally in the basin come from agriculture (diffuse sources of pollution), slightly more than one quarter from domestic sources, an additional larger share comes from industry and the remainder from “background” sources.

Annual Nitrogen Load in the Danube (in kt/y), by countries of origin, with a high estimate for the in stream denitrification (= removal rate)



2 Project Objectives

The long-term development objective of the proposed Regional Project is to contribute to sustainable human development in the DRB through reinforcing the capacities of the participating countries in developing effective mechanisms for regional cooperation and coordination in order to ensure protection of international waters, sustainable management of natural resources and biodiversity.

In this context, the proposed GEF Regional Project should support the ICPDR, its structures and the participating countries in order to ensure an integrated and coherent implementation of the Strategic Action Plan 1994 (SAP 1994), the Common Platform and the forthcoming JAP and the related investment programmes in line with the objectives of the DRPC.

The overall objective of the Danube Regional Project is to complement the activities of the ICPDR required to provide a regional approach and global significance to the development of national policies and legislation and the definition of priority actions for nutrient reduction and pollution control with particular attention to achieving sustainable transboundary ecological effects within the DRB and the Black Sea area.

The specific objective of Phase 1, July 2001 – June 2003, is to prepare and initiate basin-wide capacity-building activities, which will be consolidated in the second phase of the Project. This second Phase will be implemented from July 2003 – June 2006, building up on the results archived in the first Phase. During the first Phase, altogether 20 project components with 80 activities will be carried out and thus establishing a solid base for the implementation of Phase 2 of the GEF support to the ICPDR.

Further, the Danube Regional Project, in its Phases 1 and 2, shall facilitate implementation of the Danube River Protection Convention in providing a framework for coordination, dissemination and replication of successful demonstration that will be developed through investment projects (World Bank-GEF Partnership Investment Facility for Nutrient Reduction, EBRD, EU programmes for accession countries etc.).

Taking into account the basic orientations of the Danube/Black Sea Basin Strategic Partnership, the following immediate objectives can be designed to respond to the overall development objective:

(1) OBJECTIVE : Creation of sustainable ecological conditions for land use and water management

Output : Concepts for nutrient reduction policies and legal instruments and measures for compliance are developed for all Danube River Basin countries with particular attention to the EU Water Framework Directive, integrated river basin management, best agricultural practices, appropriate land use and wetlands management and economic instruments.

Approach : Supporting the ICPDR and the DRB countries in developing of appropriate policies and legal instruments for river basin management, appropriate land use, improved water management and water quality control with particular attention to toxic substances and nutrient reduction (e.g. agricultural, industrial, and municipal policy and legislative reforms, wetlands management) and in developing mechanisms for exacting compliance with policies and legislation.

Assuring policy coherence to the guidelines of the Global Programme of Action on Control of Land Based Sources of Pollution, with particular emphasis on the strategic goals regarding mitigation of transboundary effects and rehabilitation of the Black Sea.

(2) OBJECTIVE : Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the DRB

Output : Institutional and organizational mechanisms for transboundary cooperation in pollution control and nutrient reduction are put in place and concepts for improved water quality monitoring, emission control, emergency warning and accidental prevention are developed.

Approach : Conceptualizing and putting in place “Inter-ministerial Committees” at the national level, involving all technical, administrative and financial departments to assure adequate coordination and implementation of policies, legislation and projects for nutrient reduction and pollution control. Supporting the ICPDR and its Expert Groups to improve their institutional, administrative and technical capacities to assure basin wide harmonization of water quality regulatory standards including specific provisions for nutrient reduction; to further develop specific regional information system and mechanisms for transboundary pollution monitoring and evaluation considering EU regulations (WFD) and GEF IW M&E indicators (process, stress reduction, environmental status).

Organizing workshops and training courses on institutional, administrative, technological and economic issues for individuals and participants from ministries, public authorities and private institutions with responsibilities related to the use, control and impacts of nutrients in the DRB, respectively their effects on the Black Sea.

(3) OBJECTIVE : Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems

Output : The DEF Secretariat is fully operational and supports national NGOs. Community based projects for nutrient reduction (Small Grants Programme) and awareness campaigns are prepared and information material is regularly published. Consequently public concern and response to ecological issues has increased.

Approach : Supporting NGOs in professional, institutional, administrative and funding issues to boost their capacities for active participation in transboundary pollution control with particular attention to nutrients and certain toxic substances. In this context, NGO activities and public awareness shall be reinforced through the setting up of a Small Grants Programme providing financial support for community based nutrient reduction projects. Concepts for special campaigns for awareness raising and information of the public shall be developed and cooperation with mass media shall be reinforced.

(4) OBJECTIVE : Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances

Output : A Danube Basin wide system for monitoring and evaluation of environmental impacts is prepared and indicators are identified for process, stress reduction and environmental status in line with EU and international reporting requirements. Economic instruments for nutrient reduction (nutrient trading possibilities) are analyzed and findings are published.

Approach : Supporting the development and upgrading of monitoring and information systems, which are of significant importance for transboundary cooperation in water quality and water management and of common interest for the Danube and the Black Sea countries. Particular attention will be given to the development of indicators (process, stress reduction and environmental status indicators) to monitor progress of project implementation. For this purpose special methodologies will be developed for assessment nutrient removal capacities of wetlands. Also economic mechanisms will be analyzed to encourage investments in nutrient reduction measures.

3 Project description

The compilation of immediate objectives indicates the broad spectrum of 20 project components and 80 activities to be dealt with in the framework of the proposed Phase 1 of the Danube Regional Project in order to fulfill its role as an integral part of the proposed Danube/Black Sea Basin Strategic Partnership.

In line with the immediate objectives, the particular 20 project components of the proposed Phase 1 of the Danube Regional Project can be grouped as follows:

1. Creation of sustainable ecological conditions for land use and water management;
2. Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin;
3. Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems;
4. Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances.

3.1 Creation of sustainable ecological conditions for land use and water management

In most central and downstream DRB countries, the development of water-related policies and legal instruments are still in the phase of preparation and it is obvious that there are significant deficiencies in the existing policy framework. Most of these countries are in the EU accession process and have to adjust their legal frame to meet the EU directives and regulations and assure compliance. For issues that are of common interest for the DRB countries and of special importance for water quality and water resource management, particularly related to nutrients, eight project components have been identified to be carried out in the frame of the present Regional Project.

(i) Development of policy guidelines for river basin and water resources management

Considering the DRPC's mandate to assure sustainable water management in the DRB and taking into account the central role of the river basin management in implementing the new EU Water Framework Directive, there is a substantial need to facilitate the development of river basin management plans in the Danube River Basin and in its sub-basin areas. These river basin management plans will have to deal with nutrient reduction from point- and non-point sources.

To assure efficient implementation of the EU Water Framework Directive and a coherent approach to River Basin Management, the ICPDR has set up a specialized Expert Group to develop guidelines for the elaboration of the River Basin Management Plans, their implementation and the development of institutional and legal mechanisms. Two workshops have been organized in the frame of the EC Phare assistance programme and case study material had been prepared. These elements will be integrated in the proposed activities of the GEF-DRP. During the Phase 1 of the Danube Project concepts and analytical material will be prepared, which later during Phase 2 of the Project will be implemented in form of national contributions, pilot projects and workshops on river basin management and implementation of the EU WFD.

The activities of the EG shall be supported by international expertise in order to develop standardized methodologies and guidelines for sub-river basin management plans and a methodology for the aggregation of the sub-river basin management plans to a basin wide management concept. This should take into consideration EU-WFD and GEF IW strategies to develop guidelines for particular sub-river basins to reinforce transboundary cooperation.

The main activities to be supported and carried out in Phase 1 in cooperation with the RBM Expert Group can be summarized as follows:

- Identifying River Basin District (RBD), in particular the assignment of coastal waters and groundwater bodies;
- Developing common approaches and methodologies for pressure and impact analysis;
- Implementing the common approaches and methodologies for pressure and impact analysis at the national level *(to be followed up in Phase 2)*;
- Applying the EU Guidelines for economic analysis and arrive at the overall economic analysis for the Danube River Basin *(to be followed up in Phase 2)*;
- Developing RBM tools (mapping, GIS, remote sensing, etc.) and related data management, including the arriving at the typology of surface waters and the relevant reference conditions *(to be followed up in Phase 2)*;
- Identifying pilot river basins and apply common approaches, methodologies, standards and guidelines, in observing also the link to the Working Groups of the European Commission *(to be followed up in Phase 2)*;
- Develop concepts and programmes for workshops and training courses in order to produce the River Basin Management Plan and to strengthen basin-wide cooperation *(to be followed up in Phase 2)*.

(ii) Reduction of nutrients and other harmful substances from agricultural point and non-point sources through agricultural policy changes

As indicated in chapter 1.7 it is assumed that about half of nutrients discharged internally in the Danube Basin to the fine web of the river network come from agriculture. The project will support a series of measures to operationalize actions for pollution reduction from point and non-point source. In the Phase 1 of the Project, a first analysis should be based on a revised and prioritized “hot spot” inventory of point and non-point sources of pollution and take into account the findings and recommendations of the field-based demonstration programmes conducted in Eastern European countries with the support of the European Union and GEF. The project will update the information on the use of agrochemicals and identify specific policy and legal measures to assist the participating countries in meeting their obligations to reduce agricultural point and non-point source pollution. For EU accession countries, specific programmes will be developed that will assist them in meeting their obligations under the EU Environment and Water Framework Directives, as well as the requirements of the important Nitrate Directive (91/676/EEC). In Phase 2 of the Project policy and legal recommendations will be worked out for DRB governments to reinforce the introduction of “best agricultural practice” and to optimize the use of agrochemicals

The main focus of this assistance is to identify for each DRB country the main administrative, institutional and funding deficiencies and to develop priority reform measures for policies which are expected to best support the integration of environmental concerns into farm management (“best agricultural practices”), including improvements in the handling of manure and sludge from livestock operations, minimization of chemical fertilizers and pesticides, promotion of improved tillage methods, management of restored wetlands and buffer zones as well as farmer education and outreach activities.

For this purpose, the following actions should be considered in Phase 1:

- Up-dating the basin-wide inventory on priority agricultural point and non-point sources of pollution “hot spots” in line with EMIS emission inventory;
- Reviewing the relevant legislation, existing policy programmes and actual state of enforcement in the DRB with respect to promotion and application of best agricultural practices *(to be followed up in Phase 2)*;
- Reviewing the inventory on important agrochemicals (nutrients etc.) in terms of quantities of utilization, their misuse in application, their environmental impacts and potential for reduction *(to be followed up in Phase 2)*;

- Identifying the main institutional, administrative and funding deficiencies (including complementary measures) to reduce pollutants;
- Introducing or, where existing, further developing concepts for the application of best agricultural practices in all DRB countries, by taking into account country-specific traditional, social and economic issues, and the ECE recommendations (*to be followed up in Phase 2*).

(iii) Development of pilot projects on reduction of nutrients and other harmful substances from agricultural point and non-point sources

This pilot project component has to be considered as complementary to the above-described policy component, which also includes the updating of the list of point and non-point sources of pollution with particular attention to priority agricultural “hot spots”. It is particularly focusing on adequate handling of manure and on the practical introduction of organic farming methods. Agricultural point sources (e.g. large pig farms), including inappropriate handling of manure, are estimated to supply 2.5% and 6.8 %, respectively, of the nitrogen and phosphorus reaching the Danube River Basin.

The initial project review of existing national programmes promoting best agricultural practice should be based on and take into account the findings and recommendations of the field-based demonstration programmes conducted in Eastern European countries with the support of the European Union and GEF.

Specific needs to improve agricultural practices and relevant sites for demonstration activities on manure handling and should be identified in practical concepts for each DRB country. Focus countries for pilot projects (training and institutional development of best agricultural practice) should be Ukraine, Moldova, Romania, Bulgaria, Yugoslavia and Bosnia & Herzegovina. The implementation of the prioritized pilot projects will be carried out in Phase 2.

The following steps should lead to an efficient implementation of this project component in Phase 1:

- Analyzing existing programmes and pilot projects promoting best agricultural practice (especially regarding animal farming and manure handling, as well as organic farming) in DRB countries, and assess nutrient reduction capacities;
- Developing practical concepts for the introduction respectively promotion of appropriate agricultural practices and manure handling in the central and downstream DRB countries by taking into account national demand and international markets and ECE recommendations;
- Preparing and implementing for the central and lower DRB countries typical pilot projects (especially in UA, MD, RO, BG, YU and B-H) to train and support farmers in the application of best agricultural practice (*to be followed up in Phase 2*).

(iv) Policy development for wetlands rehabilitation under the aspect of appropriate land use

In the case of conflicting land use, priorities were in the past usually set on extension and intensification of human settlement and economic activities, with the consequence that ecologically sensitive areas/wetlands were steadily impacted in their function or completely disappeared.

The present project component shall address questions in relation to typical situations of inappropriate land use resulting from municipal settlement, agricultural activities, hydraulic structures and their impact on ecologically sensitive areas and wetlands and effects of transboundary pollution with particular attention to nutrients and toxic substances. Standardized concepts shall be developed for the rehabilitation of selected sensitive areas/wetlands and for an integrated land use especially around these wetlands. In Phase 2 of the Project, these concepts shall be implemented and required policy, legal and institutional reforms shall be applied for integrated land use as models for the DRB.

The main tasks of the proposed activity in Phase 1 can be summarized as follows:

- Define methodology for integrated land use assessment around wetlands (called "wetland areas");
- Carry out case studies for selected wetland areas and assess inappropriate land use (e.g. forestry, settlements and development zones, agriculture and hydraulic structures);
- Develop alternative concepts and strategies for achieving integrated land use and management in chosen wetland areas, including required actions and measures (regulatory and legal issues, economic fines and incentives, compensation payments, etc.)

(v) Industrial reform and development of policies and legislation for application of BAT (best available techniques including cleaner technologies) towards reduction of nutrients (N and P) and dangerous substances

Industrial reform is one of the most urgent and most critical issues in most central and lower DRB countries and can certainly not be efficiently initiated by an environmental programme of this scale. Considering that in transition countries the industrial production is actually very low, it is not surprising, that industry generates only respectively 5 and 8 % of nitrogen and phosphorus that enter the Danube River.

Taking into account the expected revitalization of industries, it is necessary to focus on industrial policies and on a review of legislation in order to ensure that environmental considerations are adequately taken into account and that mechanisms for compliance are put in place.

The project should also address the problem of industrial “hot spots” in relation to Significant Impact Areas (SIA) as identified in the Transboundary Analysis, to determine transboundary nutrients and toxics pollution from particular industries and identify possible solutions (BAT - best available techniques including cleaner technologies, treatment process, etc.) to reduce the emissions of toxic substances and nutrients in particular. While Phase 1 of the Project focuses on the identification of gaps and opportunities for reforms, Phase 2 will later develop pilot applications of BAT concepts in selected countries.

The subject of this component is closely related to the work of the EMIS/EG, therefore the project component should closely cooperate with the envisaged UNIDO-TEST MSP to ensure that interventions at the policy/legislative and at the technical (demonstration) levels are complementary. In this context, the execution of the project component through an IAA or sub-contract with UNIDO should be considered.

The following steps should lead in Phase 1 to an efficient implementation of this project component:

- Up-dating the basin-wide inventory on industrial and mining “hot spots” (EMIS inventory) taking into account emissions of nutrient and toxic substances;
- Reviewing data and information on the actual status of industrial production techniques involving nutrients (N and P) and dangerous substances in the DRB countries;
- Reviewing policies and relevant existing and future legislation for industrial pollution control and identification enforcement mechanisms on a country level *(to be followed up in Phase 2)*;
- Comparing and identifying gaps between relevant EU and national legislation *(to be followed up in Phase 2)*;
- Developing necessary complementing policy and legal measures for the introduction of BAT taking into account regulatory and legal issues, awareness raising, financial fines and incentives, etc *(to be followed up in Phase 2)*;
- Identifying, in relation to Significant Impact Areas, industrial “hot spots” having a significant impact on water resources and water quality *(to be followed up in Phase 2)*;
- Organizing workshops with participants from relevant ministries, industrial managers, banking institutions, introducing information on best available technologies, financial support, etc. *(to be followed up in Phase 2)*.

(vi) Policy reform and legislation measures for the development of cost-covering concepts for water and waste water tariffs, focusing on nutrient reduction and control of dangerous substances

The funding of water sector-related investments and the cost coverage for the operation of WWTP in the DRB countries largely depends on economically and socially acceptable water and waste water tariffs. An assessment of water and waste water tariffs is currently being conducted with financial support from the Austrian Environmental GEF Trust Fund. Based on the results of this study, which will be available in June 2001, policy and legislative measures shall be developed for interested DRB countries to assure the introduction of economically and socially acceptable tariffs. This project component shall help to improve the investment possibilities for reduction of nutrients and toxic substances. Phase 1 of the Project will focus on developing country-specific concepts for tariff reforms while the Phase 2 will analyze and finalize these results in cooperation with all national stakeholders.

The implementation of new policy and legislative measures can make a substantial contribution towards increasing internal funds and releasing public budgets and can thus facilitate the provision of baseline contributions for new investment projects in transboundary nutrient reduction and pollution control.

Based on the results of the assessment of Water and Waste Water Tariffs, the following actions shall be considered in Phase 1:

- Analyzing significant differences /deficiencies regarding water sector relevant legislation, level of tariffs, status of metering, level of illegal and unaccounted for consumptions, collection rate, etc.; assessing the potential for the increase of revenues of the companies operating in the water and waste water sector;
- Developing appropriate concepts for tariff reforms aimed at cost covering models in line with the EU WFD (on a country level).

(vii) Implementation of effective systems of water pollution charges, fines and incentives, focusing on nutrients and dangerous substances

Most DRB countries are not putting into operation any effective system of fines for water pollution or respective incentives as applied in industrialized Western European countries. The basic idea is, therefore, to assist the interested DRB countries to develop an effective system of fines and incentives to promote rational utilization of water resources and to prevent or reduce effects of environmental pollution, specifically nutrients and certain toxics. Within the broad framework of fines and incentives particular attention should be given on discharges of nutrients and toxic pollutants with significant transboundary effects. Phase 1 of the Project will produce a DRB-wide assessment of presently existing tools and institutional mechanisms, while Phase 2 will prepare and suggest guidelines for the most appropriate charges, fines and incentives.

The main tasks of the proposed component in Phase 1 can be summarized as follows:

- Analyzing the present systems of water pollution charges, fines and incentives in the DRB countries and identifying significant deficiencies (types and basis of charges, fines and incentives, effectiveness, collection procedures, exemptions, etc);
- Identifying the most essential and effective water pollution charges, fines and incentives, assessing the main obstacles/barriers to their introduction and develop enforcement mechanisms;
- Assessing the institutional and economic capabilities of the particular DRB countries for a reform of water pollution charges, fines and incentives.

(viii) Recommendations for the reduction of phosphorus in detergents

The EU policies and legislation do not provide for phosphate detergents phase-out plans. The present situation in the EU countries is based on voluntary arrangements set by the industry. Phase 1 of the Project will assess the country-specific situation and discuss measures to overcome reduction barriers, while Phase 2 will later periodically check the implementation of recommendations.

The basic idea of this project component in Phase 1 is to:

- Reviewing the existing legislation, policies and voluntary commitments;
- Developing recommendations for phosphorus reduction in detergents in line with EU regulations and commonly agreed international standards;
- Developing proposals for enforcement and compliance (economic, financial incentives);
- Organizing a basin-wide workshop dealing with the implementation of recommendations at national level (*to be followed up in Phase 2*).

The country-specific recommendations and implementation schedules should be mostly based on the experiences from Western European countries and should take into account the institutional and especially the economic capability of the particular DRB countries.

3.2 Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin

One of the essential and positive results of the previous GEF Pollution Reduction Programme was the successful support provided for institutional strengthening and capacity building of government, local administration and the private sector (NGOs) in the participating DRB countries.

In order to ensure efficient implementation of the ICPDR policies and related Investment Programme defined under the DRPC, it is recommended that national capacities of the central and the sub-ordinate national level should be reinforced. In this context, exchange of information, reinforcement of environment research and standardization of methods and parameters are essential to strengthen regional cooperation and joint decision making in implementing the SAP. At the national level “Inter-ministerial Committees” will be set up to assure adequate coordination and implementation of policies, legislation and projects for nutrient reduction and pollution control.

The respective project components defined in the frame of the present Regional Project (Phases 1 and 2) are primarily designed to support the ICPDR in establishing an appropriate Management and Information System, and in establishing appropriate indicators for evaluation and monitoring of programme and project implementation (process, status and stress reduction). Secondly, the Expert Groups established under the ICPDR should be supported in carrying out the particular tasks and activities clearly dealing with nutrient reduction and transboundary issues, which might not be adequately covered without GEF assistance.

(i) Setting up of “Inter-ministerial Committees” for development, implementation and follow-up of national policies legislation and projects for nutrient reduction and pollution control

To assure adequate coordination and implementation of policies, legislation and projects for nutrient reduction and pollution control, “Inter-ministerial Committees” will be set up at the national level involving all technical, administrative and financial departments. The following steps are foreseen :

- Evaluate existing national structures for coordination of water management and water pollution control (follow up action on report on “Existing and planned inter-ministerial coordination mechanisms relating to pollution control and nutrient reduction”, August 2000, Annex 8.1);
- In cooperation with national governments, propose adequate structures, including technical, administrative and financial departments to coordinate the review and implementation of policies, legislation and projects for nutrient reduction and pollution control;
- Assist Governments in setting up national “Inter-ministerial Committees” and provide initial guidance for the implementation of GEF project components.

(ii) Development of operational tools for monitoring, laboratory and information management and for emission analysis from point and non-point sources of pollution with particular attention to nutrients and toxic substances

The subject of this component is professional and financial support aimed at reinforcing the activities related to emission control (EMIS/EG) and monitoring of water quality, laboratory and information management (MLIM/EG), particularly aiming at improvement, further development and application of:

- the Danube Water Quality Model;
- the Modelling Nutrient Emissions in River Systems (MONERIS);
- the Analytical Quality Control (AQC).

If adequately designed and provided with reliable data, these two models and the quality assurance programme are essential tools for a profound assessment of transboundary nutrient and toxic pollutant flows as well as an assessment of the expected effects of nutrient and other pollution reduction measures. The present nutrient reduction plans can be adjusted and the implementation of policy measures can be focused on specific areas or sectors. Phase 1 of the Project will prepare the upgrading of existing operational tools, while Phase 2 will secure their effective application and the DRB-wide data availability.

Further assistance is proposed in Phase 1 to strengthen other activities in the MLIM/EG and the EMIS/EG, with particular attention to the following nutrient/pollution reduction and transboundary issues:

- Harmonizing water quality standards and quality assurance for nutrients and toxic substances *(to be followed up in Phase 2)*;
- Assisting in the creation of a database and emission inventory for point and non point sources of phosphorus and nitrogen, including maps *(to be followed up in Phase 2)*;
- Optimizing TNMN and identifying sources and amounts of transboundary pollution for substances on the list of EU priority substances *(to be followed up in Phase 2)*.

In this context, consultation and working meetings of the Expert Groups for particular research work (modelling, development of nutrient data base, etc) should be arranged in cooperation with international consultants specialized in the respective field of work. For this purpose, special TOR have to be defined by the Expert Groups.

To assure the coherence and viability of data collection in all Danube countries, it would be necessary to provide training and additional laboratory and monitoring tools, in particular for those countries that:

- still need to be brought to the same operational level (Ukraine, Moldova) or
- are not yet integrated in the MLIM and EMIS systems (Bosnia-Herzegovina, FR Yugoslavia).

(iii) Improvement of procedures and tools for accidental emergency response with particular attention to transboundary emergency situations

The recent accidental pollution of the Tisza river from mining activities and the effects of NATO intervention in Yugoslavia, the bombing of petrochemical and other industrial complexes in the Danube River Basin, led to a contamination of ground water and rivers with toxic substances (PCBs, PAHs, cyanide, etc.), the accumulation of heavy metals in sediments and to a degradation of ecosystems (fish kill). Hence, urgent support is needed to improve preventive and emergency response measures.

The subject of this project component is to support development activities for accident emergency warning and prevention of accidental pollution. The experience from the recent accidental pollution events indicates that the basically established AEPWS/EG needs substantial improvement before it can become a satisfactory tool for adequate management of transboundary contamination from catastrophic events. During Phase 1 of the Project, the operational bases of the alarm system will be

upgraded and preventive policy measures recommended. During Phase 2, the practical application of the alarm system will be further extended in the DRB.

In this context, technical assistance and reinforcement of operational conditions are required in Phase 1 for:

- The reinforcement of operational conditions in national alert stations (PIACs) and geographical extension of the AEPWS in Bosnia & Herzegovina and the FR of Yugoslavia²⁾ *(to be followed up in Phase 2)*;
- The completion of the inventory presently available only for the upper Tisza River Basin, and evaluation of all high accidental risk spots in all countries in the Danube River Basin, in line with EU legislation, considering that similar accidental “hot spots” exist in many transition countries *(to be followed up in Phase 2)*;
- The designing of preventive measures, the adjusting of national legislation and improved compliance with safety standards *(to be followed up in Phase 2)*;
- Maintenance and calibration of the Danube Basin Alarm Model (DBAM), to predict the propagation of the accidental pollution and evaluate temporal, spatial and magnitude characteristics in the Danube river system and to the Black Sea *(to be followed up in Phase 2)*.

(iv) Support for reinforcement of ICPDR Information and Monitoring System (DANUBIS)

The Danube Information System (DANUBIS) has been developed with the financial support from the Austrian Government (computer equipment and software) and from the Austrian Environmental Trust Fund, administered by UNOPS (concept and development of the Information System). The system is presently installed at the Permanent Secretariat of the ICPDR (Vienna International Center) and fully operational.

Further professional/technical and financial support is needed for the build-up and extension of DANUBIS to assure adequate administration of the information and reporting obligations under the DRPC. A new interactive web-site is to be adapted ensuring a smooth flow of textual and geographic information between the national level and the central unit at the ICPDR Secretariat to achieve permanent monitoring and exchange of information on pollution control and nutrient reduction measures and to disseminate information to the public on policy and legal matters related to nutrient reduction: GEF nutrient reduction policies, relevant EU guidelines and directives, other information from international initiatives/conventions concerning land based sources of pollution, agricultural practices, fertilizer application, phosphate free detergents, etc. During Phase 1 of the Project, the DANUBIS website extension will be made fully operational, during Phase 2 the new interactive website will be built up.

This would require in Phase 1 that:

- The ICPDR Information System is fully developed and used by its expert groups and other operational bodies;
- All Contracting Parties of the ICPDR and other participating countries would be linked to DANUBIS, which applies the development and implementation of national linkages and establishment of operational units to communicate also in case of accidental emergency situations *(to be followed up in Phase 2)*;

²⁾ The FR of Yugoslavia is situated in an extremely important geographical position in the center of the Danube River Basin where the most important tributaries, Tisza, Sava and Drava are joining the Danube. During the recent accidental pollution the AEWS has also informed Yugoslavia and cooperated with its technical staff to monitor the effects of accidental pollution. The UNEP Balkan Task Force and the EU-Baia Mare Task Force have closely cooperated with Yugoslavian authorities in the assessment of accidental pollution and the design of emergency measures.

- DANUBIS would be reinforced through the implementation of an interactive web-site to integrate further textual, numerical and digital mapping information and to fulfill all the requirements of the work of the nutrient reduction programme (communication, monitoring, public information, etc.) *(to be followed up in Phase 2)*;
- An extensive training programme would be launched and series of workshops be organized at different users levels and in different regions of the DRB to train and assist futures users in the best use of the tools made available by the system *(to be followed up in Phase 2)*.

It should be noted that the ICPDR assure regular maintenance and updating of the information with particular attention the Data Base developed within the frame of the previous GEF project (Danube Pollution Reduction Programme).

(v) Implementation of the Memorandum of Understanding between the ICPDR and the ICPBS relating to discharges of nutrients and hazardous substances to the Black Sea

This component implies assisting the ICPBS and the ICPDR in further implementing the Memorandum of Understanding (MoU), identifying appropriate modalities for the implementation and developing of a monitoring system for commonly agreed process, stress reduction and environmental status indicators for the Black Sea. During the Phase 1 of the Project, a joint working programme will be worked out and approved, which will be practically applied in Phase 2.

The main tasks for the implementation of the MoU in Phase 1 can be summarized as follows:

- Developing a joint work programme for MoU implementation *(to be followed up in Phase 2)*;
- Defining and agreeing on status indicators to monitor nutrient transport from the Danube and change of ecosystems in the Black Sea *(to be followed up in Phase 2)*;
- Defining and establish reporting procedures *(to be followed up in Phase 2)*;
- Re-establishing and organizing regular meetings of the Joint Danube-Black Sea working groups to evaluate progress of nutrient reduction and recovery of Black Sea ecosystems *(to be followed up in Phase 2)*;
- Organizing joint Danube-Black Sea meeting to approve and sign MoU by both Commissions.

(vi) Training and consultation workshops for resource management and pollution control with particular attention to nutrient reduction and transboundary issues

In order to assure sustainability of appropriate resources management and pollution control and to assure the same level of understanding throughout the Danube River Basin, it is necessary to provide training in the fields of environmental analysis and planning, management and impact assessment for nutrient reduction and control of toxic substances through workshops, consultation meetings and study tours for participants from government, local administration, NGOs and other stakeholder from the private sector (professional associations, opinion leaders, etc.). Besides this, additional materials and equipment should be supplied and technical assistance should be provided where necessary. During the Phase 1 of the Project, the various training programmes will be worked out and trainers trained, during the Phase 2 Project these trainings will be organized and evaluated.

Besides the workshops on policy development and legislation to be organized in the frame of each of the above-described project components, training courses should be provided in Phase 1 in the following fields:

- Policy development and legal frame for transboundary cooperation in nutrient reduction and control of toxic substances *(to be followed up in Phase 2)*;
- Technical and legal issues of river basin planning and transboundary water resources management in line with the new EU Water Framework Directive with a view to ensuring effective nutrient reduction *(to be followed up in Phase 2)*;
- Technical and legal issues (land reclamation) of wetland restoration and management to assure nutrient removal *(to be followed up in Phase 2)*;

- Innovative technologies for municipal and industrial waste water treatment; use of sewage and animal waste as fertilizer to reduce nutrient emissions *(to be followed up in Phase 2)*;
- Technical and legal issues of management and control of use of fertilizers and manure *(to be followed up in Phase 2)*;
- Preparation of documents for nutrient reduction projects with international co-funding and application of GEF criteria concerning incremental cost calculation *(to be followed up in Phase 2)*;
- Training courses for NGO activities *(to be followed up in Phase 2)*.

The last training course should also focus on methodology and standards for economic and financial analysis of bankable projects with international co-funding; and in particular on identification and documentation of nutrient reduction projects according to GEF requirements and guidelines regarding baseline / incremental cost, transboundary effects, etc.

The proposed training courses should be organized with the assistance of experienced international consultants in a series of three-to-five-days workshops and should also be run in the national languages at least once in each Project Phase (i.e. twice during the total project period of 5 years). Regional Workshops designed to reinforce transboundary cooperation should be attended by at least two or three participants from each DRB country. One essential task will be to prepare, prior to the workshops, adequate documents and case study materials for dissemination among the participants.

3.3 Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems

All activities outlined in the previous chapter on institutional strengthening and capacity building contribute to awareness raising in a broader sense. The publication through the mass media and through publications of the ICPDR (Danube Watch etc.) of the results of ICPDR's and its Expert Groups' activities, in particular the results of workshops and consultation meetings, constitute an excellent opportunity to raise public awareness. These actions of awareness raising should primarily address representatives from central and local governments and from administration and - to a lesser extent - from the private sector.

The Regional Environmental Center (REC) in Hungary has elaborated a project proposal for GEF financial support for the Building of Environmental Citizenship to Support Transboundary Pollution Reduction in the Danube. Public awareness and public participation, as well as cooperation with the government and administration, shall be demonstrated in the frame of two pilot projects in Hungary and Slovenia.

The present GEF Regional Project component has a much wider spectrum and geographical outreach but should nevertheless benefit from the REC initiative and establish close cooperation during its implementation period.

The objective of the Project is to enhance awareness raising in the civil society and the reinforcement of the role of NGOs in water management and pollution reduction (nutrients and toxic substances) with particular attention to transboundary cooperation and river basin management. This can best be achieved through practical measures and the support of community-based activities for rational resources management, transboundary cooperation and pollution control with particular attention to nutrient reduction. Financial support should be provided to assist the implementation of community-based demonstration projects in various Danube River Basin countries (Small Grants Programme).

Cooperation of the civil society and in particular the local NGOs is essential to achieving the objectives and goals of the ICPDR and the new Danube Regional Project. Particular attention will be given to the reinforcement and the role of the Danube Environmental Forum (DEF), which is the umbrella organization of the NGOs in the Danube River Basin. The previous GEF Project has

provided some support to facilitate the organization of NGO cooperation at the national level and the establishment of the Danube Environmental Forum.

Within the frame of the present GEF project component, the support for awareness raising should be extended (i.e. make each project more relevant), linked with the reinforcement of NGO activities and should focus on concrete demonstration measures of pollution control, nutrient reduction and transboundary cooperation. In this context, the following project components have been identified as particularly promising:

(i) Support for institutional development of NGOs and community involvement

This should come in the form of technical/professional assistance and financial support for the Danube Environmental Forum and for national NGOs working on transboundary pollution issues and nutrient reduction. During Phase 1 of the Project, this will be focusing on making the DEF fully operational and preparing the training programmes which will be followed up in Phase 2 with the actual training and publications:

- Support for the DEF Secretariat for operation, communication and information management *(to be followed up in Phase 2)*;
- Organization of consultation meetings and training workshops on nutrients and toxics issues *(to be followed up in Phase 2)*;
- Publishing special NGO publications in national languages on nutrients and toxic substances *(to be followed up in Phase 2)*;
- Organization of training courses for the development of NGO activities and cooperation in national projects (nutrient reduction) *(to be followed up in Phase 2)*.

(ii) Applied awareness raising through community-based “Small Grants Programme”

It is important and necessary to provide administrative, professional and financial support for the extension of the GEF-Small Grants Programme. This is mainly focusing in Phase 1 of the Project on the identification of suitable projects and the preparation of applications for financial support. In Phase 2 of the Project grants will be awarding and the programme will be implemented:

- Identifying NGO grants programme and projects for reduction of nutrients and toxic substances and mitigation of transboundary pollution;
- Designing and implementing a region-wide granting programme focusing on demonstration activities and awareness campaigns for sustainable land management and pollution reduction (nutrients) in the agricultural, industrial and municipal sectors *(to be followed up in Phase 2)*;
- Designing and implementing two granting programmes at the local and national level in terms of small scale community based investment projects for pollution control, rehabilitation of wetlands, best agricultural practices, reduction of use of fertilizers, manure management, improvement of village sewer systems, etc. *(to be followed up in Phase 2)*.

Based on previous experience and good performance, this project component shall be implemented with technical and policy guidance from the ICPDR, by the Regional Environmental Center (REC) in Hungary. Through its national offices, the REC will inform local communities and NGOs to develop and submit relevant project proposals and will organize and follow-up in the 2nd Phase of the Project the implementation of selected projects for nutrient reduction and awareness raising.

(iii) Organization of public awareness raising campaigns on nutrient reduction and control of toxic substances

The practical awareness and daily sensitivity of the general public on pollution problems and their transboundary impacts is still very low in most DRB countries. The many new local NGO small grants projects organized within this GEF Project frame (component 3.3.(i)) will become more relevant for the public's opinion-making at national and regional scale if they will be complemented by nation-wide awareness campaigns. Therefore, the GEF Project aims at raising awareness on accidental pollution and prevention and nutrient reduction in daily life through media activities and campaigning. Phase 1 of the Project will prepare and start first public activities in the DRB countries, which will be intensified in Phase 2 of the Project. Further support will be given in both Phases by the publication of periodicals in English and in national languages.

Phase 1 of the Project will therefore focus on:

- Conceptualization and implementation of public awareness raising campaigns on nutrients issues *(to be followed up in Phase 2)*;
- Development and production of materials for public press and mass media on nutrients and toxics *(to be followed up in Phase 2)*;
- Support to the publication of scientific documents and regular papers or special issues on water management and pollution reduction with particular attention to nutrient issues and Black Sea recovery *(to be followed up in Phase 2)*.

3.4 Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances

The development and the upgrading the monitoring and information systems is of significant importance for transboundary cooperation in water quality and water management, and of common interest for the Danube and the Black Sea countries. Particular attention will be given to the development of indicators (process, stress reduction and environmental status indicators) to monitor progress of project implementation. For this purpose, special methodologies will be developed to assess sediments (heavy metals, toxic substances) and nutrient removal capacities of wetlands. Also economic mechanisms will be analyzed to encourage investments in nutrient reduction measures.

Regarding specific issues on monitoring and preparation of information, the following project activities have been proposed to be carried out within the frame of Phase 1 and 2 of the Danube Regional Project:

(i) Development of indicators for project monitoring and impact evaluation

To assure efficient monitoring and evaluation of project implementation, and to document project and programme achievements, it is necessary - in line with EU and the existing international requirements - to establish an operational system of indicators (process, stress reduction and environmental status) under the ICPDR. It should be considered, that under the new EU Water Framework Directive criteria for the assessment of the ecological status of the rivers and for monitoring the achievement of good ecological status will have to be applied. Within Phase 1 of the Project, new indicators and methodologies will be developed, which will be established and applied in Phase 2.

The following tasks should therefore be carried out in Phase 1 under this component:

- Establishing a system for M&E in using specific indicators for process (legal and institutional frame), stress reduction (emissions, removal of hot spots) and environmental status (water quality, recovery of ecosystems) to demonstrate results of programme and project implementation and to evaluate environmental effects of implementation of policies and regulations (nutrient reduction) *(to be followed up in Phase 2)*;
- Reviewing in the frame of the ICPDR Trans National Monitoring Programme (TNMN) specific indicators (e.g. bio-indicators) for emission control and water quality monitoring with particular attention to nutrients and toxic substances *(to be followed up in Phase 2)*;
- Establishing monitoring system in using specific progress indicators (benchmarks) for project implementation (GEF- projects activities) *(to be followed up in Phase 2)*;
- Implementing ecological status assessment in line with requirements of EU WFD using specific bio-indicators to demonstrate effects of pollution /nutrient reduction in water-bodies and ecosystems *(to be followed up in Phase 2)*.

(ii) Analysis of sediments in the Iron Gate reservoirs and impact assessment of heavy metals and other dangerous substances on the Danube and Black Sea ecosystems

(This component will be carried out in the Phase 2 of the Project.)

(iii) Monitoring and assessment of nutrient removal capacities of riverine wetlands

In the frame of the GEF Pollution Reduction Programme, the rehabilitation and management of about 600.000 hectares of wetlands and floodplains in the DRB have been proposed. In the World Bank-GEF Partnership Investment Facility for Nutrient Reduction, the restoration or creation of wetlands is one of the three types of projects eligible for funding. It is generally recognized that the removal capacity varies considerably according to water flow, concentration, loads and natural conditions of the wetlands.

In the frame of Phase 1 and 2 of the Projects, a quantified approach could be made for the DRB wetlands to better assess their removal capacities and the possibilities in wetland management to optimise such processes, while still giving priority to the ecological needs of these ecosystems. These results would considerably improve and disseminate world-wide the knowledge about nutrient removal through wetlands rehabilitation and would define the technical and economic parameters for efficient wetlands management.

This proposed project component, which would support a larger GEF need in the frame of Targeted Research, should cover in Phase 1 preparatory tasks and would later in Phase 2 provide the actual removal observation programme and management guidance:

- Classifying the wetlands and floodplains in the DRB by category and define potential observation sites;
- Defining the methodological approach for assessment of nutrient removal capacities of wetlands and flood plains.

(iv) Danube Basin study on pollution trading and corresponding economic instruments for nutrient reduction

In the frame of the study on Financing Pollution Reduction Measures in the DRB – Present Situation and Suggestions for New Instruments, the implementation of a system of nutrient discharge quotas and auctions has been proposed. Considering the diversified economic conditions of the riparian countries and the particular relation of the Danube countries to the Black Sea, new approaches, in particular economic instruments, could be necessary to achieve efficiency in nutrient reduction reforms. Whenever the principle of “pollutant auctions” is presently not compatible with the EU water quality guidelines, which are based on the emission principle, interesting and innovative approaches could be

developed and possibly introduced in the forthcoming EU policies to solve the nutrient problem. Further, the results would also contribute to support a larger GEF need for Targeted Research in developing economic instruments for nutrient reduction.

This component should therefore assess the viability and feasibility of “pollution trading” concept in the DRB countries (Phase 1 of the Project) and initiate a broad discussion with all stakeholders on alternative economic concepts for pollution control (Phase 2 of the Project). It should further be noted that the present study proposed for the Danube River Basin (considering in particular the EU policies and directives) is complementary to a similar study conducted by the World Bank in the frame of the Black Sea Regional Project, which shall develop the concept of nutrient emission trading taking into account the specific conditions of the Black Sea countries.

For this purpose, it is proposed to prepare an EU-Danube specific assessment covering in Phase 1 the following main issues:

- Reviewing existing concepts of successful “pollutant trading / auctions” or corresponding economic instruments in the water and air pollution sector in the US, Australia and Europe;
- Studying the general possibilities to establish the idea of "pollution trading" or corresponding economic instruments for nutrient reduction under the EU policies and directives in the Danube River Basin;
- Assessing the main problems / obstacles for "pollution trading" and corresponding economic instruments in the DRB and the interest of the particular DRB countries for implementation.

4 Sustainability and Participation

The proposed Danube Regional Projects (Phases 1 and 2) have to be seen as a logical continuation of the GEF assistance to the Danube Environmental Programme. The Danube Pollution Reduction Programme has established the necessary conditions for the ICPDR and for the DRB countries to assure efficient implementation of policies and measures for pollution reduction and resource management. The proposed Danube Regional Projects can build on a very favorable framework for sustainability and participation, and on the findings and recommendations of:

- the SAP 1994 as the agreed-upon policy document of the EPDRB focusing on policies and strategies for pollution control and resource management,
- the Common Platform for the Development of National Policies and Actions for Pollution Reduction under the DRPC, representing a summary of policies and actions developed in the frame of the Pollution Reduction Programme,
- the Danube Pollution Reduction Programme (DPRP) and the Inventory of Investment Projects (Database) providing the operational basis for promoting investments for pollution reduction measures.

Institutional capacities and arrangements: With its entry into force on 22 October 1998, the Danube River Protection Convention (DRPC), to which the ECE-Convention for the Protection and Use of Transboundary Waters (Helsinki Convention 1992) is the framework, became the overall legal instrument for cooperation and transboundary water management in the Danube River Basin. Since mid-1999 all bodies of the ICPDR, the Expert Groups and the ICPDR Permanent Secretariat have been fully operational. The primary objective of the proposed Danube Regional Project is to support the ICPDR in order to achieve a well-balanced integrated implementation of the Common Platform, the PRP and the forthcoming JAP. It is assured that there is a full developed and functioning institutional framework for project performance.

As the ICPDR is permanently sustained via financial contributions of the member states, the GEF intervention would support and strengthen the ICPDR and its Expert Groups to improve technical and management capacities for the implementation of nutrient reduction measures identified in the Pollution Reduction Programme.

The participation of the contracting parties including the European Community, the signatory countries (Ukraine) and other cooperating countries (Bosnia-Herzegovina and Yugoslavia) of the DRB is assured through the work of ICPDR-Steering Group and the through the Conference of Parties, which is the highest body for the implementation of the Danube River Protection Convention.

Government commitment: All countries in the DRB have actively participated in the frame of the elaboration of the Pollution Reduction Programme and have provided all necessary information for the preparation of the present Project Brief (PDF-Block B actives) and thus demonstrated their interest in and commitment to pollution control, nutrient reduction and sustainable water management. Further, it should be noticed that central and downstream Danube countries are actually preparing for accession to the European Union and are therefore committed to applying the European water directives and guidelines for pollution reduction with particular attention to the EU Nitrate Directive, the Urban Waste Water Directive and the implementation of the new EU Water Framework Directive.

Legal Frame: The Danube River Protection Convention is a legally binding instrument, which provides a solid framework and a legal basis for cooperation, including enforcement. The International Commission for the Protection of the Danube River (ICPDR) has been established according to the Danube River Protection Convention provision (Art.18) and has its seat in Vienna, Austria. The ICPDR and its bodies are responsible for the implementation of the Danube River Protection Convention.

Stakeholder participation: The development of NGOs and the re-establishment of the Danube Environmental Forum as an umbrella organization for all Danube NGOs was an essential contribution of the previous GEF assistance to assure public participation in the planning and plan implementation processes. Further, the GEF Small Grants Programme has facilitated the implementation of community-based projects in the middle and lower Danube countries. It is thus assured that the existing structures of local NGOs and the DEF will play an important role in the implementation of the GEF Danube Regional Project and in the development and application of new policies and regulation to improve water quality and to assure rational use of resources.

5 Lessons Learned

Some important lessons have been learned from a range of GEF and other environmental planning projects in the Danube region, and especially from the GEF-supported Danube Pollution Reduction Programme (DPRP), which was completed in June 1999. In the frame of this project, the Danube countries cooperating under the DRPC have achieved important results in terms of capacity building and institutional strengthening. The planning process in elaborating the Transboundary Analysis and in revising the SAP, which involved stakeholders from the local governments, scientific institutions and NGOs had created a high momentum in adopting GEF operational principles for the protection of international waters and ecosystems. Further, the interaction with other organization, in particular the EU Phare and Tacis, the World Bank, the EBRD, etc., and joint actions with the Black Sea Programme have set new standards for regional cooperation. These positive achievements will be consolidated in implementing the Danube / Black Sea Basin Strategic Partnership.

The first phase of the DPRP indicated how time consuming and difficult it is to set up institutional structures, information networks and to introduce new approaches of planning in countries that are in a continuous process of political and economic transition. Based on this experience, it is recommended that – wherever possible - the newly created institutional settings, networks and methodological tools should be reinforced through the Danube Regional Project. Special emphasis should be put on the maximum utilization of the participatory approach that is now fully understood and accepted by the participating countries.

In many transition countries, the policy and legal frame is presently being reviewed and adjusted, focusing in particular on unclear land ownership and uncontrolled resource management (forestry, mining, etc.), which lead to environmental degradation and damage. In many countries, compliance with environmental laws and regulations is not controlled and is consequently very low. This is partially due to structural and organizational weaknesses and more to budgetary limitations.

Inter-ministerial coordination is another common and serious problem for project implementation when coordinating structures are missing at national levels. The involvement and cooperation of all relevant governmental bodies, in particular the Ministry of Finance, Ministry of Agriculture, of Land Reform, of Foreign Affairs, etc. is essential in the early project preparation phase.

Another lesson learned is that project activities conducted by international expert teams without close integration and cooperation with experts from the relevant Danube countries are often not recognized. In the frame of the Environmental Programme for the Danube River Basin (EU Phare) many project components have failed to be sufficiently coordinated with the ICPDR and its Expert Groups and thus did not respond to the expressed needs of the beneficiaries. It is therefore recommended that all project components should be carried out under the guidance of the ICPDR and in close cooperation with its expert bodies and that highly qualified national experts/consultants – available in all DRB countries – should be contracted.

A particular feature impacting basin-wide project activities is that of the disparities between the DRB countries, which have clearly different institutional, administrative and economic capabilities and are confronted with qualitatively different requirements. Particular attention should be paid on the one hand to the EU accession countries that have reached a high level of competence and organization and, on the other hand, to the central Danube Basin countries as Bosnia-Herzegovina and Yugoslavia, which have been affected by the war and political instability.

In this context, IW: LEARN, a distance education programme whose purpose is to improve the global management of transboundary water systems, will contribute to improve regional cooperation and capacity building. Following the experience gained in the DPRP, IW: LEARN should be connected to the Danube Information System (DANUBIS) and used as an interactive conference capacity across and within GEF international waters projects for sharing information and learning related to nutrient reduction and river basin and coastal zones management. Training courses started during the DPRP will be revitalized and continued to enhance technical knowledge for water managers in nutrient reduction and sustainable management of water resources and ecosystems in the Danube River Basin.

6 Project Budget and Financing

6.1 GEF Budget Contribution

The total financial requirements for the performance of the proposed Phase 1 Danube Regional Project are USD 5,000,000. According to the provisional estimates the allocation of the budget by cost categories is anticipated as follows:

BUDGET OF THE DRP BY COST CATEGORIES	USD	Percentage
Permanent professional project staff	386,000	7.7 %
Project Support Staff	256,250	5.1 %
Subcontractors / International consultants	1,404,000	28.1 %
National consultants from the DRB countries	1,080,000	21.6 %
Workshops, training courses, meetings	536,890	10.8 %
Identification and preparation of “GEF- Small Grants Projects”	153,350	3.1 %
Awareness raising and public information material	100,000	2.0 %
Equipment for nutrient monitoring/information	267,000	5.3 %
Project operational costs	246,140	4.9 %
Organizational support for DEF and NGOs	200,000	4.0 %
UNOPS/ICPDR Support cost	370,370	7.4 %
Total	5,000,000	100 %

The allocation of the budget by the main project components according to the budget proposal (Annex 4) is as follows:

	BUDGET BY MAIN PROJECT COMPONENTS	USD	Percentage
(1)	Creation of sustainable ecological conditions	2,425,400	48.5 %
(2)	Capacity building and reinforcement of transboundary cooperation	821,940	16.4 %
(3)	Strengthening of public involvement and reinforce. community actions	827,650	16.6 %
(4)	Reinforcement of monitoring, evaluation and information systems	554,640	11.1 %
	UNOPS/ICPDR Support cost	370,370	7.4 %
	Total	5,000,000	100,0 %

From the GEF budget contributions 48.5 % is earmarked for the development of policies and legal instruments for nutrient reduction and will be invested directly in supporting the work at the national level. 16.4 % of the budget is aimed at strengthening regional cooperation for implementing the ICPDR policies and related investment programmes (JAP) and at reinforcing monitoring and information capacities. In both first project components a total of 10.8 % is allocated for training courses and preparation of workshops.

The budgetary allotment for awareness raising and NGO activities is 16.6 % to assure participation of the civil society in nutrient reduction activities. 11.1 % of the GEF budget is earmarked for strengthening monitoring, evaluation and information systems. 7.4 % is earmarked as support cost for the executing agencies.

Detailed Budget by Project Components and Assigned Baseline Costs (USD)		Project Budget		Baseline Costs
		GEF	Particip. Danube Countries	
1 Creation of sustainable ecological conditions for land use and water management				
	General project costs	629,032		400,000
1.1	Development and implementation of policy guidelines for river basin management	447,600	1,188,000	22,470,000
1.2	Reduction of nutrients and harmful substances from agricultural point and non-point sources through agricultural policy changes	380,600		16,740,000
1.3	Development of pilot projects on reduction of nutrients and other harmful substances from agricultural point and non-point sources	269,200		16,810,000
1.4	Policy development for wetland rehabilitation under the aspect of appropriate land use	246,400		9,460,000
1.5	Industrial reform and development of policies and legislation for application of BAT	269,600		16,215,000
1.6	Policy reform and legislation measures for the development of cost-covering concepts for water and waste water tariffs	163,000		7,780,000
1.7	Implementation of effective systems of water pollution charges, fines and incentives, focusing on nutrients and dangerous substances	92,000		4,700,000
1.8	Recommendations for the reduction of phosphorus in detergents	122,000		3,780,000
	Subtotal	2,619,432	1,188,000	98,355,000
2 Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the DRB				
	General project costs	243,255		2,400,000
2.1	Setting up of “Inter-ministerial Committees” for development, implementation and follow-up of national policies, legislation and projects for nutrient reduction and pollution control	38,000	181,500	3,720,000
2.2	Development of operat. tools for monitoring, laboratory and information management and for emission analysis from point and non-point sources of pollution	178,720	1,089,000	22,320,000
2.3	Improvement of procedures and tools for accidental emergency response with particular attention to transboundary emergency situations	81,160	762,300	15,624,000
2.4	Support for reinforcement of ICPDR Information System (DANUBIS)	202,160	1,089,000	20,832,000
2.5	Implementation of the “Memorandum of Understanding” between the ICPDR and the ICPBS relating to discharges of nutrients and hazard. Substances to the Black Sea	27,600	217,800	4,464,000
2.6	Training and consultation workshops for resource management and pollution control with particular attention to nutrient reduction and transboundary issues	116,800		137,800,000
	Subtotal	887,695	3,267,000	207,160,000
3 Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems				
	General project costs	167,212		10,100,000
3.1	Support for institutional development of NGOs and community involvement	275,300	143,220	2,570,000
3.2	Applied awareness raising through community based “Small Grants Programme”	188,350	55,440	9,030,000
3.3	Awareness raising campaigns on nutrient reduction & control of toxic substances	263,000	263,340	108,800
	Subtotal	893,862	462,000	21,808,800
4 Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances				
	General project costs	167,121	0	
4.1	Development of indicators for project monitoring and impact evaluation	126,150	363,000	7,440,000
4.2	Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals and other substances on the Danube and the Black Sea ecosystems	0	396,000	5,580,000
4.3	Monitoring and assessment of nutrient removal capacities of riverine wetlands	109,340	528,000	7,520,000
4.4	Danube Basin study on pollution trading and corresponding economic instruments for nutrient reduction	196,400	396,000	5,580,000
	Subtotal	599,011	1,683,000	18,680,000
	PDF-B	350,000		
	PROJECT TOTAL	5,350,000	6,600,000	353,443,800

6.2 Contributions from the ICPDR and participating countries:

Total ICPDR and Danube country contributions :	6,600,000 USD
<ul style="list-style-type: none"> ○ The ICPDR, Permanent Secretariat will facilitate overall project implementation with an annual operational budget of 800,000 USD for a period of 2 years : 	1,600,000 USD
<ul style="list-style-type: none"> ○ The ICPDR Expert Groups will assure the implementation of project components. The cost for experts, operation, participation and communication can be estimated at 1,200,000 USD per year, for a period of 2 years : 	2,400,000 USD
<ul style="list-style-type: none"> ○ The participating countries will contribute in the frame of joint activities under the DRPC to project implementation through financial and in kind contributions (experts, equipment, operational cost), estimated at 100,000 USD per country and year, for 13 countries and 2 years : 	2,600,000 USD

6.3 National Capital Investments and Development Costs (2001 – 2006)

The Joint Action Programme (JAP) has been developed under the ICPDR, and is in most cases coherent with the Five-Year Nutrient Reduction Action Plan prepared in the frame of the PDF-Block B activities (see Annex 8-3). The following costs for policy and legislation development and for capital investments for municipal and industrial waste water treatment and wetland restoration have been identified :

Total capital investments³⁾	4.40 billion €
<ul style="list-style-type: none"> ○ Assured national funding ○ Assured international loans ○ Expected grants (national and EU) ○ Additional funding to be raised 	1.72 billion € 1.16 billion € 0.66 billion € 0.86 billion €
Total cost for non-structural measures	0.51 billion €

It should be noted that from the planned investments of 4.40 billion €, about 3.54 billion € have been made available from national funding sources, whereas 0.86 billion € remain to be raised. 510,989,000 € are estimated for developing adequate monitoring and enforcement systems in the frame of the EU accession process⁴⁾ and are considered as non-structural investments to be mobilized by all Danube countries.

6.4 World Bank Partnership and UNDP (estimated 5 years period)

W.B. Nutrient reduction projects

<ul style="list-style-type: none"> ○ Loans ○ GEF Grants 	210,000,000 USD 70,000,000 USD	} 280,000,000 USD
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UNDP country programmes (2 to 4 years)	1,069,000 USD
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³⁾ 4.0 billion USD, respectively 3.22 billion USD available and 0.78 billion USD to be raised

⁴⁾ Sector Case Study, WRc, Report CO 3291/2, 1993

6.5 Investments from EU for environmental measures (accession countries)

The following investment from the EU is for a period of seven years to assist accession countries to improve environmental management and to build or modernize waste water treatment plants and other technical structures; it can be assumed that about half of the Phare money is earmarked for non-structural measures:

Total investment for a period of 7 years ⁵⁾	13.5 billion €
○ EU Stability Pact for Southeastern Europe (Danube countries)	3.0 billion €
○ Phare for environmental protection (Danube countries)	5.3 billion €
○ ISPA funds for environment and infrastructure (Danube countries)	3.5 billion €
○ SAPARD funds for agricultural sector (Danube countries)	1.7 billion €

6.6 Assistance from bilateral sources (estimated 2 to 4 years)

○ USAID (amount allocated for environmental/sustainable development projects in 2000 out of which 120.000.000 for structural projects)	162,000,000 USD
○ Danish Environmental Protection Agency (DEPA)	} not available
○ Netherlands (Wetlands Ukraine)	

6.7 Assistance provided through private sector organizations (international and Danube NGOs for a 2 to 4 years period)

Total Investments (estimated 2 to 4 years period)	29,437,800 USD
○ Regional Environmental Center (REC): support for national NGO activities (environmental, sustainable development, awareness raising)	22,500,000 USD
○ World Wide Fund for Nature (WWF): Implementation of environmental projects in cooperation with governments and national NGOs	5,800,000 USD
○ Danube national NGOs (ECCG-Romania, Distelverein-Austria)	1,137,000 USD

6.8 Total contributions for environmental protection and nutrient reduction in the Danube River Basin

The total allocations earmarked for pollution control and nutrient reduction in the Danube River Basin fall into two categories:

- 1. Non-structural projects (estimation for 2 years period):** Reinforcement of legislation and institutional mechanisms for transboundary cooperation (Danube Regional Project for nutrient reduction):
 - GEF UNDP: Danube Regional Project Phase 1 (2 years) + PDF-B 5,350,000 USD
 - ICPDR and participating countries for Danube Regional Project (2 years) 6,600,000 USD
 - National investments for monitoring and enforcement systems (2 years) 186,000,000 USD
 - International private organizations and NGOs 2 to 4 years) 11,774,800 USD
 - Bilateral Assistance (USAID) and UNDP (2 to 4 years) 17,869,000 USD
 - EU programme for Danube accession countries, 2 years period 137,800,000 USD
(10 % of Phare programme is estimated for non structural measures)

⁵⁾ 12.28 billion USD, applied exchange rate : 1 € = 0.91 USD

The GEF budget and the contributions from the ICPDR and the participating countries are considered as “incremental” costs for the overall development and implementation of new policies and legislation in line with GEF operational principles for international waters and with EU environmental directives. The non-structural “baseline” cost is estimated at 353.4 million USD, out of which the Danube countries will contribute 52.6 % and the EU in the frame of the Phare programme 40.0 %. NGOs will provide 3.3 % of the total costs. However, it has to be taken into account that the actual figures are incomplete and that real bilateral and NGO contributions in the coming 2 to 5 years will be a great deal higher than indicated.

Summary of capital investments by country and expected nutrient reduction (5 years programme)

Country	Funding Scheme (€)			Expected Reduction (t/y)	
	Assured Funding	Funds to be raised	Total Investments	N	P
Germany	231,000,000		231,000,000	4,091	74
Austria	264,000,000		264,000,000	3,950	404
Czech Republic	104,000,000	43,000,000	147,000,000	1,091	62
Slovakia	54,000,000	65,000,000	118,000,000	2,574	147
Hungary	682,000,000	5,000,000	687,000,000	6,708	1,522
Croatia	12,000,000	421,000,000	433,000,000	5,233	814
Slovenia	382,000,000	2,000,000	384,000,000	1,509	239
Bosnia & Herzegovina		176,000,000	176,000,000	4,700	853
Yugoslavia	785,000,000		785,000,000	6,793	4,850
Bulgaria	37,000,000	88,000,000	125,000,000	2,683	599
Romania	493,000,000		493,000,000	11,860	1,591
Moldova	493,000,000		493,000,000	6,901	905
Ukraine	5,000,000	62,000,000	67,000,000	486	65
TOTAL	3,542,000,000	862,000,000	4,404,000,000	58,579	12,138

2. **Structural projects (estimation for 2 years period)** : Investment figures as presented in the previous chapters 6.3, 6.4 and 6.5 have been theoretically adjusted to a 2 years period to demonstrate the capital investments during the project period. In the project period, the following investments for waste water treatment facilities, wetland restoration, the reduction of pollution from agricultural non-point sources, etc. could be expected:

- GEF World Bank Partnership Programme (loans and GRF grants) 112,000,000 USD
- Bilateral Assistance (USAID, other not available) 120,000,000 USD
- Joint Action Programme (assured funds from Danube countries) 1,289,000,000 USD
- EU programme for Danube accession countries, 2-year period 3,600,000,000 USD (ISPA, SAPARD, Stability Pact, 90% Phare for structural measures)

In the frame of the ICPDR Joint Action Programme (5-Year Nutrient Reduction Plan), the Danube countries contribute from own resources and internal loans for an estimated 2 years period 25.1 % to finance structural projects (municipal and industrial waste water treatment plants, wetlands restoration, agricultural projects etc.). The EU provides the biggest share of 70.3 % of investments to support national efforts of EU accession countries.

The contribution of the World Bank Partnership represents 2.2 % of investments for structural projects and is complementary to the UNDP/GEF Danube Regional Project. Other contributions, e.g. from the EBRD or the EIB, are not taken into account.

Summary of investments for reinforcement of legislation and institutional mechanisms (non-structural projects / programmes) by country and expected nutrient reduction (5 years programme)

Country	Funding Scheme (USD)						Expected Reduction (t/y)	
	Governments	UNDP	USAID	EU	NGO	Total	N	P
Germany	51,290,900					51,290,900	6,800	111
Austria	43,400,000				1,583,300	44,983,300	7,700	114
Czech Republic	15,781,800	95,000	2,455,000	14,681,900	2,983,300	35,997,000	1,500	33
Slovakia	29,309,100	125,000	5,454,000	27,266,400	2,983,300	65,137,800	4,500	170
Hungary	57,490,900		5,454,000	53,484,000	2,741,700	119,170,600	4,650	380
Croatia	9,581,800		3,954,000	8,914,000	2,741,700	25,191,500	3,000	130
Slovenia	18,036,400	80,000	2,455,000	16,779,300	2,741,700	40,092,400	3,450	220
Bosnia & Herzegovina	16,345,500		3,954,000	15,206,200	2,500,000	38,005,700	3,600	220
Yugoslavia	50,727,300		2,455,000	47,191,800	2,741,700	103,115,800	7,200	700
Bulgaria	21,981,800		3,954,000	20,449,800	3,466,700	49,852,300	2,300	400
Romania	127,381,800		6,955,000	118,503,800	3,503,700	256,344,300	12,100	1,270
Moldova	6,200,000		2,455,000	5,767,900	483,300	14,906,200	397	70
Ukraine	17,472,700	769,000	2,455,000	16,254,900	966,600	37,918,200	2,800	200
TOTAL	465,000,000	1,069,000	42,000,000	344,500,000	29,437,000	882,006,000	59,997	4,018

Total Expected Nutrient Reduction from Capital Investments and Investments for Non-structural Projects	118,576 tons N/y = 22 %
	16,156 tons P/y = 33 %

7 Incremental Costs

The description and calculation of baseline and incremental costs can adequately be done for technical investment projects designed for the protection and management of international waters, respectively the conservation of biodiversity. In these cases it is possible to determine for each expected output and for each activity the respective baseline and incremental costs and analyze the resulting domestic and global benefits.

In the case of the Danube Regional Project, “incremental” costs are considered to be the GEF project cost (including PDF-B) of 5,350,000 USD. The special contributions of the ICPDR and the participating countries for implementing the DRPC, which amount to 6,600,000 USD, are considered as “incremental” co-financing costs. The Project, with a total financial support of 11,950,000 USD will reinforce - in addition to the investments described under “baseline” cost - the capacities of the ICPDR and the participating countries to address adequately the problem of nutrient reduction. “Incremental” costs are specially defined to strengthen transboundary cooperation under the DRPC for the development of national policies and legislation and the identification of jointly implemented priority actions for nutrient reduction leading to the restoration of the Black Sea ecosystems.

For the definition of “baseline” costs directly related to the development of adequate monitoring and enforcement systems at the national level, the results of the WRc Sector Case Study from 1993⁶⁾ have been taken into account. According to this report, the present systems of monitoring are budget inadequate, staff resources are overstretched and laboratory facilities overloaded. The report estimates the annual cost of compliance for Bulgaria 10 million €, Hungary 12 million €, Romania 28 million € and Slovakia 6 million € based on per capita cost of 1.16 € at 1990 prices. Based on this information, the total cost for compliance, also for those Danube countries, which are not yet in the approximation process but which are undertaking special efforts to upgrade their legislation and mechanisms for compliance with international and EU standards has been estimated at 186,000,000 USD for the coming 2 years.

Other “baseline” costs, with a total of 416.9 million USD, but only indirectly related with project activities, can be identified in relation to non-structural projects for the development of policies, legislation, institutional mechanisms and enforcement systems, which are financed in the frame of technical assistance projects from bilateral and international sources :

- | | |
|---|-----------------|
| • Bilateral Assistance (USAID) and UNDP | 17,869,000 USD |
| • International private organizations and NGOs | 11,774,800 USD |
| • EU programme for Danube accession countries, 5 years period
(10 % of the Phare Programme is estimated for non structural measures) | 137,800,000 USD |

Considering that the approximation process of the Danube countries will take between 10 and 20 years, including the introduction of new environmental standards in line with international and EU directives, the “incremental” support of the Project will enhance the process with particular attention to nutrient reduction and will considerably accelerate the development and implementation of policies, regulations and adequate monitoring and enforcement systems for nutrient emissions and reduction of nutrient loads discharged into the Black Sea.

Structural projects concerning actually planned investments in waste water treatment facilities, wetland restoration, agricultural pilot projects and other environmental measures, contributing mostly to pollution reduction from point sources or in-stream pollution reduction, amount to 12.6 billion USD. To demonstrate the capital investments during the project period, investment figures as presented in chapters 6.3, 6.4 and 6.5 of the Project Brief have been theoretically adjusted, indicating an amount of 5.1 billion USD for a period of 2 years. These capital investments are not contributing to project implementation and therefore are not considered as baseline cost.

⁶⁾ Sector Case Study, WRc, Report CO 3291/2, 1993

8 Cost-effectiveness

Taking into account the social and economic development which will take place in the coming 10 to 20 years in the Danube transition countries and considering the EU approximation process and the need to adapt environmental standards to international and EU directives, it is evident that investments in environmental protection and management of resources are necessary to assure a sustainable development in the countries of the Danube River Basin.

It is to be expected that most Danube countries - mainly those in transition – will in the next five to seven years see their GDP grow at an annual rate of 2 to 4 % ending up in five years from now at 10 to 20 % above its current level. This economic growth will be the result of economic recovery in transition countries and new investments in industry, agriculture and services. The development and implementation of adequate environmental standards and mechanisms for compliance is, therefore, essential to assure sustainable development in the region.

The implementation of projects for waste water treatment in the urban and industrial sectors (including agro-industries) is part of national investment programmes for pollution reduction from point sources, summarized in the Five-Year Nutrient Reduction Action Plan and the Joint Action Plan of the ICPDR respectively. According to these documents, capital investments will be about 4.4 billion € (4.0 billion USD). Considering EU engagements for accession countries and other multilateral and bilateral assistance in the form of soft loans and grants (World Bank/GEF), the additional financial assistance for implementation of structural projects will be 9.4 billion USD. These investments will lead to an annual reduction of 58,600 tons of nitrogen and 12,100 tons of phosphorus representing 10.6 % and 24.8 % respectively of the total nutrient loads discharged into the Black Sea.

Non-point sources of pollution in relation to land use and agricultural activities represent about half of all nutrients, in particular nitrogen, discharged into the Black Sea. It is assumed that through the development and implementation of policies, legislation and mechanism for compliance, nutrient emissions from non-point sources (land use and agriculture) can be considerably reduced. The actual estimations in the Five-Year Nutrient Reduction Action Plan show that development and implementation of appropriate policies and legislation will lead to a reduction of about 60,000 tons of nitrogen and 4,000 tons of phosphorus, representing 10.9 % and 8.2 % respectively of total nutrient loads discharged into the Black Sea.

The corresponding investments for the development of new policies, legislation and monitoring and enforcements systems in line with international and EU directives are 913.9 million USD, out of which the major part – 465.0 million USD or 50.9 % – is considered as national contributions and part of direct baseline costs. 344.5 million USD or 37.7 % is provided from the EU Phare programme to the accession countries and 72.5 million USD or 7.9 % is provided in the frame of international, bilateral and non-governmental assistance. These investments for technical assistance are also baseline cost but only indirectly related to project implementation measures.

Considering the GEF/ICPDR investment of 11.95 million USD for a period of 2 years and taking into account additional investments of 19.9 million USD in the 2nd Phase of the project (July 2003 to June 2006), in the particular sector of nutrient reduction and restoration of the Black Sea ecosystems, the benefits for nutrient reduction from non-point sources of pollution - 10.9 % for nitrogen and 8.2 % for phosphorus - can be calculated as representing 20 % of the value for capital investments for nutrient reduction in point sources projects of the Five Year Nutrient Reduction Action Plan, which is equal to 800.0 million USD, respectively 320.0 million USD for a period of 2 years⁷⁾.

⁷⁾ The Pollution Reduction Programme Report, GEF/Environmental Programme for the DRB, June 1999 indicates in its methodological approach that 20 % of investments in WWTP are specified for nutrient reduction. Considering a total investments in the 5-YNRAP of 4.4 billion € = 4.0 billion USD, 20 % of the investment = 800.0 million USD would be needed for pollution reduction from point sources. This amount is considered as the comparative benefit for removal of nutrient also from non-point sources of pollution.

The cost-effectiveness of this Project lies in the opportunity to improve water quality in general and to reduce transboundary nutrient loads in particular, thus contributing to the rehabilitation of the Black Sea ecosystems. Considering incremental cost of 11.95 million USD for the 1st Phase of the Project, the benefits of the Project, at a cost-effectiveness ratio of 1:27 for the first two years period and of 1:25 for the full five years period, are considerable in terms of its contribution to reducing and mitigating serious damage to regional and globally important waters and ecosystems.

9 Project Risks

The success of two Regional Projects for the Danube and the Black Sea depends ultimately upon the political willingness and the financial and technical means of the contracting parties and participating countries to cooperate. This willingness depends not only on issues related to national or international security but also on changing political and economic conditions of the countries involved. Risks for the performance of the proposed Danube Regional Project might be occur in the following fields:

(i) Commitment of the UNDP/GEF

Taking into account that the submission of the Strategic Partnership Programme for Nutrient Reduction in the Black Sea and the Danube Basin to the GEF Council in November 2000 was deferred due to resources constraints, the actual Project as prepared in 2000 with a total budget of 15 million USD had to be split in two phases. The present Project Brief with a budget of 5 million USD, to be approved by the GEF Council in May 2001, covers the 1st Phase of the Project from July 2001 to June 2003. The 2nd Phase, with a budget of 10 million USD, will cover the period from July 2003 to June 2006. The 2nd tranche to be approved by the GEF Council in May 2002 includes 16 million USD for capacity building out of which 10 million are earmarked for the Danube and 6 million for the Black Sea Programme. The approval of these funds is essential to assure the continuation of the activities initiated in the 1st Phase of the project and to achieve the ultimate goals.

(ii) Commitment of participating countries

At the institutional level the conditions for the implementation of the Danube Regional Project are already set-up through the structures of the ICPDR, which have already been successfully utilized in the frame of the Pollution Reduction Programme. Taking into account that financial inputs from the participating countries are relatively small, there are probably no significant risks for project performance. All Danube countries are prepared to deliver in-kind contributions in the frame of the ICPDR Expert Groups and experience has shown that special in-kind contributions to the project implementation are also voluntarily made available.

Considering political and administrative constraints and slow decision-making process, a certain risk can be expected for the actual implementation of the findings and recommendations of the project, especially regarding the issues of policy reforms and changes of legislation. Also administrative obstacles might hamper the implementation of measures for exacting compliance.

(iii) Methodological approach

The methodological approach as applied for the implementation of the proposed project components is in line with the work programme of the ICPDR and corresponds national standards. It is therefore unlikely to expect major problems. However, as mentioned in point (i), the ultimate goals of the project will only be achieved if the funding for the 2nd Phase of the GEF assistance will be made available in time.

For project implementation the choice of qualified experts is an essential prerequisite. Experts and consultants should be familiar with the social and economic conditions in the Danube River Basin and in the participating countries, knowledgeable about modern planning methodology and the efficient organization of consultation meetings and workshops.

The scope for the organization of workshops and awareness building activities should be clearly defined from the beginning and accepted by the participating countries; this should include the precise definition and agreement for the selection of participants, which is a joint responsibility of the stakeholders involved.

The same agreements have to be reached for the identification of sub-contractors and national consultants, which should respond to defined levels of professional standards and be acceptable to the ICPDR and the Executing Agency.

(iv) Delivery of counterpart contribution and availability of information

Considering administrative and financial constraints, participating countries might not be able to provide in time necessary data for the proposed project components and administrative support for meetings and workshops.

Hence, requests for counterpart contribution are to be precisely defined and timely delivery has to be agreed upon. The type of analysis and information needed has to be clearly identified in order to assure the timely availability of precise and viable information.

10 Institutional Frameworks and Implementation

10.1 Institutional Arrangements

Taking into account that there was a successful GEF project in operation for 6 years, which resulted in a revised SAP (Common Platform for Development of National Policies and Actions for Pollution Reduction under the DRPC), and a Pollution Reduction Programme for the DRB, it is proposed to make utmost use of institutional mechanisms and structures which are already operational.

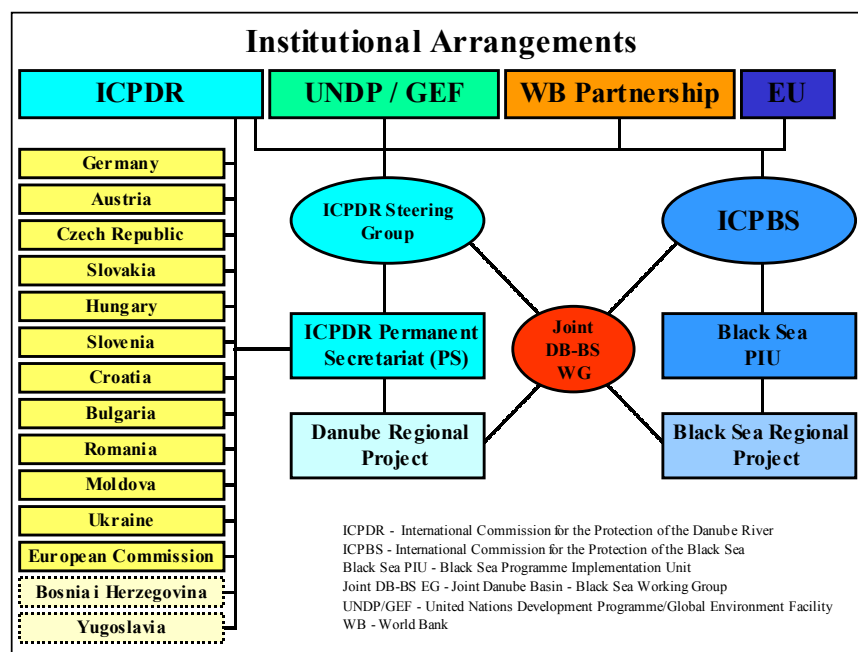
In this context it is proposed that the International Commission for the Protection of the Danube River (ICPDR) will become the responsible organization for project implementation in cooperation with UNOPS as executing agency. A Project Manager, under the supervision of the ICPDR Executive Secretary, shall establish close cooperation with all participating countries, organize efficiently the planning process and assure timely execution of all project components.

The ICPDR Steering Group(SG) should guide the implementation of the Danube Regional Project and assure engagement and cooperation at the national level. For this purpose the ICPDR SG should meet :

- at the beginning of Phase 1 of the Project to review and define scope, planning approach and work programme of the project;
- during project implementation use regular, twice a year, Steering Group meetings to review and assess the progress, to evaluate completed project components and to make recommendations for the continuation and/or adjustment of activities;
- at the end of Phase 1 of the Project to assess and approve the final results at a joint review meeting and to re-examine the planned activities of the 2nd Phase of the Project.

Regarding the elaboration of detailed scope of work and actual performance of the various project components it is proposed to use the professional competence and country specific experience of the existing Expert Groups established under the ICPDR : EMIS, MLIM, AEPWS, the newly created Expert Group for River Basin Management and implementation of the EU Water Framework Directive (RBM EG) and the Ad-hoc Ecological Expert Group (ECO EG).

At the central level, the Project Manager, under the supervision of the ICPDR Executive Secretary and following the directives of the ICPDR Steering Group, will have the mandate to organize and coordinate the planning process and implementation activities and to assure, with UNOPS administrative support, proper management of the GEF project funds.



At the national level it is proposed to incorporate as far as possible the professional competence, experience and knowledge of the Country Programme Coordinators (CPC) assigned in the framework of the previous GEF-Pollution Reduction Programme.

During Phase 1 of the project, “Inter-ministerial Committees” will be put in place to assure that all technical, administrative and financial departments are involved to facilitate and coordinate the implementation of policies, legislation and projects for nutrient reduction and pollution control.

At the regional level, a Joint Danube Basin-Black Sea Working Group (DB-BS/WG) shall assure proper coordination of activities between the Danube Project, the Black Sea Project and the W.B. Partnership Programme. Besides this coordinating role of project activities, the WG shall also follow-up the implementation of the Memorandum of Understanding for the Protection of the Black Sea agreed upon by the two Commissions. The Joint DB-BS Working Group shall meet at least twice a year after the respective Steering Group meetings of the two Commissions.

According to the broad spectrum of activities it is envisaged that most of the particular project components should be carried out by consultant services (on the basis of sub-contracts for international consulting companies and individual consultants from the DRB countries). Objectives, scope and terms of reference will have to be defined in close co-operation with the respective Expert Groups of the ICPDR and approved by the Steering Group Meeting.

In this case the project personnel employed on a fixed term basis and located in the offices of the ICPDR Permanent Secretariat can be restricted to :

- one Project Manager, specialist in environmental policy, with particular experience in institutional arrangements and water pollution legislation and knowledge of EU environmental directives and guidelines and nutrient issues;
- one specialist for awareness raising, organization of training courses and follow up of NGO activities, in particular implementation of the Small Grants Programme;
- one project administrator, with particular experience in budgeting, follow-up of expenditures and establishment of contracts;
- two administrative project assistant/secretary (support staff).

For specific tasks, conceptualization of activities and evaluation of results, highly specialized international consultants shall be assigned.

10.2 Monitoring and Evaluation

Project objectives, activities outputs and emerging issues will be regularly reviewed and evaluated by the competent bodies of the executing and implementing agencies (UNDP/GEF and UNOPS) and the ICPDR.

During the 1st Phase of the Project, a Monitoring and Evaluation System shall be developed and indicators for pollution reduction (process and stress indicators) and environmental status indicators will be defined. Progress indicators for project implementation are defined in the Logical Frame Matrix and will be revised at the initial phase of the Project to relate to specific activities and outputs of project components. Taking into account that in Phase 1 in most cases only intermediary results will be achieved and considering that the timeframe is relatively short, only process indicators can reasonably be applied. Final results, in measurable terms of stress reduction and environmental status will be reached in Phase 2 of the Project (5 years after begin of project activities). Annex 2.2 shows measurable indicators for Phase 2 of the Project demonstrating environmental impact and allowing final evaluation of project implementation measures. 90,000.00 USD, representing 1.8 % of the project budget is earmarked for the development of indicators for project monitoring and impact evaluation.

The annual review will focus on performance (effectiveness, efficiency and timeliness) and evaluate the results in applying the defined progress indicators. At the ICPDR Steering Group Meeting, the

Project will submit and present an APR (Annual Project/Programme Report) in line with UNDP requirements and also participate in the GEF's PIR (Project Implementation Review) exercise each year.

The project will be subject to an external Project Performance Review at the end of the two-years project period. On these occasions an independent consultant team shall make an overall assessment of the project advancement and prepare an independent evaluation. During this review the team should pay particular attention to formulating recommendations for adjustments of procedures and activities of the 2nd Project Phase as needed.

Members of the ICPDR Steering Group should meet after the external review to evaluate project performance and make recommendations for the continuation and/or adjustment of activities in the 2nd Phase and should assess and approve the final results of the joint review meeting.

At the end of the 2nd project period, the project team, under the guidance of the ICPDR Permanent Secretariat, shall prepare a Project Performance Evaluation Report, which should be endorsed by the ICPDR Plenary Session.

10.3 Implementation Schedule

A provisional implementation schedule for the proposed Phase 1 Danube Regional Project is presented in Annex 5.

The project is supposed to start in the second half of 2001 and have a total duration of 24 months. This period includes a project mobilization phase of four months for putting in place the institutional structures and for the organizational preparation of project activities.

Each project component has a preparatory phase of two-to-three months and a consolidation phase of two-to-three months at the end of Phase 1 of the Project. This arrangement facilitates the preparation of the 2nd Project Phase from July 2003 to June 2006.

ANNEXES

- ANNEX 1 Incremental Cost Analysis and Matrix
 – Project Phase 1**
- ANNEX 2 Logical Frame Matrix – Phase 1 and Phase 2
 (Objectives, Results, Activities)**
- ANNEX 3 STAP Review (UNDP) and Response**
- ANNEX 4 Project Budget – Project Phase 1**
- ANNEX 5 Project Implementation Schedule
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- ANNEX 6 Assessment of Nutrient Emissions and Loads
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 Pollution in the frame of the DRPC**
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ANNEX 1 Incremental Cost Analysis and Matrix – Project Phase 1

INCREMENTAL COST ANALYSIS

1. BROAD DEVELOPMENT GOAL

The Danube River Basin is an extensive unique ecosystem in which the balance between the non-living and living resources on one hand and human population on the other has been repeatedly disturbed. Due to the numerous environmental disturbances within its own limits, the Danube River has a negative impact on the complex ecosystems of the Black Sea. All Danube countries are urgently seeking to address environmental protection of transboundary waters under the Danube River Protection Convention.

The current economic conditions of the countries in transition do not allow them to fully respond to the needs for environmental protection and implementation of pollution control measures. Therefore, the GEF project will assist the countries in transition to respond to regional and global environmental issues with particular attention to pollution control and nutrient reduction.

The major perceived problems of the Danube River Basin can be summarized as follows:

- Significant degradation of water quality and ecosystems
- Change in hydrological systems
- Increased nutrient loads to the Black Sea
- Reduced quality of life and human health
- Limited capability to create a sustainable mechanism for co-operation that will be embodied in an international legal and policy framework for co-operation in protection and sustainable use of the Danube River.

The long-term development objective of the proposed Regional Project is to contribute to sustainable human development and promotion of economic activities in the DRB through reinforcing the capacities of the participating countries in developing effective mechanisms for regional cooperation and coordination, in order to ensure protection of international waters, sustainable management of natural resources and biodiversity.

2. BASELINE

The need for protection and management of the Danube River Basin environment and its resources has preoccupied the Danube countries for some years. However, while the EU member States, Germany and Austria have already adapted their legal frame according to EU requirements, the Danube countries in transition are still making great efforts to revise and adapt their legislation to EU standards.

Recently, largely as a consequence of the development of previous UNDP/GEF project "Danube Pollution Reduction Programme", there has been an increasing awareness that legal measures and projects to reduce emissions from point and non-point sources of pollution are urgently needed, in particular measures that will substantively contribute to reducing the transport of nutrients, in particular nitrates to the Black Sea.

The commitment to cooperate and seek common solutions towards implementing nutrient reduction and pollution control measures has been underlined during the development of the Pollution Reduction Programme and the elaboration of the Transboundary Analysis. In addition, the Danube countries have cooperated either in the frame of ICPDR or bilaterally and multilaterally, through conventions and agreements, with a view to jointly formulating and implementing transboundary pollution reduction and environmental protection actions and measures.

However, national mechanisms for pollution control in transition countries are often not fully operational and the inter-ministerial structures for transboundary cooperation in water related environmental issues are weak or missing in most of the transition countries.

All Danube countries, in particular Germany and Austria, have made significant investments in an effort to reduce emissions and improve environmental standards. These ongoing programmes form an important part of the project baseline. In addition, there is financial support being provided by international and bilateral organizations. Contributions came from EU PHARE and TACIS, GEF/UNDP, USAID, DEPA, and other multilateral and bilateral donors as well as from international NGOs.

The ICPDR Expert Groups and the Joint Danube-Black Sea Ad-hoc Working Group have already formulated and facilitated the development of common strategies and policies to assure a reduction of nutrient load in the Black Sea. It is a solid baseline for co-operative research and joint implementation of measures for pollution abatement. Moreover, the ICPDR Information System, DANUBIS, has contributed to an efficient exchange of information throughout the Danube Basin countries.

In November 2000 the ICPDR and the countries participating in the implementation of the Danube River Protection Convention (DRPC) have agreed to develop a common approach for implementing the EU Water Framework Directive. This important decision provides the common platform for cooperation in setting up mechanisms and in implementing programmes and projects for sustainable water management, protection of ecosystems, pollution control and nutrient reduction also in view to rehabilitate the ecological conditions of the Black Sea.

Considering that the approximation process of the Danube countries will take 7 to 20 years, including the introduction of new environmental standards in line with international and EU directives, the “incremental” support of the Project will enhance the process with particular attention to nutrient reduction and will considerably accelerate the development and implementation of policies, regulations and adequate monitoring and enforcement systems for nutrient emissions and reduction of nutrient loads discharged into the Black Sea.

3. GLOBAL ENVIRONMENTAL OBJECTIVE

The global environmental objective of the proposed project is to ensure a regional approach to (i) the development of national policies and legislation and, (ii) the identification of priority measures and actions for nutrient reduction and pollution control, so as to obtain maximum long-term benefits while protecting human health and ecological integrity and ensuring sustainability.

The potential global and regional benefits are likely to be substantial, including the protection of international waters, sustainable management of natural resources and the maintenance of a diverse aquatic ecosystem. The project will also develop effective mechanisms for regional co-operation and co-ordination geared towards the implementation of pollution control and nutrient reduction measures.

The GEF interventions will be accompanied by the current support through bilateral and multilateral programmes in the basin.

4. GEF PROJECT ACTIVITIES

GEF will provide the catalytic support for incremental costs associated with the development of nutrient reduction policies and the creation of efficient mechanisms for regional co-operation under the Danube River Protection Convention to assure efficient control and monitoring of transboundary benefits of the reduction of nutrients and toxic substances within the Danube River Basin.

The strengthening of transboundary co-operation will contribute to an efficient implementation of the ICPDR Joint Action Programme under DRPC with particular benefits gained due to nutrient reduction in the Black Sea and the rehabilitation of its ecosystems.

The approach would be consistent with the guidance for the GEF “Waterbody-based Operational Programme.” For this project, the goal is to assist the Danube countries, especially the transition countries, in making changes in the ways that human activities are conducted in different sectors so that the Danube River and its multi-country drainage basin can sustainably support the human activities. Projects in this Operational Programme focus mainly on seriously threatened water bodies and the most imminent transboundary threats to their ecosystems as described in the Operational Strategy. Consequently, priority is placed on changing sectoral policies and activities responsible for the most serious root causes needed to solve the top priority transboundary environmental concerns which is given for this present project by the pollution and nutrient reduction.

The GEF alternative would support the proposed project in:

- Developing nutrient reduction policies and legal instruments and measures for exacting compliance
- Strengthening institutional mechanism and building capacity for transboundary cooperation in nutrient reduction
- Raising awareness and reinforcing NGO participation in implementing “Small Grants” Projects
- Strengthening the monitoring and information mechanisms on transboundary pollution control and nutrient reduction

This regional project represents a motivating case in which the improvement of transboundary co-operation and co-ordination shall help ICPDR and the countries to reinforce their efforts aimed at an efficient implementation of the DRPC.

In addition, improved transboundary co-operation will provide a better basis for the sustainable use of natural resources and the conservation of biological diversity in the Danube river basin. The cost of doing this is evidently incremental to the national efforts of all thirteen countries, focused on maximizing environmental benefits through comprehensive global and domestic environmental management strategies.

In its 1st Phase, the Project will reinforce existing implementation mechanisms, analyze and prepare methodological and practical approaches for various project components and organize workshops to train trainers in technical, legal and economic aspects of water management and pollution reduction. The 2nd Phase of the Project will build up on the results of the 1st Phase and assure full implementation of all project components and efficient achievement of set targets for sustainable management of waters and protection of ecosystems in the Danube River Basin and the Black Sea.

5. SYSTEM BOUNDARY

For the purpose of this project, the area of GEF interventions is defined by the hydrological catchment basin of the Danube river, as regards the international water boundaries, and beyond this, the natural resources of the Danube countries, as regards the natural resources management and biodiversity conservation objectives.

The project will inevitably result in a large number of domestic and regional impacts and benefits and attention has been paid to include these within the system boundary.

The participating countries include Germany, Austria, the Czech Republic, the Slovak Republic, Hungary, Slovenia, Croatia, Bosnia & Herzegovina, Yugoslavia, Bulgaria, Romania, Moldova and Ukraine.

Over the long-term, a variety of domestic benefits would be gained through the implementation of the proposed project. The most valuable domestic benefits to be gained from the project are associated with substantially strengthened institutional and human capacity in pollution control and water quality assessment, increased technical knowledge and public awareness of Danube environmental issues and transboundary co-operation, and improved national capacities in environmental legislation and enforcement as well as in natural resources management.

Bilateral and multilateral programmes focused on domestic improvements in water management and pollution control have been included within the baseline in order to clearly distinguish between actions most likely to result in domestic benefits (baseline bilateral projects) and those that will mainly result in regional and global ones (the present project).

Summary Incremental Costs (2 years period):

Baseline	353,443,800 USD
Alternative	365,393,800 USD
Incremental	11,950,000 USD

GEF Financing:

Project Phase 1	4,629,630 USD
PDF-B	350,000 USD
Project Support Costs	370,370 USD
Co-Finance	6,600,000 USD
Total project Cost	11,950,000 USD

Incremental Cost Matrix – Benefits

Component	Benefits	Baseline	Alternative	Incremental
OBJECTIVE 1: Creation of sustainable ecological conditions for land use and water management	Domestic	<ol style="list-style-type: none"> 1. EU member states, Germany and Austria, have adapted their legal frame to EU standards and are improving conditions through additional investments to assure compliance; 2. Danube countries in transition are in different stages of adapting their legislation to EU standards; 3. Countries in transition have to revise their water and waste water tariffs to assure amortization of investments and economic operation of treatment plants, considering in particular third stage for nutrient removal; 4. At the national level, most Danube countries in transition have no efficient mechanisms or inter-ministerial structures for cooperation in water related environmental issues (pollution control, nutrient removal, etc.); 5. All Danube countries have developed investment programmes to reduce emissions and improve environmental standards; the total investment of committed priority projects for municipal, industrial, agricultural waste water treatment facilities and wetland restoration projects is 4.4 billion €. 	<ol style="list-style-type: none"> 1. EU member states Germany and Austria will continue to improve compliance with guidelines for nutrient reduction from non-point sources of pollution through changes in agricultural and land use practices (eco-farming); 2. Countries in transition in the central and lower DRB will increase their efforts to adapt national legislation to EU standards with particular attention to the EU nitrate directives and phosphorus phase-out regulations for detergents; 3. Economic conditions for investments and operation of waste water treatment facilities in the municipal, industrial and agro-industrial sectors, in particular for nutrient reduction, will be improved through adopted regulations and new tariffs for waste water management; 4. Policies and regulations as well as mechanisms for compliance will be developed for nutrient reduction from non-point sources of pollution with particular attention to agricultural practices (organic farming) and land management (green river belts, wetlands restoration; etc). 	<ol style="list-style-type: none"> 1. Review of the present situation, update of EMIS emission inventory for agricultural and industrial “hot spots” and development of new concepts for improved harmonization of policies and regulations with those existing in EU member states and improved mechanisms for compliance are developed to assure efficient reduction of nutrients and toxic substances : <ul style="list-style-type: none"> • from agricultural non-point sources of pollution by introducing best agricultural practices (agrochemicals, organic farming) and land management (green river belts, wetlands restoration; etc); • from agricultural point sources of pollution (animal farms, agro-industries) by introducing adequate waste water treatment and best manure handling practices; • from industrial and mining companies by introducing “clean” (BAT) industrial production and safety regulation in the industrial sectors; 2. Analysis to assess options to revise tariffs, incentives and fines in all transition countries to assure amortization of investments and coverage of operational cost for waste water treatment and nutrient reduction;

Component	Benefits	Baseline	Alternative	Incremental
				3. Analysis to achieve improved legislation adapted to EU standards in all transition countries and measures for compliance in relation to the implementation of the Nitrate Directive and regulations for phosphorus phase-out in detergents.

Component	Benefits	Baseline	Alternative	Incremental
OBJECTIVE 1: Creation of sustainable ecological conditions for land use and water management	Global-Regional	<ol style="list-style-type: none"> 1. Either in the frame of the ICPDR or bilaterally and multilaterally, the Danube countries formulate common policies and actions for transboundary cooperation in pollution reduction and environmental protection; compliance is often not assured 2. The ICPDR has created working group to assure efficient implementation of the new EU Water Framework Directive using river basin management as the appropriate approach to assure stakeholder participation and transboundary cooperation; 3. In the Joint Action Programme of the ICPDR, transboundary policy measures and projects have been identified to reduce transboundary pollution. 	<ol style="list-style-type: none"> 1. The harmonization of national standards and procedures will facilitate regional cooperation under the Danube River Protection Convention as well as control and monitoring of transboundary benefits of pollution and nutrient reduction; 2. The new EU WFD will be implemented in the whole DRB using river basin management as the most efficient approach; this calls for the cooperation of all Danube countries, the civil society and NGOs to develop joint mechanisms and structures at the ICPDR and the sub-regional level; 3. The implementation of the Joint Action Programme under the DRPC will be reinforced through transboundary cooperation, defining complementary actions to reach common goals of pollution reduction in Significant Impact Areas (SIA) and rehabilitation of ecosystems; particular benefits will be the reduction of nutrient load in the Black Sea and the rehabilitation of its ecosystems. 	<ol style="list-style-type: none"> 1. Reviews of the present situation and development of new concepts for improved and harmonized standards and procedures in all participating countries will facilitate joint monitoring of transboundary effects and control of pollution and nutrient reduction measures introduced in municipal, industrial and agricultural sectors; 2. Middle and lower Danube states will have defined their respective programme of cooperation for the implementation of the EU WFD and their participation in the development of River Basin Management Plans; 3. The first and second phase of the EU WFD will be implemented by the majority of the DRB countries and operational mechanisms and structures for the preparation of RBM plans will be put in place; 4. Concepts for common policies for sustainable use of land and natural resources, nature conservation and wetland restoration, developed in the frame of an Annex to the Convention, will facilitate the development of RBM plans; 5. Recommendations for improving the capacities for cooperation under the DRPC and improved linkages to International Financing Institutions will facilitate the implementation and enlargement of the Joint Action Plan and, consequently, a further reduction of pollution and nutrient loads affecting SIA in the DRB and

Component	Benefits	Baseline	Alternative	Incremental
				the Black Sea.
OBJECTIVE 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin	Domestic	<ol style="list-style-type: none"> 1. National mechanisms for pollution control in transition countries are frequently not fully operational (lack of funds, outdated equipment etc.) 2. National allowable emissions and quality standards are not yet fully harmonized with EU standards and control mechanisms (laboratories) are insufficiently equipped; 3. In transition countries, national mechanisms for environmental impact assessment are weak and control mechanisms are often not operational (see recent accidental pollution in the Tisza and Siret River Basins). 	<ol style="list-style-type: none"> 1. National and transboundary mechanisms for pollution control will reach comparable standards in all Danube countries to assure reliable data and coherence of information; 2. National emission limits and water quality standards will be adapted to EU regulations and control mechanisms will be fully functional in all DRB countries; 3. Environmental impact assessment will be part of national regulations to assure efficient control of industrial, mining and transport activities and to introduce preventive measures. 	<ol style="list-style-type: none"> 1. National “Inter-ministerial Committees” will be created to assure implementation of new policies and legislation for nutrient reduction and pollution control. The development of concepts for environmental impact assessment and harmonized standards for emission control and water quality assessment will provide the base for further improvement of mechanisms for regional cooperation; 2. Concepts for the improvement of the accidental emergency system will facilitate efficient monitoring of accidental “hot spots” and prevention of accidental pollution from toxic substances from mining and industrial plants.
	Global-Regional	<ol style="list-style-type: none"> 1. The ICPDR has put in place Expert Groups to develop common strategies and standards for pollution control (emissions), water quality control, accidental emergency warning, ecology and river basin management (implementation of EU WFD); 2. The Joint Danube–Black Sea ad-hoc working group has formulated common strategies to assure a reduction in nutrient load in the Black Sea with the objective to restore the Black Sea ecosystems; 3. The ICPDR has put in place an Information System (DANUBIS) to assure efficient exchange of information within the member states and Expert Groups and to provide information to the public. 	<ol style="list-style-type: none"> 1. To facilitate monitoring and evaluation of joint implementation of pollution reduction measures, the participating countries under the ICPDR will improve mechanisms for monitoring and evaluation and develop indicators to measure process, environmental status and stress reduction; 2. The Danube–Black Sea Joint Working Group will implement the commonly agreed strategies and actions, develop respective impact indicators and report the results regularly to both Commissions; 3. All Danube countries will use the ICPDR Information System (DANUBIS) as an interactive plat-form for the development and exchange of information and provide access to reliable data and information to the public. 	<ol style="list-style-type: none"> 1. Proposals for commonly agreed indicators to measure process, environmental status and stress reduction will facilitate joint monitoring and evaluation of the implementation of pollution reduction measures; 2. Increased technical and managerial know-ledge for transboundary cooperation and development of joint policies and actions through the preparation of programmes for training and capacity building; 3. The preparation of regular evaluation reports on water quality and nutrient loads/ concentrations in the TNMN Yearbooks and other relevant documents will facilitate cooperation and public information;

Component	Benefits	Baseline	Alternative	Incremental
				<p>4. A working programme issued by the Joint Danube-Black Sea Working Group will result in regular reports on the status of the Black Sea ecosystems and is based on observation of commonly agreed indicators;</p> <p>5. The existence of the ICPDR Information System will facilitate interactive internal monitoring and information exchange and provide information to the public.</p>
OBJECTIVE 3: Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems	Domestic	<p>1. National NGOs have been actively participating in implementing GEF Small Grants projects and in conducting awareness raising campaigns for pollution reduction;</p> <p>2. In Germany as well as in Austria and also in several Danube transition countries, national NGOs have established good working or influential relationships with governments at national and local level;</p> <p>3. Government campaigns for awareness raising for pollution control and waste water management are relatively rare in transition countries (scarcity of funding);</p> <p>4. Reports from mass media on National Planning Workshops, organized in the frame of the UNDP/GEF Pollution Reduction Programme in 1998/99, contributed to public awareness raising.</p>	<p>1. Community-based activities for pollution /nutrient reduction measures and wetlands restoration will be supported by the “Small Grants Programme” and implemented through NGOs involvement;</p> <p>2. National NGOs will be strengthened to enable them to participate in national debates and public hearings on environmental issues with particular attention to pollution control, nutrient reduction and EIA;</p> <p>3. National NGOs will organize and implement, in relation to “Small Grants Programmes” particular awareness raising campaigns for pollution control and nutrient reduction.</p>	<p>1. Community based actions and programmes for nutrient reduction and awareness raising are efficiently prepared for the financial support of the “Small Grants Programme”, and aiming at the cooperation of national NGOs;</p> <p>2. Efficient participation of NGOs in national debates and public hearings related to environmental protection and RBM is prepared through their involvement in the Small Grants Programme and in the organization of awareness raising campaigns;</p> <p>3. Improved public awareness and response to nutrient reduction and pollution control is prepared through public campaigns and the implementation of actions and projects in the frame of the Small Grants Programme (“applied” awareness raising).</p>
	Global-Regional	<p>1. At the regional level, national NGOs are organized in the Danube Environmental Forum (DEF); DEF representatives participate in ICPDR meetings and in the RMB EG and ad-hoc ECO Expert Group; an</p>	<p>1. The Danube Environmental Forum will be fully operational at the national and regional levels; the DEF will participate with qualified expertise in all ICPDR Expert Groups to assure the</p>	<p>1. The existence of operational mechanisms and structures for basin-wide coordination and development of NGO policies and actions under the DEF is achieved through operational</p>

Component	Benefits	Baseline	Alternative	Incremental
		<p>internal information exchange by e-mail is functioning;</p> <p>2. International NGOs, and WWF in particular, play an important role in wetland restoration and environmental awareness raising and participate in all emergency situations (Balkan Task Force, Baia Mare Task Force, etc.);</p> <p>3. Under the Danube River Basin Environmental Programme, the periodical “Danube Watch” was published quarterly from 1994 to 2000 as a channel to inform the government and private readers about water pollution and related problems in the DRB and the progress made in implementing the programme in support of the DRPC.</p>	<p>implementation of NGO strategies and actions in support of the DRPC;</p> <p>2. The DEF has developed mechanisms to assure sustainable financial resources for its operation and activities;</p> <p>3. Under the ICPDR, basin-wide awareness raising campaigns will be organized to enhance public participation in the implementation of the water framework and nitrate directives with particular attention to nutrient reduction measures and phosphorus phase-out programmes;</p> <p>4. The Danube Watch will be used as a periodical information journal of the ICPDR.</p>	<p>and structural support;</p> <p>2. Improved and efficient cooperation with the ICPDR is assured through NGOs participation in ICPDR bodies (observers);</p> <p>3. Financial sustainability of the DEF is addressed through development of funding schemes and resource mobilization;</p> <p>4. Increased awareness of the public and the decision makers of nutrient reduction and pollution control will be achieved through public awareness raising campaigns to be organized in Phase 2 of the Project in cooperation with the DEF and national NGOs and through special publications of the ICPDR.</p>
OBJECTIVE 4: Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances	Domestic	<p>1. In transition countries, the analysis of sediments and monitoring of bio-indicators is only done occasionally; funding of institutions and laboratories is insufficient to conduct regular programmes;</p> <p>2. Monitoring of nutrient-removal capacities of wetlands is only done in the frame of specific projects <u>outside</u> the DRB; no regular observation programme exists in the Danube countries.</p>	<p>1. Specialized institutions at the national level will be identified to participate in the sampling and analysis of bio-indicators and sediments to control toxic substances, heavy metals and other pollutants in national waters;</p> <p>2. In the frame of the implementation of wetland rehabilitation projects, monitoring programmes will be set up to analyze the effects of nutrient reduction and to determine the most cost-effective solutions for wetland restoration in the DRB.</p>	<p>1. Preparation for improved performance of national institutions to execute sampling and analysis of environmental status indicators (with particular attention to bio-indicators) and sediments to control toxic substances, heavy metals and other pollutants in national waters;</p> <p>2. Improved knowledge on toxic substances accumulated in sediments in the Danube River and its tributaries and on possible effects on the Black Sea;</p> <p>3. Improved knowledge on the most cost-effective way of wetland restoration and nutrient removal in the DRB.</p>
	Global-Regional	<p>1. Upstream Danube countries, in particular Germany and Austria, have not yet fully adapted national legislation to EU water</p>	<p>1. EU countries, Germany and Austria are increasing their efforts to comply with EU Nitrate Directive in regard to diffuses</p>	<p>1. Economic instruments are assessed and discussion with the EU is initiated to identify new or alternative ways for</p>

Component	Benefits	Baseline	Alternative	Incremental
		<p>quality directives (Nitrate Directive) and have not yet established mechanisms for compliance whereas downstream countries have a good potential (but no funds!) to introduce cost-efficient nutrient reduction measures</p> <p>2. Transboundary effects of pollutants in sediments (toxic substances and heavy metals) are not investigated; transport mechanisms of sediments and effects on the Black Sea ecosystems are presently not known.</p>	<p>sources of pollution, (in particular agricultural activities); in this context, economic measures will be examined to speed up nutrient reduction measures in the frame of joint actions under the ICPDR;</p> <p>2. The ICPDR will set up a regular programme for the sampling and analysis of bio indicators and sediments to control transboundary flow of toxic substances, heavy metals and other pollutants as well as their effects on ecosystems in the DRB and the Black Sea.</p>	<p>the implementation of nutrient reduction measures, including incentives and voluntary measures of basin wide cooperation;</p> <p>2. Regular monitoring programmes are prepared to analyze the effects of nutrient reduction and to evaluate their effect on ecosystems in the DRB and the Black Sea.</p>

Component	Benefits	Baseline	Alternative	Incremental
INVESTMENTS: Five Year Nutrient Reduction Plan / ICPDR Joint Action Programme	Domestic	<p>Investments: 4.4 billion € for five years out of which 39% of funding is assured through national funding, 26 % through international loans and 15% through international grants; 20% of the proposed investment remains to be raised.</p> <p>Through the implementation of projects for waste water treatment in the municipal, industrial and agro-industrial sectors (ICPDR Joint Action Programme), important domestic benefits in pollution reduction (COD, BOD, N + P) are achieved also during the first from 2001 to 2003 covered by the 1st Phase of the GEF Project.</p>	<p>In the frame of the existing funding schemes, covering a period of 5 years, additional funds (850 million €) will be mobilized through:</p> <ul style="list-style-type: none"> World Bank Partnership : 210 million \$ in loans and 70 million \$ in GEF grants ISPA funds : 3.5 billion € SAPARD funds : 1.7 billion € Other EU funds : 8.3 billion € EBRD funds : to be determined Bilateral funds : to be determined <p>Considering that the economic situation of all transition countries will be improved over time, the 5-year investment programme can be amended and additional investments can be foreseen to further facilitate the implementation of pollution reduction measures. Particular attention will also be paid to nutrient reduction from non-point sources of pollution through the development and implementation of respective policies and legislation.</p>	<p>Through the implementation of the above-mentioned measures described in Phase 1 of the GEF Regional Project in terms of the assessing and improving policies and regulations for nutrient reduction in line with EU Directives (Urban Waste Water Directive, Nitrate Directive, WFD, etc.), additional benefits will be achieved in reducing emissions from point and non-point sources, in particular from agricultural activities.</p> <p>The 1st Phase of capacity building measures from 2001 to 2003 will reinforce the 5 years investment programme and will increase the effectiveness of measures for pollution reduction.</p>
	Global-Regional	<p>The implementation of the above measures will also yield transboundary and therefore regional benefits; concerning the reduction of nutrient transport to the Black Sea, global benefits will also be achieved.</p>	<p>All the projects described above and the measures implemented at the national level will have transboundary consequences in the improvement of health and ecological conditions in the Danube River Basin (Significant Impact Areas) and, through reduction of nutrient load, in the recovery of the Black Sea ecosystems.</p>	<p>The implementation of the above measures at the national level will also yield transboundary and therefore regional benefits in improving the ecological conditions in Significant Impact Areas of the DRB; concerning the reduction of nutrients from point and non-point sources, substantive global benefits will also be achieved for the Black Sea and the restoration of its ecosystems.</p>

Danube Regional Project - Phase 1 / Incremental Costs Matrix - Costs

Objective	Outputs	Baseline Costs (USD)						Alternative Costs (USD)	Incremental Costs (USD)		
		Governments	UNDP	Bilat. Donors (USAID)	EU	NGOs	Total Baseline		ICPDR	GEF	Total Incremental
Objective 1: Creation of sustainable ecological conditions for land use and water management	General costs related to Objective 1			400,000			400,000	835,000		435,000	435,000
	1.1 Development and implementation of policy guidelines for river basin and water resources management.	22,320,000	150,000				22,470,000	24,105,600	1,188,000	447,600	1,635,600
	1.2 Reduction of nutrients and other harmful substances from agricultural non-point sources through agricultural policy changes	16,740,000					16,740,000	17,120,600		380,600	380,600
	1.3 Development of pilot projects on reduction of nutrients and other harmful substances from agricultural point-sources	16,740,000	70,000				16,810,000	17,079,200		269,200	269,200
	1.4 Policy development for wetlands rehabilitation under the aspect of appropriate land use	9,300,000	80,000			80,000	9,460,000	9,706,400		246,400	246,400
	1.5 Industrial reform and development of policies and legislation for application of BAT (best available techniques including cleaner technologies) towards reduction of nutrient (N and P) and dangerous substances	13,950,000	265,000	2,000,000			16,215,000	16,484,600		269,600	269,600
	1.6 Policy reform and legislation measures for development of cost-covering concepts for water and waste water tariffs, focusing on nutrient reduction and control of dangerous substances	5,580,000	200,000	2,000,000			7,780,000	7,943,000		163,000	163,000
	1.7 Implementation of effective systems of water pollution charges, fines and incentives, focusing on nutrients and dangerous subst.	4,650,000	50,000				4,700,000	4,792,000		92,000	92,000
	1.8 Recommendations for the reduction of phosphorus in detergents	3,720,000	60,000				3,780,000	3,902,000		122,000	122,000
	Subtotal	93,000,000	875,000	4,400,000		80,000	98,355,000	101,968,400	1,188,000	2,425,400	3,613,400
Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin	General costs related to Objective 2			2,400,000			2,400,000	2,577,500		177,500	177,500
	2.1 Setting up of "Inter-ministerial Committees" for development, implementation and follow-up of national policies, legislation and projects for nutrient reduction and pollution control	3,720,000					3,720,000	3,939,500	181,500	38,000	219,500
	2.2 Development of operational tools for monitoring, laboratory and information management and for emission analysis from point and non-point sources of pollution with partic. attention to nutrients and toxic substances	22,320,000					22,320,000	23,587,720	1,089,000	178,720	1,267,720
	2.3 Improvement of procedures and tools for accidental emergency response with particular attention to transboundary emergency situations	15,624,000					15,624,000	16,467,460	762,300	81,160	843,460
	2.4 Support for reinforcement of ICPDR Information and Monitoring System (DANUBIS)	20,832,000					20,832,000	22,050,560	1,016,400	202,160	1,218,560
	2.5 Implementation of the "Memorandum of Understanding" between the ICPDR and the ICPBS relating to discharges of nutrients and hazardous substances to the Black Sea	4,464,000					4,464,000	4,709,400	217,800	27,600	245,400

Objective	Outputs	Baseline Costs (USD)						Alternative Costs (USD)	Incremental Costs (USD)		
		Governments	UNDP	Bilat. Donors (USAID)	EU	NGOs	Total Baseline		ICPDR	GEF	Total Incremental
	2.6 Training and consultation workshops for resource management and pollution control with particular attention to nutrient reduction and transboundary issues	0			137,800,000		137,800,000	137,916,800	0	116,800	116,800
	Subtotal	74,400,000		2,400,000	137,800,000		207,160,000	219,051,940	3,630,000	821,940	4,088,940
Objective 3: Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems	General costs related to Objective 3			4,000,000		6,100,000	10,100,000	10,201,000		101,000	101,000
	3.1 Support for institutional development of NGOs and community involvement		70,000			2,500,000	2,570,000	2,988,520	143,220	275,300	418,520
	3.2 Applied awareness raising through community based “Small Grants Programme”		30,000	6,000,000		3,000,000	9,030,000	9,273,790	55,440	188,350	243,790
	3.3 Organization of public awareness raising campaigns on nutrient reduction and control of toxic substances		94,000			14,800	108,800	635,140	263,340	263,000	526,340
	Subtotal		194,000	10,000,000		11,614,800	21,808,800	23,098,450	462,000	827,650	1,289,650
Objective 4: Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances	General costs related to objective 4							122,750		122,750	122,750
	4.1 Development of indicators for project monitoring and impact evaluation	7,440,000					7,440,000	7,929,150	363,000	126,150	489,150
	4.2 Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals and other dangerous substances on the Danube and the Black Sea ecosystems	5,580,000					5,580,000	5,976,000	396,000	0	396,000
	4.3 Monitoring and assessment of nutrient removal capacities of riverine wetlands	7,440,000				80,000	7,520,000	8,157,340	528,000	109,340	637,340
	4.4 Danube Basin study on pollution trading and corresponding economic instruments for nutrient reduction	5,580,000					5,580,000	6,172,400	396,000	196,400	592,400
	Subtotal	18,600,000	0			80,000	18,680,000	20,554,640	1,320,000	554,640	2,237,640
Total Capacity Building		186,000,000	1,069,000	16,800,000	137,800,000	11,774,800	353,443,800	364,673,430	6,600,000	4,629,630	11,229,630
PDF-B										350,000	350,000
Support Costs										370,370	370,370
Total		186,000,000	1,069,000	16,800,000	137,800,000	11,774,800	353,443,800	365,393,800	6,600,000	5,350,000	11,950,000

Bilateral Donors:
USAID, DEPA

NGOs: REC, WWF, Danube NGOs

ANNEX 2 Logical Frame Matrix (Objectives, Outputs, Activities)

Annex 2.1 Logical Frame Matrix – Project Phase 1

Logical Frame Matrix – Phase 1 (Objectives, Outputs, Activities)

Objectives/Purpose	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p><u>1. Long-term Development Objective:</u> The long-term development objective of the proposed Regional Project is to contribute to sustainable human development in the DRB through reinforcing the capacities of the participating countries in developing effective mechanisms for regional cooperation and coordination in order to ensure protection of international waters, sustainable management of natural resources and biodiversity.</p> <p><u>2. Overall Objective:</u> The overall objective of the Danube Regional Project is to complement the activities of the ICPDR required to provide a regional approach and global significance to the development of national policies and legislation and to the definition of priority actions for nutrient reduction and pollution control with particular attention to achieving sustainable transboundary ecological effects within the DRB and the Black Sea area.</p> <p><u>The specific objective of Phase 1 of the Project</u> is to prepare and initiate basin-wide capacity-building activities with particular attention to creation of inter-ministerial committees, concept development for implementation of policies, legal and economic instruments, mechanisms for monitoring and evaluation and development of programmes for awareness raising and NGO strengthening.</p>	<p>Overall Project Objective: At the end of Phase 1 of the Project, methodologies and concepts have been developed under the DRPC to introduce and implement legal and institutional mechanisms for efficient pollution control and reduction of nutrient loads to the Black Sea.</p>	<ul style="list-style-type: none"> • Project progress and evaluation report • Summary Reports on ICPDR meetings and resolutions • National reports on the process of implementation of legal and institutional instruments 	<ul style="list-style-type: none"> • All countries participate under the ICPDR in implementing legal and institutional mechanisms for pollution reduction and sustainable water management.
	<p>Objective 1: At the end of the Project Phase 1, all Danube River Basin countries have reviewed policies and legal instruments in relation to ecological land use (River Basin Management) and water management and have prepared mechanisms to adapt their national legislation to international and EU standards.</p>	<ul style="list-style-type: none"> • Project progress and evaluation report • National reports on existing and proposed policies, legal instruments and measures for compliance. 	<ul style="list-style-type: none"> • All countries participate under the ICPDR in the implementation of EU WFD and other Directives for pollution reduction.
	<p>Objective 2: Operational mechanisms for the monitoring of water pollution and control of emissions from point and non-point sources and a reliable information system under the ICPDR are designed and ready for implementation at the regional and national level to assess improvement of water quality and nutrient reduction in the Black Sea.</p>	<ul style="list-style-type: none"> • Working area of the ICPDR Information System showing concepts and design of monitoring systems for water quality, emissions and emergency warning; • Reports from the MLIM and EMIS Expert Groups 	<ul style="list-style-type: none"> • National Experts are proactively participating in the implementation of the DRPC and Governments have provided sufficient funding for the operation of national Information System.

Objectives/Purpose	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>3. Purpose of the Project:</p> <p>Further, the Danube Regional Project shall facilitate project implementation by providing a framework for coordination, dissemination and replication of successful demonstration that will be developed through the implementation of investment projects.</p>	<p>Objective 3: At the end of Phase 1 of the Project the Secretariat of the Danube Environmental Forum (DEF) is fully operational and national representations exist in all Danube countries. National NGOs are involved in project preparation and have identified community-based nutrient reduction projects to be financed under the GEF Small Grants Programme and have prepared at least two national awareness-raising campaigns.</p>	<ul style="list-style-type: none"> • Reports on staffing and operation of the DEF Secretariat • List of national NGOs adhering to the DEF and of National DEF Focal Points; • National lists of projects to be financed in the frame of the GEF Small Grants Programme. 	<ul style="list-style-type: none"> • The DEF has the necessary personnel and commitment to play its role efficiently in the DRB.
	<p>Objective 4: At the end of Phase 1 of the Project, the ICPDR has conceptualized and developed its monitoring and evaluation system and has identified the indicators for pollution reduction and environmental status; knowledge on removal of nutrients and toxic substances is increased and economic instruments to encourage investments for nutrient reduction are developed at the national and regional level.</p>	<ul style="list-style-type: none"> • Concept of M&E system indicators (process stress, status) developed and accessible in DANUBIS working area; • Report on methodological approach and programmes to assess nutrient-retention capacities of wetlands; • Report on economic instruments to facilitate investments in nutrient reduction projects. 	<ul style="list-style-type: none"> • Cooperation of all countries and organizations, in particular the EU, in the development and application of indicators for project monitoring and evaluation.

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.1: Development and implementation of policy guidelines for river basin and water resources management	1. River Basin Districts are defined 2. River basin management practices are identified and gaps and needs in relation of WFD requirements are clarified 3. Methodology for preparation of RBD management plans is implemented in pilot river basins 4. Transboundary cooperation and coordination is enhanced	1. Map with Danube RBD boundaries 2. Report on concepts for river basin management plans 3. Pilot River Basins identified 4. Reports on regular meetings of the ICPDR River Basin Management Expert Group	1. Differing concepts on the sub-river basins delimitation might appear 2. Limited capacities for implementation of WFD of downstream countries 3. Financial support for preparation of pilot projects is assured
1.1.1 Identification of the River Basin Districts (RBD), in particular the assignment of coastal waters and groundwater bodies; 1.1.2 Developing common approaches and methodologies for pressure and impact analysis; 1.1.3 Implementing the common approaches and methodologies for pressure and impact analysis (at the national level); 1.1.4 Applying the EU Guidelines for economic analysis and arriving at the overall economic analysis for the Danube River Basin; 1.1.5 Developing RBM tools (mapping, GIS, remote sensing, etc.) and related data management, including the arriving at the typology of surface waters and the relevant reference conditions; 1.1.6 Identify pilot river basins and apply common approaches, methodologies, standards and guidelines (observe also the link to the Working Groups of the European Commission); 1.1.7 Organize workshops and training courses in order to produce the River Basin Management Plan and to strengthen basin-wide cooperation; 1.1.8 <i>(to be carried out in the Phase 2);</i> 1.1.9 <i>(to be carried out in the Phase 2).</i>			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.2: Reduction of nutrients and other harmful substances from agricultural point and non-point sources through agricultural policy changes	<ol style="list-style-type: none"> 1. List of priority ‘hot spots’ and assessment of legislation on point and non-point sources of pollution are updated 2. Review of hazardous agrochemicals and their impacts is worked out 3. Conventional and alternative agricultural practices and farming in line with EU requirements for central and downstream Danube countries are analyzed 4. National deficiencies in agricultural policy are identified 	<ol style="list-style-type: none"> 1. National analysis reports for each DRB country 2. DRB report on the use and impact of agrochemicals 3. Draft concepts for strengthening best agricultural practices in DRB countries 	<ol style="list-style-type: none"> 1. Cooperation of national level needs and production of national reports must be available in time 2. Economic conditions are unfavorable for adoption of new appropriate agricultural practices and organic farming
<ol style="list-style-type: none"> 1.2.1 Up-dating the basin-wide inventory and prioritization on agricultural point and non-point sources of pollution “hot spots” in line with EMIS emission inventory; 1.2.2 Review relevant legislation, existing policy programmes and actual state of enforcement in the DRB with respect to promotion and application of best agricultural practices; 1.2.3 Review inventory on important agrochemicals (nutrients etc.) in terms of quantities of utilization, their misuse in application, their environmental impacts and potential for reduction; 1.2.4 Identify main institutional, administrative and funding deficiencies (incl. complementary measures) to reduce pollutants; 1.2.5 Introduce or, where existing, further develop concepts for the application of best agricultural practices in all DRB countries, by taking into account country-specific traditional, social and economic issues, and the ECE recommendations; 1.2.6 <i>(to be carried out in the Phase 2).</i> 			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.3: Development of pilot projects on reduction of nutrients and other harmful substances from agricultural point and non-point sources	<ol style="list-style-type: none"> 1. Assessment of practical promotion of best agricultural practices and manure handling is updated 2. Alternative concepts for farming and manure handling in line with EU requirements for central and downstream Danube countries are elaborated 3. Needs for pilot activities in best agricultural practices are identified in UA, MO, RO, BG, YU and B-H 4. Understanding of decision makers and farmers on the need to introduce new concepts for animal farming and manure handling is addressed 	<ol style="list-style-type: none"> 1. Identification list for pilot projects in best agricultural practices 3. Concepts for introduction of best agricultural practices 	<ol style="list-style-type: none"> 1. Cooperation of stakeholders and difficulty to identify community interest, 2. Knowledge is needed to inform farm managers and policy makers on the trade-off between on-farm practices and off-farm consequences 3. Controversy on the economic and financial viability of selected pilot farms may occur
1.3.1	Analyze existing programmes and pilot projects promoting best agricultural practice (especially regarding animal farming and manure handling, as well as organic farming) in DRB countries, and assess nutrient reduction capacities;		
1.3.2	Develop practical concepts for the introduction resp. better promotion of appropriate agricultural practices and manure handling in the central and downstream DRB countries by taking into account national demand and international markets and ECE recommendations;		
1.3.3	Prepare and implement for the central and lower DRB countries typical pilot projects (especially in UA, MD, RO, BG, YU and B-H) to train and support farmers in the application of best agricultural practice.		
1.3.4	<i>(to be carried out in the Phase 2)</i>		

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.4: Policy development for wetlands rehabilitation under the aspect of appropriate land use	1. Areas for land use planning in pilot river basins are identified 2. Methodology and concepts for appropriate land use and wetland restoration are developed 3. Inappropriate land use at wetland restoration is discussed with stakeholders (workshop)	1. Draft reports on land use in two sub-river basin areas 2. New concepts and strategies for land use reforms of selected wetland areas (wetland rehabilitation schemes)	1. Limited knowledge on economic and environmental benefits and costs of various land uses 2. Difficulty to assure participatory approach and cooperation between environmentalists and government
1.4.1 Define methodology for integrated land use assessment around wetlands (called "wetland areas"); 1.4.2 Carry out case studies for selected wetland areas and assess inappropriate land use (e.g. forestry, settlements and development zones, agriculture and hydraulic structures); 1.4.3 Develop alternative concepts and strategies for achieving integrated land use and management in chosen wetland areas, including required actions and measures (regulatory and legal issues, economic fines and incentives, compensation payments, etc). 1.4.4 <i>(to be carried out in the Phase 2)</i> 1.4.5 <i>(to be carried out in the Phase 2)</i>			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.5: Industrial reform and development of policies and legislation for application of BAT (best available techniques including cleaner technologies) towards reduction of nutrients (N and P) and dangerous substances	1. Updated list of ‘hot spots’ and inventory on industries with outdated techniques and facilities (accidental risks), related to SIAs, are produced 2. Existing policies and legislation at the national level are collected and existing gaps with EU legislation are identified 3. Workshop programmes for BAT introduction are prepared	1.+2. National reports on inventory of industrial technologies and legal status 3. Training programmes and training materials	1. Difficulty to access most recent database 3. Industrial managers, researchers and policy makers have to perceive the benefits of implementing EU environmental directives
1.5.1 Up-dating the basin-wide inventory on industrial and mining “hot spots” (EMIS inventory) taking into account emissions of nutrient and toxic substances 1.5.2 Review data and information on the actual status of industrial production techniques involving nutrients (N and P) and dangerous substances in the DRB countries. 1.5.3 Review policies and relevant existing and future legislation for industrial pollution control and identification enforcement mechanisms on a country level; 1.5.4 Compare and identify gaps between relevant EU and national legislation; 1.5.5 Develop necessary complementing policy and legal measures for the introduction of BAT (regulatory and legal issues, awareness raising, financial fines and incentives, etc); 1.5.6 Identify in relation to Significant Impact Areas, industries having a significant impact on water resources and water quality; 1.5.7 <i>(to be carried out in the Phase 2)</i> 1.5.8 Organize workshops with participants from relevant ministries, industrial managers, banking institutions, introducing information on best available technologies, financial support, etc..			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.6: Policy reform and legislation measures for the development of cost-covering concepts for water and waste water tariffs, focusing on nutrient reduction and control of dangerous substances	1. Deficiencies in international comparison related to tariffs, metering, types of collection etc. are identified 2. Most appropriate cost recovery models and gradual tariffs reform are proposed for specific countries	1. Comparative tariff study 2. Policies and recommendations on cost recovery models for Danube countries	1. Information accessibility in the various DRB countries 2. Political and administrative constraints
1.6.1 Analyze significant differences /deficiencies regarding water sector relevant legislation, level of tariffs, status of metering, level of illegal and unaccounted for consumptions, collection rate, etc.; assess the potential for the increase of revenues of the companies operating in the water and waste water sector; 1.6.2 Develop appropriate concepts for tariff reforms aimed at cost covering models in line with the EU WFD (on a country level); 1.6.3 <i>(to be carried out in the Phase 2);</i> 1.6.4 <i>(to be carried out in the Phase 2)</i>			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.7: Implementation of effective systems of water pollution charges, fines and incentives, focusing on nutrients and dangerous substances	1. Present systems of charges, fines and incentives is analyzed nationally and DRB-wide. 2. Alternative concepts for the introduction of incentive-based instruments for groups of DRB countries are identified 3. Institutional, economic and social capabilities to implement economic instruments are assessed	1. National and regional reports. 2. Proposals for incentives for specific stakeholder/user groups in DRB countries 3. Recommendations on strengthening of institutional mechanisms for exacting compliance	1. Low government willingness to introduce economic incentives 2. Lack of commitment of economic authorities to introduce incentives 3. Limited knowledge on costs and benefits of incentives schemes
1.7.1 Analyze the present systems of water pollution charges, fines and incentives in the DRB countries and identify significant deficiencies (types and basis of charges, fines and incentives, effectiveness, collection procedures, exemptions, etc). 1.7.2 Identify the most essential and effective water pollution charges, fines and incentives, assess the main obstacles/barriers to their introduction and develop enforcement mechanisms; 1.7.3 Assess the institutional and economic capabilities of the particular DRB countries for a reform of water pollution charges, fines and incentives; 1.7.4 <i>(to be carried out in the Phase 2);</i> 1.7.5 <i>(to be carried out in the Phase 2).</i>			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.8: Recommendations for the reduction of phosphorus in detergents	1. Analysis of legal and institutional possibilities for introducing restrictive standards for detergents use in particular DRB countries is performed 2. Proposals of severe standards and implementation schedule for phosphorus reduction are developed 3. Proposals for enforcement and compliance are elaborated 4. Organization of workshops on phase out of phosphorus in detergents	1. National statistics on P-based detergents 2. Draft standards and phase-out plans for phosphorus detergents 3. Proposals for economic and financial rules 4. Workshop reports	1. Low priority concern for introducing detergents standard at governmental level 3. Weak governmental support for producers of detergents
1.8.1 Review the existing legislation, policies and voluntary commitments; 1.8.2 Develop recommendations for phosphorus reduction in detergents in line with EU regulations and commonly agreed international standards; 1.8.3 Develop proposals for enforcement and compliance (economic, financial incentives); 1.8.4 Organize a basin-wide workshop dealing with the implementation of recommendations at national level; 1.8.5 <i>(to be carried out in the Phase 2)</i>			

Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 2.1: Setting up of “Inter-ministerial Committees” for development, implementation and follow-up of national policies legislation and projects for nutrient reduction and pollution control	<ol style="list-style-type: none"> Existing structures and mechanisms for implementation of environmental policies and legislation analyzed Adequate structures proposed in cooperation with relevant ministerial departments Inter-ministerial Committees established 	<ol style="list-style-type: none"> Analysis report Proposal of structural chart and description of mandate Reports from meetings of the committees 	<ol style="list-style-type: none"> Reluctance from certain Governments to create the Inter-ministerial Committees Missing cooperation among ministries concerned
<p>2.1.1 Evaluate existing national structures for coordination of water management and water pollution control (follow up action on report on “Existing and planned inter-ministerial coordination mechanisms relating to pollution control and nutrient reduction”, August 2000)</p> <p>2.1.2 In cooperation with national governments, propose adequate structures, including technical, administrative and financial departments to coordinate the review and implementation of policies, legislation and projects for nutrient reduction and pollution control</p> <p>2.1.3 Assist Governments in setting up national “Inter-ministerial Committees” and provide initial guidance for the implementation of GEF project components</p>			
Output 2.2: Development of operational tools for monitoring, laboratory and information management and for emission analysis from point and non-point sources of pollution with particular attention to nutrients and toxic substances	<ol style="list-style-type: none"> Water quality objectives and nutrient and toxics quality conditions are developed Statistics of emissions from point and non-point sources for P and N are existing Inventory of priority chemicals in line with EU is prepared Laboratory equipment in selected countries is reinforced Information system and network are improved 	<ol style="list-style-type: none"> Report and map on standards and river classification List of N, P emissions from point and non-point sources Statistics of priority chemicals Laboratories of TMNM in selected countries Transmission reports 	<ol style="list-style-type: none"> Criteria for harmonization agreed - 4. All national data are available and comparable at regional scale Need for participatory approach
<p>2.2.1 Harmonize water quality standards and quality assurance for nutrients and toxic substances;</p> <p>2.2.2 Assist in the creation of database and emission inventory for point and non-point sources of phosphorus and nitrogen, including maps,</p> <p>2.2.3 Optimize TMNM and identify sources and amounts of transboundary pollution of substances on the list of EU priority substances.</p>			

Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 2.3: Improvement of procedures and tools for accidental emergency response with particular attention to transboundary emergency situations	1. National stations - PIACs for MD, UA, BiH, YU are planned and programme for implementation prepared 2. Inventory and assessment of high accidental risks spots are produced in all countries 3. DBAM is prepared for improvement to respond to pollution transport issues	1. Implementation programme for PIAC extension 2. National inventories of accidental risk spots 3. Proposal for calibration and operation of DBAM	1. Low priority for accidental pollution issues in the ministries 2. Delays in regulatory decisions 3. Financial and material resources secured 4. Countries need to receive information and assessment in developing new management skills
2.3.1 Reinforce operational conditions in the national AEPWS alert centers (PIACs) and geographical extension in Bosnia-Herzegovina and the FR of Yugoslavia; 2.3.2 Complete the inventory presently available only for the upper Tisza river basin, and evaluate all high -accident-risk spots in all countries in the Danube River Basin, in line with EU legislation and considering that similar "hot spot" industrial activities exist in many transition countries ⁸), 2.3.3 Design preventive measures, adjust national legislation and improve compliance with safety standards, 2.3.4 Maintenance and calibration of the Danube Basin Alarm Model (DBAM), to predict the propagation of the accidental pollution and evaluate temporal, spatial and magnitude characteristics in the Danube river system and to the Black Sea; 2.3.5 <i>(to be carried out in the Phase 2)</i>			

⁸ The F.R. of Yugoslavia is situated in an extreme important geographical position in the center of the Danube River Basin where the most important tributaries, Tisza, Sava and Drava are joining the Danube. During the recent accidental pollution the AEWS has also informed Yugoslavia and cooperated with its technical staff to monitor the effects of accidental pollution. The UNEP Balkan Task Force and the EU-Baia Mare Task Force have closely cooperated with Yugoslavian authorities in the assessment of accidental pollution and the design of emergency measures.

Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 2.4: Support for reinforcement of ICPDR Information and Monitoring System (DANUBIS)	1. ICPDR Information System is fully operational with internal working area and public accessible area 2. Networking within DANUBIS by all ICPDR contracting parties is developing 3. Interactive DANUBIS web site is developing 4. Mechanisms for many users of having access to information are available	1. DANUBIS web site 2. + 3. Information exchange between Expert Groups and in emergency situations 3. Rules of accessions rights to DANUBIS	1. Low commitment and limited resources of governments to link to DANUBIS 2. Inadequate user skills 3. Countries must undertake interactions to facilitate transboundary communication
2.4.1 Fully develop ICPDR Information System and ensure that it is used by its expert groups and other operational bodies; 2.4.2 Link all Contracting Parties of the ICPDR and other participating countries to DANUBIS, which implies the development and implementation of national linkages and the establishment of operational units to communicate also in case of accidental emergency situations; 2.4.3 Reinforce DANUBIS through the implementation of an interactive web-site to integrate further textual, numerical and digital mapping information and to fulfil all requirements of the work of the nutrient reduction programme (communication, monitoring, public information, etc.); 2.4.4 Launch an extensive training programme and organize a series of workshops at different user levels and in different regions of the Danube River Basin in order to train and assist future users in the best use of the tools made available by the system.			
Output 2.5: Implementation of the "Memorandum of Understanding" between the ICPDR and the ICPBS relating to discharges of nutrients and hazardous substances to the Black Sea	1. Joint work programme for MoU is approved 2. Agreement of status indicators is reached 3. Rules of reporting are developed 4. Agreement on regular meetings is concluded 5. MoU is signed	1. Joint work programme 2. - 4. Agreements on the indicators and reporting rules 5. MoU document	1. Unequal involvement of ICPDR and ICPBS 2. Delayed national contributions to the implementation of the MoU
2.5.1 Develop joint work programme for MOU implementation 2.5.2 Define and agree on status indicators to monitor nutrient transport from the Danube and change of ecosystems in the Black Sea; 2.5.3 Define and establish reporting procedures; 2.5.4 Re-establish and organize regular meeting of the Joint Danube - Black Sea Working Groups to evaluate progress of nutrient reduction and recovery of Black Sea ecosystems; 2.5.5 Organize joint Danube - Black Sea meeting to approve and sign MoU			

Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 2.6: Training and consultation workshops for resource management and pollution control with particular attention to nutrient reduction and transboundary issues	1. Training needs are assessed, training programmes and course materials are developed 2. Sub-contractors and organizations for training courses are identified and contracts are prepared	1. Training programmes and course materials 2. List of subcontractors and conditions for organization of training courses	1. Difficulty to identify appropriate training consultants, 2. Lack of participation, differences in competence of participants, absence of certain DRB countries in training workshops
Training courses in the following fields: 2.6.1 Develop policy and legal frame for transboundary cooperation in nutrient reduction and control of toxic substances (in the context of bilateral and multilateral agreements); 2.6.2 Bring technical and legal issues of river basin planning and transboundary water resources management in line with the new EU Water Framework Directive with a view to ensuring effective nutrient reduction; 2.6.3 Technical and legal issues (land reclamation) of wetland restoration and management to assure nutrient removal; 2.6.4 Innovative technologies for municipal and industrial waste water collection, treatment; use of sewage and animal waste as fertilizer to reduce nutrient emissions; 2.6.5 Technical and legal issues of management and control of use of agrochemicals and manure; 2.6.6 Prepare documents for nutrient reduction projects with international co-funding and application of GEF criteria concerning “incremental cost” calculation; 2.6.7 Training courses for NGO activities.			

Objective 3: Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 3.1: Support for institutional development of NGOs and community involvement	1. Optimal operation of DEF secretariat is achieved 2. Training needs identified and programmes on environmental issues developed 3. Publications and materials for awareness raising on nutrient and toxics are conceptualized and prepared 4. Training courses and materials to reinforce NGO cooperation are prepared	1. Rules of operation of the DEF secretariat and recruitment of professional staff 2. Training programme 3. List of materials to be published 4. Training course materials	1. Lack of adequately trained professional staff 2. Professional knowledge of NGOs in pollution issues 4. Low willingness of governments to collaborate with NGOs, resp. of NGOs with governments
3.1.1 Support for the DEF Secretariat for operation, communication and information management; 3.1.2 Organization of consultation meetings and training workshops on nutrients and toxics issues; 3.1.3 Editing of special NGO publications in national languages on nutrients and toxic substances; 3.1.4 Organization of training courses for development of NGO activities and cooperation in national projects.			
Output 3.2: Applied awareness raising through community based "Small Grants Programme"	1. Conditions and implementation mechanisms for Small Grants Programme prepared and disseminated (topics, criteria, timing) 2. Calls for a regional and two local grants programmes	1. Small Grants Programme approved to start 2. NGO applications submitted to Grants Programme administrator	1. Correct acknowledgement of the SGP ensured 2. Clear and fair conditions for all NGOs
3.2.1 Identification of NGO grants programme and projects for reduction of nutrients and toxic substances and mitigation of transboundary pollution; 3.2.2 Design and implementation of region-wide granting programme focusing on demonstration activities and awareness campaigns for sustainable land management and pollution reduction (nutrients) in the agricultural, industrial and municipal sectors; 3.2.3 Design and implement two granting programmes at the local and national level in terms of small scale community based investment projects for pollution control, rehabilitation of wetlands, best agricultural practices, reduction of use of fertilizers, manure management, improvement of village sewer systems, etc.			
Output 3.3: Organization of public awareness raising campaigns on nutrient reduction and control of toxic substances	1. Realistic approach on organizing public campaigns is developed 2. Sufficient and reliable information for mass media purposes are prepared and published 3. Basin-wide documents are periodically published	1. Campaigns concept 2. Mechanisms of having access to information 3. Printed materials disseminated	1. Willingness of local administration to support organization of public events; 2. Campaign subject bears local conflicts with polluter 3. Information access restricted 4. Limited funds

Objective 3: Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
3.3.1	Conceptualization and implementation of public awareness raising campaigns on nutrient-related issues in all DRB countries, national projects awarded through grants;		
3.3.2	Development and production of materials for public press and mass media on nutrients and toxics;		
3.3.3	Support publication of scientific documents and regular papers or special issues on water management and pollution reduction with particular attention to nutrient issues and Black Sea recovery.		

Objective 4: Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 4.1: Development of indicators for project monitoring and impact evaluation	1. Monitoring and evaluation system for project implementation is developed 2. Indicators for emissions and water quality are reviewed to respond to nutrient concerns 3. Progress indicators for monitoring project implementation are developed 4. Impact indicators to evaluate environmental effects are defined 5. Environmental status indicators are developed	1. Description for monitoring and evaluation procedures 2. Description of environmental status (water quality) and stress reduction (emission) indicators 3. - 5. List of progress, impact and environmental status indicators	1. Cooperation with all Expert Groups and introduction of EU environmental parameters necessary 2. -5. Countries need to agree with selected indicators
4.1.1 Establishing a system for M&E in using specific indicators for process (legal and institutional frame), stress reduction (emissions, removal of hot spots) and environmental status (water quality, recovery of ecosystems) to demonstrate results of programme and project implementation and to evaluate environmental effects of implementation of policies and regulations (nutrient reduction); 4.1.2 Reviewing in the frame of the ICPDR Trans National Monitoring Programme (TNMN) specific indicators (e.g. bio-indicators) for emission control and water quality monitoring with particular attention to nutrients and toxic substances; 4.1.3 Establishing monitoring system in using specific progress indicators (benchmarks) for project implementation (GEF- Nutrient reduction projects activities); 4.1.4 Implementing ecological status assessment in line with requirements of EU WFD using specific bio-indicators to demonstrate effects of pollution /nutrient reduction in water-bodies and ecosystems; 4.1.5 <i>(to be carried out in the Phase 2)</i>			
Output 4.2: Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals and other dangerous substances on the Danube and the Black Sea ecosystems	<i>Carried out only in the 2nd Phase of the Project!</i>		

Objective 4: Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances

Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 4.3: Monitoring and assessment of nutrient removal capacities of riverine wetlands	1. Criteria for wetlands classification and observation priorities are defined 2. Methodological approach for assessment of nutrient removal capacities is developed taking into account results of other projects 3. Observation programme to assess annual removal capacities is designed and approved	1. List of criteria and results of case studies for various types of wetland 2. Report on methodological approach 3. Observation programme	1. Lack of understanding on the need to restore wetlands for pollution reduction 2. Differences in methodology for correlation and interpretation of results of linked projects 3. Limited information on scientific and economic conditions for nutrient removal capacities in wetlands.
4.3.1 Classify the wetlands and floodplains in the DRB by category and define potential observation sites; 4.3.2 Define the methodological approach for assessment of nutrient removal capacities of wetlands and flood plains; 4.3.3 <i>(to be carried out in the Phase 2);</i> 4.3.4 <i>(to be carried out in the Phase 2);</i> 4.3.5 <i>(to be carried out in the Phase 2);</i> 4.3.6 <i>(to be carried out in the Phase 2);</i> 4.3.7 <i>(to be carried out in the Phase 2).</i>			

Objective 4: Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances			
Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 4.4: Danube Basin study on pollution trading and corresponding economic instruments for nutrient reduction	1. Economic instruments for nutrient reduction analyzed elaborated 2. Assessment on legal and policy issues related to economic instruments in DRB countries 3. Needs and barriers for "pollution trading" studied	1. Analytical report on economic instruments in DRB countries and world-wide experience 2.+3. Report on legal and policy instruments for nutrient trading	1. "Pollution trading" is for some contracting parties (EU) not an option to be considered; 2. Financial constraints for some Government to implement economic instruments 3. Tradable permits must be carefully adapted to economic and social condition of the countries and regions
4.4.1 Review existing concepts of successful "pollutant trading / auctions" or corresponding economic instruments in the water and air pollution sector in the US, Australia and Europe; 4.4.2 Study the general possibilities to establish the idea of "pollution trading" or corresponding economic instruments for nutrient reduction under the EU policies and directives in the Danube River Basin; 4.4.3 Assess the main problems / obstacles for "pollution trading" and corresponding economic instruments in the DRB and the interest of the particular DRB countries for implementation; 4.4.4 (to be carried out in the Phase 2).			

ANNEX 2 Logical Frame Matrix (Objectives, Outputs, Activities)

Annex 2.2 Logical Frame Matrix – Project Phase 2

Logical Frame Matrix - Phase 2 (Objectives, Outputs, Activities)

Objectives/Purpose	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>1. Long-term development Objective: The long-term development objective of the proposed Regional Project is to contribute to sustainable human development in the DRB through reinforcing the capacities of the participating countries in developing effective mechanisms for regional cooperation and coordination in order to ensure protection of international waters, sustainable management of natural resources and biodiversity.</p> <p>2. Overall Objective: The overall objective of the Danube Regional Project with its Phase 1 and Phase 2 is to complement the activities of the ICPDR required to provide a regional approach and global significance to the development of national policies and legislation and the definition of priority actions for nutrient reduction and pollution control with particular attention to achieving sustainable transboundary ecological effects within the DRB and the Black Sea area.</p> <p>The specific objective of Phase 2 of the Project is to set up institutional and legal instruments to assure nutrient reduction and sustainable management of water bodies and ecological resources. To do this, the project has to build up on the results of Phase 1.</p>	<p>Overall Project Objective: At the end of Phase 2 of the Project, nutrient loads to the Black Sea are considerably reduced by 21.1 % for nitrogen and 32.0 % for phosphorus,</p>	<ul style="list-style-type: none"> • Reports of Joint Danube/ Black Sea Working Group, in 2005; • TNMN Annual Reports. 	<ul style="list-style-type: none"> • The Danube/Black Sea Joint Working Group is operational.
	<p>Objective 1 : At the end of the Project Phase 2, all Danube River Basin countries have developed and ratified policies and legal instruments for sustainable water management and nutrient reduction and have put in place mechanisms for exacting compliance.</p>	<ul style="list-style-type: none"> • EU Water Framework Directive applied in the frame of RBM Plans; • National policies and legislation in line with EU Directives; • Institutional and legal mechanisms for exacting compliance 	<ul style="list-style-type: none"> • All countries participate in the development of new legal and institutional instruments
	<p>Objective 2: Institutional and organizational mechanisms for transboundary cooperation and improved water quality monitoring, emission control emergency warning, accidental prevention and information management are fully operational at the regional and national level to assess improvement of water quality and nutrient reduction to the Black Sea.</p>	<ul style="list-style-type: none"> • Working reports of Inter-ministerial Committees for nutrient reduction and pollution control; • Regular publication of TNMN annual reports; • Up-dated emission inventories and list of priority pollutants; • Operational accidental warning system and prevention (accidental risk inventory) • Progress reports from the Danube-Black Sea Joint Working Group. 	<ul style="list-style-type: none"> • National Governments continue providing sufficient funding for monitoring and evaluation operation of national Information Systems.

Objectives/Purpose	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
<p>the results of Phase 1.</p> <p>3. Purpose of the Project:</p> <p>Further, the Danube Regional Project (Phase 1 and Phase 2) shall facilitate project implementation in providing a framework for coordination, dissemination and replication of successful demonstration that will be developed through the implementation of investment projects.</p>	<p>Objective 3: The civil society and in particular national NGOs in all Danube countries are at the end of the Project proactively implicated in national nutrient reduction programmes, have organized workshops and produced in national language information material for awareness raising campaigns and have successfully implemented community based nutrient reduction projects financed under the GEF Small Grants Programme.</p>	<ul style="list-style-type: none"> Fully operational and self-sustained DEF Secretariat; List of NGOs in all Danube countries and their activity reports and results of nutrient reduction Fully implemented GEF Small Grants Programme with 80 % of all projects showing sustainable results 	<ul style="list-style-type: none"> The DEF has the personnel and has mobilized financial support to play its role efficiently in the DRB
	<p>Objective 4: Knowledge on sedimentation, transport and removal of nutrients and toxic substances is considerably increased and economic instruments to encourage investments for nutrient reduction are accepted and implemented at the national and regional level.</p>	<ul style="list-style-type: none"> Projects/measures to reduce toxic substances in the Iron Gate reservoirs; Reports on quantified nutrient retention capacities of DRB wetland; Endorsed wetlands management programmes; Economic instruments to facilitate investments in nutrient reduction projects. 	<ul style="list-style-type: none"> Cooperation of all countries and organizations, in particular the EU, in defining economic instruments

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.1: Development and implementation of policy guidelines for river basin and water resources management	1. National reports on environmental characteristics and economic analysis in line with EU WFD existing; 2. River basin management practices and gaps in relation of WFD requirements identified 3. GIS and related data base for RBM Planning 4. Pilot River Basin Plans in line with EU WFD 5. Appropriate structures for transboundary cooperation such as river basin committees are created and operational	1. National reports and analytical summary reports 2. GIS system and maps showing typology of surface waters and groundwater bodies 3. RBM Plans for pilot river basins 4. Guidelines for compliance with EU directives	1. Differing concepts on the sub-river basins delimitation might appear 2. Limited capacities for participation in workshops and for implementation of WFD in downstream countries
1.1.1 <i>(accomplished in the Phase 1)</i> 1.1.2 <i>(accomplished in the Phase 1)</i> 1.1.3 Implementing the common approaches and methodologies for pressure and impact analysis (at the national level); 1.1.4 Applying the EU Guidelines for economic analysis and arrive at the overall economic analysis for the Danube River Basin; 1.1.5 Synthesize the results of the national analyses on environmental characteristics, evaluate the observed deficiencies in national reports and suggest ways to overcome them; 1.1.6 Developing RBM tools (mapping, GIS, remote sensing, etc.) and related data management, including the arriving at the typology of surface waters and the relevant reference conditions; 1.1.7 Identify pilot river basins and apply common approaches, methodologies, standards and guidelines (observe also the link to the Working Groups of the European Commission); 1.1.8 Assist Danube River Basin countries in developing strategies to come in compliance with the EU WFD, and in particular the EU Nitrate Directive, in preparing the programme of measures; 1.1.9 Organize workshops and training courses in order to produce the River Basin Management Plan and to strengthen basin-wide cooperation.			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.2: Reduction of nutrients and other harmful substances from agricultural point and non-point sources through agricultural policy changes	<ol style="list-style-type: none"> 1. Concepts for best agricultural practices in line with EU requirements for central and downstream Danube countries are elaborated and discussed in workshops 2. National experts are trained to introduce best agricultural practices in their countries 3. Internet information on the introduction of best agricultural practices in each DRB country 	<ol style="list-style-type: none"> 1. Recommendations for application of best agricultural practices for each DRB country 2. Workshop Report 3. Internet address 	<ol style="list-style-type: none"> 1. Information need to be available 2. Policy makers discourage the adoption of best agricultural practices 3. Limited internet access in some DRB countries
<p>1.2.1 <i>(accomplished in the Phase 1)</i></p> <p>1.2.2 Review relevant legislation, existing policy programmes and actual state of enforcement in the DRB with respect to promotion and application of best agricultural practices;</p> <p>1.2.3 Review inventory on important agrochemicals (nutrients etc.) in terms of quantities of utilization, their misuse in application, their environmental impacts and potential for reduction;</p> <p>1.2.4 <i>(accomplished in the Phase 1)</i></p> <p>1.2.5 Introduce or, where existing, further develop concepts for the application of best agricultural practices in all DRB countries, by taking into account country-specific traditional, social and economic issues, and the ECE recommendations;</p> <p>1.2.6 Discuss the new concepts with and disseminate results to governments, farming communities and NGOs in the basin.</p>			
Output 1.3: Development of pilot projects on reduction of nutrients and other harmful substances from agricultural point and non-point sources	<ol style="list-style-type: none"> 1. Pilot projects (related to identified priority "hot spots") on practical farm training and institutional support to expand best agricultural practices are carried out. 2. New institutions (networks) on eco-farming are initiated resp. strengthened 3. Pilot project monitoring and progress evaluation regarding financial implications is performed 4. Demonstration workshops assessing practical experiences in pilot projects conducted 	<ol style="list-style-type: none"> 1. Pilot project reports for six DRB countries 2. New farming network addresses 3. Better agricultural practices and manure handling (less input of agro-chemicals, less nutrient emissions) 4. Number of pilot projects, trained farmers and farming experts 	<ol style="list-style-type: none"> 1. Technical feasibility at pilot sites 2. Conflict with existing farm networks 3. Knowledge needed to inform farm managers and policy makers on the trade-off between on-farm practices and off-farm consequences 4. Controversy on the economic and financial viability of selected pilot farms may occur
<p>1.3.1 <i>(accomplished in the Phase 1)</i></p> <p>1.3.2 <i>(accomplished in the Phase 1)</i></p> <p>1.3.3 Prepare and implement for the central and lower DRB countries typical pilot projects (especially in UA, MD, RO, BG, YU and B-H) to train and support farmers in the application of best agricultural practice;</p> <p>1.3.4 Disseminate the results of the pilot projects.</p>			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.4: Policy development for wetlands rehabilitation under the aspect of appropriate land use	1. Three concepts for land use reforms of selected wetland are discussed with stakeholders (proposal: Morava, Drava, Tisza) 2. New concepts for wetland areas are endorsed by governments (legal and institutional reform for integration of environmental and economic issues is prepared) 3. DRB workshop on project results and conclusions	1. Three new land-use concepts for wetland areas 2. Policy and legal commitment for land use reform around wetlands 3. New wetland projects in preparation or under implementation	1. Need for interdisciplinary problem solving research system 2. Disinterest of authorities for commitment; lack of financial resources
1.4.1 <i>(accomplished in the Phase I)</i> 1.4.2 <i>(accomplished in the Phase I)</i> 1.4.3 Develop alternative concepts and strategies for achieving integrated land use and management in chosen wetland areas, including required actions and measures (regulatory and legal issues, economic fines and incentives, compensation payments, etc); 1.4.4 Secure governmental commitments to implement the newly proposed integrated land use for selected wetland areas; 1.4.5 Disseminate project results in the Danube river basin.			
Output 1.5: Industrial reform and development of policies and legislation for application of BAT (best available techniques including cleaner technologies) towards reduction of nutrients (N and P) and dangerous substances	1. Annually updated assessment of the progress in existing legislative and enforcement status is elaborated 2. DRB countries have adapted national legislation in line with the EU 3. Measures for nutrient reduction in relation to SIA and industrial “hot spots” are implemented 4. Case studies on environmentally friendly production technologies in industries in particular countries are performed 5. Knowledge and understanding on the benefits and costs of various alternative concepts are improved	1. Annual reports on existing legal status 2. Statistics of compliance schedule and enforcement actions taken by industries 3. Guides to pollution reduction for different industries 4. Case studies on application of alternative concepts 5. Number of trained industry experts	1. Accessibility to the most updated databases 3. Industrial managers, researchers and policy makers will perceive the benefits of the EU policies 5. The industries are reluctant to the changes
1.5.1 <i>(accomplished in the Phase I)</i> 1.5.2 <i>(accomplished in the Phase I)</i> 1.5.3 Review policies and relevant existing and future legislation for industrial pollution control and identification enforcement mechanisms on a country level; 1.5.4 Compare and identify gaps between relevant EU and national legislation; 1.5.5 Develop necessary complementing policy and legal measures for the introduction of BAT (regulatory and legal issues, awareness raising, financial fines and incentives, etc); 1.5.6 Identify in relation to Significant Impact Areas, industrial “hot spots” having a significant impact on water resources and water quality; 1.5.7 Develop appropriate implementation concepts for a step-by-step introduction of BAT in industrial sectors; 1.5.8 Organize workshops with participants from relevant ministries, industrial managers, banking institutions, introducing information on BAT, financial support, etc.			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.6: Policy reform and legislation measures for the development of cost-covering concepts for water and waste water tariffs, focusing on nutrient reduction and control of dangerous substances	1. Economic and financial viability of the tariffs reform for the water companies in specific countries are ensured 2. Improved knowledge on the best tariff alternatives is ensured for all stakeholders	1. Financial accounts of the water companies 2. Economically and socially accepted tariff scheme rules	1. Information accessibility; 2. Political and administrative constraints 3. Keeping the water companies cooperative and competitive 4. Absence of governmental income support programme
1.6.1 <i>(accomplished in the Phase 1)</i> 1.6.2 <i>(accomplished in the Phase 1)</i> 1.6.3 Develop for the different categories of DRB countries alternative concepts for tariff reforms, considering cost covering models also for the low income segments of the population; 1.6.4 Assess for the particular DRB countries the potential for additional revenues from water and wastewater services as additional funding sources for water sector operation and investment.			
Output 1.7: Implementation of effective systems of water pollution charges, fines and incentives, focusing on nutrients and dangerous substances	1. Recommended water pollution fines, incentives and tariffs are harmonized and implemented 2. Information on the cost-benefits of incentives based on instruments is discussed and disseminated	1. Country-specific recommendations for rules on water pollution fines, incentives and tariffs 2. Workshop reports , number of trained participants	1. Low government willingness to introduce economic incentives 2. Lack of commitment of economic authorities to introduce incentives 3. Limited knowledge on costs and benefits of incentives schemes
1.7.1 <i>(accomplished in the Phase 1)</i> 1.7.2 <i>(accomplished in the Phase 1)</i> 1.7.3 <i>(accomplished in the Phase 1)</i> 1.7.4 Develop appropriate concepts for the introduction of balanced and effective systems of water pollution charges, fines and incentives in the particular DRB countries; 1.7.5 Organize workshops on the application of appropriate water pollution charges, fines and incentives, with participants from relevant ministries, municipalities and the private sector.			

Objective 1: Creation of sustainable ecological conditions for land use and water management			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.8: Recommendations for the reduction of phosphorus in detergents	1. Lessons on phosphorus reduction are learned during implementation of new phasing-out programme for P-detergents	1. Monitoring and evaluation reports on P reduction 2. Recommendations on future actions on phosphorus reduction	1. Low priority concern for introducing detergents standard at governmental level 2. Availability of data from some countries
1.8.1 <i>(accomplished in the Phase 1)</i> 1.8.2 <i>(accomplished in the Phase 1)</i> 1.8.3 <i>(accomplished in the Phase 1)</i> 1.8.4 Organize a basin-wide workshop dealing with the implementation of recommendations at national level 1.8.5 Monitor and evaluate results.			

Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 2.1: Setting up of “Inter-ministerial Committees” for development, implementation and follow-up of national policies legislation and projects for nutrient reduction and pollution control	<i>Carried out only in the Phase 1 of the Project!</i>		
Output 2.2: Development of operational tools for monitoring, laboratory and information management and for emission analysis from point and non-point sources of pollution with particular attention to nutrients and toxic substances	1. Classification of water quality objectives and nutrient and toxics quality conditions is finalized 2. Inventories of emissions from priority point and non-point sources (“hot spots”) for P and N are revised 3. Inventory of priority chemicals in line with EU are updated 4. Laboratories are better equipped and operational 5. Information system and network are operational	1. Reviewed standards and river classification 2. Annual lists of N, P emissions from point and non-point sources 3. Reviewed statistics of priority chemicals 4. Results of analysis 5. Annual transmission reports on EU priority substances	1. Criteria for harmonization agreed 2. - 4. Continuous capacity building and training ensured 4. Need for participatory approach
2.1.1 Harmonize water quality standards and quality assurance for nutrients and toxic substances; 2.1.2 Assist in the creation of database and emission inventory for point and non-point sources of phosphorus and nitrogen, including maps (municipal, industrial and agricultural “hot spots”), 2.1.3 Optimize TNMN and identify sources and amounts of transboundary pollution of substances on the list of EU priority substances.			

Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 2.3: Improvement of procedures and tools for accidental emergency response with particular attention to transboundary emergency situations	<ol style="list-style-type: none"> 1. Guidelines on accidental pollution prevention are reviewed 2. National stations - PIACs for MD, UA, BiH, YU are fully operational 3. Inventory and assessment of high accidental risks spots are completed in all countries 4. DBAM is improved to respond to pollution transport issues 5. Cooperation on preventive and emergency measures is improved 	<ol style="list-style-type: none"> 1. Upgraded Guidelines on interventions during accidents 2. Transmission files 3. , 5. Accessible reports and statistics of emissions 4. Rules of operation of DBAM 5. Completed workshops with trained participants 	<ol style="list-style-type: none"> 1. Low priority for the accidental pollution issues in the ministries 2. Delays in regulatory decisions 3. Financial and material resources secured 4. Countries need to receive information and assessment in developing new management skills 5. Methods have not focused on integrating knowledge into practical solutions to intervene during accidents
<p>2.3.1 Reinforce operational conditions in the national AEPWS alert centers (PIACs) and geographical extension in Bosnia-Herzegovina and the FR of Yugoslavia;</p> <p>2.3.2 Complete the inventory presently available only for the upper Tisza river basin, and evaluate all high -accident-risk spots in all countries in the Danube River Basin, in line with EU legislation and considering that similar accidental "hot spot" industrial activities exist in many transition countries 9),</p> <p>2.3.3 Design preventive measures, adjust national legislation and improve compliance with safety standards,</p> <p>2.3.4 Maintenance and calibration of the Danube Basin Alarm Model (DBAM), to predict the propagation of the accidental pollution and evaluate temporal, spatial and magnitude characteristics in the Danube river system and to the Black Sea;</p> <p>2.3.5 Organization of workshops to reinforce cooperation in accidental emergency warning and development of preventive measures.</p>			

⁹ The F.R. of Yugoslavia is situated in an extreme important geographical position in the center of the Danube River Basin where the most important tributaries, Tiza, Save and Drave are joining the Danube. During the recent accidental pollution the AEWS has also informed Yugoslavia and cooperated with its technical staff to monitor the effects of accidental pollution. The UNEP Balkan Task Force and the EU-Baia Mare Task Force have closely cooperated with Yugoslavian authorities in the assessment of accidental pollution and the design of emergency measures.

Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 2.4: Support for reinforcement of the ICPDR Information System (DANUBIS)	1. Networking within DANUBIS by all ICPDR contracting parties is realized 2. Interactive DANUBIS web site is operational 3. Mechanisms of having access to information are available	1. Number of users of the working area by ICPDR Expert Groups 2. Information exchange during emergency situations 3. Regular updated DANUBIS data base 4. Number of trained users	1. Delays in reaching agreement on the integration within WPPCM 2. Low commitment and limited resources of governments to link to DANUBIS 3. Inadequate user skills 4. Countries must undertake interactions to facilitate transboundary communication
2.4.1 <i>(accomplished in the Phase 1)</i> 2.4.2 Link all Contracting Parties of the ICPDR and other participating countries to DANUBIS, which implies the development and implementation of national linkages and the establishment of operational units to communicate also in case of accidental emergency situations; 2.4.3 Reinforce DANUBIS through the implementation of an interactive web-site to integrate further textual, numerical and digital mapping information and to fulfill all requirements of the work of the nutrient reduction programme (communication, monitoring, public information, etc.); 2.4.4 Launch an extensive training programme and organize a series of workshops at different user levels and in different regions of the Danube River Basin in order to train and assist future users in the best use of the tools made available by the system.			
Output 2.5: Implementation of the "Memorandum of Understanding" between the ICPDR and the ICPBS relating to discharges of nutrients and hazardous substances to the Black Sea	1. Joint work programme for MoU is applied 2. Reports are produced according to new rules 3. Agreement on regular meetings is concluded	1. Regular meetings (meeting reports) of joint working group 2. – 4. Agreements on the indicators, monitoring and reporting	1. Unequal involvement of ICPDR and ICPBS 2. Delayed national contributions the MoU
2.5.1 Develop joint work programme for MOU implementation 2.5.2 Define and agree on status indicators to monitor nutrient transport from the Danube and change of ecosystems in the Black Sea; 2.5.3 Define and establish reporting procedures 2.5.4 Reestablish and organize regular meeting of the Joint Danube - Black Sea working Groups to evaluate progress of nutrient reduction and recovery of Black Sea ecosystems; 2.5.5 <i>(accomplished in the Phase 1)</i>			

Objective 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 2.6: Training and consultation workshops for resource management and pollution control with particular attention to nutrient reduction and transboundary issues	1. Knowledge, professional skills and understanding on nutrient reduction issues are enhanced 2. Training evaluation is updated	1. Number of conducted workshops and trained participants 2. Evaluation Report	1. Lack of participation, differences in competence of participants, absence of certain DRB countries in training workshops
Training courses in the following fields: 2.6.1 Develop policy and legal frame for transboundary cooperation in nutrient reduction and control of toxic substances (in the context of bilateral and multilateral agreements); 2.6.2 Bring technical and legal issues of river basin planning and transboundary water resources management in line with the new EU Water Framework Directive with a view to ensuring effective nutrient reduction; 2.6.3 Technical and legal issues (land reclamation) of wetland restoration and management to assure nutrient removal; 2.6.4 Innovative technologies for municipal and industrial waste water collection, treatment; use of sewage and animal waste as fertilizer to reduce nutrient emissions; 2.6.5 Technical and legal issues of management and control of use of agrochemicals and manure; 2.6.6 Prepare documents for nutrient reduction projects with international co-funding and application of GEF criteria concerning “incremental cost” calculation; 2.6.7 Training courses for NGO activities.			

Objective 3: Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 3.1: Support for institutional development of NGOs and community involvement	1. Optimal operation of DEF secretariat is achieved 2. Knowledge on nutrient and toxic are improved 3. Reports on nutrient and toxic, in national languages, are published 4. Cooperation between NGOs and governments is strengthened	1. Praised service of the Secretariat 2. Implemented training programme 3. Printed publications 4. First partnerships of NGOs and governments	1. Consistent performance of the Secretariat 2. Low interest of NGOs in pollution issues 4. Low willingness of governments to collaborate with NGOs, resp. of NGOs with governments
3.1.1 Support for the DEF Secretariat for operation, communication and information management; 3.1.2 Organization of consultation meetings and training workshops on nutrients and toxics issues; 3.1.3 Editing of special NGO publications in national languages on nutrients and toxic substances; 3.1.4 Organization of training courses for development of NGO activities and cooperation in national projects.			
Output 3.2: Applied awareness raising through community based "Small Grants Programme"	1. Efficient and effective NGO involvement through one regional and two local grants programmes	1. List of proposed and implemented grants projects 2. Local impacts of NGO activities on pollution problems	1. Correct acknowledgement of the SGP ensured 2. Failure of NGO activities
3.2.1 <i>(accomplished in the Phase 1)</i> 3.2.2 Implementation of region-wide granting programme focusing on demonstration activities and awareness campaigns for sustainable land management and pollution reduction (nutrients) in the agricultural, industrial and municipal sectors; 3.2.3 Implement two granting programmes at the local and national level in terms of small scale community based investment projects for pollution control, rehabilitation of wetlands, best agricultural practices, reduction of use of fertilizers, manure management, improvement of village sewer systems, etc.			
Output 3.3: Organization of public awareness raising campaigns on nutrient reduction and control of toxic substances	1. Public campaigns are implemented 2. Sufficient and reliable information for mass media purposes are prepared and published 3. Basin-wide documents are periodically published	1. Number of trained participants and national campaigning activities 2. Public interest in material (e.g. via media reports) 3. Printed and published material	1. Willingness of local administration to support organization of public events; 2. Campaign subject bears local conflicts with polluter 3. Information access restricted 4. Limited funds
3.3.1 Conceptualization and implementation of public awareness raising campaigns on nutrient-related issues in all DRB countries, national projects awarded through grants; 3.3.2 Development and production of materials for public press and mass media on nutrients and toxic substances; 3.3.3 Support publication of scientific documents and regular papers or special issues on water management and pollution reduction with particular attention to nutrient issues and Black Sea recovery.			

Objective 4: Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 4.1: Development of indicators for project monitoring and impact evaluation	1. Monitoring and evaluation system for project implementation is operational 2. Indicators for emissions and water quality are applied to respond to nutrient concerns 3. Progress indicators for monitoring project progresses are applied 4. Impact indicators to evaluate environmental effects are applied 5. Guidelines for the use of monitoring and impact indicators are available	1. Monitoring and Evaluation System at the ICPDR and at national level 2. Improved statistics on the emissions and water quality status (TNMN yearbooks) 2.-4. Data from monitoring systems 6. Guidelines	1.-5. Continued cooperation of all ICPDR Expert Groups 1.-5. Countries need to apply selected indicators
4.1.1 Establishing a system for M&E in using specific indicators for process (legal and institutional frame), stress reduction (emissions, removal of hot spots) and environmental status (water quality, recovery of ecosystems) to demonstrate results of programme and project implementation and to evaluate environmental effects of implementation of policies and regulations (nutrient reduction); 4.1.2 Reviewing in the frame of the ICPDR Trans National Monitoring Programme (TNMN) specific indicators (e.g. bio-indicators) for emission control and water quality monitoring with particular attention to nutrients and toxic substances; 4.1.3 Establishing monitoring system in using specific progress indicators (benchmarks) for project implementation (GEF- Nutrient reduction projects activities); 4.1.4 Implementing ecological status assessment in line with requirements of EU WFD using specific bio-indicators to demonstrate effects of pollution /nutrient reduction in water-bodies and ecosystems; 4.1.5 Prepare a manual on use and application of monitoring and impact indicators.			
Output 4.2: Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals and other substances on the Danube and the Black Sea ecosystems	1. Assessment of the sediment contents and impact on environment and health in relation to the sediments dynamics are analyzed 2. Recommendations, control measures and monitoring programmes are proposed	1. Report including maps and diagrams showing the existing situation and expected trends 2. Recommendations for Joint Action Programme	1. Appropriate analysis equipment, data and trained personnel available 2. Financial sources assured
4.2.1 Collect and review existing data and information on present situation; 4.2.2 Assess main types and quantities of dangerous substances; 4.2.3 Assess potential environmental impacts in the Danube and the Black Sea; 4.2.4 Forecast development for a period of 20 years; 4.2.5 Discuss possible precautionary and rehabilitation measures for the Danube and the Black Sea; 4.2.6 Prepare recommendations how to deal with this problem in the forthcoming decade (measures to be include in the a joint action programme of the ICPDR); 4.2.7 Propose further monitoring programmes.			

Objective 4: Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances			
Objective / Output / Activity	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 4.3: Monitoring and assessment of nutrient removal capacities of riverine wetlands	<ol style="list-style-type: none"> 1. Observation programme to assess annual removal capacities is implemented 2. Effects on pollution removal are assessed and quantified and wetland management schemes are identified 3. DRB governments agree on wetland management plan 	<ol style="list-style-type: none"> 1. Observation programme file and data 2. Recommendations for specific wetland management and restoration 3. Government commitment 	<ol style="list-style-type: none"> 1. Lack of understanding/support on the need to restore wetlands for pollution reduction 2. Limited availability of other data sources 3. Difference in effects between pollution removal and ecology needs in wetland management 4. Lack in follow-up funding for observation and wetland management programmes
<p>4.3.1 <i>(accomplished in the Phase 1)</i></p> <p>4.3.2 <i>(accomplished in the Phase 1)</i></p> <p>4.3.3 Implement the observation programme to assess the annual removal capacity (tons of N & P and of harmful substances per ha) for each category of wetland for a period of 20 years (3 years covered by the present project)</p> <p>4.3.4 Assess possibilities for follow-up financing of observation programme after 2005;</p> <p>4.3.5 Evaluate the aggregated removal capacities/potentials of nutrient & other harmful substances for the wetlands proposed for restoration (DPRP), taking into account the results of other investment and observation pro-grams (incl. Danube Partnership, "Lower Danube Green Corridor");</p> <p>4.3.6 Develop optimized wetland management programmes to assure ecologically acceptable nutrient removal in the Danube River Basin;</p> <p>4.3.7 Prepare relevant regulations for wetland restoration to assure implementation of projects with ecologically acceptable removal capacities for nutrients & other harmful substances.</p>			
Output 4.4: Danube Basin study on pollution trading and corresponding economic instruments for nutrient reduction	<ol style="list-style-type: none"> 1. Comprehensive discussion paper addresses the main stakeholders 2. Options are intensively discussed at DRB level 	<ol style="list-style-type: none"> 1. Discussion paper 2. Workshop conclusions 	<ol style="list-style-type: none"> 1. "Pollution trading" is for some contracting parties (EU) not an option to be considered; 2. Constraints for governmental support to implement economic instruments 3. Tradable permits must be carefully adapted to economic and social condition of the countries and regions
<p>4.4.1 <i>(accomplished in the Phase 1)</i></p> <p>4.4.2 <i>(accomplished in the Phase 1)</i></p> <p>4.4.3 <i>(accomplished in the Phase 1)</i></p> <p>4.4.4 Present the basic findings and discuss the results with all stakeholder groups on a DRB wide workshop.</p>			

ANNEX 3 STAP Review (UNDP) and Response

Annex 3.1 STAP Review

Annex 3.2 Response to STAP Review

Elaboration of a Danube Regional Project: Strengthening of Implementation Capacities for Nutrient Reduction and Transboundary Cooperation. Proposed UNDP/GEF: International Waters Project

STAP-Roster Independent Technical Review undertaken by

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Overall impressions - general soundness

Since 1992 the European Community and the UNDP/GEF have supported efforts of the Danube countries and the Interim Commission for the Protection of the Danube River (ICPDR) to develop the necessary mechanisms for effective implementation of the Convention.

The new project is developed to ensure efficient implementation of the regional Strategic Action Plan based on national contributions, the Transboundary Analysis of causes and effects of transboundary pollution within the Danube River Basin and on the Black Sea and the Pollution Reduction Program resulting from that. In order to do so it would be necessary to reinforce the appropriate development and application of policies, strategies and legislation for transboundary pollution reduction at the national level.

The new GEF assistance, which is planned within the frame of the Danube/Black Sea Basin Strategic Partnership for the Danube and the Black Sea Basin, should complement the activities of the ICPDR and the Black Sea Program Implementation Unit. It shall

- provide assistance for them to reinforce their activities in terms of policy/legislative reforms and enforcement of environmental regulations, including for measures introduced at the national levels of the participating countries, and
- facilitate project implementation in providing a framework for dissemination and replication of successful demonstration that will be developed through the implementation of investment projects through the World Bank-GEF Partnership Investment Facility for Nutrient Reduction.

The Danube Regional Project is, according to the Project Brief, to be seen as an Integral Part of the Danube/Black Sea Basin Strategic Partnership and a logical continuation of the GEF support for capacity building provided for a period of six years to the countries of the Danube River Basin. The Project is to utilise available expertise and build on the existing mechanisms and structures.

The overall impressions of the project as described in the project brief are very positive. Even though a Strategic Action Plan has been developed and revised for the area it is essential that regional policies and strategies be coordinated with the development of national policies and legislation and implemented through national investment programs. Some of the countries will need assistance to develop adequate policies and legislation for emission control with particular attention to nutrient reduction. This is particularly true for those who will need to re-organise their political, legal, administrative and socio-economic structures due to the economic transition process or to the aftermath of the war. The project will facilitate the provisions for protection of the environment in those countries where environment protection and investments for pollution reduction are not the priority issues in the near future. It will thus help providing for a coordinated regional and transboundary water management of the whole Danube River Basin including its discharge area in the Black Sea.

1. Relevance to GEF, priority

The project would be of great importance and it relates highly to the *International Waters focal area* as it will ensure protection of international waters (the Danube River Basin and the Black Sea), sustainable management of natural resources and biodiversity. It is of high priority as it would help ensuring

implementation of regional policies and strategies for nutrient and pollution reduction at national level in the whole river basin.

It has particular relevance under the Operational Program Number 8: *Waterbody-Based Operational Program* and to some extent under OP No 10: *Contaminant-Based OP*. It aims at "undertaking projects that involve helping groups of countries to work collaboratively with the support of implementing agencies in achieving changes in sectoral policies and activities so that transboundary environmental concerns degrading specific water-bodies can be resolved"(OP 8). It does also aim at "demonstrate ways of overcoming barriers to the use of best practices for limiting release of contaminants causing priority concerns in the International Waters focal area..."(OP 10).

2. Objectives

The overall objective of the Danube Regional Project is to "complement the activities of the ICPDR required to provide a regional approach and global significance to the development of national policies and legislation and the priority actions for nutrient reduction and pollution control with particular attention to transboundary effects within the DRB and the Black Sea area". This objective is valid although it lacks the recognition of the environmental concerns that needs to be taken into account. A long term objective should be to achieve environmental sustainability in the transboundary Danube River Basin including in its discharging area in the Black Sea. To reach such an objective it would be necessary to apply the regional approach and undertake the priority actions as described. It is essential that a GEF supported project is focused towards achieving sustainable transboundary *ecological* effects.

The presented four immediate objectives:

- "development of nutrient reduction policies and legal instruments and measures for exacting compliance;
- institutional strengthening and capacity building for transboundary cooperation in nutrient reduction;
- awareness raising and reinforcement of NGO participation in nutrient reduction activities; and
- strengthening the monitoring and information mechanisms on transboundary pollution control and nutrient reduction"

in the presentation should further be regarded as activities to reach the objectives. They do, how ever necessary, sound too technical to be regarded as objectives and do not pay sufficient attention to the ecological concerns. The activities as described in the project brief would if properly implemented result in a transboundary cooperation and ecological sustainability but the latter must be clearly identified as an objective to ensure such a result.

3. Approach

The project brief defines the approach as being coherent and coordinated and that the project will build on existing mechanisms and structure. As the proposed Danube Regional Project is to be an integral part of the proposed Danube/Black Sea Basin Strategic Partnership it needs to be identified within that framework. The approach is technically sound, in line with the overall framework. It would result in achieving the objectives as presented, including the environmental benefits that are not identified in the project brief but would be an overall long-term objective for GEF support.

As the Black Sea is a water-body big enough to have a coriolis induced current system, nutrients and pollution discharged by the Danube River into the Black Sea might adversely affect coastal zones of other countries in the Black Sea. These effects might be defined in earlier Black Sea projects but are not taken into account in the current project brief. Such effects need to be made clear in order to define whether any of the other Black Sea riparians ought to be included in the project.

4. Background Information

As the Danube Regional Project is seen as a logical continuation of previous projects, focusing on Strengthening of Implementation Capacities for Nutrient Reduction and Transboundary Cooperation background information provided is essentially building on information within this context. This information is both relevant and substantial. It would, however, be useful to include project evaluations of these projects

as annexes. This information could serve as a useful point-of-departure for the project as defined in the project brief.

5. Funding level

The project needs to be seen within the framework of the whole Danube-Black Sea program which is composed of three complementary parts:

1. a series of country-related investment projects executed through the World Bank-GEF Partnership Investment Facility for Nutrient Reduction with GEF financial support,
2. two Regional Projects, for the Danube River Basin and the Black Sea respectively, and
3. other GEF and donor interventions in the basin targeting reduction of nutrients and toxic pollutants.

The proposed Danube Regional Project should be implemented within that context, thus taking into account and build on the existing mechanisms and structures. The project would thus not need to establish new systems which of course would imply financial as well as structural benefit. Funding for the Environmental protection and nutrient reduction in the Danube River Basin will be provided from different sources in accordance with what is described in the project brief. The proposed UNDP/GEF Danube Regional Project would be an integral part of that. Against this background, the funding level should be seen as appropriate.

6. Innovation

The most innovative aspects of this project proposal lie in the framework in which it is based, the Danube/Black Sea Strategic Partnership. This has a truly integrated approach, including its technical aspects of transboundary pollution reduction, and application of regional policies at national level to protect the environment. The transboundary cooperation that is needed to succeed in development and application of policies and strategies between countries where the economic, social and political pre-conditions are so different is a true challenge.

One of the activities to be undertaken as part of the project in order to meet the immediate "objective" of awareness raising and reinforcement of NGO participation in nutrient reduction activities is supporting NGOs to boost their capacities for active participation within the project by setting up a Small Grants Program. This would provide for cooperation between all actors, governmental as well as NGOs. Such innovative cooperation if successful could serve as a model for future cooperation and collaboration in larger, integrated GEF-supported projects.

7. Strengths/Weakness

The greatest strength of the project is the it could be seen as a natural continuation of two successful projects, and what is described above as the most innovative aspects of the proposal.

The most significant weaknesses of the proposal is that it is lacking proper references to the environmental impacts of the nutrient and toxic emissions. Further, although the strengthening of the monitoring and information mechanisms is one of the immediate "objectives", there is no proper process for Monitoring and Evaluation of the project included in the project brief. The component aiming at Strengthening of the monitoring and information mechanisms would include provisions for "Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals and other toxic substances on the Danube and the Black Sea ecosystems", "Monitoring and assessment of wetlands' nutrient removal capacities", and "Danube Basin feasibility study and consultation process on economic instruments for nutrient reduction".

Some of the aspects of these monitoring and assessments could be used in a Project Monitoring and Evaluation process of the Project Implementation but it is important to early in the process establish criteria and indicators in order to be able to undertake a proper process, thereby to identify successes and failures in the project and its implementation.

The project, which is a very useful and innovative project would benefit from a stronger reference to and analyses of environmental impacts and ecosystem degradation from the nutrient and toxic effluents. A better developed system for project Monitoring and Evaluation should be developed. And an evaluation report from the earlier GEF supported projects in the Danube and Black Sea should be annexed. This would strengthen the project.

28 August, 2000

Gunilla Björklund

Response from the ICPDR/GEF Project team to the comments from:

STAP-Roster Independent Technical Review undertaken by

Dr Gunilla Björklund

Marmorv 16A

SE-752 44 Uppsala, SWEDEN

On the Danube Regional Project: “Strengthening of Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin

General comment:

We appreciate the comments received from Dr Gunilla Björklund, which are well founded and which we have taken into account to prepare a revised version of the Project Brief. This revised version reflects also other comments received in the meantime from participating countries and from the GEF Secretariat, as from Al Duda and others.

Specific amendments in relation to STAP-Roster Independent Technical Review:

2. Objectives

1. We think that the overall objective reflects the situation under given conditions and in how far the project can contribute to environmental concerns.
2. The Project Objective has been amended : The overall objective of the Danube Regional Project is to complement the activities of the ICPDR required to provide a regional approach and global significance to the development of national policies and legislation and the definition of priority actions for nutrient reduction and pollution control with particular attention **to achieving sustainable transboundary ecological effects** within the DRB and the Black Sea area.
3. The four immediate objectives have been changed (made less technical), we do hope with some success :
OBJECTIVE 1: Creation of sustainable ecological conditions for land use and water management
OBJECTIVE 2: Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the DRB
OBJECTIVE 3: Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems
OBJECTIVE 4: Reinforcement of monitoring, evaluation and information systems for transboundary pollution control and nutrient reduction

3. Approach

Effects concerning the ecosystems in the Black Sea and its coastal zones are indeed defined in other reports : (i) we do hope in the Black Sea Project Brief and (ii) in the report , Annex 11 to the Danube Project Brief : "Causes and Effects of Eutrophication in the Black Sea".

4. Background Information

Two evaluation reports from the UNDP/GEF Pollution Reduction Program have been added in Annex 12 : (i) Terminal Evaluation from UNOPS, (ii) Terminal Report from the Project Manager.

6. Innovation

Thanks for recognizing this innovative approach; I do hope that all decision makers see this as well: "One of the activities to be undertaken as part of the project in order to meet the immediate "objective" of awareness raising and reinforcement of NGO participation in nutrient reduction activities is supporting NGOs to boost their capacities for active participation within the project by setting up a Small Grants Program. This would provide for cooperation between all actors, governmental as well as NGOs. Such innovative cooperation if successful could serve as a model for future cooperation and collaboration in larger, integrated GEF-supported projects".

7. Strengths/Weakness

To provide information on environmental impacts of the nutrient and toxic emissions, we have added as Annex 11 a report on "Causes and Effects of Eutrophication in the Black Sea"; this report has been elaborated in June 1999 by the joint Danube/Black Sea Ad-hoc working Group and is the basis for the "Memorandum of Understanding" between the Danube and the Black Sea Commission and describes the effects of nutrient emission and toxic substances to the Black Sea.

Concerning Objective 4, which has been reformulated, we have moved Activity 2.4 under Objective 4 to adequately respond to activities in relation to monitoring, evaluation and information, with particular attention to indicators. Activities under Objective 4 are now the following:

- (i) Development of Indicators for project monitoring and impact evaluation;
- (ii) Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals and other toxic substances on the Danube and the Black Sea ecosystems;
- (iii) Monitoring and assessment of wetlands nutrient removing capacities;
- (iv) Danube Basin feasibility study and consultation process on economic instruments for nutrient reduction.

Concerning development of indicators please refer also to Annex 8.5 : "Development of Process, Stress Reduction and Environmental Status Indicators to Monitor Nutrient Reduction and its Effects in the Danube River and the Black Sea".

Vienna, August 31, 2000
Joachim Bendow
Executive Secretary ICPDR

ANNEX 4 Project Budget – Project Phase 1

DANUBE REGIONAL PROJECT - REVISED BUDGET - PHASE 1

Project Components and Objectives	Permanent Project Staff				Sub-contractors/				Workshops/Training Courses/Meetings				Investments (Small Grants, equip./trans.)	Operation & Admin. support	Support cost UNOPS/ ICPDR	TOTAL Budget
	Professional Staff		Admin. Technical Support Staff		Int. Consultants		National Consultants		(natl.: 50 USD per diem /day/partic., 20 USD travel) (intl.: 120 USD/day/partic.; 500 USD travel / partic.)							
					(18000 USD/month)		(5000 USD/month)									
	Months	USD	Months	USD	Months	USD	Months	USD	No of workshops	No of Particip	No of Days	USD				
												USD	USD	USD	USD	
1. Creation of sustainable ecological conditions for land use and water management																
General Project Costs	10	130,000	20	125,000								80,000	100,000	194,032	629,032	
1.1 Development and implementation of policy guidelines for river basin and water resources management.					12	216,000	22	110,000	4	40	3	121,600			447,600	
1.2 Reduction of nutrients and other harmful substances from agricultural non-point sources through agricultural policy changes					10	180,000	35	175,000	1	40	2	25,600			380,600	
1.3 Development of pilot projects on reduction of nutrients and other harmful substances from agricultural point-sources					6	108,000	22	110,000	2	40	2	51,200			269,200	
1.4 Policy development for wetlands rehabilitation under the aspect of appropriate land use					6	108,000	20	100,000	2	30	2	38,400			246,400	
1.5 Industrial reform and development of policies and legislation for application of BAT (best available techniques including cleaner technologies) towards reduction of nutrient (N and P) and dangerous substances					8	144,000	20	100,000	1	40	2	25,600			269,600	
1.6 Policy reform and legislation measures for development of cost-covering concepts for water and waste water tariffs, focusing on nutrient reduction and control of dangerous substances					4	72,000	15	75,000	1	25	2	16,000			163,000	
1.7 Implementation of effective systems of water pollution charges, fines and incentives, focusing on nutrients and dangerous substances					2	36,000	8	40,000	1	25	2	16,000			92,000	
1.8 Recommendations for the reduction of phosphorus in detergents					4	72,000	10	50,000				0			122,000	
SUBTOTAL	10	130,000	20	125,000	52	936,000	152	760,000	11	215	13	294,400	80,000	100,000	194,032	2,619,432

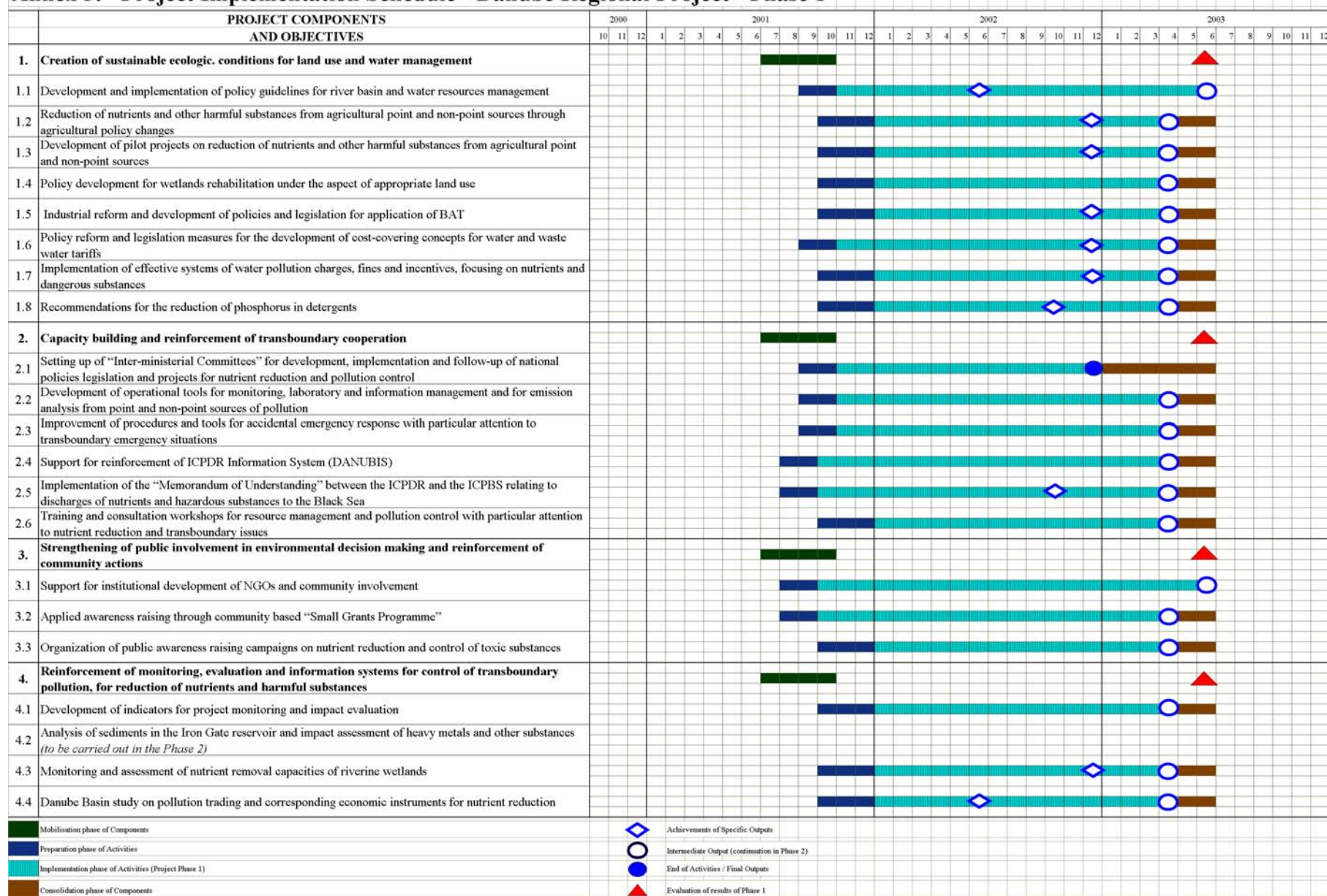
Project Components and Objectives	Permanent Project Staff				Sub-contractors/				Workshops/Training Courses/Meetings				Investments (Small Grants, equip./trans.)	Operation & Admin. support	Support cost UNOPS/ ICPDR	TOTAL Budget
	Professional Staff		Admin. Technical Support Staff		Int. Consultants		National Consultants		(natl.: 50 USD per diem /day/partic., 20 USD travel) (intl.: 120 USD/day/partic.; 500 USD travel / partic.)							
					(18000 USD/month)		(5000 USD/month)									
	Months	USD	Months	USD	Months	USD	Months	USD	No of workshops	No of Particip	No of Days	USD				
2. Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the DRB																
General Project Costs	5	65,000	10	62,500										50,000	65,755	243,255
2.1 Setting up of “Inter-ministerial Committees” for development, implementation and follow-up of national policies legislation and projects for nutrient reduction and pollution control					1	18,000	4	20,000								38,000
2.2 Development of operational tools for monitoring, laboratory and information management and for emission analysis from point and non-point sources of pollution with particular attention to nutrients and toxic substances					1	18,000	7	35,000	2	22	4	38,720	87,000			178,720
2.3 Improvement of procedures and tools for accidental emergency response with particular attention to transboundary emergency situations					1	18,000	7	35,000	2	22	2	28,160				81,160
2.4 Support for reinforcement of ICPDR Information and Monitoring System (DANUBIS)					3	54,000	4	20,000	2	22	2	28,160	100,000			202,160
2.5 Implementation of the “Memorandum of Understanding” between the ICPDR and the ICPBS relating to discharges of nutrients and hazardous substances to the Black Sea					1	18,000			1	15	2	9,600				27,600
2.6 Training and consultation workshops for resource mamangement and pollution control with particular attention to nutrient reduction and transboundary issues					4	72,000			2	35	2	44,800				116,800
SUBTOTAL	5	65,000	10	62,500	11	198,000	22	110,000	9	217	22	149,440	187,000	50,000	65,755	887,695

Annex 4: Project Budget

Project Components and Objectives	Permanent Project Staff				Sub-contractors/				Workshops/Training Courses/Meetings				Investments (Small Grants, equip./trans.)	Operation & Admin. support	Support cost UNOPS/ ICPDR	TOTAL Budget
	Professional Staff		Admin. Technical Support Staff		Int. Consultants		National Consultants		(natl.: 50 USD per diem /day/partic., 20 USD travel) (intl.: 120 USD/day/partic.; 500 USD travel / partic.)							
					(18000 USD/month)		(5000 USD/month)									
	Months	USD	Months	USD	Months	USD	Months	USD	No of workshops	No of Particip	No of Days	USD				
3. Strengthening of public involvement in environm. decision making and reinforcement of community actions for pollution reduction and protection of ecosystems																
General Project Costs	2	26,000	4	25,000										50,000	66,212	167,212
3.1 Support for institutional development of NGOs and community involvement	3	21,000					4	20,000	2	35	2	34,300		200,000		275,300
3.2 Applied awareness raising through community based “Small Grants Programme”	5	35,000			4	72,000	12	60,000	1	35	3	21,350				188,350
3.3 Organization of public awareness raising campaigns on nutrient reduction and control of toxic substances	10	70,000			1	18,000	15	75,000					100,000			263,000
SUBTOTAL	20	152,000	4	25,000	5	90,000	31	155,000	3	70	7	55,650	100,000	250,000	66,212	893,862
4.Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances																
General Project Costs	3	39,000	7	43,750										40,000	44,371	167,121
4.1 Development of indicators for project monitoring and impact evaluation					3	54,000	11	55,000	1	35	2	17,150				126,150
4.2 Analysis of sediments in the Iron Gate reservoir and impact assessment of heavy metals and other dangerous substances on the Danube and the Black Sea ecosystems (to be carried out in the Phase 2)																
4.3 Monitoring and assessment of nutrient removal capacities of riverine wetlands					3	54,000	6	30,000	1	30	2	19,200		6,140		109,340
4.4 Danube Basin study on pollution trading and corresponding economic instruments for nutrient reduction					8	144,000	6	30,000	1	35	2	22,400				196,400
SUBTOTAL	3	39,000	7	43,750	14	252,000	23	115,000	3	100	6	58,750	0	46,140	44,371	599,011
TOTAL BUDGET	38	386,000	41	256,250	82	1,476,000	228	1,140,000	26	602	48	558,240	367,000	446,140	370,370	5,000,000

ANNEX 5 Project Implementation Schedule – Project Phase 1

Annex 5: Project Implementation Schedule - Danube Regional Project - Phase 1



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ANNEX 6 Assessment of Nutrient Emissions and Loads Discharged into the Black Sea

Assessment of Nutrient Emissions and Loads Discharged into the Black Sea

1. Introduction

The Danube River Protection Convention, created in the framework of the ECE-Convention for the protection of trans-boundary waters (Helsinki Convention 1992), became with its entry into force on 22 October 1998 the overall legal instrument for co-operation and trans-boundary water management in the Danube River Basin. The overall objective of the DRPC is to achieve and maintain the sustainable development and use of water resources in the Danube River Basin. The Contracting Parties are recommended to aim at an intensified regional co-operation, a due balance between ecology and economy, an integrated implementation as well as goal-oriented policies and strategies, executive structures and tools. In order to achieve substantial progress in the protection and sustainable use of the water resources, the following overall strategic goals and targets are defined:

- to maintain and improve the status of water resources as to quality and quantity;
- to prevent, reduce and control water pollution, including accidental pollution, in particular where hazardous substances and nutrients are involved;
- to improve the aquatic ecosystems and biodiversity;
- to contribute to the protection of the Black Sea from land-based pollution.

National and regional policies are based on common principles related to the protection and use of natural resources, in particular on the Precautionary and the Polluter Pays Principles, the best available technology (BAT) and the best environmental practice (BEP). The same applies to the Convention. Most of the Contracting Parties have developed a water management policy as part of their national policy. Sector policies for reducing point sources of pollution are mostly in place whereas specific policies for reducing diffuse sources of pollution are partly under development; policies regarding wetland rehabilitation are emerging.

The protection of the Black Sea and its ecosystems from land-based pollution constitutes a multifaceted regional framework objective. Its realisation depends to a considerable degree on the implementation of relevant objectives and policies in the Danube River Basin, in particular regarding eutrophication caused by nutrient discharges. Hence, the Commissions responsible for the protection of the Danube River (ICPDR) and the protection of the Black Sea (ICPBS) jointly declare their policies and willingness to co-operate for achieving common strategic goals as specified in a “Memorandum of Understanding” which shall be adopted in the year 2000. These goals particularly address assessment and urgent control measures regarding nutrients and hazardous substances. A defined ecological status is intended to be maintained and in the long term recovered through ensuring appropriate practices and measures.

In the frame of the Danube Environmental Programme, the UNDP through the Global Environment Facility and the EU through its Phare and Tacis programs, have since 1992 provided international assistance to develop appropriate mechanisms and planning tools for the implementation of the Danube River Protection Convention. In the particular context of the Pollution Reduction Programme, the causes and the effects of water pollution have been analysed and policy guidelines, strategies, and projects for pollution reduction and water management have been developed. The project considers root causes for “Inadequate Management of Water Resources”, referring primarily to the middle and lower Danube countries, taking into account problems related to socio-political transition, reforms and general economic recession; war and displacement of population; absence of national strategies for water management and inefficient environmental management, enforcement and compliance.

Concerning direct causes, important sources of pollution or priority “hot spots” have been identified for the municipal, industrial and agricultural sectors. 51 “Significant Impact Areas” have been identified in the Danube River Basin, which are in particular affected by industrial pollution, COD and toxic materials as well as by excessive nutrient loads. Special consideration was also given to the nutrient transports to the Black Sea, indicating a total of 552 kilotons of Nitrate and 48,9 kilotons of Phosphorus annually reaching the Black Sea.

In the frame of the “Five Year Nutrient Reduction Programme”, elaborated under the PDF-B activities, over 240 projects have been developed, responding generally to “hot spots” or point sources of emission, representing national priorities and taking equally into account the obligation to mitigate trans-boundary effects. Particular attention was given to the identification of sites for wetland restoration, which play an important role not only as natural habitats, but also as nutrient sinks.

The total investment required to respond to the priority projects is estimated to be about 4.4 billion US\$, covering the following sectors:

- Municipal waste water collection and treatment plants
- Industrial waste water treatment
- Agricultural projects and land use
- Rehabilitation of wetlands

The expected results of the implementation of the Five Year Nutrient Reduction Plan show a considerable decrease of pollution in terms of COD/BOD, respectively in terms of N and P. The implementation of the proposed priority projects in the municipal, industrial and agricultural sectors will lead to an annual reduction of about 118,576 tons of N and 16,156 tons of P. The latter has a direct influence on the Black Sea and will contribute to achieving common Danube and Black Sea goals to restore marine ecosystems in the north-western shelf.

2. The Danube Water Quality Model

The Danube Water Quality Model (DWQM) was developed in the frame of the Danube Pollution Reduction Programme to simulate the actual in-stream nutrient load. Simulations have been conducted to support the Trans-boundary Analysis as well as to support the definition of priority measures of the Pollution Reduction Programme demonstrating nutrient reduction through the implementation of the projects and policy measures. Details about the work can be found in the related report (GEF, 1999).

2.1 System description

The Danube Water Quality Model (DWQM) describes the fate of the nutrients nitrogen (N) and phosphorus (P) in the Danube catchment. These nutrients are discharged in the aquatic environment due to human activities and natural processes. The model contains a schematisation of the Danube River and its main tributaries, derived from (Vituki, 1996) and the National Reviews (GEF, 1998), called “the network” as presented in Fig. 1.



Fig. 1: The river network of the DWQM.

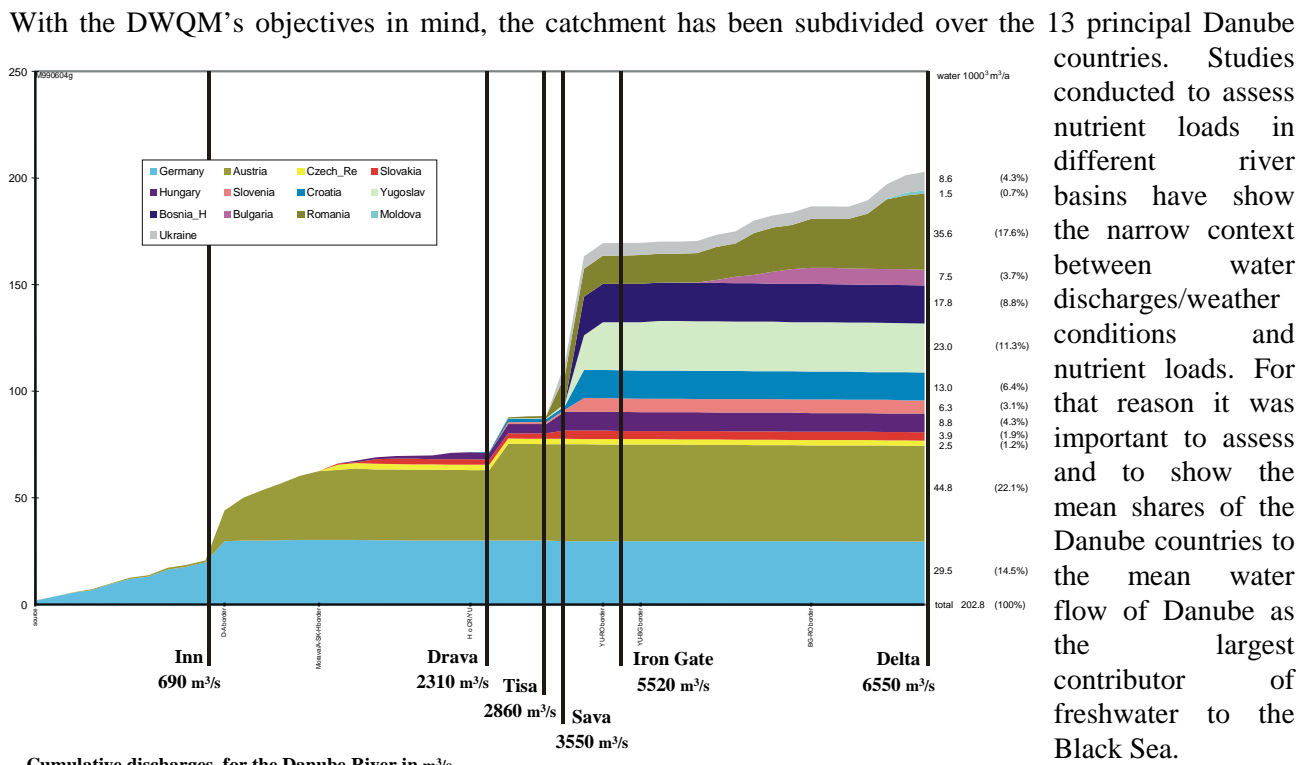


Fig. 2: Longitudinal profile of the annual water volume in the Danube in $1000^3 \text{ m}^3/\text{a}$, by countries of origin.

2.2 Conceptual model

The conceptual model of the DWQM is shown in Fig. 3. The emissions are split into two parts: the emissions directly to the river network and the retained emissions, which refer to any process effectively removing nutrients from the catchment¹. Seasonal cycles of uptake and release are not considered retention.

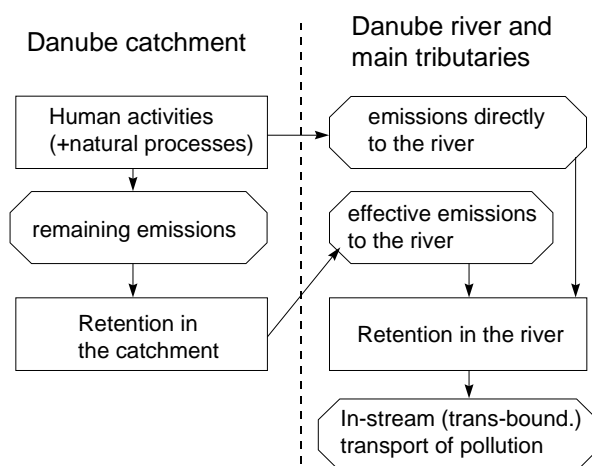


Fig. 3: Systems diagram

2.3 Implementation

The total emissions have been computed for all the Danube countries based on the “materials accounting method” (University of Vienna et al., 1997). The emissions estimates were originally made for the years

¹ The subject of retention of nutrients in the aquatic cycles of river catchments has been described in detail by many authors, e.g. Tonderski (1997), de Wit (1999).

1988/1989 and 1992, but were later updated (University of Vienna, 1999) to 1994-1997 based on data collected in the National Reviews (GEF, 1998), see Fig. 4 and Fig. 5.

Large individual point sources of N and P discharging directly to the river network were identified based on the EMIS inventory (Mehlhorn, 1998) and the National Reviews (GEF, 1998). The remaining emissions (Fig. 3) were computed by subtracting these emissions directly to the river from the total emissions discussed above.

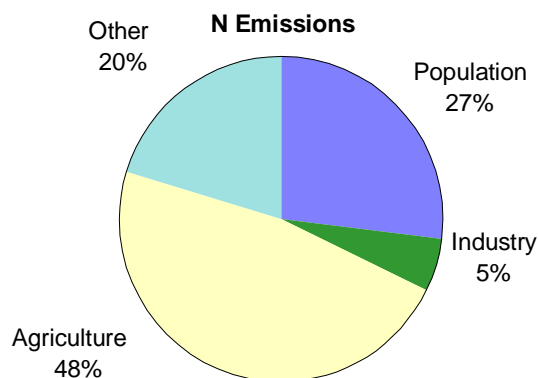


Fig. 4: Subdivision of N emissions.

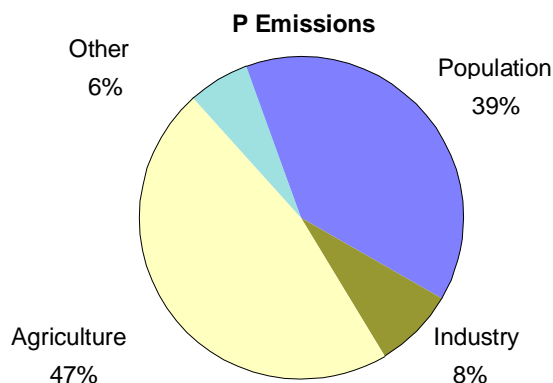


Fig. 5: Subdivision of P emissions.

The retention in the catchment is represented by an empirically derived "immission/emission-ratio". High (95% probability) and low (5% probability) estimates for these factors for N and P, as a function of the area specific run-off, were derived from Behrendt et al. (1999). The values for N range from 5-36% (low runoff) to 59-88% (high runoff), while the values for P range from 5-36% (low) to 72-100% (high).

Based on an analysis of the available data, two processes were identified as having the potential to cause a non-negligible retention in the river: denitrification (N) and net sedimentation in the backwater area of the Iron Gates dams on the Yugoslavian-Romanian border (P).

3. Results

3.1 The Trans-boundary Analysis

The Danube Water Quality model has been used to support the Trans-Boundary Analysis (TBA). To this end, a computation was carried out for a situation somewhere between the high and low estimates.

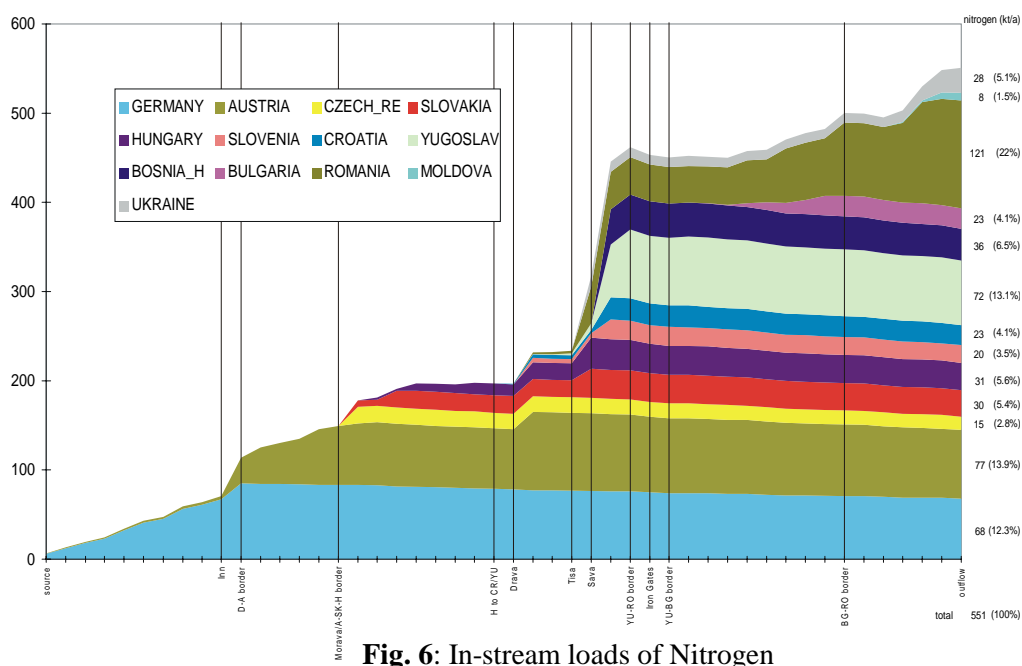


Fig. 6: In-stream loads of Nitrogen

The precise definition of the computation was made by matching in-stream loads with the best available load data derived from observed nutrient concentrations and water discharges.

The overall computation was split into 13 different segments: each one of them with the emissions from one individual country. The results of the 13 computations were

superimposed to obtain the overall result. Because all equations in the DWQM were strictly linear, this was a mathematically valid procedure.

The results are presented in Fig. 6 and Fig. 7. Both figures present the nutrient loads (vertical axis) as a function of the distance along the river (horizontal axis).

Fig. 6 shows the gradual increase of the in-stream nitrogen load from the source of the Danube up to the middle Danube area, where it increases very rapidly due to the inflows of the Drava, Tisza and Sava tributaries. The gradual increase continues up to the outflow.

The country contributions show a gradual or jump-wise build-up, similar to the build-up of their catchment and flow contributions (see Fig 2). Downstream, the country nitrogen load contributions decrease gradually. This is the result of in-stream denitrification.

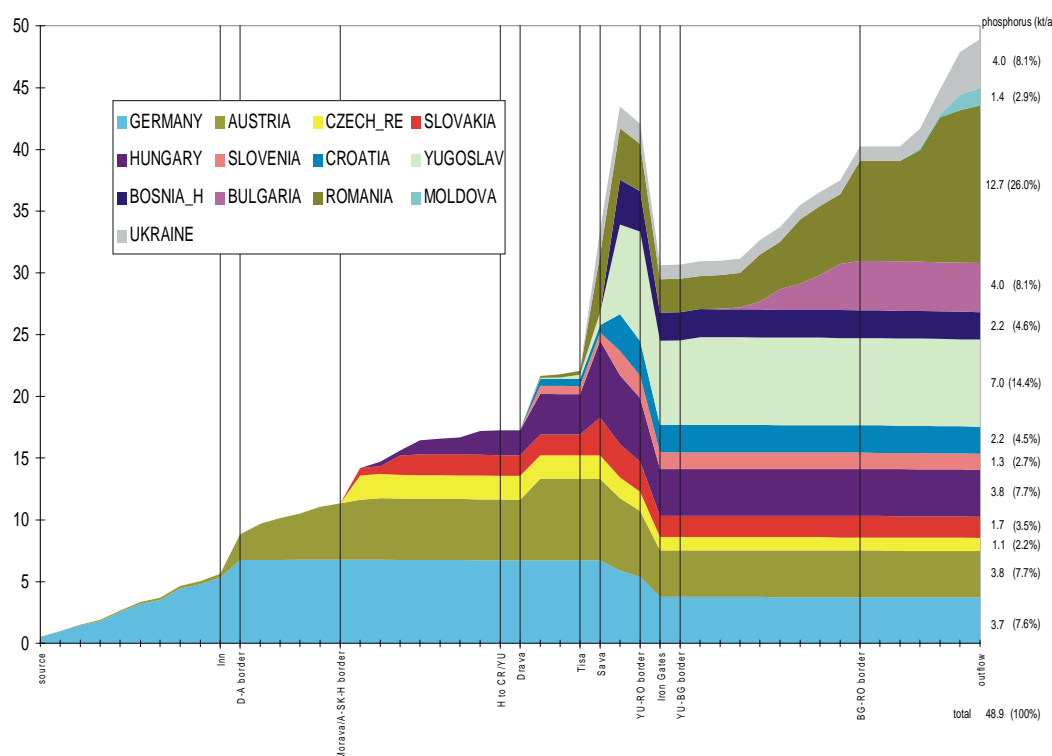


Fig. 7: In-stream loads of Phosphorus.

Fig. 7 shows a similar picture for phosphorus. In this case, however, the in-stream removal is not distributed over the whole river as with nitrogen.

Phosphorus is only removed from the river in the Iron Gates lakes area, downstream of the inflows of the Drava, Tisza and Sava tributaries.

Therefore, the in-stream load sharply decreases just downstream of the strong increase at the locations of these tributaries.

3.2 The Five Year Nutrient Reduction Action Plan

Taking into account the implementation of all projects of the Five Year Nutrient Reduction Action Plan (5YNRAP) and other pollution reduction measures in the Danube River Basin countries, the expected

pollution reduction in terms of N is presented per country and sector in Fig 8 and summarised for N and P per sector in Fig. 9.

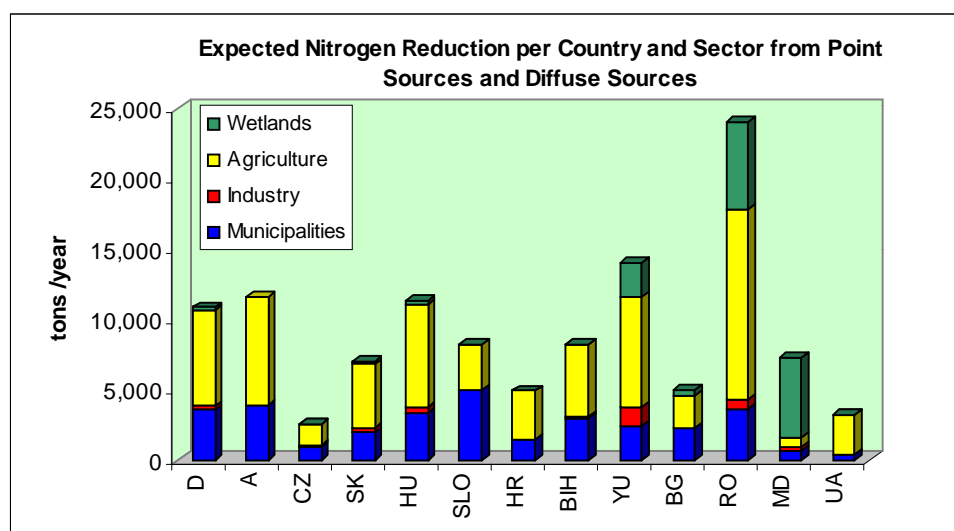


Fig. 8: Expected pollution reduction of N from proposed and ongoing national projects and policy measures per country and per sector.

The presentation shows the particular importance of N and P reduction through municipal waste water treatment facilities and through the restoration or rehabilitation of wetlands functioning as nutrient sinks.

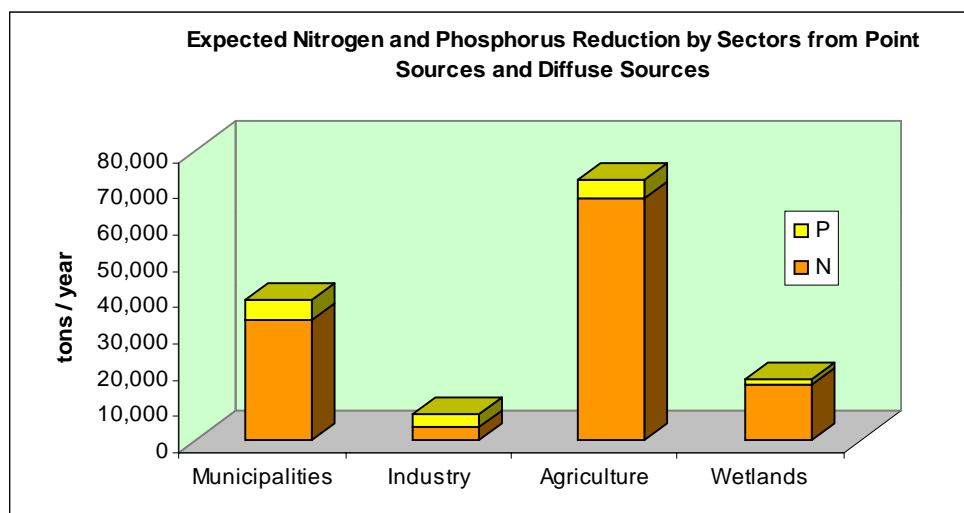


Fig. 9: Expected pollution reduction of N and P from proposed and ongoing national projects, summarised per sector

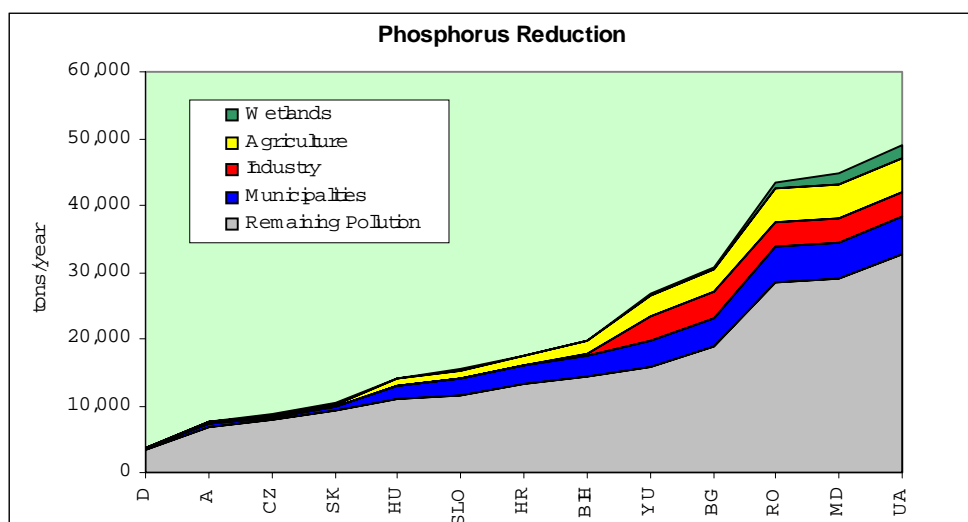


Fig. 11: Schematic in-stream phosphorus load profile for the Danube countries, before and after implementation of the 5YNRAP, with the additional effect of the restoration of wetlands.

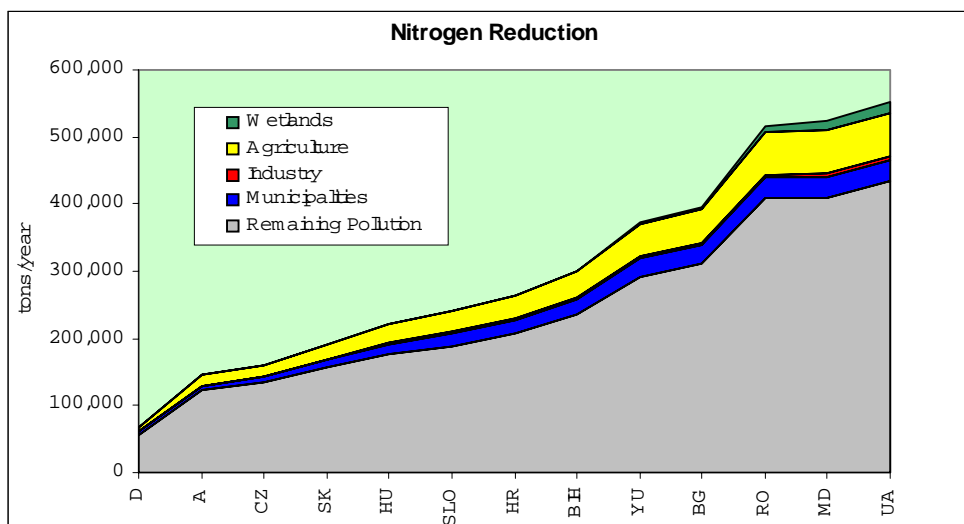


Fig. 10: Schematic in-stream nitrogen load profile for the Danube countries, before and after implementation of the 5YNRAP, with the additional effect of the restoration of wetlands.

Concerning the comparatively high reduction from the agricultural sector, it should be noted, that agricultural projects refer mainly to point sources of pollution (animal farms). The largest share of the nutrient pollution in the agricultural sector, which is caused by diffuse emissions from fertiliser application, will be reduced through a change of agricultural practices and new policy instruments, which will be developed during the new GEF Regional Project.

The positive impacts on the Black Sea concerning the reduction of nitrogen and phosphorus load are indicated in Fig 10 and Fig. 11.

Altogether the reduction of nutrient load discharged into the Black Sea is expected to reach the amount of 119,000 t/y (22%) for nitrogen and 16,000 t/y (33%) for phosphorus after the implementation of the proposed projects for municipal, industrial, agricultural waste water treatment plants, wetland restoration and reduction from agricultural non-point sources of pollution through the application of EU Nitrate Directive and consequent change of agricultural practices.

Implementation of the program will reduce the nutrient loads to the Black Sea below the 1997 level and will thus be in compliance with the strategic goals of the Memorandum of Understanding between the ICPDR and ICPBS.

The highest concentration of hot spots is in the middle but also in the lower part of the Danube River Basin. As the DWQM results show that P reduction in respect to the Black Sea might be more effective closer to the Black Sea, whereas N reduction does not appear to be so distance related, emphasis should be given to projects in the middle and lower Danube to reduce loads to the Black Sea. These considerations should be balanced with the responsibility of all countries that contribute nutrients to the Danube to take action (Polluter Pays Principle).

The analysis of the effects of emission reductions per sector (see Fig. 10 and 11) shows clearly the importance of actions to be undertaken in the central and downstream countries of the Danube River Basin. Projects developed for the urban sector (population) are leading to a considerable decrease of nutrient emissions in particular phosphorus, which reflects the result of important investments in this sector. The industrial sector seems insignificant in terms of nutrient emissions, but could have a devastating effect if in downstream countries old industries with outdated technologies would be put back into operation. The agricultural sector accounts for the highest contribution of the nutrient load and proposed measures will in fact show more important results after 2005, when all policy measures for nutrient reduction have been implemented.

In the downstream countries, the reduction of nutrients is merely due to the rehabilitation of wetlands then to the reduction of use of fertilisers and pesticides. The most attention should therefore be paid to policy reforms and changes of agricultural practices, which is the main focus of the present GEF Regional Project.

Annex: Estimation of Nutrient Load and Expected Reduction

Country	Total Emissions (DWQM)		Five Year Nutrient Reduction Plan								Total Expected Load Reduction				Remaining Pollution	
			Municipalities		Industry		Agriculture*		Wetlands**							
	N (t/y)	P (t/y)	N (t/y)	P (t/y)	N (t/y)	P (t/y)	N (t/y)	P (t/y)	N (t/y)	P (t/y)	N (t/y)	N(%)	P (t/y)	P(%)	N (t/y)	P (t/y)
Germany	68,000	3,700	3,620	13	260	40	6,800	111	211	21	10,891	16	185	5	57,109	3,515
Austria	77,000	3,800	3,950	404	0	0	7,700	114			11,650	15	518	14	65,350	3,282
Czech Republic	15,000	1,100	1,010	58	61	1	1,520	36	0	0	2,591	17	95	9	12,409	1,005
Slovakia	30,000	1,700	2,001	125	348	0	4,500	170	225	23	7,074	24	318	19	22,926	1,382
Hungary	31,000	3,800	3,455	1,153	420	6	7,250	720	233	23	11,358	37	1,902	50	19,642	1,898
Slovenia	20,000	1,300	5,053	786	0	0	3,180	158	0	0	8,233	41	944	73	11,767	356
Croatia	23,000	2,200	1,509	239	0	0	3,450	220	0	0	4,959	22	459	21	18,041	1,741
Bosnia -Herzegovina	36,000	2,200	3,005	450	125	53	5,170	570	0	0	8,300	23	1,073	49	27,700	1,127
Yugoslavia***	72,000	7,000	2,486	700	1,347	3,571	7,840	942	2,320	350	13,993	19	5,563	79	58,007	1,437
Bulgaria	23,000	4,000	2,308	562	0	0	2,300	400	375	37	4,983	22	999	25	18,017	3,001
Romania	121,000	12,700	3,644	823	688	3	13,474	1,420	6,154	615	23,960	20	2,861	23	97,040	9,839
Moldova***	8,000	1,400	784	119	167	36	747	95	5,600	725	7,298	91	975	70	702	425
Ukraine	28,000	4,000	486	65	0	0	2,800	200	0	0	3,286	12	265	7	24,714	3,735
Total	552,000	48,900	33,311	5,497	3,416	3,710	66,731	5,156	15,118	1,794	118,576	21	16,157	33	433,424	32,743

* Agriculture = agricultural industries and diffuse sources

** Wetlands = in-stream reduction

*** Data adjusted: YU - Municipalities; MD - Wetlands

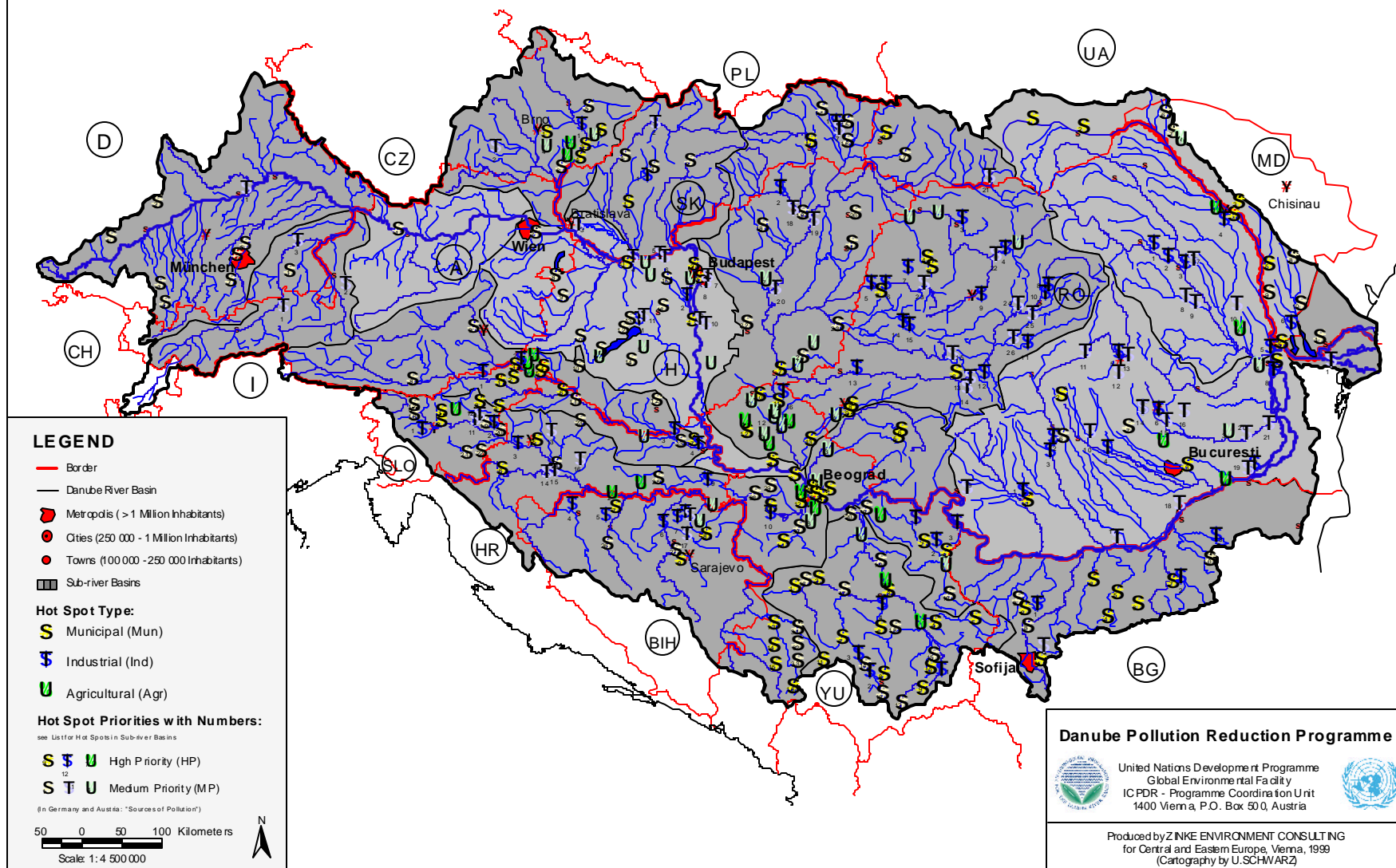
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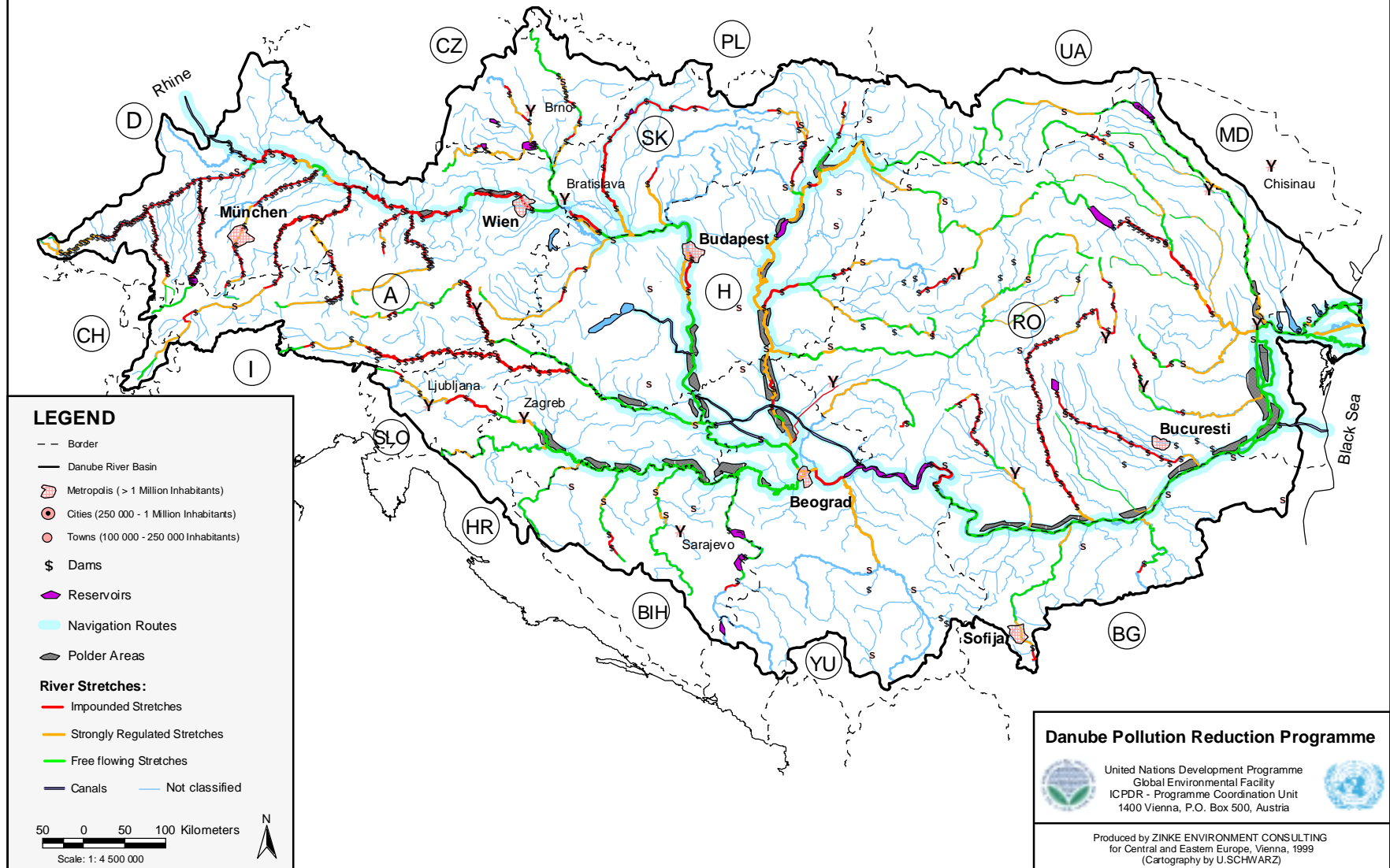
Distribution of Hot Spots in the Danube Sub-river Basins

Based on National Planning Workshop Reports 1998, Updates March 1999



Major Hydraulic Structures and Description of Rivers in the Danube Basin

Based on Information from National Level and Additional Research 1999



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**STRENGTHENING THE IMPLEMENTATION OF NUTRIENT
REDUCTION MEASURES AND TRANSBOUNDARY
COOPERATION IN THE DANUBE RIVER BASIN**

**EXISTING AND PLANNED INTER-MINISTERIAL
CO-ORDINATION MECHANISMS RELATING TO
POLLUTION CONTROL AND NUTRIENT
REDUCTION**

SUMMARY REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000



**International Commission for
the Protection of the Danube River**



UNDP/GEF Assistance

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LIST OF ABBREVIATIONS

AHEG	Ad-Hoc Expert Group
BD	Bucharest Declaration
BOD5	Biochemical Oxygen Demand in 5 days
COD	Chemical Oxygen Demand
CPC	Country Program Co-ordinator
DRB	Danube River Basin
DRBPRP	Danube River Basin Pollution Reduction Programme
DWQM	Danube Water-Quality Model
EIA	Environmental Impact Assessment
EMIS/EG	Emission Expert Group
EPA	Environmental Protection Act
EPDRB	Environmental Programme for Danube River Basin
EU	European Union
GEF	Global Environment Facility
GNP	Gross National Product
HS	Hot Spot
ICPDR	International Commission for the Protection of the Danube River
IPPC	Integrated Pollution Prevention and Control
ISPA	Instrument for Structural Policies for Pre-Accession
IWWTP	Industrial Waste-Water Treatment Plants
LAWA	Joint Austrian water commission of the states
MAFF	Ministry of Agriculture, Forestry and Food
MTCWM	Ministry of Transport, Communication and Water Management
MESP	Ministry of Environment and Spatial Planning
MH	Ministry of Health
MIT	Ministry of Industry and Trade
N	Nitrogen (all forms)
N/A	Not Available (i.e. missing data)
NEAP	National Environmental Action Programme
NEPP	National Environmental Protection Program
NFP	National Focal Point
NGO	Non-Governmental Organisation
NRL	National Reference Laboratory
P	Phosphorus (all forms)
PCU	Program Co-ordination Unit (in Vienna)
PE	Population Equivalent = load of one person into waste water
PHARE	European Union Programme for Development
PPP	Polluter Pays Principle
RBM	River Basin Management
SIA	Significant Impact Areas
SWWTP	Small Waste-Water Treatment Plants
TAIEX	European Union programme for technical assistance
TOR	Terms of Reference
UNDP	United Nations Development Programme
UWWTD	Urban Waste Water Treatment Directive
WFD	Water Framework Directive

1 INTRODUCTION

The purpose of this Summary Report is to provide an overview and assessment of the existing and planned inter-ministerial mechanisms related to pollution abatement with particular attention to nutrient control and reduction in the Danube River Basin countries.

The Summary Report is an integral component for the preparation of the GEF/UNDP funded project entitled "Strengthening Implementation of Nutrient Reduction Measures and Transboundary Co-operation in the Danube River Basin". The basic task of this preparatory work is to prepare a qualified material basis for the elaboration of a complete Danube Regional Project for submission to the GEF Council.

The GEF/UNDP funded project aims to promote (i) a basin wide approach to the development of national policies and legal instruments to improve water quality, (ii) integration of nutrient control and reduction measures into environmental policies, (iii) institutional strengthening and capacity building to assure compliance and enforcement, and (iv) awareness raising for active involvement in transboundary pollution control and environmental protection.

The underlying problem causing unsustainable water use practices leading to an increased nutrient content in the Danube River is that nutrient control and reduction measures are often not determined and implemented as part of water resources management policies or environmental protection strategies. For some countries, such as the Czech Republic, nutrient control and reduction measures are part of the water and environmental protection strategy.

This Summary Reports represents an assessment for all DRB countries, respectively particular categories of DRB countries and the country presentation on existing and planned inter-ministerial structures relating to nutrient control and reduction, based on reports from national consultants for each of the DRB countries. The contributions delivered by the consultants differ in terms of depth, completeness and totality of the presentations.

The structure of the Country Report follows the structure of the "national reports", and provides both particular information and data for each of the DRB countries. Country-specific information is structured as follows:

- (1) Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction
 - Organization, duties, responsibilities, rules of procedure and results
 - Co-operation between governments and local communities/ non-governmental organizations in relation to nutrient reduction concerns
 - Description of main problems
- (2) Guidelines for the improvement/creation of national inter-ministerial nutrient control and reduction mechanisms
 - Recommendations for improvement of the existing national inter-ministerial mechanisms to respond to nutrient reduction concerns
 - Suggestions for the creation of new mechanisms for nutrient control and reduction
- (3) Main barriers to the creation of national inter-ministerial mechanisms
 - Legal and institutional barriers
 - Financial barriers
- (4) Proposed national inter-ministerial mechanisms
 - Institutional and legal framework
 - Schedule for implementation
- (5) Main country-specific features and conclusions

2 ASSESSMENT OF RESULTS AND CONCLUSIONS

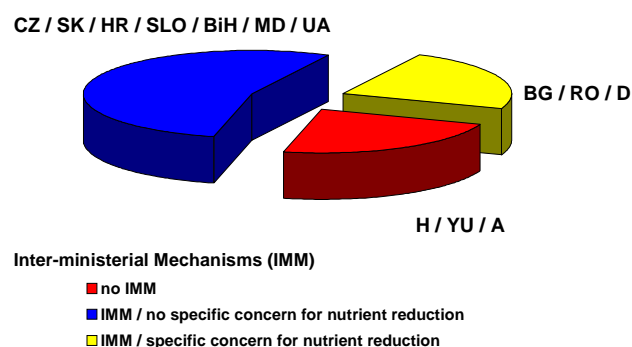
2.1 Analysis of the existing national inter-ministerial mechanisms for nutrient control and reduction

Not all Danube countries place sufficient emphasis on cooperation between environmental and agricultural authorities or industrial enterprises, farmers and local communities as a substitute for the traditional systems based on fragmented decision making process. For most of the countries, especially for those in transition, the idea of a national inter-ministerial mechanism for pollution control and nutrient reduction does not represent a priority. However, the governments are aware of the potential such a mechanism carries in terms of reducing nutrients in the Danube River Basin and the Black Sea. The diversity of views and proposals and the biases built into modern EU Directives concepts create a precondition encouraging the countries to create a new inter-ministerial mechanism or improve the existing structures by charging them with nutrient reduction and pollution control responsibilities.

The Danube countries identified agricultural diffuse sources as the most damaging and widespread threat to the environment.

There is a substantial need in the Danube River Basin countries for the creation of nutrient reduction and pollution control mechanisms. Among the accession countries in particular, there is a large potential and willingness to implement nutrient reduction measures.

Existence of Inter-ministerial Mechanisms for Nutrient Reduction



Based on the findings of the national contributions, the countries can be divided into three groups. The first group includes EU member countries such as Germany and Austria, whose existing national inter-ministerial and ministerial structures allow an effective performance of nutrient reduction and control tasks. The second group includes countries where specific mechanisms for nutrient reduction do not exist. However, there are several relevant national inter-ministerial mechanisms with responsibilities for water pollution abatement and environmental protection. Most of these structures also deal with diffuse pollution, implementing pollution reduction measures or approving new investments in the water

sector. This group comprises the Czech Republic, Romania and Bulgaria. Finally, in the rest of the Danube countries, nutrient reduction and pollution control is not high on the policy makers' agenda.

The existing national inter-ministerial and ministerial mechanisms include central environmental authorities, water companies, agricultural, forestry, industry, finance and health authorities.

Composition of the Existing Inter-ministerial Mechanisms

	D	A	CZ	SK	H	SLO	HR	BiH	YU	BG	RO	MD	UA
central environm. authorities								x					x
environment	x	x	x	x	x	x	x		x	x	x	x	
water	x	x	x		x		x		x	x	x	x	
agriculture	x	x	x	x	x	x	x		x	x	x	x	
forestry		x					x			x	x	x	
industry						x	x			x	x	x	
finance				x					x				
health					x	x	x		x	x	x	x	

2.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

Proposals for the improvement or creation of inter-ministerial mechanisms capable to respond to nutrient reduction concerns have been developed by all countries.

These proposals refer to both legal and institutional frameworks and include: (i) the implementation of nutrient-related legislation based on EU Directives and ratified International Conventions, (ii) the development of instruments for diffuse pollution characterization and control, (iii) the creation of rules for good farming practices and good practices in drinking water protection zones, and (iv) the application of an integrated approach to the management of water resources on the river basin level.

The Danube countries believe that cooperation between governments and local communities/ non-governmental organizations with respect to nutrient reduction issues is very important. Nutrient reduction is directly or indirectly included in the duties and responsibilities of several ministries, local authorities, farmers, new owners of industrial plants, environmental NGOs and researchers.

The majority of DRB countries have proposed the creation of national pollution control and nutrient reduction mechanisms.

Proposed Improvement of Inter-ministerial Mechanisms													
	D	A	CZ	SK	H	SLO	HR	BiH	YU	BG	RO	MD	UA
legislative improvement of existing IMM	x		x			x	x	x	x	x		x	x
institutional improvement of existing IMM	x	x	x		x	x	x	x			x	x	x
creation of new legislation			x	x	x	x		x	x	x	x		x
creation of new institutions			x	x	x	x	x	x	x	x	x		x

Very good examples for cooperation between the governments, the inter-ministerial mechanisms and the local communities and NGOs are shown by the majority of the countries through the establishment of the river basin authorities.

However, there are limitations to the identified mechanisms of the middle and lower Danube countries, including:

restricted financial resources, inadequate legal and institutional frameworks, and low priority placed on nutrient reduction compared to other water quality or environment-related problems.

2.3 Main barriers to the creation of national inter-ministerial mechanisms

There are several legal and institutional barriers to the creation of national inter-ministerial mechanisms dealing with nutrient reduction and pollution control.

These measures are mainly referring to the (i) lack of adequate environmental legislation and institutional frame, (ii) fragmentation of responsibilities among the water, environmental and agricultural authorities, and (iii) limited integration of environmental requirements into economic development policies. In addition, transition countries are faced with financial barriers related to reduced financial resources.

Problems of the Existing Inter-ministerial Mechanisms													
	D	A	CZ	SK	H	SLO	HR	BiH	YU	BG	RO	MD	UA
fragmented water management administration tasks		x	x			x						x	x
low priority of nutrient reduction at the governmental level					x		x	x					
weak institutional capabilities								x		x			
insufficient legal framework				x		x	x	x	x	x	x		
insufficient database								x					
limited funds			x	x		x	x	x					x

2.4 Proposed national inter-ministerial mechanisms

The proposals - formulated mainly by the transition countries - for the improvement or creation of national inter-ministerial mechanisms for nutrient reduction and pollution control are related to both legal and institutional framework and cover:

- (i) harmonization of the existing legislation with the EU requirements, including the implementation of nutrient-related legislation based on EU Directives and ratified international conventions and agreements,
- (ii) the creation of rules for good agricultural practices, and
- (iii) the introduction of an integrated water management approach on the river basin level, including the creation of river basin committees.

The majority of the Danube River Basin countries do have the potential and the willingness for the creation of national pollution control and nutrient reduction mechanisms.

2.5 Inter- ministerial Mechanisms for Nutrient Reduction in the Danube River Basin

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	Composition	Tasks	Problems	Improvement of existing structures		Creation of new structures	
				Legal framework	Institutional framework	Legal framework	Institutional framework
1. Germany (incl. Bavaria)							
1) Co-ordination of legalisation on federal and state level	1. LAWA* and federal ministries	1. Implementation of EU-directives, federal regulations and acts; set minimum requirements for municipalities and industries					
2. Coordination groups for legal regulations and planning 3. Coordination groups for environmental affairs 4. Regional planning association 5. Working groups on administrative level 6. Cooperation between federal and state administrations and scientific and technical associations	2. State ministries 3. State ministries for environment and agriculture 4. Relevant social groups including municipalities 5. State office for water management, Geological survey, state offices for agriculture 6. LAWA and ATV-DVWK	2. Bavarian water act, State development program 3. Program „Stickstoff 2000“; „Gülleprogramm“; „Kultur-Landschaftsprogramm“ „Good farming practice“ 4. Regional plans (18 Regions) 5. Regulations for protected areas for drinking water, program for water quality in rural areas, projects for water quality protection in catchment areas of lakes and reservoirs 6. Investigations and reviews concerning agricultural impacts on water quality		1. Intensify the use of the existing mechanism	1. Intensify the use of the existing mechanism		

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	Composition	Tasks	Problems	Improvement of existing structures		Creation of new structures	
				Legal framework	Institutional framework	Legal framework	Institutional framework
2. Austria							
1. The main competencies for protection of waters are allocated to the Ministry of Agriculture, Forestry, Environment and Water Management. 2. Work based on inter-ministerial co-operative mechanism was done on a case by case basis: e.g.: Former Elaboration of Austria’s National Environmental Plan (in cooperation with different ministries, stakeholders and NGO’s) e.g.: Former Elaboration of the National Environmental Health Action Plan within the frame of UN-ECE Water and Health.	1. Central authority for water protection is the Ministry of Agriculture, Forestry, Environment and Water management. 2. Soil protection is competence of the Länder. 3. Implementation of related EU-legislation lies within the federal level and Länderlevel	1. Policy setting and implementation 2. Preparation of water and environmental legislation. Provision of financial incentives for technical measures as well as for introduction of environmental friendly agricultural practices. 3. Water Quality and Quantity monitoring. 4. Awareness raising	1. By combining the former Ministry of Agriculture and Forestry and the former Ministry of the Environment (Youth and Family) co-operation and co-ordination has further improved.		1. Improvement of co-operation between central authorities		
3. Czech Republic							
1. Ad-hoc WG on various subjects 2. WGs on harmonisation of legislature with EU 3. No specific mechanism on nutrient reduction	Central and local authorities dealing with environment, water and agriculture	1. Water and environmental protection 2. Drafting new laws 3. Harmonization with EU regulations	1. Division of main tasks in water management between two ministries 2. Lack of funds	1. Finalization of the new Water Act	1. Intensified research regarding EU Directive on Nitrates requirements	1. Approval of new Water Act and of a set of laws regarding state administration 2. EU Directive on Nitrates implementation	1. Improved co-operation between responsible ministries in the form of WGs on specific subjects

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	Composition	Tasks	Problems	Improvement of existing structures		Creation of new structures	
				Legal framework	Institutional framework	Legal framework	Institutional framework
4. Slovakia							
1. Inter-ministerial co-operation during permitting process 2. No specific mechanism on nutrient reduction set up but with initial elements in place	Central authorities dealing with environment, soil management, economy, finance	1. Water quality and environmental protection 2. Designing legislation	1. Incomplete legislation 2. Limited financial support			1. Design EU harmonized legislation 2. Introduce rules on the use of P-free detergents	1. Create WG on nutrient reduction 2. Improve communication and exchange of information between sectors
5. Hungary							
1. No specific mechanism 2. Co-operation between specific bodies: Inter-ministerial Committee on Central Environmental Fund, chaired by MoE, Inter-ministerial Committee on Water Management Fund chaired by MTWM, Inter-ministerial Steering Committee for the Implementation of WFD chaired by MTWM, WG for the implementation of NEPP 3. National Environmental Council 4. Bodies of the ongoing government programmes	Central authorities for environment, agriculture, regional development, health, transport, water In the intersectoral bodies, NGOs and the commercial sector are represented	1. Water and environmental protection, according to the National Environmental Protection Programme, including nutrient reduction	1. Slow development process	1. Incorporate more explicitly nutrient reduction concerns into the existing legislation	1. Improve operation of National Environmental Council 2. Establish institutional mechanism for the implementation of WFD	1. Implement WFD 2. Implement Nitrate Directive 3. Implement Urban Waste Water Directive 4. Implement Sewage Sludge Directive	1. Create bodies requested by WFD and with the nutrient handling body as advised by EU 2. Set up National Water Framework Committee 3. Create National River Basin Planning Committee

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	Composition	Tasks	Problems	Improvement of existing structures		Creation of new structures	
				Legal framework	Institutional framework	Legal framework	Institutional framework
6. Slovenia							
1. Inter-ministerial ad-hoc groups responsible for environment and physical planning, industry, agriculture, public health, etc.	Central authorities dealing with environment and physical planning, industry, agriculture	Water and environmental protection and public health	1. Absence of adequate legal framework 2. Lack of financial support 3. Conflicts of interest between bodies	1. Set up government body for sustainable development	1. Improve local level Agenda 21 body for sustainable development	1. Implement Water Framework Directive	1. Develop regional level authority for integrated river basin management
7. Croatia							
1. National Water Council co-operating with other bodies 2. No specific mechanism on nutrient reduction	State Water Directorate, Croatian Waters, central authorities dealing with environment, agriculture and forestry, health, public works, tourism and finance	Water quality protection including nutrient reduction concerns	1. Absence of legal framework 2. Low priority 3. Lack of time 4. Lack of funds	1. Improvement of National Water Council	1. Improvement of National Water Council		1. Creation of a special Co-ordination Body for nutrient reduction
8. Bosnia-Herzegovina							
1. Environmental Steering Committee 2. Commission for Water Management	Central authorities dealing with environment, physical planning, construction	1. Environmental protection 2. Water management	1. Lack of adequate unified legal approach between the bodies 2. Weak institutional capabilities 3. Insufficient database 4. Low priority 5. Limited funds	1. Ensure implementation of an integrated approach to the management of water resources 2. Implement EU Directive on nitrates	1. Set up for both countries a common central authority responsible for environmental and water issues	1. New legal framework 2. Create complete database 3. Access to information 4. Develop pollution register	1. WG co-ordinated by the Environmental Steering Committee

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	Composition	Tasks	Problems	Improvement of existing structures		Creation of new structures	
				Legal framework	Institutional framework	Legal framework	Institutional framework
9. Yugoslavia							
1. WG on various subjects 2. No specific mechanism on nutrient reduction	Federal and republican-level ministries dealing with water, environment, agriculture, health and economy	1. Water management and environmental protection	1. Absence of adequate legal framework for nutrient reduction	1. Improve legal framework		1. Develop new rules imposing tasks on nutrient reduction	1. Create new inter-ministerial mechanism at the governmental level for nutrient reduction
10. Bulgaria							
1. Inter-ministerial Expert Group for Implementation of NEHAP 2. National Environmental Protection Fund 3. Supreme Environmental Experts Council 4.WG on various subjects 5. National Commission for Sustainable Development 6. Advisory Council of MOEW	1-6. Central authorities dealing with environment, agriculture, water, forest, health, public works and regional development	1. Environment and water management on national and regional levels 2, 3. Approval of investments 4-6. Water quality, health and environmental protection	1. Insufficient staff 2. Lack of adequate legislation, including a nutrient reduction strategy	1. Completion of the ongoing process of development of new EU-harmonised legislation for water, environment, CAP and BAT. 2. Ensure introduction of River basin management and implementation of integrated environment and water management		1. Design new strategy for nutrient reduction 2. Set up river basin management plan	1. New Inter-ministerial Commission 2. Creation of a commission with the Supreme Consultative Water Council 3. Creation of River Basin Council

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	Composition	Tasks	Problems	Improvement of existing structures		Creation of new structures	
				Legal framework	Institutional framework	Legal framework	Institutional framework
11. Romania							
1. Inter-ministerial committee for environmental development 2. Various structures (WG, Task Force) co-operating on environmental and water issues	Central, basin-level and local authorities dealing with water, environment, forestry, agriculture, food, industry, trade, land planning, consumer protection, health	1. Multipurpose water management approach, integrated land and water management plans, environmental audit, mechanisms for control of nutrient application 2. Pollution abatement, design of economic instruments	1. Lack of logical framework approach matrix for long/ short terms 2. Unclear developed objectives	1. Implement BEP and BAT		1. Develop specific sectoral strategy for sustainable agricultural practices	1. Create special WG for nutrient reduction
12. Moldova							
1. National Committee 2. Inter-ministerial committees 3. No specific nutrient reduction mechanism	Central and local authorities dealing with environment, industry, foreign affairs, civil defense, health, water and forest companies, institutes for hydro-meteo, geography ecology, zoology	Water and environmental protection	1.Division of responsibilities 2. Too many organizations 3. Lack of collaboration at the central level	1. Intensified collaboration 2. integration of environmental concerns into sectoral policies	1. Strengthening institutions capabilities		

Existing inter-ministerial mechanisms				Proposed inter-ministerial mechanisms			
Name	Composition	Tasks	Problems	Improvement of existing structures		Creation of new structures	
				Legal framework	Institutional framework	Legal framework	Institutional framework
13. Ukraine							
1. Inter-sectoral committees with WGs on various subjects 2. Council for Environmental Problems of Dnipro River Basin	Ministry of the Environment and Natural Resources	Water quality protection, environmental concerns	1. Lack of funds 2. Conflict of interest between bodies 3. Insufficient co-ordination between state programs	1. Harmonize legislation with EU	1. Improve institutional capacity for pollution control and prevention during land privatization process 2. Improve institutional capacities of river basins authorities	1. Create regulatory framework for decreasing the use of P-free detergents	1. New inter-sectoral committee with WG on nutrient reduction 2. New inter-sectoral committee for the implementation of State Program for the Protection and Rehabilitation of Azov and Black Seas

ANNEX COUNTRY REPORTS

- 1. GERMANY**
- 2. AUSTRIA**
- 3. CZECH REPUBLIC**
- 4. SLOVAKIA**
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- 11. ROMANIA**
- 12. MOLDOVA**
- 13. UKRAINE**

1 GERMANY

1.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

In Germany, inter-ministerial cooperation takes place on both federal and state levels. First, on the federal level, there is inter-ministerial coordination in the frame of legislative procedures, e.g. plant protection act, nutrient-application regulation, implementation of EU-directives, development of minimum requirements for point sources for municipalities as well as industrial branches. Second, coordination and cooperation between the federal and the state levels exist for the establishment of legislative procedures through a joint water commission of the states (LAWA). Third, at the state level (Bavaria), there are inter-ministerial coordination groups for legal regulations and planning on state level, e.g. Bavarian water act and state development program. Finally, there is bilateral cooperation in cases of inter-ministerial concern. Examples of cooperation of the state ministries for environment and agriculture include "Stickstoff 2000", "Gülle Programm", "Kultur-Landschafts-Programm" programmes involving the development of rules for good farming practices.

In most of the states, nutrient control and reduction is under the responsibility of the ministries of the environment and the ministries of agriculture. The implementation of the relevant legal regulations belongs to the responsibilities of the state administrations. The nitrate directive and the requirements for drinking water supply from groundwater are controlled by the agricultural as well as by the water administration. Groundwater protection and in this context the role of agriculture as the main non-point source of pollution are of major importance for the policy makers.

In Bavaria, on the state level, in all water plans prepared until now, the relevant topics concerning nutrients and pesticides have been developed in cooperation with the agricultural administration. Further, inter-ministerial activities on the administrative level include the development of recommendations for good practices in drinking water protection zones.

There is cooperation between governments and local communities / non-governmental organizations in relation to nutrient reduction concerns. In the preparation phase of all laws in general, the federal and state ministries usually arrange hearings with relevant experts and, in particular, with the technical and scientific associations (ATV-DVWK).

On the federal level, working groups are organized, with participants coming from state institutions as well as from industries, universities and private consultant enterprises.

In Bavaria, forums for different environmental aspects are established, and one of them relates to environment and agriculture. The participants come from different governmental, economic, social and private institutions and organizations.

Agricultural associations are usually represented in the state development and regional planning councils. Intensive negotiations take place between water supply companies and municipalities on the one side and farmers in the catchment area of the groundwater abstraction locations on the other side, based on the recommendations developed by the state administration.

Germany has suggested that cooperation between the water and the agricultural administration should be intensified in the sense that the measures regarding farming practices and agricultural methodologies should to a large extent be placed under the responsibility of the agricultural administrations and associations. The first steps have already been taken and the necessary negotiations on the inter-ministerial level are have been embarked on.

1.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Recommendations for improvement of the existing national inter-ministerial mechanisms to respond to nutrient reduction concerns.

For Germany, the development of nutrient control mechanisms should be based on (i) legal regulations and mandatory objectives for ground and surface water quality, (ii) instruments of execution which include emission standards, water quality standards for users and ecological requirements and regulations or standards for a good and ecologically sustainable practice, and (iii) enforcement through licensing, command and control measures, economic instruments or action programs.

Therefore, Germany has proposed improvements of the legal instruments on diffuse sources, which are less developed. On the emission side, regulations exist for fertilizers and their application, which were originally not designed with a view to meeting the EU-Nitrate-Directive. The execution of these regulations is difficult and requires strong cooperation between water and agricultural administrations. Positive steps have already been taken through the implementation of several programs initiated by the agricultural and environmental administrations.

- (2) Suggestions for the creation of new mechanisms for nutrient control and reduction

Additional mechanisms of inter-ministerial coordination might be necessary if the responsibilities are spread over more than one ministry or distributed between the federal and state administrations. Especially for the control of pollution from non-point sources, new and efficient mechanisms have to be developed through joint efforts of the agricultural and water administrations.

1.3 Main barriers to the creation of national inter-ministerial mechanisms

- (1) Legal and institutional barriers

The main barrier to progress in nutrient control is set by the difficult economic situation in agriculture. A profitable agricultural production implies application of intensive farming methods with high rates of fertilizers, which contravene the environmental requirements.

- (2) Financial barriers

The high cost of preparing arable land for a switch to extensive production methods or for reduction of cattle density per ha could be considered as financial impediments. Since arable land is private property, income reductions have to be compensated by incentives, such as subsidies.

1.4 Proposed national inter-ministerial mechanisms

- (1) Institutional and legal framework

In Germany, both the existing institutional and legal frameworks allow the creation of new inter-ministerial structures according to requirements mainly imposed by nutrient reduction and control from diffuse sources of pollution. There is a specific concern that fully developed methods, which have proved their efficiency in practical tests, may be implemented on small-scale applications as well as to larger catchment areas.

- (2) Schedule for implementation

Germany considers that a stepwise approach seems to be the only way of ensuring development and application of regionally differentiated rules for best farming practice, teaching and education of farmers and implementation of methods for minimization of fertilizer input based on a regional balance. The whole process is expected to take five years.

1.5 Main country-specific features and conclusions

Germany is one of the few countries in the Danube River Basin where cooperation between the environmental and agricultural authorities through inter-ministerial mechanism on nutrient reduction and control issues is significant. One specific feature involves the existence of two levels of cooperation, the federal and state levels. Other features of Germany are related to (1) intensified activities leading to the development and implementation of rules for good farming practices and good practices in drinking water protection zones, (2) the importance placed by the policy makers on groundwater protection issues and the role of agriculture as the main non-point pollution source, and (3) active co-operation between governments and local communities/non-governmental organizations regarding nutrient reduction concerns.

Like other Danube countries, Germany considers that there is a need to enhance cooperation between the water and agricultural administrations. Positive steps are already taken through the implementation of several programs initiated by the agricultural and environmental administrations.

Germany believes that additional mechanisms of inter-ministerial coordination might be necessary, especially for the control of pollution from non-point sources through joint efforts of both agricultural and water administrations.

2 AUSTRIA

2.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

In Austria, the Federal Ministry of Agriculture and Forestry formulates the agricultural and water protection policies. Therefore, competencies and responsibilities for implementing nutrient control and reduction measures belong to the same authority.

There were in the past examples of overall environmental policy formulation which also involved the Ministry of the Environment.

With the changes the new Austrian government introduced in spring 2000, the former Ministries of Agriculture and Forestry and the Ministry of the Environment (previously responsible for overall environmental policy affairs) were merged and now constitute a single Ministry of Agriculture, Forestry, Environment and Water Management.

2.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Recommendations for improvements of the existing national inter/ministerial mechanisms to respond to nutrient reduction concerns

Austria considers that the implementation of agricultural and water policies through the newly created central authority is a way to assure that responsibilities related to nutrient reduction are efficiently carried out.

- (2) Suggestions for the creation of new mechanisms for nutrient control and reduction

Austria considers that an inter-ministerial mechanism for co-operation on nutrient reduction measures is not necessary as long as the Federal Ministry of Agriculture and Forestry efficiently performs the tasks related to pollution control and nutrient reduction concerns.

2.3 Main barriers to the creation of national inter-ministerial mechanisms

- (1) Legal and institutional barriers

There are no institutional or legal barriers that might impede a clear functioning of the new ministry as a mechanism able to perform pollution control and nutrient reduction tasks.

- (2) Current financial barriers

Austria considers that also, there are no significant financial barriers.

2.4 Proposed national inter-ministerial mechanisms

- (1) Institutional and legal framework

No inter-ministerial mechanism is needed in the future as all environmental competencies, including those related to nutrient reduction, have recently been assigned to a single ministry.

2.5 Main country-specific features and conclusions

The most outstanding feature is related to the fact that Austria is the only one country in the Danube River Basin that has one competent central authority that can function as an inter-ministerial mechanism on nutrient reduction and control problems. Therefore, the country considers that an inter-ministerial mechanism for co-operation on nutrient reduction measures is not necessary as long as the Federal Ministry of Agriculture, Forestry, the Environment and Water Management efficiently performs, among its other responsibilities, the tasks related to nutrient reduction and control concerns.

Significant efforts are being made by the policy makers to reduce and control nutrients from both types of pollution sources, diffuse and point sources.

3 CZECH REPUBLIC

3.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

The Czech Republic is actively preoccupied with the requirements related to the expected accession to the European Union. Most of its environmental policy and legislation is geared towards preparing the Czech Republic for membership in the European Union, which is the government's first priority.

In the Czech Republic, nutrient control and reduction concerns are an integral component of comprehensive water resources management activities.

Two ministries share the main responsibilities for water and environmental protection in the Czech Republic: Ministry of the Environment and Ministry of Agriculture.

Ad-hoc working groups have been created to fulfill the tasks emerging especially from the need to develop new laws and other regulations.

There is also a Working Committee for the Realization of the European Agreement, which co-ordinates the activities of all central authorities to meet the targets related to the EU accession.

Based on the decision of the Working Committee, 23 working groups have been established. In some of these groups, in co-operation with all interested ministries, water quality-related issues are addressed together with some broader environmental problems.

The Czech Republic considers that a well-informed public is a powerful tool for implementing government policy in environmental protection, with NGOs playing the main role. This legal tool allows the public to be actively involved in the decision making process.

Although the Czech Republic, unlike most Danube countries, has reported good results in water protection actions and in water management planning, nutrient removal in wastewater treatment plants was neglected in the past. The new economic and political situation since 1990 has brought about new challenges, which are supposed to be solved in the next few years, especially those related to the (i) completion of the legislative arrangement and its approximation to EU regulations, (ii) need to change the public administration structure, and (iii) clarification of duties and responsibilities in relation to water management problems.

3.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Recommendations for improvements of the existing national inter-ministerial structures to answer to the nutrient reduction concerns

The Czech Republic considers that the main frame-guidelines for water quality improvement are provided by the 1999 updated version of the State Environmental Policy.

New principles have been incorporated in these guidelines, relating to (i) sustainable development, (ii) harmonization of the Czech legislation with EU regulations, (iii) shift from the traditional command and control approach to market-based instruments, and (iv) introduction of voluntary compliance.

In addition, the regulations establish parameters and their limits for municipal, industrial and agricultural point sources of pollution. Moreover, immission limits for two categories of surface waters are also defined.

The Czech Republic has also introduced a flexible and incentive system of charges for wastewater discharge into surface water. Emissions exceeding the limited amount or concentration of COD, dissolved matters, suspended solids, nutrients, specific organic compounds and some heavy metals are chargeable.

One significant initiative of the country is reflected in the Voluntary Agreement the Ministry of the Environment concluded with the Association of Soap and Detergents Producers on the reduction of environmental impact of their products. The producers are bound by the

agreement to ensure that their products do not exceed a 5% limit on phosphorus content, while the production of detergents without phosphorus is encouraged.

The Czech Republic proposes recommendations for expanding cooperation between the involved authorities within the work performed by WGs to incorporate specific nutrient reduction tasks.

As nutrient control and reduction measures are viewed as an integral part of water protection in general, the Czech Republic does not make any additional proposals for mechanism for nutrient reduction and control. The new Water Act will bring positive changes in terms of incorporating modern principles and strict permitting procedures. The new law on water supply and sewage systems will also contribute to the improvement of the existing legal framework, by setting severe limits on discharges to the municipal sewage systems.

(2) Suggestions for the creation of new mechanisms for nutrient control and reduction

As for the Czech Republic, nutrient reduction and control measures are perceived as an integral part of water protection measures. The suggestions include the creation of a special working group to carry out tasks related to nutrient reduction and control while at the same time avoiding an unnecessary increase in the number of working groups and commissions of this type.

3.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

The Czech Republic recognizes the need to update the current legal framework to better respond to the actual needs, especially related to the EU harmonization process. One particular example is the Water Act of 1973, which has already been revised and is in the stage of approval.

In the field of water management and protection, preparations for entry in the EU are complicated and require both a large investment and respective organizational measures.

(2) Financial barriers

There is a need to ensure the necessary funds for the improvement of water-related infrastructure in small municipalities. In addition, there is little experience with co-financing on municipal level. Finally, there is not a sufficient level of willingness on the part of small municipalities to form associations in order to solve wastewater problems.

3.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

The Czech Republic will create inter-ministerial working groups and specify their responsibilities according to the actual need. The ad-hoc working group set up to design the new Water Act is an example of such a mechanism.

(2) Schedule for implementation

The schedule for harmonization of the Czech laws with EU regulations is provided in the Approximation Strategy. Priority is given to EU directives 91/271/EEC, 91/676/EEC, and 75/440/EEC, which relate to water protection against nutrients and their control. The Czech Republic will create working groups on other specific concerns according to the actual need.

3.5 Main country-specific features and conclusions

Like some other Danube countries, the Czech Republic, too, is actively involved with the requirements related to the expected accession to the European Union.

A specific feature of the country's legal framework is the application of an integrated approach to the management of water resources, in which nutrient reduction already occupies an important place. The responsible bodies for water and environmental protection include Ministry of the Environment and Ministry of Agriculture.

Ad-hoc working groups have been created to fulfil tasks emerging especially from the need to develop new laws and regulations.

There is also a Working Committee for the Realization of the European Agreement, which co-ordinates the activities of all central authorities in order to fulfill the targets related to the EU accession.

The Czech Republic believes that a well-informed public is a powerful tool in the government's environmental policy and that NGOs have a major role to play in this respect.

Unlike most Danube countries, the Czech Republic has reported good results in its efforts to improve water quality. One significant initiative of the country is reflected in the Voluntary Agreement which the Ministry of the Environment concluded with the Association of Soap and Detergents Producers regarding the reduction of environmental impact of their products. The producers are bound by the agreement not to exceed the 5% limit on the content of phosphorus in their products while the production of detergents without phosphorus is encouraged.

The Czech Republic has made recommendations for expanding cooperation between the involved authorities within the work performed by WGs to incorporate specific nutrient reduction tasks.

In addition, the country has pointed to the need to create a new working group, with experts from various organizations, able to implement nutrient reduction and control tasks in line with the EU Association Agreement.

4 SLOVAKIA

4.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

In the Slovak Republic, competencies related to water management are shared between the Ministry of the Environment (MOE) and Ministry of Soil Management (MSM). In addition, state administration of the regions is carried out by eight Regional Offices and 79 District Offices with their Environmental Departments established under the Ministry of the Interior. The operation and maintenance of drinking water systems, public sewerage and WWTPs, as well as agricultural activities, are under the scope of activities of MSM.

For the time being, there are no established inter-ministerial environmental committees, which should have a responsibility for the coordination of activities related to control and reduction of nutrient content in surface waters. However, coordination of these activities does exist and elements of inter-ministerial mechanisms designed to protect surface water quality can be considered as existing on different levels.

In the case of control of nutrient input into surface waters from point sources of pollution, there is a governmental decree that sets maximum permissible pollution levels (including N and P) in both discharged waste waters and in receiving surface water.

Slovakia is among the few countries that have designed a Law on Fertilizers. The new Law on Fertilizers establishes conditions for the registration, stocking, and utilization of both artificial fertilizers and manure.

An example of cooperation between the government, local communities and NGOs in the development of legislative material is the preparation of National Environmental Action Plan II, which defines the priorities, principles, objectives of the state environmental policy and measures to be realized to fulfill the set objectives.

4.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Recommendations for improvements of the existing national inter-ministerial structures to respond to nutrient reduction concerns

First improvements related to the clarification of duties and responsibilities between the relevant sectors will be reflected in the new Water Law expected to come into force in 2001. Second, transposition of the EU water legislation in the national legislation is seen as a major contribution towards water pollution abatement and control mechanisms.

As regards the control of quality of wastewater discharged into surface waters, the content of N and P is not measured for all relevant polluters. This makes it difficult to calculate the nutrient input from point sources of pollution, although such information is very important for the state administration to set quantitative targets, plan measures for the protection of waters, and monitor improvements. It is suggested that this activity should be coordinated from one organization/institution of MOE, in order to ensure a unified approach.

The other recommendation refers to the need to involve the Ministry of Finance in solving the problem of compensation of financial losses to agricultural companies, which would result from limitation of their activities in the areas of special land regime.

- (2) Suggestions for the creation of new mechanisms for nutrient control and reduction

One suggestion made by Slovakia involves the creation of mechanisms for decreasing the use of P-free detergents. The process should involve Ministry of the Environment, Ministry of Soil Management, Ministry of Economics and the Finance Ministry.

Another suggestion involves the creation of economic tools for applying ecological soil management.

4.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

The only legal or institutional barriers to be considered for the operation of a future inter-ministerial structure on nutrient reduction issues are those related to the completeness of the existing legislation, with required pieces of laws and rules for pollution abatement, in particular for nutrient reduction.

(2) Financial barriers

The available financial sources are a limiting factor in the process of reduction of nutrients input into waters. Funding is necessary for the construction of sewerage, waste water treatment plants, technological changes in the manufacturing process, building of suitable storage capacities for manure, etc. This problem is a real concern for Slovakia.

4.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

In the national inter-ministerial mechanisms for nutrient reduction and control to be created in the future, the Ministry of the Environment, Ministry of Soil Management, Ministry of the Interior, Ministry of Economics and the Finance Ministry should be involved as core sectors.

The general objective should refer to the reduction of nitrogen and phosphorus.

In order to ensure an effective reduction in nitrogen and phosphorus content in waters, actions and measures need to be taken by all involved ministries, which should closely co-operate from the very start, i.e. in defining the targets and measures. The targets and measures need to be achievable and realistic in terms of the current economic situation in the country.

(2) Schedule for implementation

The proposed inter-ministerial mechanism may be created during the coming three-year period.

4.5 Main country-specific features and conclusions

Since the Slovak Republic is in the process of accession to the EU, transposition and implementation of EU Directives, including those related to control and reduction of nutrients in water, are the government's priorities. Therefore, it is expected that important legislation regarding the reduction and control of nutrients will come into force in the coming few years.

As a result of the country's economic transformation, the amount of used fertilizers and the amount of produced manure have rapidly decreased, and the reduction of nutrient input from fertilizers/manure does not seem to be a priority. As it is expected that the amount of fertilizers/manure will be continuously increasing in the future, it is necessary to prepare proper legislation regarding good agricultural practice, in order to minimize the input of nutrients into waters from soil management.

Slovakia proposes the creation of mechanisms for decreasing the use of P-free detergents. Moreover, the introduction and use of economic instruments to control soil management is also seen as an immediate priority.

5 HUNGARY

5.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

In Hungary, the regulation of inter-ministerial mechanisms for nutrient control and reduction is part of the general provisions of the environmental legislation. There are no mechanisms addressing exclusively nutrient control and reduction.

However, there are some inter-ministerial structures dealing with nutrient control, which include (1) Inter-ministerial Committee on Central Environmental Fund chaired by MoE, (2) Inter-ministerial Committee on Water Management Fund chaired by MTWM, and (3) Inter-ministerial Steering Committee for the Implementation of Water Framework Directive, also chaired by MTWM.

There are, in addition, other inter-sectoral coordinating bodies dealing with nutrient reduction, including the National Environmental Council and the National Regional Development Council.

Finally, Hungary has several ongoing governmental programmes related to nutrient control, in which the decision of the government determines the required inter-ministerial mechanism for their implementation. These programs are related to the water management development program for Lake Balaton, the national programme for the protection of other lakes, and a programme for the rehabilitation of oxbows and floodplains of the Tisza river.

5.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Recommendations for improvements of the existing national inter-ministerial structures to respond to nutrient reduction concerns

Hungary believes that the development of inter-ministerial mechanisms for nutrient reduction should be correlated with the provisions of the draft Water Framework Directive (WFD). Proposals are currently being drafted and the process is controlled by an inter-ministerial Steering Committee.

- (2) Suggestions for the creation of new mechanisms for nutrient control and reduction

Hungary has proposed an inter-ministerial mechanism on nutrient reduction to be developed in accordance with the provisions of the Water Framework Directive (WFD). This exercise is already initiated and coordinated by an inter-ministerial Steering Committee. In addition, Hungary has suggested that the performance of this inter-ministerial mechanisms for nutrient-reduction should be synchronized with the administrative arrangements within the river basin districts.

It is expected that the implementation of WFD will require a global co-ordination mechanism for all water management issues, both at the river basin and ministerial levels. The nutrient reduction problems that cannot be handled at the river basin level will be solved through inter-ministerial mechanisms.

5.3 Main barriers to the creation of national inter-ministerial mechanisms

- (1) Legal and institutional barriers

Hungary believes that, from the legal and institutional point of view, there are no detectable barriers to the functioning of the existing mechanisms.

- (2) Financial barriers

The creation of a national inter-ministerial mechanism for nutrient control is not only a financial issue; rather, it depends on governmental priorities in environmental protection.

5.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

Hungary has proposed the creation of two major structures at the ministerial level: Water Framework Committee and River Basin Planning Committee. Clarification of duties and responsibilities has not yet been achieved. A Nutrient Reduction Working Group could be set up as a subdivision to the Water Framework Committee.

(2) Schedule for implementation

The schedule for the implementation of the proposed inter-ministerial mechanism is directly influenced by (i) date of entering into force of the WFD and (ii) the country's preparation programme for EU membership. According to the Government Programme, Hungary has to fulfill all the legal approximation by December 31, 2001.

5.5 Main country-specific features and conclusions

Like other countries of the Danube River Basin, Hungary has embarked on an ambitious program leading to EU accession.

One obvious particularity of Hungary is the current reduced interest in nutrient reduction concerns on the part of policy makers. However, this may be taken into consideration and further developed within the framework of the future proposed committees.

The proposals refer to the creation of inter-ministerial committees that will deal with the Water Framework Directive and with the implementation of river basin planning approach through the creation of river basin councils. The created bodies will also undertake tasks related to nutrient reduction and control measures.

6 SLOVENIA

6.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

Like other Danube countries, Slovenia is rapidly approaching the EU – regarding the adoption of the EU legislation, restructuring of the economy and government administration, building democracy, etc.

Inter-ministerial cooperation and coordination is still developing, with occasional problems related to intra-ministerial coordination. Still, a number of bodies and working groups have been established to ease the cooperation and coordination between different sectors and ministries.

Vertical cooperation is to some extent obstructed by two distinct levels of administration, i.e. the state government and the local government. In this respect, Slovenia will have to introduce an intermediate level – a regional (basin wide) level.

As regards nutrient control and reduction or removal measures, Slovenia has already adopted some key EU directives, such as the Nitrates Directive, the Urban Wastewater Treatment Directive, the Quality of Water for Human Consumption and is preparing to accept Water Framework Directive through the Water Law (Water Act), which is currently being debated in Parliament.

Environmental considerations are being integrated into the policies of five key sectors - industry, energy sector, agriculture and forestry, traffic and tourism. The aim of the integration of environmental policy into individual activities/sectors is primarily linked to the harmonization process with the requirements of Agenda 21, the Environmental Protection Act and EU policy in individual areas.

Coordination between different ministries during the phase of preparation of legal instruments, such as national programmes, strategies, action plans, laws and implementing regulations is informal. Formally, these instruments are coordinated at the cabinet level by at least one of the three existing standing governmental committees.

Cooperation is mainly established through many NGOs, which take an active part in public life and in ministerial affairs. Ministries are keen to invite public and NGOs to workshops and other public presentations or working bodies for diverse projects.

Slovenian NGOs have participated in the preparation of initiatives and demands concerning motorway construction and in the preparation of the document “Agenda 21 for Slovenia”. NGOs also play an important role in the promotion of sustainable agriculture and nature conservation (in the process of the adoption of agricultural reform, e.g. PHARE pilot project on Dravsko polje) and in the field of energy efficiency (example: the construction of a new facility - thermal power plant Trbovlje 3).

6.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Develop recommendations for improvement of the existing national inter-ministerial structures with the revision of their responsibilities to respond to nutrient reduction concerns

By signing the Europe Agreement, Slovenia accepted the foundations of the environmental protection policy of the EU and committed itself to establishing and using new instruments for its enforcement. This calls for (1) active monitoring of the adoption of new environmental protection requirements within the EU, and (2) incorporation of these requirements into the Slovenian legal system in all sectors. It also requires an upgrading of the institutional system for putting these requirements into practice.

- (2) Suggestions for new mechanisms for nutrient control and reduction

Slovenia is willing to propose a new inter-ministerial mechanism charged with nutrient reduction tasks. The ongoing pre-accession programs (e.g. twinning, TAIEX, PHARE) will help develop the needed mechanisms for better inter- as well as intra-ministerial cooperation and coordination. The task of establishing an intermediate level of government (at the basin level) will also stipulate cooperation between ministries. More active involvement of the public and NGOs will also be needed.

6.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

Slovenia recognizes the presence of some barriers which include: (I) conflict of interests – environmental protection hinders the implementation of certain sectoral policies (i.e. agriculture/nature; energy sector/environment), (ii) political opposition, (iii) lack of legal, administrative and institutional capabilities, (iv) lack of qualified staff.

(2) Financial barriers

The integration of environmental considerations into sectoral policies demands substantial financial resources which the economy is reluctant to commit due to a lack of money.

6.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

Slovenia is willing to create a new inter-ministerial structure based on a detailed analysis. The Ministry of Environmental and Spatial Planning is willing to harmonize all the relevant environmental legislation within a short period of time of approx. 2-3 years. The involvement of the Ministry of Agriculture, Forestry and Food, which is already performing tasks related to nutrient reduction, is essential for the efficiency of nutrient reduction and control measures implementation phase.

(2) Schedule for implementation

An implementation period of 2-3 years is anticipated. However, a common agreement between the main players (the two ministries) is needed in order to ensure an effective nutrient reduction and an efficient nutrient control.

6.5 Main country-specific features and conclusions

Slovenia believes that - in spite of a certain lack of administrative and institutional capabilities - one must recognize the already existing large administration in a relatively small country. Thus, a very special program of professional education of key ministerial personnel will be of utmost importance.

Slovenia hopes for more flexibility on the policy makers' side to facilitate the implementation of new water pollution measures, including those related to nutrient reduction.

7 CROATIA

7.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

Croatia has identified two coordination bodies subordinated to the government: Governmental Coordination for Environment and Governmental Coordination for the Economy, which usually deal with water issues.

In accordance with the provisions of the Water Act, another officially created mechanism is in existence, i.e. the National Water Council, established for carrying out water management activities, coordination of various needs and interests, and proposing measures for the development and improvement of the water system in the Republic of Croatia.

There are two main organizations with responsibilities in relation to nutrient control and reduction:

- The State Water Directorate is responsible for the protection of water and sea from land-based sources, for planning and harmonizing the development and construction of water supply and waste water systems of national importance and for water management inspection. The State Water Directorate is established as the leading body in all nutrient control and reduction issues
- “Hrvatske vode” – Croatian Waters – is an institution dealing with water resources management and operates under the supervision of the State Water Directorate.

Other responsible ministries are: Ministry of the Environment and Physical Planning, Ministry of Agriculture and Forestry, Ministry of Health, Ministry for Public Works, Reconstruction and Construction.

However, in any debate related to nutrient control and reduction, the Ministry of Economics, Ministry of Tourism and the Finance Ministry can make important contributions to the nutrient issue dialogue.

Cooperation between the government and local communities/ non-governmental organizations in relation to the nutrient reduction concerns usually takes place at the rule-making stage.

However, there are limitations associated with the identified mechanisms, including: limited time allocated, reduced financial resources, inadequate legal framework and low priority placed on nutrient reduction concern against other water quality or environment-related problems.

7.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Recommendations for improvements of the existing national inter-ministerial structures to respond to nutrient reduction concerns

Croatia's first recommendation is that the National Water Council, as an already existing body, should become fully operational. This mechanism can play an important role in promoting environmental protection, integrated water management and nutrient control and reduction. The second recommendation is related to the need to improve cooperation between the ministries and state directorates not only during the design but also during the rule implementation stage.

There is currently ongoing cooperation between the State Water Directorate and the Ministry of Agriculture and Forestry on problems related to nutrient pollution from diffuse sources.

- (2) Suggestions for the creation of new mechanisms for nutrient control and reduction

One suggestion for the creation of new mechanisms is linked to the proposal of establishing a coordinating body for the implementation of measures for nutrient control and reduction within the National Water Pollution Control Plan. This coordinating body would be responsible for the implementation of the National Water Pollution Control Plan, especially for nutrient control and reduction measures. The responsible bodies for the implementation according to the mentioned plan would be the State Water Directorate, Hrvatske vode, industries, municipalities, and other potential water pollution. Effective harmonization and

close collaboration between the responsible bodies would be necessary to facilitate the implementation of this plan under the coordination of the State Water Directorate.

The government of the Republic of Croatia has already been informed about the preparation of this project and the future need for national inter-ministerial mechanism. Strong emphasis is placed on full participation of other responsible ministries and institutions and their possible financial support. Information about the specific implementation schedule cannot yet be provided at this stage.

7.3 Main barriers to the creation of the national inter-ministerial mechanisms

(1) Legal and institutional barriers

Croatia believes that once the design of the National Water Pollution Control Plan has been finalized and its main implementing bodies have been nominated, the success of the performed nutrient reduction and control tasks will depend only on the current institutional capabilities of the main involved stakeholders.

(2) Financial barriers

The creation of a new mechanism (coordinating body, working group, etc) would require some funding. This can be considered as a serious constraint towards a smooth implementation of the nutrient reduction measures.

7.4 Proposed national inter-ministerial mechanism

(1) Institutional and legal framework

Croatia's proposal refers to the creation of a new mechanism closely related to the new structure within the National Water Pollution Control Plan, i.e. the Coordination Body for the Implementation of Measures for Nutrient Control and Reduction. The State Water Directorate shall ensure its coordination. The preparation of a National Nutrient Reduction Action Plan represents the main initial task of this inter-ministerial mechanism.

(2) Schedule for implementation

The National Water Pollution Control Plan has incorporated deadlines for its implementation schedule based on long periods of time: short-2005, medium-2010 and long terms-2025.

7.5 Main country-specific features and conclusions

Croatia is one of the few Danube countries that has the privilege to initially benefit from both institutional and legal capabilities to perform water pollution control, and nutrient reduction tasks in particular. This is facilitated by the existing structures that include the State Water Directorate and the Croatian Waters, institutions dealing mainly with issues related to the management of water resources. Moreover, the development of the National Water Pollution Control Plan ensures an initial legal background for carrying out these activities.

The proposed structure, i.e. the Coordination Body for the Implementation of Measures for Nutrient Control and Reduction within the National Water Pollution Control Plan" under direct supervision of the State Water Directorate, may perform tasks such as those related to the preparation of National Nutrient Reduction Action Plan.

However, financial constraints might impede the progress of the proposed structure.

Finally, the country is willing to promote any necessary measure to implement nutrient reduction actions within its share of the Danube basin.

8 BOSNIA – HERZEGOVINA

8.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

According to the provisions of the Dayton Peace Accord, environmental issues represent a common concern for both The Federation of B&H and Republic of Srpska.

F B&H and RS have a separate system of organisation of the environmental sector. The Federal Ministry of Physical Planning and the Environment is the relevant ministry in the F B&H, while the relevant ministry in RS is Ministry of Urbanism, Physical Planning, Construction and the Environment. In both F B&H and RS, the Ministry of Agriculture, Water Management and Forestry (MoAWF of F B&H and MoAWF of RS) plays the main role in the water sector. The ministries are responsible for water strategy and policy, including the setting of standards and regulations as well as the enforcement of laws and regulations through licensing and inspections.

At present, national inter-ministerial mechanisms for water quality and particularly for nutrient control and reduction do not exist. Control of nutrients is included in water quality control that is organized by Public Companies for the Watershed Area of the Sava river (in F B&H) and by Hydrometeorological Institute of RS (in RS). There is no harmonized monitoring and control of surface and ground waters of B&H. In addition, the Water Law does not contain sufficient provisions on permitting procedures, legal procedures, international standards or conditions for rational water use.

However, during the last few years, international programs have supported the development of new legislative and institutional structures dealing with environmental protection and water quality control. Another very important issue has been the improvement and strengthening of co-operation between the two entities, F B&H and RS, in dealing with environmental protection issues.

In spite of the currently large number of citizens associations and professional organizations engaged in environmental protection actions, there is a lack of co-operation between governments and non-governmental communities. Vertical co-ordination in F B&H is weak (at all levels: local, cantonal, federal), with responsibilities overlapping between different government levels and departments. Inter-entity institutional co-ordination is also poor.

Moreover, there is a lack of encouragement to improve environmental practices while in some cases experts are independently employed in developing projects aimed at improving agricultural practices or raising public awareness.

The main problems of the current mechanisms are linked to (i) institutional and human resources problems and, (ii) water quality issues.

First, a lack of adequate co-operation on the national level and inappropriate institutional capacity building to implement the legislation represent the main constraints which impede a satisfactory performance of environmental and water quality tasks.

Second, the absence of sufficient and coordinated environmental databases, together with a lack of monitoring, restrain the enforcement of and compliance with environmental legislation. In extension, there is ineffective co-ordination between the various sectors at both local and national levels in performing water management tasks; low priority is awarded to nutrient reduction issues at the government level and limited funds are consequently earmarked for the purpose.

8.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Recommendations for improvements of the existing national inter/ministerial mechanisms to respond to nutrient reduction concerns

B&H believes that the implementation of integrated approach to the management of water resources on the river basin level, with strong horizontal and vertical co-operation, is the most appropriate recommendation for improving the existing environmental and water quality mechanisms to perform water pollution reduction tasks. The other recommendation is related to the urgent need to facilitate the implementation of the EU Directive on nitrates, i.e. the Framework Water Directive.

- (2) Suggestions for the creation of new mechanisms for nutrient control and reduction

There are proposals directed to the creation of new structures able to carry out tasks related to nutrient control and reduction measures, including: (i) the establishment of a surface and ground water quality data base within an adequate water quality control (including nitrates, phosphorus), (ii) the creation of mechanisms providing access to relevant data on groundwater quality, monitored by public water supply companies, according to the provisions of the Water Law, and (iii) the establishment of a register of point sources of pollution.

8.3 Main barriers to the creation of national inter-ministerial mechanisms

- (1) Legal and institutional barriers include:

- Fragmentation of responsibilities as the principle of integrated water resources management on river basin level has not yet been implemented
- Environmental legislation and policy has not yet been harmonized with the EU legislation
- Water management issues are not integrated in environmental management concerns.

- (2) The current financial barriers are related to the following deficiencies:

- Poor social and economic conditions hampering an adequate development of environmental policy
- Economic instruments are not yet introduced
- Reduced financial resources as the reconstruction of the country and ongoing process of privatization consumed most of the government's financial funds.

8.4 Proposed national inter-ministerial mechanisms

- (1) Institutional and legal framework

A key institutional proposal - also suggested in a previous EU-developed project - refers to the need of integration of environmental and water administrations in a new structure called the Ministry of Environment and Water Management (MoEWM) for F B&H and RS.

This body would be responsible for (i) developing water policies and environmental strategies, (ii) drafting legislation and, (iii) issuing regulations. The Ministry would apply its policy through a network of seven new River Basin Steering Committees (RBSC) in the respective River Basin Bodies, in both FB&H and RS.

In addition, working groups need to be established, with members drawn from all involved ministries, to deal with nutrient control and reduction issues. These working groups should be co-ordinated by the Environmental Steering Committee (on both levels - river basin and national) on items related to nutrient control and reduction, particularly on actions that include: (i) participation in the implementation of water-management plans for catchment basins, (ii) developing codes of good agricultural practice for the training of farmers, (iii) establishing and implementing action programs for vulnerable zones, and (iv) periodically reviewing designations and effectiveness of the action programs.

(2) Schedule for implementation

1st September 2000 represents the date for the implementation of Terms of Reference for the preparation of environmental legislation in Bosnia-Herzegovina, within the EU Environmental Program for B&H as well as the date for the implementation of the Water Sector Institutional Strengthening in both F B&H and RS.

8.5 Main country-specific features and conclusions

One significant particularity of B&H is related to the actual institutional framework dealing with water and environmental issues, which is fragmented between the two entities F B&H and RS.

Recognizing the need to (i) strengthen the institutional system, (ii) develop and implement EU-harmonized legislation, (iii) incorporate market-based instruments in water and environmental policies, and (iv) enhance the understanding of both government and local communities on the necessity to urgently consolidate the link between them, the country embarked on an ambitious program of legal and institutional reform. This action will also include tasks related to the improvement of water quality, pollution abatement and the implementation of nutrient control and reduction measures.

Recommendations for the improvement of the existing inter-ministerial mechanisms to respond to nutrient reduction concerns include (i) the application of water resources integrated man integrated approach to the management of water resources on the river basin level, with effective horizontal and vertical co-operation and (ii) the implementation of the Directive on Nitrates, i.e. the Framework Water Directive.

9 YUGOSLAVIA

9.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

There is no specific inter-ministerial mechanism responsible for nutrient control and reduction. However, Yugoslavia believes that such a structure could operate through the Federal Government as well as through the Republican Governments Ministries responsible for environmental and water protection the implementation of any proposal concerning nutrient control and reduction.

Those responsible for water-related issues directly or indirectly connected with nutrient control and reduction include (i) at the Federal Level – the Federal Ministry for Development, Science and the Environment, the Federal Ministry of Agriculture, the Federal Ministry of Health and Social Affairs and the Federal Ministry of Economics, and (ii) at the Republican Level – the Ministry of Agriculture, Forestry and Water Resources Management, the Ministry for the Protection of the Environment, the Ministry of Civil Works, the Ministry of Health, the Ministry of Economics.

All departments of the Ministry of Agriculture, Forestry and Water Resources Management are directly or indirectly responsible for nutrient control and reduction.

Cooperation between the governments and local communities/non-governmental organizations in relation to nutrient reduction concerns can not be judged properly as there has not been any important request by local communities/NGOs in that direction. Nevertheless, the government(s) are open for cooperation and support various activities of NGOs. Representatives of NGOs participate in meetings organized by ministries while the ministries responsible for environmental and water protection disseminate relevant information and support the organizing of workshops, conferences and other appropriate activities of NGOs, particularly those dealing with the presentation of research results.

9.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Develop recommendations for improvement of the existing national inter-ministerial structures with the revision of their responsibilities to answer to the nutrient reduction concerns

Yugoslavia believes that the existing environmental legal and institutional framework needs to be revised. In addition, it is necessary to strengthen the enforcement of and compliance with the environmental requirements.

- (2) Suggestions for the new mechanisms for nutrient control and reduction

Since it is recognized that there is a certain lack of knowledge concerning nutrient control and removal, it has been suggested that the country would benefit from a timely and serious deployment of national scientific and research potentials in order to improve knowledge about nutrient control and removal, through cooperation with the relevant international research and consulting centers.

Other suggestions refer to the necessity to construct new wastewater treatment plants for municipalities and industries in Yugoslavia as measures to reduce and control pollution.

9.3 Main barriers to the creation of national inter-ministerial mechanisms

- (1) Legal and institutional barriers

There are no legal or institutional barriers to the creation of national inter-ministerial mechanisms. The Government(s) allow(s) enough room for inter-ministerial cooperation for any initiative coming from the ministries responsible for environmental issues.

Lack of adequate legislation related to nutrient reduction is one of the main constraints recognized by Yugoslavia.

(2) Financial barriers

Financing is the driving force behind any improvement in the field of water pollution control and in nutrient control and reduction. The economy of FR of Yugoslavia is weak in this moment and is, therefore, not able to provide funds for serious investment in water pollution control. Yugoslavia needs financial support to be able to carry out specific tasks related to nutrient reduction issues.

9.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

There is no special proposal for national inter-ministerial mechanism. It may be created at any when and if the need arises.

(2) Schedule for implementation

Yugoslavia will provide this information during project development stage.

9.5 Main country-specific features and conclusions

Yugoslavia is as willing to create an inter-ministerial mechanism dealing with nutrient reduction issues as its neighboring Danube countries.

Besides, the country already possesses the conditions necessary for the creation and operation of such a structure. The main constraint is related to the limited financial resources to translate into practice any water pollution abatement measure.

10 BULGARIA

10.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

Bulgaria has identified several relevant national inter-ministerial mechanisms with responsibilities for water pollution abatement and environmental protection. Most of these structures also deal with diffuse-source pollution, implementing pollution reduction measures or approving new investments in the water sector.

Among them, the Supreme Environmental Experts Council (within the Ministry of the Environment and Water), the Supreme Technical Experts Council (within the Ministry of Regional Development and Public Works) or the existing Expert Working Groups within the Ministry of the Environment and Water are viewed as the existing structures that can easily incorporate tasks related to nutrient control and reduction.

To exemplify, the Supreme Environmental Experts Council is a current inter-ministerial body, established on a national level, with representatives of different ministries, such as the MRDPW, MoAF, MoH, MoE, MT, MoF, National Electrical Company and representatives of BAS and other experts. The SEEC is chaired by the Deputy Minister of Environment and Water. The main duties of the Council are to discuss EIA Reports and to decide on issuing permits for the construction/rehabilitation of WWTP's. This would also reflect the reduction of nutrient pollution load from the municipalities and from the industry by the introduction of best environment- friendly technologies.

Bulgaria believes that the future adoption and enforcement of (i) the Regulation on the Protection of Water from Pollution with Nitrates of Agricultural Origin, (ii) the Regulation on the Emission Norms for Admissible Content of Harmful and Dangerous Substances in Wastewater Discharged into Natural Receivers, (iii) the Regulation on Issuing Permits for Wastewater Discharges in Water Bodies and, (iv) the setting of individual emission limits on point sources of pollution should have a significant positive impact on nutrient reduction.

In order to facilitate water management at the national level (according to Article (9) of the Water Law), a Supreme Consultative Water Council will be established within the MOEW. The SCWC will include representatives of the MOEW, MRDPW, MoAF, MoE, MoT, MoH, MoF, Civil Defense, the State Agency for Energy and Energy Resources, the Bulgarian Academy of Sciences, the municipalities, non-governmental organizations directly related with waters etc. The Minister of the Environment and Waters will issue a Regulation defining the structure and activities of the Supreme Consultative Water Council.

The management at basin level within one or several watersheds will be implemented by basin water management bodies, such as the Basin Directorates under MOEW and Basin Councils (according to Art. 153 of the Water Law). The Basin Council will be a state public consultative commission responsible for supporting the activities of the Basin Directorate. The Basin Council will include representatives of the state administration, municipal administration, water users and environmental organizations within the range of the basin as well as representatives of the scientific organizations connected with water-related issues.

An analysis of the relevant, existing national inter-ministerial mechanisms shows that these councils, expert working groups and commissions have, to a certain level, duties and responsibilities in relation to nutrient reduction and control or other similar tasks related to fertilizers, nitrates and/or phosphorus use and control. However, none of these structures has direct duties or responsibilities in relation to nutrient reduction and control.

Bulgaria believes that cooperation between governments and local communities/ non-governmental organizations in relation to nutrient reduction is very important. Nutrient reduction is included - directly or indirectly - in the duties and responsibilities of several ministries, local authorities, farmers, new owners of industrial plants, environmental NGOs and researchers.

One very good example of cooperation between the governments, inter-ministerial mechanisms and the local communities and NGOs is the establishment of the pilot Yantra River Basin Council. The main purpose in establishing the Council was to experiment with the implementation of integrated water resources management in Bulgaria and was to some extent related to nutrient reduction. Another example of ongoing cooperation between the governments, inter-ministerial mechanisms and local communities/NGOs in relation to general pollution reduction concerns is provided by the public discussions of EIA reports. Yet another

example is – to some extent - the existing Group 22. Finally, the preparation of the project for wetland rehabilitation in Kalimok and Belene in relation to nutrient reduction and biodiversity preservation is also worth mentioning in this context.

Even now, some of the inter-ministerial structures could be used for co-ordination of the development of a National Nutrients Reduction Strategy and the co-ordination of the implementation of the NNRAP. However, the main problems are due to the limitations of the duties and responsibilities of the already identified structures.

10.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Recommendations for improvements of the existing national inter-ministerial mechanisms to respond to the nutrient reduction concerns

The recommendations are not oriented to the improvements of the existing national inter-ministerial mechanisms to respond to nutrient reduction concerns because of their status duties and responsibilities. Nevertheless, at this stage a revision of the responsibilities of the SEEC at the MOEW to answer to the nutrient reduction concerns as a temporary measure could be considered as the most appropriate recommendation.

- (2) Suggestions for the creation of new mechanisms for nutrient control and reduction

Bulgaria has proposed the creation of a new mechanism for nutrient control and reduction. First, there are two possibilities on the national level: the creation of a separate inter-ministerial body or the creation of a commission in the future Supreme Consultative Water Council. Second, on the basin level it will be possible to use the future Basin Council.

10.3 Main barriers to the creation of national inter-ministerial mechanisms

- (1) Legal and institutional barriers

Inter-ministerial co-ordination and co-operation for the implementation of nutrient reduction and control measures depends to a great extent on the need to enhance the understanding of policy makers. The main barriers are related to the (i) limited number of staff at the ministries (ii) lack of a clear division of duties and responsibilities between different ministries, and (iii) absence of adequate legislation. However, new legislation is in the process of being developed.

- (2) Financial barriers

Effective nutrient control and reduction requires a huge amount of investment. Absence of financial support could be one of the main barriers.

10.4 Proposed national inter-ministerial mechanisms

- (1) Institutional and legal framework

Bulgaria has proposed the establishment of a new national, interim inter-ministerial commission on an expert level, within the MOEW, with full commitment of the other interested ministries. Based on the rule of procedures proposed by the Minister of the Environment and Waters, the commission will initially have a limited mandate until an adequate commission is created under the future Supreme Consultative Water Council. The main duties of the Commission should be (i) to provide support to the MOEW for the development of a National Nutrient Pollution Reduction Strategy and the implementation of the Action Plan and, (ii) to coordinate the activities of the different institutions for better nutrient control and reduction actions.

(2) Schedule for implementation

Such an inter-ministerial structure is currently being established in order to support the preparation of the 5-year draft Nutrient Reduction Action Plan for the Black Sea catchment area. Under the new Water law, Bulgaria will have four Expert Groups (EG) for its four river basin regions. Therefore, four national commissions can be established where each EG will be responsible for coordinating the activities in one of the four basin regions. The proposed schedule for implementation of a new inter-ministerial mechanism able to carry out the tasks related to nutrient reduction and control starts in May 2000 and will last for the next 5 years. The new Four River Basin Councils could be created within this period of time.

10.5 Main country-specific features and conclusions

Bulgaria is one of the few countries of the Danube River Basin which benefits from the results of many identified national inter-ministerial mechanisms with responsibilities for water pollution abatement and environmental protection. Most of these structures are also dealing with diffuse pollution, implementing pollution reduction measures or approving new investments in the water sector.

The Supreme Environmental Experts Council is a current inter-ministerial body, established on a national level, with representatives of different ministries, such as the MRDPW, MoAF, MoH, MoE, MT, MoF, National Electrical Company and representatives of BAS and other experts. The SEEC is chaired by the Deputy Minister of Environment and Water. The main duties of the Council are to discuss EIA Reports and to decide on issuing permits for construction/rehabilitation of WWTP's. This would also reflect on the reduction of nutrient pollution load from the municipalities and from the industry by the introduction of best environment-friendly technologies.

Bulgaria believes that the future adoption and enforcement of the (i) Regulation on the Protection of Water from Pollution with Nitrates of Agricultural Origin, (ii) Regulation on Emission Norms for Admissible Content of Harmful and Dangerous Substances in Wastewater Discharged into Natural Receivers, (iii) Regulation on Issuing Permits for Wastewater Discharges in Water Bodies and, (iv) determination of individual emission limitations of point sources of pollution should have a significant positive impact on nutrient reduction.

Within the MOEW, a Supreme Consultative Water Council will be created.

Bulgaria believes that cooperation between governments and local communities/ non-governmental organizations in relation to nutrient reduction concerns is very important. Nutrient reduction issues are included, directly or indirectly, in the duties and responsibilities of several ministries, local authorities, farmers, new owners of industrial plants, environmental NGOs and researchers.

A very good example of cooperation between the governments, the inter-ministerial mechanisms and the local communities and NGOs is the establishment of the pilot Yantra River Basin Council.

Some inter-ministerial structures could be charged with coordinating the development of a National Nutrients Reduction Strategy and the implementation of the NNRAP. However, the main problems are due to the too narrowly defined scope of the duties and responsibilities of the already identified structures.

Bulgaria has proposed the creation of a new mechanism for nutrient control and reduction. First, there are two possibilities on the national level: the creation of a separate inter-ministerial body or the creation of a commission in the future Supreme Consultative Water Council. Second, on the basin level it will be possible to use the future Basin Council.

11 ROMANIA

11.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

Inter-ministerial co-ordination mechanisms for environmental problems, particularly relating to nutrient control and reduction, are in Romania based on a special Committee which is mainly responsible for (i) providing a general framework for the development of environmental strategy taking into consideration sectoral strategies, (ii) creating an operational frame for the implementation of a National Environmental Action Plan (NAEP), and (iii) improving public participation – in the sense of access to information and involvement.

There is no special committee for nutrient control and reduction but there is an inter-ministerial working group for environmental development. In the case of water-related problems, including nutrients, the most relevant institutions involved include: the Ministry of Waters, Forests and Environmental Protection, Ministry of Agriculture, Ministry of Industry, Ministry of Health, Ministry of Public Works and Land Planning, National Water Company Apele Romane, Consumer Protection Office, NGOs and some donor organizations.

The specific tasks related to nutrients include (1) implementation of nutrient-related legislation based on EU Directives and International Conventions ratified by Romania, (2) carrying out international programmes in which Romania is involved, (3) periodical assessment of the PSIR cycle (pressure/ stress/ impact/ reaction) and control of relationships functions between priority pollutants/ target group/ environmental functions/ environmental themes, (4) assessment of national nutrient balance, (5) development of instruments for diffuse pollution characterization and control (risk assessment and management).

Apart from some general barriers (lack of legislation, management tools, and infrastructure), there are other specific constraints related to the agricultural sector in particular (lack of logical framework Approach Matrix (LFA), absence of clear objectives, etc).

11.2 Guidelines for the improvement of national inter-ministerial nutrient control and reduction mechanisms

- (1) Recommendations for improvements of the existing national inter-ministerial structures to answer nutrient reduction concerns

Romania has developed several recommendations aimed at improving cooperation between various representatives within the existing inter-ministerial mechanism.

- (2) Suggestions for the creation of new mechanisms for nutrient control and reduction

A special Working Group for Nutrient Control and Reduction Action Plan (NCRAP) should be created in the ICIM. Based on the already started process of approximation to the EU legislation, the Working Group will focus on nutrient-related topics addressed by: EWFD (COM 98/76), IPPC Directive (96/161/EEC), Urban Waste Directive (91/271/EEC, 98/15/EEC), Nitrate Directive (91/676/EEC) etc. In addition, one of the Group's main tasks would be the establishment of mechanism to control nutrient application.

11.3 Main barriers to the creation of national inter-ministerial mechanism

- (1) Legal and institutional barriers

There are not any major legal or institutional barriers to be considered in the operation of the inter-ministerial structure on nutrient reduction issues. The current legal framework facilitates the creation and functioning of such a mechanism while its host, ICIM, could provide the institutional arrangements.

- (2) Financial barriers

Romania believes the current limited financial resources to represent one of the most relevant constraints.

11.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

The proposed specific WG dealing with nutrient reduction and control problems needs to be created within the ICIM. This WG will take measures to facilitate the development and implementation of the Nutrient Reduction and Control Action Plan.

(2) Schedule for implementation

As Romania is already committed to the implementation of nutrient reduction measures, the time schedule is very tight and the WG is due to be set up during this year.

11.5 Main country-specific features and conclusions

Romania is one of the Danube countries for which nutrient reduction and control represents a main concern. This is why the country has already created an inter-ministerial mechanism to address broader environmental topics, but with environmental and agricultural authorities already involved. Moreover, Romania is willing to improve this structure with an additional WG, designated only for nutrient reduction and control issues.

Another specific characteristic of Romania is related to the continuous support the government provides to environmental authorities for their institutional strengthening and capacity building, for reinforcing environmental research, improving exchange of information and public involvement, and for intensifying regional cooperation on the implementing nutrient reduction measures.

12 MOLDOVA

12.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

In Moldova, there is a National Committee established in 1996 and responsible for supervising the implementation of the provisions of a number of international agreements, including those related to pollution control and reduction. Several relevant sub-committees and inter-ministerial committees were established, charged with environment-related responsibilities. However, cooperation between these entities is weak.

There is no example of nutrient-related cooperation between governmental organizations and local communities and non-governmental organizations. This is due to two reasons. Firstly, there is a reduced interest in nutrient reduction issues on the part of policy makers. Secondly, there is a general absence of good cooperation in relation to environmental issues.

However, Moldova believes that - for the time being - there is no need to establish specific committees dealing with nutrient control and reduction issues since this problem is not on the country's priority list given that it is faced with more acute problems affecting its economy.

The division of responsibilities between the Ministry of the Environment and Territorial Development and the Ministry of Health, set out in a 1992 agreement between the two entities, provides for a clear division of tasks in relation to water. The Department of Environmental Protection is responsible for water quality and pollution control, rational use, restoration and protection of water, promotion of best available technologies for water use and treatment, etc. The same agreement clarified the allocation of tasks between the Ministry of Environment and Territorial Development and the former Ministry of Agriculture and Alimentation on the promoting the strict regime of water resources in Moldova.

The role of local communities in the decision-making process is very small, mainly due to a lack of public access to environmental information and – in the participation process – failure to recognize their importance.

12.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Recommendations for improvement of the existing national inter-ministerial structures to answer nutrient reduction concerns

Moldova has made several recommendations aimed at (i) improving the current structure of the Ministry of the Environment and Territorial Development, (ii) strengthening the inter-ministerial mechanism in order to incorporate environmental considerations into the economic development programme, (iii) decentralizing tasks and, (iv) raising public awareness and public participation in the decision-making process.

- (2) Suggestions for the creation of new mechanisms for nutrient control and reduction

Moldova has not yet considered the option of creating a new inter-ministerial mechanism.

12.3 Main barriers to the creation of national inter-ministerial mechanisms

(1) Legal and institutional barriers

Moldova sees the following barriers:

- Inadequate legal framework dealing with issues related to water quality management, including pollution control in Moldova
- Lack of qualified staff dealing with water quality issues within the Ministry of the Environment and Territorial Development
- Insufficient cooperation between organizations, including government and NGOs
- Lack of adequate staff training programs

(2) Financial barriers

- Lack of financial support to facilitate the creation of a possible inter-ministerial mechanism.

12.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

Moldova has suggested various mechanisms, which are mainly geared towards pollution control.

This list includes (i) revision of the National Economic Development Program to meet the integration requirements with a view to incorporating environmental impacts of macro and sectoral policies into the economic development programmes, (ii) development of interim emissions limits and a compliance schedule, (iii) creation of an effective permitting systems, and (iv) implementing charge schemes.

(2) Schedule for implementation

Moldova has not yet proposed any deadlines for the implementation of the suggested measures.

12.5 Main country-specific features and conclusions

Moldova has several authorities involved in water and environmental protection activities. In addition, the existing National Committee has the task to supervise the implementation of the provisions of the different international agreements, including those related to pollution control and reduction. Several relevant sub-committees and inter-ministerial committees were established with environment-related responsibilities. However, cooperation between these entities is weak.

There is no example of cooperation between governmental organizations and local communities and non-governmental organizations in relation to nutrient reduction problems. One particularity of Moldova is related to the reduced interest in nutrient reduction issues on the part of policy makers. In addition, Moldova considers that - for the time being - there is no need to establish specific committees dealing with nutrient control and reduction issues since this problem is not on the country's priority list given that it is faced with more acute problems affecting its economy.

13 UKRAINE

13.1 Description of the relevant national inter-ministerial mechanisms with responsibilities for nutrient control and reduction

The establishment of inter-sectoral committees and working groups for co-operation between different sectors of the economy and social groups is a common practice in Ukraine.

Legislation on nutrient reduction is part of a broader body of legislation on pollution control and protection against pollution. Ukraine believes that the future development of legislative measures in this field will depend on progress made in economic reform.

The legislative acts provide some tools for decision making in the rational use of natural resources and environmental protection, but do not address nutrient reduction in particular.

The Ministry of the Environment and Natural Resources of Ukraine performs functions related to the management and control of water use and protection and renewal of water resources.

Based on these responsibilities, the Ministry of the Environment and Natural Resources co-ordinates environmentally important issues related to different sectors.

A typical example of an inter-ministerial Committee is the Council on Environmental Problems of the Dnipro River Basin and Drinking Water Quality, established to facilitate the implementation of the State Program on Rehabilitation of the Environment and Improvement of Drinking Water Quality in the Dnipro River Basin. Co-ordination of the environmental policy for the use of nature and environmental protection in the Dnipro river basin was set forth by a 1999 Resolution of the Cabinet of Ministers.

13.2 Guidelines for the improvement / creation of national inter-ministerial nutrient control and reduction mechanisms

- (1) Develop recommendations for improvement of the existing national inter-ministerial structures with the revision of their responsibilities to answer to the nutrient reduction concerns

Ukraine believes that a reorganization of the Ministry of the Environment and Natural Resources would contribute towards strengthening inter-sectoral co-ordination.

The improvement of economic conditions and the introduction of economic incentives for involved institutions and organizations in Ukraine will result in improved inter-sectoral co-operation and more efficient work of the inter sectoral bodies.

- (2) Suggestions for new mechanisms for nutrient control and reduction

Ukraine believes that the Cabinet of Ministers may create inter-ministerial mechanism charged with nutrient reduction tasks. Currently, the Ministry of the Environment and Natural Resources is drafting ministerial orders for the establishment of the Black Sea and the Danube Committees, whose agenda may involve tasks related to nutrient reduction in the Black Sea basin.

A typical arrangement would be to establish working groups within the inter-ministerial mechanism to address the more specific issues within the scope of its general objectives.

13.3 Main barriers to the creation of national inter-ministerial mechanisms

- (1) Legal and institutional barriers

Although the current legislative framework and the previous experience with inter-sectoral co-operation seem to be successful, there are some important limitations affecting the work of inter-sectoral committees.

The decision to develop nutrient reduction program will depend on the legal approval by the Cabinet of Ministers.

(2) Financial barriers

The most important barrier concerns the lack of financial resources to cover operational costs for members of inter-sectoral committees, secretarial work, office equipment and/or office space for the important programs. Insufficient funding and human resources impair the efficiency of the Inter-sectoral Committee. Within the ongoing administrative reform designed – among other things – to downsize the ministries, many tasks assigned to inter-ministerial committees will create an additional burden for the ministerial personnel.

Since inter-sectoral committees and working groups operate on a non-paid basis, the members' motivation is very low and participation becomes very formal. Moreover, due to very limited financial resources for implementing the programs, projects, proposals, the agency that initiates the activities tends to dominate and control the financial resources with all resulting drawbacks such as poor information exchange, lack of ideas sharing, etc.

13.4 Proposed national inter-ministerial mechanisms

(1) Institutional and legal framework

Ukraine has proposed several measures leading to the creation of a national inter-ministerial mechanism to address nutrient reduction concerns, including (i) strengthening river basin management, (ii) creating river basin authorities, (iii) developing environmental protection programmes. Once these programmes have been approved, inter-sectoral bodies will be created. Part of these bodies will be working groups charged with nutrient reduction and control tasks.

(2) Schedule for implementation

In the 2001-2015 period, several significant programs will be implemented in Ukraine. Firstly, the protection and rehabilitation of the Azov Sea and the Black Sea are the objectives of the main program to be implemented between 2001 and 2010. Secondly, the development and approval of the state program for environmental protection of the Danube River Basin is also scheduled for the 2002-2012 period.

13.5 Main country-specific features and conclusions

Like many other countries in the Danube River Basin, Ukraine is committed to performing nutrient reduction tasks within the existing committee or through a new mechanism.

A particularity of Ukraine is the fact that the country's legislation does not yet contain any specific provisions on nutrient reduction and control issues. Moreover, even the notion of nutrient as a pollutant is incorporated into the broad definition of a pollutant.

However, Ukraine has incorporated modern principles in environmental and water management, including integrated water resources management approach, the use of economic instruments and the polluter pays principle.

Like other countries, Ukraine is facing severe budgetary constraints that might obstruct a good performance of the prospective inter-ministerial mechanisms.

**STRENGTHENING THE IMPLEMENTATION OF NUTRIENT
REDUCTION MEASURES AND TRANSBOUNDARY
COOPERATION IN THE DANUBE RIVER BASIN**

**EXISTING AND PLANNED POLICIES AND
LEGISLATION RELATING TO POLLUTION
CONTROL AND NUTRIENT REDUCTION**

SUMMARY REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000



**International Commission for
the Protection of the Danube River**

UNDP/GEF Assistance



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LIST OF ABBREVIATIONS

AHEG	Ad-Hoc Expert Group
B&H	Bosnia-Herzegovina
BOD ₅	Biochemical Oxygen Demand in 5 days
CNC	Czech National Council
COD	Chemical Oxygen Demand
CPC	Country Program Coordinator
DPRP	Danube Pollution Reduction Programme
DRB	Danube River Basin
DRBPRP	Danube River Basin Pollution Reduction Programme
DWFD	(Draft) Water Framework Directive
DWQM	Danube Water-Quality Model
EC	European Commission
EIA	Environmental Impact Assessment
EMIS/EG	Emission Expert Group
EPA	Environmental Protection Act
EU	European Union
GFE	Global Environment Facility
ICPDR	International Commission for the Protection of the Danube River
IPPC	Integrated Pollution Prevention and Control
ISO	International Organization for Standardization
ISPA	Instrument for Structural Policies for Pre-Accession
MAFF	Ministry of Agriculture, Forestry and Food
ME	Ministry of the Environment
MESP	Ministry of Environment and Spatial Planning
MI	Ministry of the Interior
MOE	Ministry of Environment
MOEW	Ministry of Environment and Waters
N	Nitrogen (all forms)
N/A	Not Available (i.e. missing data)
NEAP	National Environmental Action Programme
NEPP	National Environmental Protection Program
NFP	National Focal Point
NGO	Non-Governmental Organisation
NIS	Newly Independent States
OHR	Office of High Representative
P	Phosphorus (all forms)
PCU	Programme Coordination Unit
PE	Population Equivalent = load of one person into waste water
PHARE	European Union Programme for Development
PWCA	Public Company for Watershed Areas
RBM	River Basin Management
SEP	State Environmental Policy
SIA	Significant Impact Areas
UNDP	United Nations Development Programme
UWWTD	Urban Waste Water Treatment Directive
WWTP	Waste Water Treatment Plant

1 INTRODUCTION

This Summary Report is an integral component for the preparation of the GEF/UNDP funded project entitled “Strengthening Implementation of Nutrient Reduction Measures and Transboundary Cooperation in the Danube River Basin”. The basic task of this preparatory work is to prepare a qualified material basis for the elaboration of a complete “Danube Regional Project” to be submitted to the GEF Council.

The purpose of this Summary Report is to provide an assessment for all DRB countries, respectively particular categories of DRB countries and the country presentations on of the existing and planned national policies and the status and reform requirements of legislation related to pollution reduction with particular attention to nutrient control and reduction in the Danube River Basin countries.

The structure of the Country Report follows the structure of the “national reports”, and provides a “country profile” for each of the Danube River Basin countries. The “country profiles” are structured as follows:

- (1) Policy objectives, priorities and principles for nutrient control / reduction**
 - General policy objectives, priorities, principles
 - Policy objectives and programmes by sectors
 - Policy objectives and programmes by short, medium, long term
 - Status of nutrient related international conventions, declarations, etc.
- (2) Status of legislation dealing with nutrient control / reduction**
 - Relevant laws and regulations currently in force
 - Relevant laws and regulations in the pipeline
 - Present status regarding out-phasing of phosphate-containing detergents
 - Main deficiencies
- (3) Main barriers to policy and legal reforms**
- (4) Proposed / envisaged changes of nutrient-related legislation**
 - Out-phasing of phosphate-containing detergents
- (5) Approximation of national legislation to EU legislation in terms of pollution control, particularly nutrient control / reduction / removal**

2 ASSESSMENT OF RESULTS AND CONCLUSIONS

2.1 Policy Objectives, Priorities and General Principles for Nutrient Control / Reduction

All DRB countries currently have a more or less comprehensive system of environmental and water sector-related policies and strategies, which usually reflects:

- the capability of the country to contribute to the solution of transboundary problems;
- the significance and evidence of country-specific environmental problems;
- the significance and evidence of environment-related health hazards;
- the economic development and potential of the country.

In this context, all countries have developed a hierarchic system of short, medium and long-term objectives and principles which usually reflect the key environmental problems and sector priorities on national and regional level.

Long-term objectives are usually very general and often not related to any time frame for implementation or solution. In addition, there is usually no assessment of the overall long-term funding requirements. In the DRB countries, long-term objectives of environmental policy mainly focus on:

- Protection of climate and ozone layers;
- Preservation of a sound environment for the future generations;
- Protection of biological diversity;
- Protection of drinking water resources.

Objectives for water pollution and especially nutrient reduction are usually incorporated as sub-components of higher objectives. However, most countries have established a system of priorities for nutrient reduction, usually defining the sequence of construction, extension, or improvement of treatment standards for WWTPs, which are usually

- differentiated by sector (municipal / industrial);
- classified by plant capacity (small / medium / large) and treatment standards;
- differentiated by sensitivity of area (vulnerable areas / significant impact areas).

Despite the diversity of problems, interests and priorities across the DRB, the Danube countries share certain values and principles relating to the environment and the conservation of natural resources. The most essential principles, also relevant for water pollution, respectively nutrient reduction, include:

- The precautionary principle: under certain circumstances it is better to be on the safe side, even if firm evidence is lacking, than to be actually wrong;
- Best available technology (BAT) - best environmental practice (BEP);
- Control of pollution at the source: it is usually less expensive to prevent the creation of harmful wastes or pollution through cleaner technologies and processes than to cure and repair the damage to the environment afterwards;
- The polluter pays principle and the related user pays principle.
- The principle of integrated approach;
- The principle of shared responsibilities, respectively the principle of subsidiarity.

In the meantime, all DRB countries have - at least theoretically - recognized that the adoption of these principles is indispensable for appropriate prioritization and implementation of environment-related measures.

None of the DRB countries presently disposes of an explicitly formulated nutrient reduction programme. Measures and activities with relevance to nutrient reduction are usually sub-components of or to a large extent incorporated in other programmes.

In all DRB countries, the main ongoing programmes regarding nutrient reduction are investment programmes for new construction, extension, rehabilitation or improvement of effluent standards (biological treatment, N+P elimination) of municipal WWTPs. Involved are occasionally the provision of guidelines for selection of priority projects, country-specific effluent standards depending on plant capacity, and technical and operational standards.

The status of nutrient-related policy and programmes in the particular DRB countries can be assessed in general terms as follows:

Table 2.1-1: Status of Nutrient-Related Policy and Programmes in the DRB Countries

Country	Explicitly formulated policy objectives for nutrient control / reduction	Programmes especially dealing with nutrient control / reduction
GER	Appropriate system of policy objectives	Programme for the implementation of buffer zones to surface waters
A	Appropriate system of policy objectives	Programme of environment-friendly agriculture;
CZ	Appropriate system of policy objectives	Programme for adequate implementation of municipal WWTPs
SK	Satisfactory system of policy objectives	Codex of Good Agricultural Practices
HUN	Appropriate system of policy objectives	National waste water collection and treatment programme; National agro-environmental protection programme; Other programmes (lake, oxbow lake, low land, etc.);
SLO	Satisfactory system of policy objectives	No explicit programmes
CRO	Satisfactory system of policy objectives	No explicit programmes
B&H	No explicit policy objectives	No explicit programmes
YUG	Satisfactory system of policy objectives	No explicit programmes
BUL	Satisfactory system of policy objectives	Programme for construction of municipal WWTPs
RO	Satisfactory system of policy objectives	A series of nutrient-related programmes to be carried out during the forthcoming period 2000-2010
MOL	No explicit policy objectives regarding nutrient emissions or loads	No explicit programmes
UA	Satisfactory system of policy objectives	No explicit programmes

2.2 Status of Legislation Dealing with Nutrient Control and Reduction

Except for Germany and Austria, the adequacy of the legal framework for sound environmental management of water resources has to be viewed against the background of political, economic, administrative and social changes which have taken place in the particular DRB countries during the previous years of transition.

In all DRB countries the legal framework for environmental management of water resources and ecosystems consists of a hierarchic system of decrees, laws, directives, ordinances, regulations and standards on different administrative levels.

The international agreements and conventions signed or ratified by the particular countries constitute a kind of orientation framework for the national environmental policies and legislation of the member countries.

In a number of countries, numerous laws and regulations were adopted a long time ago, have been frequently amended during the previous years of transition and need a fundamental revision.

The environmental efforts in the Danube countries will be dominated by the need to confirm to European standards, less by domestic priorities and not decisively by agreements within the framework of the DRPC. The EU member countries are obliged to adopt the EU directives and transform them into national legislation. The EU candidates are in process of adoption to insure the obligations of harmonization. Other Danube countries follow the same line and transform their national regulations according to EU directives

Indeed, in most DRB countries, the relevant legislation is currently in the phase of substantial reform and modernization. Due to the complexity of this task it can be anticipated that the completion of the ongoing reform process will take several years before the relevant legislation has reached an acceptable level of compliance with international requirements.

Countries in which the legal framework for environmental management of water resources and ecosystems has to be considered as fully adequate and in consistence with international requirements are Germany and Austria.

Countries in which the legal framework for environmental management of water resources and ecosystems has to be considered as generally appropriate, respectively satisfactory, are Hungary, Czech Republic, Slovenia and Slovakia.

In the other countries, the current environmental and water-related legislation cannot be considered as adequate regarding sound and sustainable environmental management of water resources and ecosystems; there are still essential deficits and problems that can be summarized as follows:

- in some countries the environmental and water-related legislation is still based to a certain extent on historical structures, with the consequence that the various changes, adjustments and modifications have led to critical inconsistencies;
- some countries are currently in the process of establishing new environmental and water-related legislation, whose practical applicability and effectiveness has not yet been proven;
- some countries have developed relatively sophisticated systems of environmental and water-related legislation, which can at present not really be enforced due to critical social and economic issues in the country.

Common deficiencies and needs for improvement regarding the water sector-related legislation in the DRB countries can be summarized as follows:

- restructuring and adjustment of relevant legislation to the requirements of modern environment-oriented market economy;
- streamlining, simplification and elimination of inconsistent components, basically resulting from ad-hoc changes during the previous transition period;
- ensuring utmost compatibility of interacting legislation on the various administrative levels;
- specification of efficient implementing regulations and enforcement mechanisms; elimination of all kinds of unjustified exemptions;
- further harmonization of national legislation with EU regulations and standards.

The status of nutrient-related legislation (and standards of nutrient control and reduction) in the particular DRB countries can be assessed in general terms as follows:

Table 2.2-1: Status of Nutrient-Related Legislation in the DRB Countries

Country	Explicitly formulated legal provisions for nutrient control / reduction	Explicitly defined standards regarding nutrient control / reduction
GER	Fully appropriate legislation	Appropriate system of standards
A	Fully appropriate legislation	Appropriate system of standards
CZ	In general appropriate legislation	In general satisfactory system of standards
SK	In general appropriate legislation	In general satisfactory system of standards
HUN	In general appropriate legislation	In general satisfactory system of standards
SLO	In general appropriate legislation	In general satisfactory system of standards
CRO	Legislation not fully satisfactory (mainly focusing on point sources);	No fully satisfactory system of standards: - Water quality standards by water classes; - Standards on hazardous substances; - Effluent standards: maximum allowed concentration of hazardous substances in waste water;
B&H	No explicit legal provisions	No satisfactory system of standards
YUG	Legislation not fully satisfactory	No fully satisfactory system of standards: - no effluent standards
BUL	Legislation not fully satisfactory	No fully satisfactory system of standards:

Country	Explicitly formulated legal provisions for nutrient control / reduction	Explicitly defined standards regarding nutrient control / reduction
		- ambient water quality permissible limits; - Black Sea water quality permissible limits; - State standard for drinking water quality;
RO	Legislation not fully satisfactory (no specific nutrient-related regulations);	No fully satisfactory system of standards
MOL	No explicit legal provisions	No fully satisfactory system of standards: Ambient water quality standards, emission standards, and effluent standards are incorporated in overall pollution control standards
UA	Legislation not fully satisfactory	No fully satisfactory system of standards

In summary, it can be concluded that in none of the DRB countries (except for Germany and Austria) nutrient-related legislation is presently on a fully adequate level from the international point of view. This indicates that the improvement of the respective legislation is an essential prerequisite and constitutes a substantial potential for future nutrient reduction in the majority of the DRB countries.

2.3 Main Barriers to Policy and Legal Reforms

Based on the information provided by the national contributions, the main barriers to policy and legal reform can be categorized as outlined below.

The assessment for the particular DRB countries (** = "high relevance"; * = "low relevance") has to be considered as provisional and should in the first place serve for a formalized identification of country-specific areas for improvement.

(1) Historical issues

- Outdated legal structures
- Outdated administrative structures
- Outdated business structures / methods
- Inappropriate agricultural structures and practices
- Inappropriate industrial structures / production / production methods
- Unsolved ownership situation - public sector
- Unsolved ownership situation - private sector
- Inappropriate attitude of population (wastage of water, etc)

Provisional assessment of the relevance of historical issues for the particular DRB country:

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	**	**	**	*		*	***	**	*	*	***	***

(2) Economic issues

- Deteriorated economic capacities
- Decreased industrial production
- Decreased agricultural production
- Decreased export opportunities
- Decreased international tourism
- Decreased livestock farming
- Inadequate status of privatization
- Inappropriate public infrastructure (waste water collection systems, WWTP)

Provisional assessment of the relevance of economic issues in the particular DRB country:

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	***	**	**	*		*	***	**	*	*	***	***

(3) Socio-economic issues

- Low private (per capita) income
- Low living standard
- High portion of low-income population
- High unemployment

Provisional assessment of the relevance of socio-economic issues in the DRB countries:

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	***	***	**	*		*	***	***	*	*	***	***

(1) Financial issues

- Lack of domestic public funds for environmental issues
- Lack of international funds at favorable terms
- Lack of adequate funding mechanisms
- Lack of adequate funding tools (incentives, charges)
- Low purchasing power of the population

Provisional assessment of the relevance of financial issues in the particular DRB county:

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	***	***	*	*		*	***	**	*	*	***	***

(2) Institutional / administrative issues

- Inadequate personnel capability
- Inadequate personnel qualification
- Inadequate technical equipment
- Inadequate structure of administration
- Inadequate allocation of responsibilities (gaps, overlaps, not defined)
- Lack of adequate vertical and horizontal coordination
- Lack of adequate cooperation within public administration
- Lack of adequate cooperation between public administration and private sector
- Lack of adequate tools for enforcement of legislation
- Lack of adequate data basis
- Lack of adequate monitoring systems and methods
- Lack of scientific knowledge
- Lack of private sector participation (investment, management)

Provisional assessment of the relevance of institutional issues in the particular DRB county:

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	**	*	*	*		*	**	*	*	*	**	**

(3) Participatory issues

- Lack of public awareness (regarding environmental issues)
- Lack of adequate awareness of decision makers (regarding environmental issues)
- Lack of public interest in solving environmental deficiencies / problems
- Lack of organizational capability (inadequate representation of NGOs)
- Lack of information / knowledge
- Lack of private sector participation (investment, management)

Provisional assessment of the relevance of participatory issues in the particular DRB county:

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	**	**	**	*		*	**	**	*	*	**	**

(4) Natural / environmental issues

- Degradation of ecosystem
- Loss of adequate biodiversity
- Inadequately high concentration of nutrients in agricultural areas
- Uncontrolled flood risk
- Inadequate utilization of water resources
- Uncontrolled discharge of waste water (in the past / ongoing)
- Unsanitary disposal of solid wastes and hazardous wastes (in the past / ongoing)
- Inadequate agricultural practices (in the past / ongoing)
- Inadequate utilization of fertilizers, pesticides, etc. (in the past / ongoing)

Provisional assessment of the relevance of natural issues in the particular DRB county:

A	B&H	BUL	CRO	CZ	GER	HUN	MOL	RO	SK	SLO	UA	YUG
	**	**	**	*		*	**	**	*	*	**	**

2.4 Envisaged Changes of Nutrient-Related Legislation

Most DRB countries do not envisage any substantial changes of nutrient-related legislation besides the changes they will carry out within the process of harmonization of national legislation with EU legislation. These changes are dealt with in Section 2.5.

Only some countries are currently in the process of updating and adjusting particular laws or regulations that are directly or indirectly related to nutrient-related issues.

The need for improvement of nutrient-related legislation in the particular DRB countries can be assessed in general terms as follows:

The EU regulations with respect to nutrient emissions require a great effort in introducing new measures, new technologies, and upgrade existing facilities.

Table 2.4-1: Needs for Improvement of Nutrient Related Legislation in the DRB Countries

Country	Needs for improvement of legislation	Needs for improvement / adjustment of nutrient related standards
GER	No need for new legislation	No requirements
A	No need for new legislation	No requirements
CZ	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for adjustment of standards
SK	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for adjustment of standards
HUN	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for adjustment of standards
SLO	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for adjustment of standards
CRO	Need for improvement of legislation	Need for completion and adjustment of standards
B&H	Substantial need for improvement of legislation	Substantial need for completion and adjustment of standards
YUG	Need for improvement of legislation	Need for completion and adjustment of standards
BUL	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for completion and adjustment of standards
RO	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for completion and adjustment of standards
MOL	Substantial need for improvement of legislation	Need for completion and adjustment of standards
UA	Need for adjustment of legislation in line with established schedule for approximation of national legislation to EU legislation	Need for completion and adjustment of standards

Regarding the particular issue of control, respectively out-phasing of Phosphate-containing detergents, the situation in the particular DRB countries is compiled in Table 2.4-2.

Table 2.4-2: Present Status and Proposed Actions Regarding Phosphate-containing Detergents

Country	Present Situation	Planned / Proposed Actions
GER	Satisfactorily regulated by respective law and ordinances	No requirements for changes in national legislation
A	Issues of detergents in washing powders are regulated by the Act on Chemicals and the Ordinance on the Degradability of Certain Detergents, which are in compliance with the respective EU Directives 73/404/ECC, 73/405/ECC and 82/243/ECC	No requirements for changes in national legislation
CZ	Voluntary agreement between the MOE and the Association of Soap and Detergents Producers on reduction of environmental impact of their products	New arrangement envisaged, form currently in discussion
SK	No explicit legal provision or regulation	There are plans to prepare by the end of 2000 a proposal on methods of control of biological degradability of active substance detergents
HUN	State standard: Pulverous synthetic detergents (MSZ 14604-86)	No plan or schedule for changes
SLO	No explicit legal provision or regulation; EU-market conditions forced industry to abandon use of phosphate; Less than 1/3 of all detergents sold is supposed to still have phosphate contents;	No explicit plan or schedule for control or out-phasing of P-containing detergents
CRO	No explicit legal provision or regulation	No explicit plan or schedule for control or out-phasing of P-containing detergents
B&H	No explicit legal provision or regulation, Present production on zeolite basis	No explicit plan or schedule for control or out-phasing of P-containing detergents
YUG	No explicit legal provision or regulation; It is left to the producers to decide what kind of detergents they produce	No explicit plan or schedule for control or out-phasing of P-containing detergents
BUL	No explicit legal provision or regulation	Plan regarding P-containing detergents currently under preparation
RO	No explicit legal provision or regulation	Introduction of P-free detergents in discussion, estimated cost ~ EUR 50 million
MOL	No explicit legal provision or regulation; Problem not relevant;	No explicit plan or schedule for control or out-phasing of P-containing detergents
UA	No explicit legal provision or regulation	No explicit plan or schedule for control or out-phasing of P-containing detergents

The information provided by the national reports indicates that there is a substantial potential for Phosphorus reduction in the majority of the DRB countries. Therefore, this issue should be followed up.

The replacement of phosphates in detergents is cost-effective strategy leading to pollution reduction.

2.5 Schedule for Approximation of National Legislation to EU Legislation

With the exception of Germany and Austria, all other DRB countries consider the harmonization of national environment and water-related legislation with the EU legislation as the most essential prerequisite for long-term sustainable nutrient control and reduction in their countries.

In the Czech Republic, Slovakia, Hungary and Bulgaria this harmonization is incorporated in an ongoing programme and considered as a short-term task.

Romania, Slovenia (and Ukraine) plan to reach a harmonization of particular national laws with EU legislation or standards in the short, respectively mid-term (2001 to 2005).

For both categories of countries, the final implementation of the Urban Waste Water Treatment Directive will require relatively long adjustment periods of at least 10 to 20 years.

For the other countries, Moldova and the war-impacted countries Croatia, B&H and Yugoslavia, the time frame for the approximation of national legislation to EU legislation is determined by the currently not fully satisfactory status of water sector legislation and the economic capability and potential of the particular country. For these countries the approximation process has to be considered as a medium to long-term task.

Table 2.5-1 shows a schedule for the envisaged approximation of the national legislation to the EU legislation (regarding selected EU Directives which are directly or indirectly related to the issue of pollution control, in particular to nutrient control / reduction).

Table 2.5-1: Planned Schedule for Approximation of National Legislation to EU Legislation

[illegible]

ANNEX COUNTRY REPORTS

- 1. GERMANY**
- 2. AUSTRIA**
- 3. CZECH REPUBLIC**
- 4. SLOVAKIA**
- 5. HUNGARY**
- 6. SLOVENIA**
- 7. CROATIA**
- 8. BOSNIA-HERZEGOVINA**
- 9. YUGOSLAVIA**
- 10. BULGARIA**
- 11. ROMANIA**
- 12. MOLDOVA**
- 13. UKRAINE**

1 GERMANY

1.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

During the previous decades, Germany has established a comprehensive hierarchic system of objectives, principles and priorities for pollution reduction both on the national level and - due to the distinct federal structure of the country – supplementary ones on the state level. Regarding pollution reduction, the policy objectives and principles are fully in compliance with international standards.

Nutrients in surface waters result from point sources and diffuse sources (mainly nutrient emissions from the agricultural sector and nitrogenous substances from the transport and industrial sector).

(1) Control of point sources

Regarding point sources, the basic principle is that nutrient load of waste water discharged from treatment plants is to be kept as low as possible according to the “best available techniques”. The particular minimum requirements regarding nutrient elimination have been laid down in the waste water emission ordinances and their annexes.

Through a strict application of the emission principle, a significant nutrient elimination could be achieved in the surface waters.

For discharge of waste water, a waste water charge is to be paid, also in the case the legal requirements are fulfilled. This waste water charge can be set off against investment cost for reduction of nutrient load; thus this regulation fulfills an essential incentive function.

The legal prescriptions regarding content of phosphorus components in washing powders and detergents have to be considered as satisfactory and have contributed to a significant reduction of phosphorus levels in surface waters.

(2) Control of non-point sources

In Germany, the impact of nutrients on both surface and ground waters has been increasingly coming from diffuse rather than point sources. The essential diffuse sources are agricultural animal keeping and land use (utilization of fertilizers) as well as nitrogenous substances from the air (e.g. from traffic, industry and agriculture).

From these diffuse sources, both soil and surface and ground water are still significantly impacted by nutrients. Attempts have been made to counteract this development by legal regulations (Water Act, Fertilizer Act, Fertilizer Ordinance, etc). A reduction is, for example, expected to be achieved by a restriction of nutrient content in fertilizers as well as by provisions regulating the utilization of fertilizers (e.g. appropriate buffer zones to surface waters, restrictions on the periods when manure may be spread, etc.).

Germany currently spends about one million EUR per annum for measures and actions aimed at nutrient reduction from diffuse sources in the DRB area of Germany.

1.2 Status of Legislation Dealing with Nutrient Control and Reduction

Legislation related to pollution, respectively nutrient reduction, is in full compliance with the requirements of EU legislation and the relevant international conventions signed by Germany.

The national legislation is composed of a comprehensive set of laws, regulations and ordinances on the national level and a relatively high number of laws and regulations on state level. The Water Resources Policy Act provides sets framework conditions for water management and water control on the national level; the federal states have their own water acts.

In fulfilling the requirements of the relevant EU Directives and the requirements of the national legislation, a multitude of projects, measures and activities related to nutrient reduction have been implemented over a long period of time and have actually led to exceptionally high standards of the relevant infrastructure and administrative and institutional framework by international comparison.

Pollution originating from non-point sources, mainly from agriculture remains a matter of concern.

1.3 Main Barriers to Policy and Legal Reforms

In Germany, the crucial problem is currently not the status of legislation, but the difficulties with the appropriate transposition of the legal regulations.

Non-point source emissions result from a variety of emitters that are partly outside the direct influence sphere of the relevant water sector authorities, which hampers protection measures.

As diffuse emissions can often not be remedied by technical measures, the nutrient emissions have to be controlled or reduced at the source. The solution to these problems requires strategies which both support awareness raising of and provide incentives for the main target groups of emitters.

However, another prerequisite is that adequate legal provisions be established and necessary technical means provided.

1.4 Proposed / Envisaged Changes of Nutrient-Related Legislation

The emission into the air of nitrogenous substances from the transport sector and the agricultural sector calls for particular measures since conventional water protection measures and regulations are in this case not efficient. Essential measures to be considered include:

- development and introduction of emission reducing technologies and techniques;
- intensification of public awareness raising and consultation;
- reduction of emissions into the air as an integral component of an overall environment protection strategy (as laid down in respective international conventions);
- environment-friendly utilization of resources (materials, energy);
- environment-friendly forms of land use;
- systematic survey of emission development,
- exchange of pertinent knowledge and experience;
- environmental impact assessment.

Reduction of phosphorous does not need to be additionally regulated in Germany.

1.5 Approximation of National Legislation to EU Legislation

Being an EU Member State implies the obligatory compliance with nutrient and waste water- relevant EU Directives.

As EU legislation provisions have been incorporated in the national laws, regulations and ordinances, the national legislation is basically in line with the requirements of the relevant EU Directives and will - where required – be gradually adjusted with regard to nutrient control and reduction.

2 AUSTRIA

2.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

In the course of the past decades the Austrian Government has undertaken ambitious efforts to reduce pressures arising from households, industry and agriculture in order to protect and maintain the water resources and their sustainable use. The present water quality monitoring results, which are published on a regular basis, prove that those efforts have been very efficient and successful.

The main principles of the Austrian Water Protection Policy with regard to nutrient control are enshrined in the Austrian Water Act in order:

- to safeguard sustainable use of water for all different purposes (households, industry, agriculture, recreation, fish life, etc);
- to protect resources against pollution that can be harmful to human health and animals;
- to safeguard water as drinking water resource;
- to maintain the natural physical, chemical and biological status of all water bodies.

The key elements for nutrient control and reduction in Austria are:

- Control of point sources via a combined approach;
- Reduction of impacts from diffuse sources.

The progressive combined approach is also enshrined in the future EU Water Framework Directive, which will come into force in the second half of the year 2000. Within this approach both the quality objectives of the receiving waters and the stringent limit values set for discharges have to be respected. Those limit values are set for all major sectors and are based on best available techniques.

The legislation in Austria is harmonised with the requirements of EU legislation for discharges and does not - in general - differentiate between short, medium or long-term measures.

2.2 Status of Legislation Dealing with Nutrient Control / Reduction

(a) Control of point sources

Under the Austrian Water Act, every impact on water (abstractions as well as discharges) that is above the level of insignificance has to be licensed by governmental water authorities. The license is granted for a limited period only. Adaptations due to changing circumstances can be requested by the authorities. Violations of the licenses are fined and in severe cases lead to loss of the permit. The licenses for waste water discharges are based on the combined approach.

Based on the Austrian 1990 Water Act, stringent requirements have been set for waste water discharges, based on best available techniques. 53 sector-specific waste water emission ordinances are currently in force. They determine the relevant sectors and specific parameters and limit concentrations or set maximum loads according to the best available techniques. These standards are part of the license issued by the authority. For waste water producers or for parameters not found in the sector-specific ordinances, the General Ordinance on Waste Water Emission with basic principles and provisions, last amended in 1996, has to be observed.

(b) Phosphorous containing detergents

There are a few legal restrictions in Austria specifically addressing the reduction of detergents in washing powders. The basic act is the Austrian Act on Chemicals BGBl. 53/1997, which requires according to §§ 32 and 33 that the ingredients of washing powder fulfil certain degradability criteria and that harmful substances be replaced by those less harmful to the environment on the basis of best available technique. Further requirements dealing with degradability are fixed in the Ordinance on the Degradability of Certain Detergents BGBl. Nr. 639/1989 as well as in the EU Directives 73/404/EEC, 73/405/EEC and 82/243/EEC.

These three EU directives are currently being reworked with a view to stipulating more ambitious levels of degradability.

Since 1987 phosphorous-containing detergents in washing powders have been reduced to a minimum, in line with the provisions of the Washing Powder Act BGBl. 300/1984, amendment in Annex 1, 1987.

Input of phosphorous in urban waste water has been reduced by more than 50% resulting in significantly reduced P-concentrations in surface waters.

(c) Control of diffuse sources

The main legal instrument to control diffuse sources is based on the EU Nitrates Directive 91/676/EEC (Council Directive covering the protection of waters against pollution caused by nitrates from agricultural sources). A new Austrian Action Programme based on §55b of the Austrian Water Act and in line with the provisions of this directive was launched in September 1999.

The core parts of this Action Programme include:

- restrictions on the period when manure may be spread;
- restrictions in the amount of manure (210 kg nitrogen per hectare at the moment, 170 kg nitrogen per hectare and year after 2002) allowed to be spread;
- provisions for minimum capacities for storage of manure;
- further restrictions on spreading manure along rivers, on slopes etc.

Application of nitrogen (sum of mineral fertiliser and manure) exceeding 210 kg nitrogen per hectare on grassland and 175 kg nitrogen per hectare arable land requires a license according to the provisions of the Austrian Water Act amended in 1990.

In order to avoid an excessive intensification of agriculture “ÖPUL” (Austrian Programme of Environmental Friendly Agriculture) was initiated. This national programme, co-financed by the EC on the basis of regulation agri-environment 2078/91, provides financial incentives for e.g.:

- renunciation of certain fertilisers and pesticides;
- stabilisation of crop rotation;
- bio-farming and integrative production;
- extensification of production;
- maintaining cultivation of extensive grassland (e.g. alpine meadows) and other ecological important areas;
- protection against erosion.

2.3 Main Barriers to Policy and Legal Reforms

In fulfilling the requirements of the relevant EU Directives and the requirements of the national legislation a multitude of projects, measures and activities related to nutrient reduction have been implemented and have led to a high standard in the relevant infrastructure and the administrative and institutional framework in international comparison. Thus, there are currently no relevant barriers to policy and legal reforms.

2.4 Envisaged Changes of Nutrient-Related Legislation

In summary, it can be stated that the objective to reduce nutrient input is laid down in various types and sectors of both national and EU legislation. At present, there seems to be no further need for new legislation or special nutrient reduction programme to be designed to address that specific issue.

2.5 Approximation of National Legislation to EU Legislation

Austria disposes of a broad set of legally binding, stringent regulations for point sources as well as for diffuse sources and detergents.

Being an EU Member State implies obligatory compliance with the waste water-relevant EU directives such as the Dangerous Substance Directive (76/464/EEC), the Urban Waste Water Treatment Directive (91/271/EEC) and the Integrated Prevention and Pollution Control – IPPC Directive (96/91/EEC) which lays down an integrated pollution prevention and control approach for industrial plants.

Provisions of the EU legislation have been incorporated in the national ordinances, so that Austrian legal norms are completely in line with the requirements of the relevant EU Directives.

3 CZECH REPUBLIC

3.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The State Environmental Policy of the Czech Republic, approved in 1995 and up-dated 1999, is focused on the strict implementation of sustainable development principles in all sectors and harmonization of the Czech legislation with EU legislation.

In approving the updated SEP, government accepts a number of principles set out in accepted documents of the international community, such as the: (i) precautionary principle, (ii) principle of prevention, (iii) principle of reducing risks at the source, (iv) *polluter pays* principle, (v) the principle of shared responsibilities, (vi) principle of subsidiarity, (vii) principle of integration, (viii) principle of best available technology, and (ix) principle of substitution.

The acceptance of these internationally approved principles is reflected in the general environmental policy objectives and measures and objectives concerning the hydrosphere as follows:

- Ensure the meeting of international commitments of the Czech Republic in relation to the protection of the watersheds of the Elbe, Morava-Danube and Odra and to co-operation with neighboring countries where waters form the border;
- gradually restore natural water cycles, protect ground waters, increase the retentive ability of the land and ensure the renewable nature of water resources;
- continue with the watercourse rehabilitation programme, renewal of riverbank vegetation and natural meanders and the creation of protective riverbank zones along watercourses and reservoirs;
- for municipal pollution sources, achieve the objective of mechanical and biological treatment of waste water for all settlements with more than 2,000 population equivalents by the year 2010;
- support the application of sludge from wastewater treatment plants in agriculture, especially through limitation of discharges of hazardous substances from industry into public sewers;
- extend monitoring of the quality and quantity of ground and surface waters, including monitoring of the ecological state of waters according to EU requirements, and unify monitoring of rivers and small watercourses;
- prepare and implement action plans for achieving the environmental quality standards set by individual EU Directives in the area of water protection.

The new strategy aims at gradually shifting from normative tools to economic and voluntary ones. Highest priority is given to the protection of surface and ground waters for human consumption, protected areas and wetlands; second priority is given to stretches of watercourses that are classified as heavily polluted.

3.2 Status of Legislation Dealing with Nutrient Control / Reduction

The most essential laws and regulations dealing with nutrient pollution control and prevention are as follows:

- Act No 138/1973 Coll. (Water Act) and its Amendment No 14/1998 Coll., according to which all waters used for human consumption are protected by „protection areas,, where agricultural activities are restricted;
- Act No. 130/1974 Coll. of CNC on State Administration and Water Management, amended by CNC Act No. 49/1982 Coll., Act No. 425/1990 Coll. and Act No. 23/1992 Coll.; (The full text of Act of CNC No. 458/1992 Coll., Amended by Act of CNC No. 114/1995 Coll.);
- Government Decree No 82/1999 Coll., establishing parameters and limits of acceptable degree of water pollution (differentiated for municipal, industrial and agricultural waste water discharge) and also immission limits for two categories of surface waters: (i) surface waters for the abstraction of drinking water and (ii) other waters;
- Act No 58/1998 Coll. on charges for waste water discharge to water bodies;

- Intimation of the Ministry of Environment No 137/1999 Coll. to the Water Act establishing the list of water reservoirs designated for drinking water production and principles for specification of protected areas of water resources.

3.3 Main Barriers to Policy and Legal Reforms

The new political orientation launched in 1990 has brought significant changes to all domains of public life. A lot of them have had a favorable impact, especially relating to the environment, and have also influenced organizational and legislative structure of water management.

The main institutional barriers to policy and legal reform include:

- Due to the privatization and removal of the centralized water management, access to needed data has partially been restricted; Law No 123/1998 Coll. regulates access to information on impact on the environment; the prepared law on water supply and sewage will enable access to information on treated and discharged waste water.
- Under the Act on Municipalities, the responsibility for drinking water supply, sewerage system and waste water treatment was assigned to municipalities. Their attitude to the solution of water management problems is weakened by the necessity to solve other problems and low accessibility of financial sources for the construction of sewer systems.
- The transformation of the legal system of the Czech Republic has not yet been accomplished. With the new act, a clear declaration of jurisdiction and responsibilities at all levels of water administration is expected.
- Changes in the structure of the public service and self-government decentralization has not yet been accomplished. The dossier of new laws specifying the responsibilities and cognizance of regions, districts and municipalities is under preparation.
- There are conflicts between environmental protection and economic concerns; lack of finances does not allow sufficient attention to be paid to water-related problems and their solution.

3.4 Envisaged Changes of Nutrient-Related Legislation

Only one directive regarding nutrient reduction is missing in the actual legislation of the Czech Republic, the Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources.

The most essential laws and regulations currently in the preparation stage include:

- The New Water Act corresponding to EU regulations is on the “legislative schedule” for the year 2000;
- A set of four laws concerning new organizational structure of state administration;
- The adjustment of all laws and regulations required for reaching full compatibility with EU legislation.

3.5 Schedule for Approximation of National Legislation to EU Legislation

The approximation process is based on the Position Document, the National Programme of the Preparation of the Czech Republic for the EU Membership, and on new Implementation Plans prepared for the individual directives.

The preparation period for the envisaged EU accession has been designated by the Czech Government until January 1, 2003. By this reference date, the EU-condition requiring incorporation of the *Acquis Communautaire* into the Czech legislature should be fulfilled and relating requirements of its practical application fully implemented.

According to the provided data, the Czech republic requests a transition period for the following issues:

- For the implementation of the Directive 91/676/ECC in connection with implementation of required measures in agriculture (2006);
- For meeting the requirements established by Directive 91/271/EEC for agglomerations between 2000 -10000 PE (construction or up-grading of WWTPs) and for more stringent level of treatment required for WWTPs in sensitive areas (2010);
- For the implementation of Directive 76/464/EEC and its daughter directives regarding some heavy metals and organic compounds from industry (2008);
- For attainment limits for the content of some organic compounds and metals in drinking water (2006)

Taking into account the significant improvements achieved during the previous few years, it is expected that the Czech Republic - one of the priority candidates for joining the EU before the year 2005 - can successfully achieve the required harmonization of national environmental legislation with the EU legislation in time; especially if this ambitious task is further supported by international co-funding.

4 SLOVAKIA

4.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The most recent document in which objectives, priorities and principles of the national environmental policy are defined is the National Environmental Action Plan II (December 1999).

The priorities of the national environmental policy of the Slovak Republic related to the water sector are defined in NEAP II as follows:

- to ensure sufficient amount and quality of drinking water and reduction of pollution of other waters to acceptable level;
- to ensure biological diversity, protection and rational use of natural resources.

The general principles of the national environmental policy are:

- solving environmental problems within the context of the economic development in the society;
- a preference for preventive measures over corrective ones;
- enforcement of environmental policy on all levels and in all sectors, responsible for taking care of the environment, including municipalities, etc;
- solving environmental problems in a synergetic way;
- considering healthy environment as a basic requirement for public health;
- implementing the polluter pays principle;
- assessing the impact of interference related to the environment.

Particular objectives for the water sector are formulated in the NEAP II as follows:

- transposition of EU legislation;
- reduction of polluting substances in waste water discharges to acceptable level by construction of WWTP; use of treatment methods with high efficiency and fulfillment of requirements of EU Directive 91/271;
- realization of measures to support water retention, especially in areas suffering on water deficiency, alleviation of negative effects of flood events;
- introduction of measures to decrease drinking water consumption mainly by reducing losses in waterworks, more reasonable handling by consumers, stricter control of and preventive measures for potential accidents;
- introduction of measures to reduce pollution of watercourses and creation of suitable conditions for their revitalization;
- stricter control and reasonable utilization of water sources;
- protection and rational use of water resources;
- reduction of amount of carcinogenic, teratogenic, mutagenic and other harmful substances in waters below defined acceptable level
- enforcement of a complex monitoring and information system.

4.2 Status of Legislation Dealing with Nutrient Control / Reduction

The water sector, respectively nutrient-related legislation is formed by the following acts:

Table 4.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Actually in Force)

(1) Law on Water 138/1973
(2) Governmental Decree 242/1993
(3) Regulation 117/1976 on Slovak Water Management Inspection
(4) Governmental Decree 31/1975 on fines for violation of obligation in the water management area
(5) Governmental Decree 35/1979 on charges in water management area
(6) Law 595/1990 on State Administration for Environment
(7) Ministerial Order 23/1977 on the protection of surface and ground water quality
(8) Ministerial Order 5000/1982 on the protection of water against pollution from agriculture
(9) Ministerial Order 5001/1982 on handling and use of manure
(10) Law 136/2000 on fertilizers

Governmental decree 242/1993 has to be used by water management authorities when issuing permits for discharge of waste water; Annex 1, respectively Annex 2 to this decree provide indicators for:

- Maximum permissible pollution level of discharged municipal and industrial waste water;
- Permissible pollution levels in receiving surface water.

Ambient water quality is dealt with in the Slovak Technical Standard STN 757221 Classification of surface water quality, used exclusively for evaluation from the ecological point of view (not for determination of suitability of water for different water uses).

Water sector-related laws currently in progress are:

(1) Law on Water (including transposition of EU directives 75/440/EEC, 76/464/EEC, 80/68/EEC, 91/271/EEC)
(2) Governmental Decree on maximum permissible pollution of waters

Current environmental legislation, especially regarding effective public participation, has not yet recognized the principles already incorporated in the legislation of western democracies.

4.3 Main Barriers to Policy and Legal Reforms

The main barriers fall into two groups: a) those concerning the process of transposition and implementation of the European Union legislation and b) those concerning the implementation and enforcement of the new legislation and regulations.

The first priority is to make a clear definition of the future competencies of the Ministry of the Environment and the Ministry of Soil Management for the water sector. This is the basic prerequisite for the preparation of a new Water Law, which will constitute the basic legal document in the water sector to be accompanied by other laws and regulations.

- (1) In order to overcome the deficiencies in institutional and administrative capabilities, the following steps are required:
 - Personnel strengthening in the Ministry of the Environment; increase of language capabilities and expertise of personnel to enable adequate transposition of EU Directives into national legislation;
 - Personnel strengthening in state administration on regional and district level to support an adequate enforcement of the new legislation;
 - Harmonization of monitoring, state statistics and preparation of reporting to the EU Commission;
 - Personnel strengthening in the Slovak Environmental Inspection to support adequate enforcement of the existing and new legislation in the environmental sector;
 - Personnel strengthening and strengthening of technical capabilities in the Slovak Hydro-meteorological Institute and in the Slovak Environmental Agency.
- (2) A very critical issue, it seems, involves the weak enforcement of legislation by the concerned authorities on the national, regional and district level, where the number of employees decreased by 32 % in comparison to year 1996. It is envisaged to reach at least again the level of year 1995. The updated Law on State Administration (planned to be in force by the year 2000) will be very important in this context.
- (3) A further critical issue involves the huge financial means required to adjust the national legislation to the EU-Legislation and to secure its implementation. It is estimated that approximately EUR 3,3 - 3,4 billion will be needed in the water sector only, mainly for the implementation of the Urban Waste Water Treatment Directive 91/271/EEC.

4.4 Envisaged Changes of Nutrient-Related Legislation

One of the basic priorities of the Government of the Slovak Republic is accession to the EU. In this context, the highest priority regarding nutrient-related legislation is the transposition and implementation of the relevant EU-legislation. Table 10.4-1 contains a list of the planned activities.

Table 4.4-1: List of planned activities in the process of transposition and implementation of EU legislation related to nutrient control and reduction

Activity	Deadline	Resp.authority
Draft Law on sewage	2002	MSM SR
Draft Law on water and related documents by which transposition of EU directives 75/440/EEC, 76/464/EEC, 80/68/EEC, 91/271/EEC will be ensured	2001	MOE SR
Draft Governmental Decree setting maximum permissible pollution	2001	MOE SR
Assessment and implementation of requirements of Water Framework Directive from the point of view of legislative and organizational competencies and duties of water management authorities/institutions	2001	MOE SR
Preparation of a time schedule of UWWT Directive in relation to investments needed	2001-2002	MOE SR
Identification of investment needed to implement UWWT Directive	2001-2002	MOE SR
Identification of technical and investment projects necessary for implementation of measures ensuring good water quality status and their monitoring in accordance with Water Framework Directive	2002	MOE SR
Identification and evaluation of areas sensitive to eutrophication processes in accordance with UWWT Directive	2002	MOE SR
Preparation and implementation of the Code of good agricultural practice with the purpose to reduce pollution caused by nitrates	2002	MSM SR
Definition of criteria for identification of water pollution by nitrates from agricultural sources (in relation to Nitrates Directive)	2002	MOE SR
Identification of vulnerable areas regarding the Nitrates Directive	2002	MoE SR
Development of Action Programmes in vulnerable areas to ensure protection of waters against pollution from agriculture (in relation to Nitrates Directive)	2004	MSM SR
Implementation of IPPC Directive in water sector (study)	2003	MOE SR

Regarding the issue of detergents, a proposal on methods of control of biological degradability of active substances detergents is planned to be prepared by the end of 2000. The Ministry of Economics is responsible for the preparation of this proposal.

4.5 Schedule for Approximation of National Legislation to EU Legislation

The National Programme for Transposition of Acquis Communautaire constitutes the basis for the definition of the envisaged time schedule as outlined in the table below and the financial requirements for the transposition of the EU legislation.

Table 4.5-1: Schedule for Approximation of National Legislation to EU Legislation

Name of National Law, Regulation	Related EU Directive / Standard	Proposed Period of Adjustment	Proposed Date of coming In Force
(1) Law on Water	75/440/EEC, 76/464/EEC, 80/68/EEC, 91/271/EEC	2002	91/271/EEC will fully be implemented by 2015
(2) Nitrates Directive (Exact name not known)	91/676/EEC	2003	Full implementation by 2008
(3) IPPC Directive	96/61/EEC		Full implementation by 2008

5 HUNGARY

5.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

According to the National Environmental Programme (1997-2002) it is an issue of high priority to decrease nitrate and phosphorous load of protected water resources sensitive to nutrients; these areas are priority areas for WWTP with improved (third degree) treatment standards.

According to the EU guidelines wastewater treatment should adequately be solved in settlements with more than 15,000 inhabitants by the year 2000 and in settlements of more than 2,000 inhabitants by the year 2005. The Hungarian national programme of waste water treatment is designed to fulfill these tasks by the year 2010 (due to financing problems).

The long-term objective of the waste water treatment programme is to achieve 67% of sewage collection and treatment all over the country, with a special emphasis on nutrient reduction at vulnerable water resources.

As approximately half of N and P pollution in the country comes from non-point sources, this is clearly recognized as the main area of concern, requiring substantial improvement.

Due to a lack of public subsidies, nutrient pollution from agriculture has dropped substantially and is currently responsible for not more than 15% of total nutrient pollution in the country. Recently, the use of pesticides and artificial fertilizers has become so low that a further reduction seems very difficult; therefore, the basic objective is to maintain the current levels and to prevent an increase in the future.

In October 1999 the Hungarian Government approved the National Agro-Environmental Protection Programme that was elaborated in accordance with Council Regulation 2078/92/EEC on implementation and support of agricultural practices serving protection of environment and safeguarding of landscape values. The programme contains measures planned for the 2000-2006 period, such as:

- Rationally reduced utilization of fertilizers and pesticides;
- Bio-production;
- Extensification;
- Reduction of density;
- Reinforcement of environmentally friendly methods;
- Conservation of landscape;
- Educational programmes and projects.

There is currently no programme on the national scale specifically related to nutrient removal or reduction. The MoE is, however, responsible for programmes that are closely linked to nutrient removal and reduction either for the whole country or for particular regions. The most important programmes are:

- National waste water collection and treatment programme, aimed at the development of adequate waste water treatment capacities of large cities and settlements according to the requirements of EU legislation between 1997 and 2010;
- Programme to improve the water quality and ecological status of Lake Balaton, including the implementation of Phase II of the Kis-Balaton project;
- Programme on Velence Lake;
- A governmental programme is being designed for the implementation of EU nitrate directive.
- Programme on Great Lowland;
- Programme on water supplement of Mid-Danube-Tisza Region;
- Programme on rehabilitation of oxbow lakes.

Hungary has with all its neighbors bilateral, trans-boundary cooperation agreements that also contain nutrient reduction related issues.

5.2 Status of Legislation Dealing with Nutrient Control / Reduction

The most essential acts currently dealing with nutrient pollution reduction and prevention are compiled in the following table.

Table 5.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Actually in Force)

Name of Law, Regulation	Main Subjects	Effective since
(1) Act no. LIII on General Rules of Environmental Protection	Concept, principles and responsibilities in relation to the environment. Functions and activities of the state and the self-governments. Protection of ground and surface waters.	22 06 1995
(2) Act no LVII on water management	Basic rules, functions and principles of water management. Obligations to water and water facilities. Provision on sewer fine. Obligations for the operating of public utilities.	23 06 1995
(3) 83/1997 Decision of Parliament on National Environmental Programme	Major targets of environmental protection by environmental elements. Tasks to reach the targets planned and proposed programmes.	26 09 1997
(4) 2126/1999 Decision of Government on Action Programme to National Environmental Programme	Tasks and programmes of year 1999.	
(5) 2207/1996 (VII.24.) Government Decision on Waste water disposal and treatment programme for Hungarian settlements		24 07 1996
(6) 3/1984 Decree of President of National Water Authority on waste water fines	Method of calculation of waste water fines. Definition of damaging pollution and the procedure of imposing and utilization of waste water fines.	00 00 1984
(7) 4/1984 Decree of President of National Water Authority on sewerage fines	Prohibits emission of harmful waste water. Regulation of sampling. Method for calculating and paying the charge.	
(8) MSZ12749 Hungarian Standard on quality of surface water; quality characteristics and classification		
(9) 33/2000 Government decree on ground water protection	Protection of ground waters in full accordance with EC 80/68/EEC directive	07.06.2000
(10) Decree of Minister of Transport, Communication and Water Management on Water management council	Regulation of the tasks, contents and field of activity of WM Councils	00 00 1998.

The following eight items, expected to regulate nutrient emissions, are currently in the process of preparation, under the co-ordination of the MoE.

Table 5.2-2: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Currently in Progress)

Name of Law, Regulation	Main Subjects	Date of Coming in Force
(1) Decree of government on surface water pollution control	EU-harmonized regulation; subject outlined in the name of the law.	2001
(2) Ministerial Decree on waste water emission permits	EU-harmonized regulation; subject outlined in the name of the law.	2001
(3) Ministerial Decree on sensitivity of surface waters	EU-harmonized regulation; subject outlined in the name of the law.	2001
(4) Ministerial Decree on water quality classification on ecological basis	EU-harmonized regulation; subject outlined in the name of the law.	2002
(5) Ministerial Decree on surface water quality objectives	EU-harmonized regulation; subject outlined in the name of the law.	2002
(6) Ministerial Decree on good agricultural practice	EU-harmonized regulation; subject outlined in the name of the law.	2002
(7) Ministerial Decree on identification of zones, vulnerable to nitrate pollution, for the protection of ground water	EU-harmonized regulation; subject outlined in the name of the law.	2002
(8) Governmental Decree on protection of waters against N-pollution from agricultural sources	EU-harmonized regulation; subject outlined in the name of the law.	2002

If these decrees should come in force as scheduled, Hungary would dispose of a relatively complete and satisfying legal framework for water management and water pollution control.

5.3 Main Barriers to Policy and Legal Reforms

The main barrier to policy and legal reforms in Hungary is the slow lawmaking process, which is mainly caused by inappropriate structure of the administrative system. The nutrient issue – including detergents – is dealt with in the following ministries:

- Ministry of the Environment,
- Ministry of Transport and Water Management,
- Ministry of Health,
- Ministry of Agriculture and Regional Development,
- Ministry of Economics.

5.4 Envisaged Changes of Nutrient-Related Legislation

- (1) Enforcement of the existing and future legislation concerning N and P removal in waste water treatment in the catchments of sensitive surface and subsurface waters.
- (2) Phosphate-free detergents

In 1996, a PHARE programme was completed on phosphorous subject. The Project no: EU/AR/205/97; Contract no. 95-0036.00 Title: Removal of Phosphate from detergents in the Danube basin.

Experts from 12 DRB countries were involved in this project. According to the findings of this project, criteria for the selection of environmentally friendly detergent products should focus on:

- reduction of the load and impact of detergents to the necessary extent (e.g. criteria on dosage, soluble/insoluble inorganic, aerobic/anaerobic biodegradable ingredients);
- preference for those ingredients undergoing quick and ultimate biodegradation and with aquatic impairments as low as possible, which is considered under the criterion: critical dilution volume;
- non-use of ingredients which are known to have adverse effects on the aquatic environment;
- restriction on ingredients having high figures on acute toxicity and on combinations with low biodegradability and/or accumulation potential;
- consumer should be better informed on the environmental impacts of the products.”

According to the above listed issues, Hungary has not introduced the simplified approach of “phosphate free detergents”, but a more careful classification of detergents with State Standard: pulverous synthetic detergents (MSZ 14604-86).

According to this Standard, detergents fall into the following categories:

- pre-wash: loosen the dirt even in cold water, making washing easier
- hand-wash: neutral, or lightly alkaline chemical reaction, suitable for sensitive to heat, alkaline and easy-to-handle textile materials, gentle hand or machine washing at the temperature of up to 60 C.
- regular: produced in the largest volume, light or medium alkaline products, suitable for washing at the temperature of 30-40 C as well as over 60 C.

Classification of detergents on the basis of phosphorus content by Standards:

Category	Description	P ₂ O ₅ - Content (%)
A	Environment friendly	less than 7%
B	Within safe limit	between 7-15%
C	Maximal allowed quantity	maximal 20%
D	Prohibited	over 20%

Zeolite A is most commonly used for replacing the water softening property of phosphates in P- free detergents The average Zeolite A content is about 20%.

- (3) Introduction of good agricultural practice including reduced use of fertilizers in sensitive areas.

5.5 Schedule for Approximation of National Legislation to EU Legislation

With decision No. 2280/1999. (XI.30.) and amendment No. 2140/2000 (VI.23) the Hungarian government has established a binding schedule for approximation of the national legislation to the EU-legislation, with the end of 2002 set as the deadline for completing the approximation.

Regarding nitrate/phosphorous reduction, the national legislation will be completed with new laws fully in line with the requirements of the respective EU-Directives:

Table 5.5-2: Schedule for Approximation of National Legislation to EU Legislation

Name of National Law, Regulation	Related EU Directive / Standard	Period of Adjustment	Date of coming In Force
(1) New regulation	EC 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources	2000-2002	2003
(2) New regulation	EC 73/404/EEC on biodegradability of detergents	2000-2002	2003
(3) New regulation	EC 73/405/EEC on establishing monitoring methods for anionic surfacants	2000-2002	2003
(4) New regulation	EC 82/242/EEC on establishing monitoring methods for non-anionic surfacants	2000-2002	2003
(5) New regulation + amendments	Water Framework Directive	2000-2002	2003
(6) New regulation + amendments	EC 91/271/EEC on urban waste water treatment	2000-2002	2003
(7) 33/2000.(III.17.) Gov. Decree on protection of quality of ground water	EC 80/68/EEC on protection of ground water	1998-2000	07.06. 2000

Taking into account the significant improvements achieved during the previous few years, it is expected that Hungary - one of the priority candidates to join the EU before the year 2005 - can successfully achieve the required harmonization of the national environmental legislation with the EU legislation in time, especially if this ambitious task is further supported by international co-funding.

6 SLOVENIA

6.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The most recent document in which objectives, priorities and principles of the state environmental policy are defined is the National Environmental Action Plan, and a more detailed action plan, i.e. the National ISPA Strategy of the Republic of Slovenia: Environmental Sector (1999).

From the NEAP, the following main policy principles can be summarized:

- Slovenia has to adapt its environmental protection system to meet the EU requirements;
- The adoption of the EU legal issues regarding the environment is not only an obligation but also an opportunity to solve the environmental problems faster;
- The alignment with EU environmental policy is an opportunity to introduce changes to the production and consumption patterns;
- The expected negative effects of Slovenia's approximation to the EU have to be controlled;
- Transitional periods and additional funds have to be ensured for certain sectors or tasks, e.g. UWWTD, IPPC, etc.

The main objectives as formulated by the National Water Programme are as follows:

- Formulation of principles for sustainable water management;
- Implementation of integrated water management;
- Creation of regional institutions and enterprises to manage water quality and quantity;
- Development of a financial system to support the water management strategy;
- Development of inspection and control systems;
- Development of an information system on water economy.

6.2 Status of Legislation Dealing with Nutrient Control / Reduction

(1) Relevant laws and regulations currently in force

In the field of pollution reduction, MESF in 1993 drafted the Environmental Protection Act (EPA) which played a major role in the modernization of the perception of the environment by all stakeholders. Nowadays, it needs some amendments that will be passed together with the Water Act (Water Law) which is expected to come into force in summer/autumn this year. Along with these two umbrella laws, a list of subordinated regulation has been made since. The most important ones are: (i) the Slovenian Urban Waste Water Treatment Directive with accompanying sub-directives regarding different types of industries and wastewater, and (ii) the Slovenian Nitrates Directive.

Table 6.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Currently in Force)

Name of Law, Regulation	Authority Responsible	Main Subjects	Effective since	Main Deficiencies
(1) Environmental Protection Act, EPA	MESP	umbrella law for the environment	(OJ RS, 32/93).	needs to be reviewed due to EU WFD and SI Water Act
(2) National Environmental Action Programme, NEAP	MESP	concrete measures up to 2003, programme up to 2008	September 1999	not specific enough
(3) Emission regulations	MESP	limit emissions in terms of concentration and mass load for WWTP's and diverse industries	Subsequently from 1996	OK, in compliance with Annex III of EU UWWTD 91/271/EEC
(4) Nitrates Directive	MESP	limit loads of nutrients and dangerous substances into soil	(OJ RS 68/96) November 1996	as in EU difficult to follow compatible to EU Nitrates Directive 91/676/EEC
(5) Water taxation	MESP	taxation for pollution, increases tax each year	Start in 1995	money goes to the state budget rather than to water sector
(6) EIA	MESP	Environmental impact assessment	2000	OK

(2) Relevant laws and regulations in progress

The most urgent regulation is the Water Act, which was supposed to come into force already two years ago. It is now finally being debated in the Parliament and is expected to come into force in summer/autumn 2000. Similarly, the Slovenian Integrated Pollution Prevention Directive is being prepared; due to the great economic impact on the industry it will probably need an implementation period until the year 2011.

The Decree On Water Pollution Tax is amended each year raising the unit price for pollution. Its progressive rise is an incentive for polluters to take care of their pollution either to reduce it by change of technology or to remove it from waste-water by WWTP.

In agriculture, there is a need to systematically review the agricultural practices in order to reduce nutrients release/washout into the environment.

Table 6.2-2: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Currently in Progress)

Name of Law, Regulation	Authority Responsible	Main Subjects	Date of coming In Force	Main Deficiencies
<u>(1) Water Act</u>	MESP	Umbrella law for water, corresponding to EU WFD	Summer 2000	not totally compatible with EU WFD
(2) Water Act	MESP	Definition of vulnerable zones	Summer 2000	OK
(3) Sensitive zones	MESP	Definition of eutrophic zones	Autumn 2000	weak definition in EU
(4) Urban agglomerations	MESP	Defines urban agglomerations for UWWTD	Autumn 2000	weak definition in EU
(5) IPPC	MESP	Integrated pollution prevention	2000	
(6) WFD	MESP	Covers issues from EU WFD	2000, or 2001	regional government is not established yet, no provision for RBM

(3) Main deficiencies

There are certainly no substantial deficiencies in the newly accepted regulations, although some of them are not fully compatible with the existing or future EU legislation. However, it is to be expected that given its restricted financial resources Slovenia will not be able to fulfill all the requirements of the new legislation by the time of the envisaged accession to the EU.

6.3 Main Barriers to Policy and Legal Reforms

Main barriers are listed in the National Environmental Action Programme (NEAP) of 1999.

(1) Main barriers to policy reform:

- Lack of adequately trained personnel at governmental level;
- Slow planning and decision making processes;
- Insufficient binding;
- Apparent lack of consistency;
- Excessive administrative apparatus.

(2) Main barriers to legal reform:

- Lack of adequately trained personnel at governmental level;
- Slow response to necessary changes;
- Legal provisions based on threats rather than rewards.

6.4 Envisaged Changes of Nutrient Related Legislation

(1) Proposed changes of relevant laws and regulations

The most urgent changes have basically been done. The UWWTD and the Nitrates Directive were introduced in 1996; the Water Act and amendments to the EPA are now expected to come into force. No explicit changes to nutrient control or reduction are expected, as the decrees already satisfactorily reflect the corresponding EU legislation. Only the agricultural sector has still to provide guidelines and regulations for sustainable agriculture.

(2) Proposed schedule for out-phasing of P-containing detergents

Slovenia is in the favorable position that the EU market has already forced industry to abandon P-containing detergents. The detergents Slovenia imports are also P- free.

6.5 Schedule for Approximation of National Legislation to EU Legislation

Due to the enormous costs associated with complying with the UWWTD (approximately 50% of all environmental costs!), Slovenia is not able to fulfill the requirements in a short time. As part of integrated water management policy, the Operational Programme for Urban Wastewater Collection and Treatment With the Water Supply Projects Programme (Ur. l. RS, 94/99) has been adopted. It determines the schedule for the implementation of measures (programmes and investments) included in the National Environmental Action Programme. The register of agglomerations - areas where the population and/or economic activities are sufficiently concentrated for urban wastewater to be collected and conducted to a public wastewater treatment plant - has been drawn up, and data on industrial waste water have been collected, as laid down in Annex III to the Directive. The final date for compliance with the EU UWWTD is scheduled for the end of 2015.

Table 6.5-1: Schedule for Approximation of National Legislation to EU Legislation

Name of National Law, Regulation	Related EU Directive / Standard	Proposed Period of Adjustment	Date of Coming in Force	Final Status of Compliance
(1) Urban Wastewater Treatment Directive, UWWTD	Urban Wastewater Treatment Directive, UWWTD	until 2015	1996 stepwise	until 31.12.2015
(2) Nitrates Directive	Nitrates Directive	until 2001	1996 stepwise	until 2001
(3) Agricultural practices	2078/92 and the Nitrates Directive	Unknown	Unknown	unknown
(4) IPPC	MESP	Integrated pollution prevention	2000	30.09.2011

7 CROATIA

7.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

According to the National Water Pollution Control Plan of January 1999, the overall objective for water pollution control is to protect the environment and life and health of people by providing adequate water for different purposes of utilization.

The priorities regarding water pollution control and water management are ranked as follows:

- Preservation of water resources which are still clean (i.e. upstream river stretches of quality class I and groundwater) as future drinking water resources;
- Avoidance of further degradation of the current water quality;
- Restoration or removal of sources of pollution concerning existing or planned drinking water resources, as well as other resources where water is used for different human and economic purposes (usually water resources of class II or III);
- Strengthening the monitoring of sources of water pollution or potential accidental emergencies.

The objective of the National Water Pollution Control Plan is that water shall be managed in accordance with the principle of integrity of the river system and the principle of sustainable development.

The National Water Pollution Control Plan includes the following principles: (i) precautionary principle, (ii) the use of BAT, (iii) control of the pollution at source, (iv) the *polluter pays* principle, and (v) commitment to regional cooperation and shared information among the neighboring countries.

Regarding municipal WWTPs, the priorities are defined as follows:

- WWTPs > 50000 PE: in this category there are 29 WWTPs to be newly constructed or extended for improved treatment standards (biological treatment, N+P elimination);
- WWTPs > 10000 PE in sensitive areas (to be implemented by the year 2005);
- WWTPs > 15000 PE (to be implemented by the year 2010);
- WWTPs between 2000 and 15000 PE (to be implemented by the year 2025).

7.2 Status of Legislation Dealing with Nutrient Control / Reduction

Due to the fact that Croatia has been an independent state only since 1990, its legal and institutional structures are still in the process of transformation, which also applies to the fields of water management and environmental protection. The most essential laws and regulations dealing with nutrient reduction are:

- The Water Act, which provides a framework for new regulations in the fields of water pollution control and water quality control in compliance with the EU regulations and the relevant international conventions;
- Water Management Financing Act (No 10795);
- Ordinance on Water Classification (No 77/98);
- Ordinance on Hazardous Substances in Water (No 78/98);
- Regulations on the issuing of water management consents and permits (No 28/96);
- National Water Pollution Control Plan (8/99);
- Regulation on the discharge of hazardous and other substances into water (No 44/99).

Ordinance No 77/98 on water classification defines: (i) water quality related to maximum allowed values of specific groups of water quality indicators, (ii) methods of sampling and analyzing and methods of defining and presenting water classification, (iii) ambient quality standards.

Ordinance 78/98 on water-related hazardous substances defines, beside others, two groups of substances:

- Group A - substances that are forbidden to be discharged into waters;
- Group B – substances that can be discharged into waters but only at maximum permissible levels; regarding nutrient reduction in group B are regulated: (i) biological non suspended detergents and other surface active substances; (ii) inorganic phosphorus compounds and elementary phosphorus, and (iii) inorganic nitrogen compounds and elementary nitrogen.

Regulation on maximum allowed concentrations of hazardous substances in waste waters defines effluent standards as follows:

- For total phosphorus, ortho-phosphates, ammonia, nitrites, nitrates, total nitrogen for discharging of waste water in categories II, III, IV, V of planned water classes (discharging of waste water to category I is forbidden);
- For waste water quality from municipal sources (SS, BOD, COD total P, total N) dependent on size of WWTP (PE), and water categorization (planned class), respectively sensitivity of the recipient.

The main deficiency underlying all legislation regarding nutrient control and reduction is that legislation is primarily oriented to point-sources pollution. The issues of diffuse pollution are regulated very generally (only basic principles).

Particular deficiencies in comparison to EU-legislation and standards exist in relation to EU Nitrates Directive. Related to Water Framework Directive and Urban Waste Water Directive, the national legislation complies with more elements than in the case of the Nitrates Directive.

Regarding the out-phasing of P-containing detergents there is no existing or planned regulation. But according to the regulations of the Water Act, water management permits have to be issued for chemicals and their derivatives which get into water after use. That is the only existing mechanism that can be directly used regarding P-containing detergents. The existing mechanisms which can indirectly be used regarding P-containing detergents are ambient quality standards and effluent standards which are regulated in the following ordinances and regulations: (i) Ordinance on water classification, (ii) Ordinance on water related hazardous substances, (iii) Regulation on maximum allowed concentrations of hazardous substances in waste water.

Mechanisms for the implementation of the legislation (especial financial mechanisms) are not completely developed. Regulations for calculation of water pollution charges and definition of charging levels are currently in the status of preparation and are expected to become effective in 2000.

7.3 Main Barriers to Policy and Legal Reforms

The main barriers to policy and legal reforms can be summarized as follows:

- Environmental protection, respectively water protection is not considered as a top priority in Croatia. As in the past, this issue continues to be neglected and mechanisms for environmental protection are not developed.
- Due to the bad economical situation and due to the basically improved environmental conditions (mainly resulting from decreased industrial and agricultural production) it is difficult to convince the responsible officials about the necessity to spend for environmental protection the money that is urgently needed for other developmental tasks.
- There is a significant lack of administrative and institutional capabilities; particularly regarding local community authorities and particularly in the less developed rural areas. In other words, a task assigned to the authorities of a local community can only be executed with assistance from the state administration.

7.4 Envisaged Changes of Nutrient-related Legislation

Since the Republic of Croatia became an independent country, legislation related to water management/pollution control has been changed. These changes are in the final phase on the state level; the coming task for the state administration will be to assist the local authorities by establishing necessary legislation/regulations on the local level and to improve and develop the mechanisms for the implementation of the legislation.

The main changes that have to be considered in the near future are supposed to result from the approximations of the national legislation to the EU legislation.

There are currently no explicit plans for nutrient-related changes in the legislation. The existing legislation requires particular tasks to be fulfilled which will definitely need changes, respectively the development of new nutrient-related legislation; these tasks are: (i) Revision of the monitoring system, (ii) Water Management Master Plan for Croatia and County Master Plans, (iii) County Water Pollution Control Plans, etc.

There is currently no concrete programme or schedule for control, respectively out-phasing of P-containing detergents.

7.5 Approximation of National Legislation to EU Legislation

Until now the Government of the Republic of Croatia has not yet established a National Programme for EU-accession. In January 1999, the government officially addressed the responsible ministries and state directorates asking them to research the possibilities for approximation of the national legislation to the EU legislation, including water management and control issues. Partial approximation has already been accepted, but there are no systematic plans for fulfilling this crucial task. The actual status can be outlined as follows:

- Water Framework Directive
 - * The approach of this Directive seems basically accepted for incorporation into national legislation (river basin approach, river basin districts, river basin management plans, public information and consultations, programme of measures).
- Nitrate Directive
 - * This Directive is only accepted as “issue” which has to be taken into consideration, but not in a systematic way.
 - * Regulation on the protection of agricultural land against pollution from hazardous substances defines (i) substances that have to be considered as hazardous for agricultural land, (ii) maximum allowed quantities of these substances in the soil, (iii) measures for soil protection in order to protect agricultural land for the production of healthy food.
- Urban Waste Water Directive
 - * This Directive is basically accepted; what currently still remains to be fully accepted is a binding time schedule for implementation, strict obligations related to tertiary treatment (only in sensitive areas), and strict standards regarding waste water control (frequency of sampling, methods of analyzing, water quality indicators); issues related to sludge treatment have basically been accepted but not regulated in detail.
 - * The national effluent standards take into account the standards of the Urban Waste Water Directive.

There are no explicit plans for a full approximation of nutrient-related national legislation to the respective EU Directives. At the same time, it is obvious that these plans will have to be defined within a very short time, but more detailed information can not be provided at this point.

8 BOSNIA-HERZEGOVINA

8.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

Since the Dayton Peace Agreement of 1995, the Republic of Bosnia-Herzegovina has consisted of two entities: the Federation of B&H and the Republic Srpska. Both entities have their own policies and legislation regarding the management and protection of water resources, but they share some common principles, i.e.:

- water is a public good;
- water is a limited natural resource which has to be used rationally within the limits of recoverability, both in quantity and quality;
- water management and protection is a joint task of all institutions, companies and individuals dealing with water.

Generally, B&H is faced with big economic and social constraints. In such a situation it is very difficult for policy-makers to develop long-term objectives with priority to environmental protection and management. Lack of coordination and cooperation between the ministries and authorities responsible for environmental issues constitutes the main obstacle to efficient and fast legislative preparation and adoption.

Until now, there have been no explicitly formulated policy objectives, priorities or programmes on water protection in general and on nutrient control / reduction in particular.

8.2 Status of Legislation Dealing with Nutrient Control / Reduction

Since the declaration of the new constitution in 1994, environmental legislation is still in the constitutional phase.

Responsible ministries in both Entities have prepared draft Environmental Laws; as it was recognized that the draft laws were not in accordance with the principles of the EU legislation. OHR terminated their adoption.

Laws on Physical Planning that are currently enforced in both Entities of B&H, address the issues of urban planning, environment protection and land, water and air protection, while the Water Laws, different for both Entities, deal with water management issues.

The Federal Water Law seems to be mainly focused on the establishment and financing of Public Companies for Watershed Areas (PWCAs) for the Sava River and the Adriatic Sea catchment areas. The Water Law does not contain sufficient provisions on permits, legal procedures, international standards and conditions for water use. In consequence, it fails to provide an effective basis for water regulation. The main deficiencies include a strong concentration of the PWCAs and insufficient alignment to EU principles, particularly those relating to an integrated environmental approach to river basin management.

Besides the Regulation on Harmful Substances not to be Discharged into Waters, there are no explicit legal provisions or standards within the current legislative directly or indirectly dealing with nutrient control and reduction.

The existing legislation does not contain any binding provisions on out-phasing P-containing detergents. The only detergent producing factory in B&H is currently using both zeolite and phosphorus components in its products. It is left to the producers to use the ingredients they prefer, but they are advised to use environment-friendly ingredients such as zeolite.

Table 8.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction

Name of Law, Regulation	Main Subjects	Effective since
(A) Currently in force		
(1) Law on Physical Planing	Urban planning, environmental protection and land, water and air protection	April, 1987
(2) Water Law	Water management	May, 1998
(3) Regulation on Hygienic Accuracy of Drinking Water	Drinking water standards	May 1987, rev. 1991
(4) Regulation on Harmful Substances not to be Discharged into Waters	Threshold values for harmful substances not to be discharged	January, 1966
(5) Regulation on Types, Manner and Scope of Measurement, Investigation of Used and Discharged Polluted Water	Wastewater quality standards, method for analysis and taxation mechanisms	December 1998
(B) Currently in progress		
(1) Regulation on Threshold Concentrations of Harmful and Dangerous Materials that May be Found in Process Waters		In progress
(2) Regulation on Threshold Concentrations of Harmful and Dangerous Materials that may be Discharged to the Recipient after Treatment		In progress
(3) Regulation on Threshold Concentrations of Harmful and Dangerous Materials that may be Discharged onto Agricultural Land		In progress

8.3 Main Barriers to Policy and Legal Reforms

During the previous decade of dramatic changes, no progress was made in the development of the national legal system in general or the legal system for environmental protection in particular. Lack of efficient coordination and cooperation between the two entities' environmental authorities and poor cooperation between provincial and local authorities responsible for environmental development and planing are considered to be the major barrier to policy and legal reforms. The issue of establishing better cooperation among environmental authorities in B&H has for some time been on the political agenda of B&H and the European Commission representatives in B&H.

The main problems and deficiencies can be summarized as follows:

- (1) Regulatory and institutional deficiencies/problems
 - environmental legislation and policy is not harmonized and integrated at the country level;
 - framework environmental laws at entity level do not exist;
 - bodies/agencies for integrated coastal and river basin management do not exist;
 - weak vertical co-ordination in the Federation of B&H;
 - weak inter-entities institutional co-operation;
 - shortage of qualified expert staff and education;
 - shortage of basic data on human activities and human resources;
 - inadequate monitoring of water quality and quantity;
 - weak public participation in decision making process.

- (2) Environmental deficiencies/problems
 - uncontrolled discharging of municipal and industrial waste water into surface waters;
 - shortage of waste water treatment plants;
 - uncontrolled disposal of solid waste - unsanitary dumping sites and illegal landfills;
 - uncontrolled flood risks;
 - ecosystem degradation;
 - loss of biological diversity, endangered species and habitats;
 - shortage of modern intensive agricultural production;
 - inadequate use of available water resources.
- (3) Social/economical problems
 - unemployment and low living standard of the population;
 - significant decrease in national and especially international tourism;
 - destroyed industrial facilities,
 - significantly reduced agricultural production and livestock farming.
- (4) Public participation
 - public participation in environmental matters is the key to successful implementation of an appropriate environmental strategy;
 - public awareness of environmental problems and interest in solving these problems do not currently exist;
 - active public participation in environmental policies has to be encouraged; non-governmental environmental organizations have to be supported; environmental information and its dissemination through the mass media have to be improved.

8.4 Envisaged Changes of Nutrient-Related Legislation

For the time being, there are no explicit plans for nutrient-related changes in legislation; but the adoption of the new environmental law is urgently awaited.

Since the envisaged harmonization of the national legislation with EU legislation will automatically lead to the elaboration and adoption of laws and regulations on nutrient control and reduction, this procedure is considered as a high priority for the current year.

There are currently no explicit plans for control, respectively out-phasing of P-containing detergents.

8.5 Approximation of National Legislation to EU Legislation

The country as a whole is deeply committed to approaching EU standards, but in order to do so it must first fulfill at least the minimum preconditions required for an appropriate management and monitoring of the environment at the national level.

Drawing up and adopting the Framework Environmental Law is a prerequisite for B&H to establish an efficient environmental management and protection system and to become a member of the EU and other international organizations. During 1999, the Terms of Reference were prepared and the finalization of this Law is expected within the current year.

It is clearly recognized that the existing laws are not harmonized with the EU principles and should therefore be modified. Within the current reforms in the water and environment sector in B&H, the EC will through the EC Environmental Programme for B&H provide technical and financial assistance for the elaboration of Laws on Water Protection, Laws on Solid Waste, Laws on Nature Protection, Laws on Air Protection, and Laws providing a comprehensive framework for environment licensing for both Entities. The drawing up of sector laws will be based on the Framework Environmental Law guidelines and is planned to start within the current year.

A concrete time schedule for approximation of national legislation to EU legislation in terms of pollution control / reduction has not yet been established.

9 YUGOSLAVIA

9.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The general policy objectives, priorities, and principles for nutrient control and reduction are laid down in the Resolution on the Environment Protection Policy adopted by the Federal Government, and can be summarized as follows:

- Creation of a basis for the development of a humane society in the Federal Republic of Yugoslavia which will continue to develop on a permanent basis in conformity with nature, bearing in mind the right of the future generations to satisfy their needs on the same or a higher level;
- Creation of conditions for the preservation and rational use of natural resources and prevention of their degradation; prevention of uncontrolled pollution and further degradation of the environment, and elimination of the consequences of earlier pollution and degradation of the environment;
- Management of the environment in a manner conducive to the protection and improvement of human health;
- Development of an integral system of protection and improvement of the environment and quality of life, improvement of the existing system of protection of the environment and provision of an institutional frame for effective operation of that system;
- Gradual enforcement of the *polluter pays* principle on the basis of regulations applicable to the country as a whole;
- Creation of conditions for the development of pollution control methods suited to the peculiarities of the country and its attained level of development;
- Preservation of a “satisfactory” ecological balance in the country and participation in the protection of the biosphere;
- Prevention of the import and transfer of hazardous matters and so-called “dirty” technologies.

Most of these objectives and principles indirectly relate to nutrient control and reduction.

Concerning water pollution control, the above mentioned objectives are to be reached by the following means:

- further development of integral River Basin Management;
- further development of “polluter pays” principle and strict implementation in the practice;
- further development of market mechanisms in Water Sector;
- implementation of strict regulations;
- construction of new WWTPs;
- renovation of industrial capacities and replacement of old facilities and technologies by environment-friendly ones;
- strengthening of monitoring system and inspection;
- strengthening of research, education and training.

All these measures will not only improve the water quality of recipients in general but also reduce nutrient emission. With the construction of the planned municipal WWTPs based on biological treatment and proper operation, an average removal of Nitrogen and Phosphorous of 15%, respectively 25% can be anticipated.

International cooperation in the field of environmental protection was very intensive and rather successful before sanctions were imposed on the Federal Republic of Yugoslavia. FR YU has ratified 51 international treaties relating to the issues of the environment thus showing its readiness to cooperate.

9.2 Status of Legislation Dealing with Nutrient Control / Reduction

The legal framework for environmental protection and the protection of water resources and aquatic ecosystems is created by federal and republican regulations. The Federal and Republican constitutions stipulate the responsibilities of the Federal level and the Republican level for environmental protection issues.

The general characteristic of the legal system of the Federal Republic of Yugoslavia, which also exerts influence on environmental protection, is a maladjustment of its elements, i.e. a discrepancy between the republican constitutions and the federal constitution. The system does provide mechanisms for the removal of these discrepancies, but they have not been sufficiently used so far. Therefore, it is reasonable to expect that these discrepancies in the system will be regulated in the near future. This calls for coordinated activities between the republics, which fully-developed systems of environmental protection, and the federation, which is authorized to lay down the fundamentals of the system of environmental protection. In addition, the federal state, as a legal entity in international law, has the right to sign and ratify international treaties and agreements.

It should be pointed out that numerous regulations relating to water management (especially by-laws) were adopted a long time ago, that they were frequently amended and that it is necessary to revise them.

There are at present no laws or regulations explicitly related to nutrient control and reduction, but there are some appropriate mechanism in use (issuing of Water Consent, approval of Environmental Impact Assessment Studies).

Regarding nitrogen and phosphorus emissions, there is a system of use-related criteria, regulations and standards for recipients. Effluent standards have not yet been established.

Maximum permissible levels for nitrogen (ammonia, nitrates, nitrites) concentration in the recipients are related to different water classes as in other countries and are relatively strict.

Maximum permissible levels for Phosphorous are not regulated in the federal legislation but are indirectly defined by oxygen saturation indicators for the different water classes.

Although the maximum permissible levels for Phosphorous in recipients are not prescribed by regulations, the State Service has been monitoring the concentration of Phosphorous in the rivers for a long period so that it was possible to compute the P-mass balance and changes of P-mass flow in the rivers within the Danube Basin in FR Yugoslavia.

9.3 Main Barriers to Policy and Legal Reforms

The main barriers to sector policy reform are:

- unstable economic and political situation;
- lack of funds.

The main barriers to legal reform are in addition:

- Lack of sectoral and regional consensus on the environmental issue;
- Lack of finance to support the urgently required revision of the existing legal framework.

9.4 Proposed Changes of Nutrient-Related Legislation

(1) Proposed changes of relevant laws and regulations

There is currently no new legal document dealing with the issue of water pollution control in general or with nutrient control/reduction in particular.

There is a substantial need to revise the legal framework related to environmental protection in general and to water protection, respectively nutrient control and reduction, in particular, in order to achieve an utmost approximation to the requirements of the EU-Legislation.

A thorough proposal for the required changes of relevant regulations could only be done on the basis of a serious study of this issue.

(2) Out-phasing of P-containing detergents

The consumption of detergents in FR of Yugoslavia is about 52 000 t/y. There is no production of P-free detergents in FR YU. In the past, the main producers have tried to establish a production of detergents based on zeolites (instead of polyphosphates) but no serious improvement was made.

For the time being, there is neither a plan nor a schedule for the out-phasing of P-containing detergents. It is left to the producers to decide what kind of detergents they will produce depending on their capabilities and availability of raw materials under the current circumstances. Therefore, there is also no analyses or estimate of the cost of introduction of P-free detergents.

9.5 Schedule for Approximation of National Legislation to EU Legislation

Although FR Yugoslavia is not seen as a candidate to access EU in the next decade, there is a general statement of the Federal Government that each new legal document has to be approximated as much as possible to the EU regulations.

Under the current political circumstances there is no real motivation for serious and urgent work for harmonization of the national legislation with EU legislation, which means that this will probably be done case by case under pressure from the need for new regulations.

For the time being, there is no schedule for approximation of the national legislation to the EU-legislation.

10 BULGARIA

10.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The MOEW carries out the government policy for integrated water management and sustainable water use aimed at meeting the demand and preserving the water resources for future users.

The environmental policy currently implemented by the Ministry of Environment and Waters, includes reduction and prevention of nutrient pollution. It is designated to:

- EC Accession Partnership and Implementation of the National Programme for the Adoption of the Acquis (NPAA);
- Government Programme 2001;
- Environmental Strategy for ISPA;
- National environmental sector strategies and programmes;
- National sector strategies and programmes; and
- fulfilling obligations under the Conventions for the Protection of the Danube River and the Black Sea.

There are several policy documents, but no one especially for nutrient reduction.

The recently developed national programme for Priority Construction of Urban WWTPs in Bulgaria was adopted by the Council of Ministers in 1999.

The objective of this programme is to establish priorities by river basin for the construction of urban WWTPs for all settlement areas in the country with over 10,000 equivalent inhabitants, as well as national short-term priorities until 2002. It includes completion, construction, reconstruction, extension and modernization of the existing urban WWTP, as well as the design and construction of new urban WWTPs. All proposed projects are within the scope and correspond to the requirements of EC Directive 91/271/EEC.

10.2 Status of Legislation Dealing with Nutrient Control / Reduction

The harmonization of the national legislation regarding water and solid waste management, ecology, health and the procedures for environmental impact assessment with international regulations and standards was started in 1990 and is an ongoing process. Up to now, the complex system of environment and water-related legislation has obviously not been made fully compatible and suitable for adequate control and management of the serious environmental problems faced by the country.

As the existing legislation in the water sector does not sufficiently correspond to the requirements of the EU legislation, a specific programme for a harmonization of the national legislation with the EU legislation has been launched.

In July 1999, a new water act was adopted by the parliament and put in force on 28 January, 2000. This water act introduces the guiding requirements of the EU Water Framework Directive and provides the framework for introducing sub-ordinate directives. It provides the basis for an integrated water resources management and sustainable use, including the protection of water from pollution. The Law regulates property rights over waters, water-economic systems, equipment and works. The water management is realized: (i) on the national level by the Council of Ministers and the MOEW, (ii) on the basin level by the River Basin Directorate.

It is expected that - with the introduction of particular laws and regulations – a complete approximation to the relevant EU directives will be achieved in the short term.

Table 10.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction

Name of Law, Regulation	Main Subjects	Effective since
(A) Currently in force		
(1) Environmental Protection Law	Environmental management	1991
(2) Regulation No 4	This Regulation sets certain conditions, procedures and requirements for Environmental Impact Assessments as provided for in the Environment Protection Act	7 July, 1998
(3) Water Law	This Law provides the activities for integrated water resources management and their sustainable use, including the protection of water from pollution. The Law regulates property rights over waters, water-economic systems, equipment and works. The water management is realized: (i) on the national level by the Council of Ministers and MOEW, (ii) on the basin level by the River Basin Directorate.	28 January, 2000
(B) In progress		
(1) Draft Law for Water Users Associations	It will regulate the establishment and competence of these associations. The law will set the rules for the exploitation of water and the use of drainage systems by the Water Users Association.	Not yet adopted

The currently adopted standards with respect to nutrient control / reduction are laid down in the following regulations:

- Regulation No 7 for the ambient water quality permissible limits;
- Regulation No 8 for the Black Sea water quality permissible limits;
- BDS 2585 - Bulgarian State Standard for drinking water quality.

A particular problem in this context is that the currently adopted ambient water quality permissible limits, which are even stronger than the EU standards, are not achievable.

10.3 Main Barriers to Policy and Legal Reforms

The main barriers to policy and legal reforms can be summarized as follows:

- Continuous transition period from planned to market-oriented economy;
- Low economic capabilities and high investment needs for further economic development;
- Lack of adequate funds;
- Social problems, especially in rural areas;
- Lack of a particular National Nutrient Pollution Reduction Strategy;
- Lack of administrative and institutional capabilities for the enforcement of EU principles and implementation of the integrated water management approach;
- Weak enforcement due to insufficient resources (staff numbers, motivation, training, equipment);
- Lack of a concept for tertiary treatment of municipal wastewater as „sensitive areas“ in the sense of the Urban Wastewater Directive have not yet been defined; according to the experts of the MOEW at least the Black Sea WWTPs require tertiary treatment (nutrient removal);
- Good agricultural practices are not pursued due to lack of knowledge, continuous agrarian reform and lack of investment means;
- Lack of control of the use of livestock waste (manure/slurry);
- Lack of public awareness, and support for necessary nutrient control initiatives.

10.4 Envisaged Changes of Nutrient-Related Legislation

Beside the ongoing process of harmonization of the national legislation with the EU legislation, there are currently no concrete plans for changes in nutrient-related legislation.

There is currently no explicit programme or schedule for the control, respectively out-phasing of P-containing detergents; plans are currently in the stage of preparation.

10.5 Approximation of National Legislation to EU Legislation

The proposed schedule for the approximation of the national legislation to the EU legislation in terms of pollution control is in accordance with the state institutions schedule in all sectors. According to the proposed schedule, national nutrient-related legislation is expected to comply by the end of the year 2000 with the following EU Directives: (i) Draft Water Framework Directive, (ii) Nitrates Directive, (iii) Urban Waste Water Treatment Directive, (iv) other directives which are not so relevant with respect to N and P control / reduction. The national laws and regulations are envisaged to be in full compliance with the requirements of the EU Directives after an envisaged transition period of two to six years.

Table 10.5-1: Schedule for Approximation of National Legislation to EU Legislation

Name of National Law, Regulation	Related EU Directive / Standard	Period and status of adjustment
(1) Regulation on survey, use and protection of ground water	Directive EC 80/68/EEC concerning the protection of ground water and Directive EC 76/464/EEC concerning dangerous substances	31.12.2000 full
(2) Regulation on the quality of water intended for human consumption and household purposes	Directive EC 98/83/EEC on the quality of water for human consumption and household needs	31.12.2000 full
(3) Regulation on the quality requirements for the surface water intended for human consumption and household purposes	Directive EC 75/440/EEC	31.12.2000 full
(4) Regulation on protection of water from pollution with nitrates from agricultural origin	Directive EC 91/676/EEC on protection of water from pollution with nitrates from agricultural origin	31.12.2000 full
(5) Regulation on the quality of fish and shellfish waters		31.12.2000 full
(6) Regulation on the categorization of the waters	Draft Framework Directive EC COM 97(49), Directive EC 76/464/EEC, Directive EC 91/271/EEC concerning urban waste water	31.12.2000 full
(7) Regulation on the quality of the coastal waters	Directive EC 79/923/EEC, Directive EC 91/271/EEC	31.12.2000 full
(8) Regulation on the emission norms for admissible content of harmful and dangerous substances in waste waters discharged into water objects	Draft Framework Directive EC COM 97(49), Directive EC 76/464/EEC and daughter directives; Directive EC 91/271/EEC	31.12.2000 full
(9) Regulation on issuing permissions for waste water discharges in water objects and determination of individual emission limitations in the point sources of pollution		31.12.2000 full

11 ROMANIA

11.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

In Romania, the Ministry of Waters, Forests and Environmental Protection (1990) plays the leading role in water management. A National Company called Romanian Waters, established in 1999, is responsible for the national strategy of water management implementation. The drinking water supply, waste water treatment, waste disposal and sewerage network are the responsibility of municipalities.

The most relevant objectives for water pollution reduction can be summarized as follows:

- Reducing nitrates, organic substances and pesticides;
- Decreasing the amounts of heavy metals and highly degradable organic compounds in sediments;
- Reducing BOD₅, N and P emissions from WWTPs;
- Controlling diffuse pollution.

The strategic directions, which are to be followed up by structural and nonstructural projects and measures proposed for pollution reduction, include:

- Gradual development of municipal waste water treatment capacities;
- Gradual development of waste water treatment in the agricultural sector;
- Gradual development of waste water treatment in the industrial sector;
- Integrated management of water resources;
- Abatement of risks related to accidental pollution and natural calamities;
- Ecological reconstruction.

In the transboundary context, Romania ratified a series of international conventions and declarations, such as: Bucharest Declaration (1985), Protection of the Transboundary Waters Convention (1995), Black Sea Convention (1992), Danube River Protection Convention (1995) and others.

11.2 Status of Legislation Dealing with Nutrient Control / Reduction

Environmental and water-related legislation is currently undergoing a process of transformation. The reorganization of the legislation framework reflects the need to manage all the natural resources as part of an integrated system and strategy, which involves cooperation between all relevant authorities and institutions on the different administrative levels.

The Frame Water Law (107/1966), which provides a framework of technical regulations for water pollution reduction and water management, and the Law on Environmental Protection (137/1995), which comprises special provisions for water protection, are in the process of being upgraded and revised. The same applies to a series of norms and standards.

Table 11.2-1: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Currently in Force)

Name/ No. Type	Responsible authority	Main subject	Effective since
Government decision			
GD 1001/1990	MWFEP	Unitary system for water management services tariffs	1990
GD 101/ 1997	MWFEP/MH	Norms for sanitary protection areas	1997
GD 730/ 1997	MWFEP	Norms for waste water discharges in receivers NTPA 001 (concentration)	1997
GD 172/ 1997	MWFEP/MH MWSP	National Register of Potentially Toxic Chemicals	1997
MWFEP orders			
NTPA 002		Conditions for discharging waste water into sewerage	1998
699		Procedure and competences for issuing water management permit/ authorisation	1999
251		Procedure, competences in the case of special monitoring regime in the case of non-compliance with water permit	1997
277		Guidelines and norms for producing technical documentations for the obtaining of water permit	1997
280		Notification procedure	1997
281		Acces mechanism for water management information	1997
282		Water users and public participation in the consulting activity	1997
166		Water Register Establishment	1997
			1999

Table 11.2-2: Main Laws and Regulations Dealing with Nutrient Control / Reduction (Currently in Progress)

Type	Authority responsible	Main subjects	Date of coming in force
Law	MWFEP	Law on the Modification of Environmental Protection Law (137/95)	2001
Law	MWFEP	Law on the Modification of Water Law (107/96)	2001
Law	MWFEP	Law on the Establishment and Operation of National Council for Environment and Sustain. Development	2001
Law	MWFEP	Law on the approval of National Plan for land planning sec.III protected areas	2001
Law	MWFEP	Law on Integrated Management of Coastal Areas	2001
GD	MWFEP	Hydrographic Basin Committee Establishment	2001
GD	MWFEP	Upgrading of NTPA 001/97	2001
GD	MWFEP	Approval of frame schemes for management and planning of hydrographic basins	2001
GD	MWFEP+ MAF	Approval of the Action Plan dor water protection against nitrate pollution from agricultural sources	2001

The most relevant deficiencies concerning the water legislation, particularly related to nutrient control, are the following:

- The N,P emissions limits are related to concentration only; there are not any provisions for discharged load except the water permit;
- there are not (yet) any national water quality objectives/ targets;
- in the case of the actual STAS 4706/88 – surface waters – quality technical conditions:
 - * the limits cover only the water column compartment without considering sediment associated pollution;
 - * for some specific pollutants (heavy metals, organic micro-pollutants) the limits are higher in comparison with EU legislation;
- there are (STAS 4706/88) not any provisions concerning nutrient concentration in the Black Sea;
- in the case of total nitrogen and total phosphorous, the current STAS 4706/88 refers to total inorganic N, P concentrations without considering the organic forms;
- there are no laws, regulations or proposals regarding phosphorous-free detergents.

11.3 Main Barriers to Policy and Legal Reforms

As regards nutrient-related issues, there are:

- general barriers (lack of adequate legislation, management mechanisms, infrastructure, etc.);
- specific constraints generated by natural resources (surface waters, ground waters, Black Sea, etc.);
- socio-economic system conflict areas (especially related to the agriculture target group).

In this respect, two interrelated issues in particular should be analyzed and followed up:

- promotion of the new legislation; and
- stipulation of specific implementation processes.

11.4 Envisaged Changes of Nutrient-Related Legislation

The proposed new legislation should provide:

- a regulatory framework for dealing efficiently with a variety of environmental problems, particularly nutrient-related ones; and
- a balance between conflicting interests in using the water, as well as between environmental issues and other issues (e.g. economic, employment and social issues).

The required actions are:

- Stepped improvement of standards:
 - * integrated approach to immission / emission (point/ diffuse) standards, particularly for nutrient reduction;
 - * ambient quality standards;
 - * effluent standards;
- Introducing an efficient framework for water management;
- Establishing adequate institutional and regulatory framework;
- Introducing Phosphorus-free detergents:
 - * improvement of detergent legislation/standards; besides biodegradability, the P content should be decreased and limited in accordance with the EU coming legislation;
 - * P-free detergent plan implementation, starting with the technological issues (MIT);
 - * marketing study;
 - * it is anticipated that the cost of introducing P-free detergent could reach EUR 50 million (provision with new technology).

Explicit proposals for changes of respective legislation are:

- The effluent standards (NTPA 001) will be revised in 2001. There are not any river quality standards (immissions) at the level of the EU, including the ICPDR. In this respect, it is envisaged by order of MWFEP to promote in October 2000 “Water Quality Targets” based on the five classes agreed by the ICPDR which is (more or less) in the light of EWFD.
- EWFD is already in force; the promotion in Romania is expected in 2001 (implementation might take 30-35 years).
- Urban Waste Water Directive, Nitrates Directive and other water-related directives are in the transposition process (2000-2001).

11.5 Schedule for Approximation of National Legislation to EU Legislation

In accordance with the National Environmental Action Plan, the following schedule is designed for the approximation process:

- Short term:
 - * transposition of the Urban Waste Water Directive (91/271/EEC);
 - * transposition of the Nitrate Directive (91/676/EEC).
- Medium and long term:
 - * Water Framework Directive (COM 97/49 – 97/614, 98/76).

Table 11.5-1: Actions for the approximation of national legislation to EU nutrient legislation

Year	EU Directive	Actions
2000	<u>Urban Waste Water Directive 91/271/EEC</u>	1. Identification of communities which need WWTP 2. Project for the Water Law (107/96) revision 3. Revision of the GD 730/97 concerning effluent discharging by introducing new definitions such as equivalent population 4. Water classification: (i) vulnerable, (ii) normal, (iii) less vulnerable 5. Generation of Priority Action Programme for implementation 6. Development of strategies for municipal WWTP sludge use
2000 2001	<u>Nitrates Directive 91/675/EEC</u>	1. Evaluation of the existing information concerning the identification of vulnerable zones 2. Identification of specific waters and notification of vulnerable zones 3. Action Programme development for the vulnerable zones
2000 2001 2002 2004 2010	<u>Framework Directive (98/76/EEC)</u>	1. Norms for surface and ground water classification; basic conditions for the establishment of protected zones 2. Analysis and implementation of a penalties system in accordance with WFD 3. Ecological status monitoring and chemical status monitoring surface waters and chemical monitoring for ground waters 4. Water management planning (hydrographic basins) 5. Updating of the EIA of human activities at the HB level 6. Approval of the HB Water Management Plans 7. Plans implementation, recovery of cost for urban waste water treatment.

Table 11.5-2: Schedule for Approximation of National Legislation to EU Legislation

Name of National Law, Regulations	Related EU Directive	Proposed period of adjustment	Proposed date of coming in force	Final status of compliance
1. Urban Waste GD	91/271/EEC	2000 - 2001	2001	2010
2. Nitrate GD	91/676/EEC	2000 – 2001	2001	2010
3. Water Framework GD	98/76/EEC	2000 – 2004	2005	2010
4. Fish waters standard	78/659/EEC	2000 – 2005	2006	>2010
5. Shellfish waters standard	79/923/EEC	2000 – 2005	2006	>2010
6. Bathing water standard	76/160/EEC	2000 - 2005	2006	>2010

12 MOLDOVA

12.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

The most important documents in which the policy objectives on environmental protection are formulated include:

- National Strategic Action Plan for Environmental Protection
- National Environmental Action Plan for the Environment
- The Comprehensive Long-Term Programme for Environmental Protection

The new priorities of environmental protection policy under the new economic situation are:

- The former environmental protection policy, focusing on end-of-pipe technologies for pollution abatement, is becoming unacceptable from the environmental and economic point of view;
- The new economic order calls for the development of market-oriented environmental policy and instruments that support the adoption of low-waste technologies and rational exploitation and use of natural resources.

The national objectives regarding reduction of water pollution are:

- to maintain human health and to eliminate health risk in water resources;
- to provide sources of nutrition and to maintain and restore biodiversity.

This would require the performance of the following tasks:

- Comprehensive evaluation of water resources conditions and elaboration of a concept of protection and rational use of water resources and water balanced systems based on sustainable development approach;
- Elaboration of a scheme for river basins use;
- Development of ecological criteria for assessment of permissible loads into surface waters;
- Development of integrated parameters and criteria for maintaining ecological balance in water bodies;
- Preparation of a profound basis for rehabilitation and maintenance of proper ecological conditions in water bodies for different uses.

There are currently no explicitly formulated policy objectives regarding nutrient emissions or loads; these issues are considered as integral parts of environmental management, waste water treatment programmes, etc.

The Foreign Policy Concept of the Republic of Moldova, approved by Parliament in February 1995, confirms the principles of international law that are of special importance both for Moldova's foreign relations and for its environmental protection.

12.2 Status of Legislation Dealing with Nutrient Control / Reduction

According to the constitution of the Republic of Moldova, the President of the Republic is responsible to the world community for the state of the environment and represents, at the international level, the interests of Moldova related to environmental protection.

Although there is a complex system of environmental legislation (with a high number of decrees, laws and regulations elaborated and amended since 1990), there remains the problem of enforcement due to the problematic economic situation and a lack of professional capability.

The existing legislation, while providing a number of starting points for the implementation of sustainability, pollution and waste reduction, and cleaner technology, is considered to be insufficient for the future.

Currently, there are no laws and regulations in force or in progress, directly dealing with nutrient control and reduction; the existing legal provisions on emission standards, effluent standards and ambient water quality are usually incorporated in overall pollution control and reduction regulations.

12.3 Main Barriers to Policy and Legal Reforms

In spite of the fact that there are clearly-determined policy objectives, legal and policy reforms are hampered due to:

- a continuous crisis of the national economy (particularly regarding industry and agricultural production);
- a lack of domestic financial resources;
- improper administrative and institutional cooperation and coordination; and
- lack of professional capability.

12.4 Envisaged Changes of Nutrient-Related Legislation

According to the provisions of the 1995 National Environmental Action Plan, changes of legislation should aim at the introduction of feasible environmental management strategies, and particularly contribute to:

- the revision of the water quality standards (within three years);
- the development and adoption of long-term environmental programme (within one year);
- the provision of a framework to restore and sustain legal reference service (within one year);
- the development of a policy toward harmonization Environmental Standards with those of the EU (within two years);
- the passage of water pollution quality law with new standards (within two years);
- the preparation of a new draft law on self-monitoring by major pollutants (within two years).

For the time being, however, these issues are not being elaborated.

There is currently no legal provision regarding control or out-phasing of P-containing detergents since this problem is not a topical issue in Moldova.

12.5 Schedule for Approximation of National Legislation to EU Legislation

In June 1998, Moldova ratified the Agreement on Partnership and Cooperation between the EU and Moldova, according to which Moldova is committed to making its legislation gradually compatible with that of the EU in a number of sectors including the environment.

The Agreement calls for a strengthening of environmental cooperation between Moldova and the EU, and states that cooperation programmes shall continue to contribute to strengthening environmental institutions and public awareness. It also states that cooperation shall aim to combat the deterioration of the environment including in particular local, regional and transboundary water pollution and water quality.

Currently, Moldovan legislation does not contain provisions equal or similar to those required by the two nutrient related EU Directives on “Urban Waste Water Treatment” and “Dangerous Substances in the Aquatic Environment”.

There is a general understanding of the necessity to approximate national pollution-related legislation (including nutrient issues) to the respective EU Directives; but at present the statements have mostly declarative character, partly due to lack of appropriate knowledge of the directives themselves and the complexity of appropriate application.

Approximation to EU-legislation would also require new conceptual approaches, which currently do not have any equivalent in the Moldovan legal framework, e.g.:

- Integrated river basin management approach;
- Combined approach for setting standards, which involves setting both discharge limits and quality standards in an integrated way;
- Licensing on the basis of:
 - * best technical means available;
 - * best available techniques;
 - * all technical precautions.

Taking into account the current discrepancies between the national legislation and the EU-requirements and the critical economic situation in the country, it cannot be expected that the harmonization of national and EU-legislation can be achieved in the short or medium term.

13 UKRAINE

13.1 Policy Objectives, Priorities and Principles for Nutrient Control / Reduction

In Ukraine, policy objectives and principles for nutrient reduction are included as sub-components in the overall environmental protection strategy formulated in the Main Directions of State Policy on the Environmental Protection, Utilization of Natural Resource and Environmental Safety (1998). This document clearly defines the key priorities of Environmental Policy and Practical Actions including international obligations of Ukraine to nutrient pollution reduction as follows:

- Improvement of the environment status in the Dniper Basin and potable water quality;
- Prevention of pollution and improvement of the environmental status of Black Sea;
- Improvement of the environmental status in the Donetsko-Prydniprovsky Industrial Regions;
- Construction and reconstruction of municipal waste water systems.

These defined priorities are directly related to sustainable water management and clearly stipulate the necessity of consolidation of national (inter-sectoral) and international efforts for practical actions in pollution reduction.

The main objectives with relevance to nutrient reduction are:

- Reduction of nutrients load (N, P, BOD), oil products, pesticides, heavy metals ions, radionuclides and other harmful substances in the water bodies;
- Pollution reduction from WWTPs, including pollution from municipal waste water;
- Pollution reduction from diffuse sources, particularly from agriculture;
- Improvement of regulatory, legislative, environmental and economic bases for quality of water bodies;
- Improvement of registration, monitoring, and control systems of surface and ground water pollution; development and setting up of a system for identification and analytical control of all surface water pollution sources;
- Conservation of biological and landscape diversity; expansion of the network of national parks and reserves and restoration of wetlands.

The integration in the European Union, identified as an objective of international policy of Ukraine, implies a sustainable use of natural resources, improvement of environmental health and a restoration of the ecosystems. Heavy environmental problems inherited from the Former Soviet Union due to extensive style of resource utilization and mismanagement, are on the top of the national priority list for actions.

13.2 Status of Legislation Dealing with Nutrient Control / Reduction

The basic principles for the protection of the environment in the Ukraine are regulated by the Law on the Protection of the Environment (1996), and the Law on Sanitary and Epidemiological Security of the Population (1994). The main water related issues are regulated by The Water Code of Ukraine (1995).

In addition, there are a number of regulations, rules norms, etc., regulating particular issues in detail.

Altogether, it is recognized that an improvement of the unsatisfactory environmental situation can only be achieved by more effective control and enforcement of gradually improved environmental legislation.

Ukraine does not currently have any direct legislative norms or standards regulating the content of nutrient discharges into surface waters and related eutrophication; instead, there are norms for N and P discharges in terms of maximum permitted concentrations which can serve as an indirect tool for controlling nutrients loads.

13.3 Main Barriers to Policy and Legal Reforms

When Ukraine became an independent country in 1991, it had to revise the former Soviet environmental legislation and develop a new, market-oriented environmental legislation.

This process was and still is hampered by:

- historical issues (structures of administration and public enterprises, ownership of public infrastructure, process of privatization, social attitudes, etc);
- critical situation of the national economy (industry, agricultural production);
- critical social situation and the low living standard of a significant portion of the population;
- typical deficiencies in institutional and administrative capabilities;
- lack of modern control tools (e.g. environmental audit);
- enforcement of new economic tools to address environmental issues and prevent environmental pollution (e.g. payments for use of natural resources and release of pollutants in the environment).

13.4 Envisaged Changes of Nutrient-Related Legislation

In order to address nutrient reduction, Ukraine plans to:

- Improve regulations on the application of N and P fertilizers;
- Develop regulations for P-free detergents;
- Develop and introduce techniques for the assessment of diffuse pollution loads.

The ultimate goal is the harmonization of Ukrainian legislation on nutrients with the existing EU Directives and future Framework Water Directive.

13.5 Schedule for Approximation of National Legislation to EU Legislation

Water-related legislation in Ukraine and the EC are substantially different in their structures. Therefore, the harmonization of the Ukrainian legislation with the EU legislation is a long-term objective (for a period until 2015).

The envisaged harmonization of Ukrainian legislation with the relevant EU Directive should take into account the following sequence of priorities:

- measures with low financial requirements including amendments and additions to the acting legislation, regulations, standards, etc.
- measures with affordable financial requirements including improvement of control system, and optimization of monitoring that satisfy the information needs of environmental management; an enforcement system for improved environmental legislation for water users and polluters of water resources, etc.
- measures that will require significant financial investments (including international investments): reconstruction and improvement of the existing manufacturing and waste water treatment technologies; construction of new urban waste water treatment facilities (in compliance with the respective EU Directives), etc.

The identification of the financial needs for the harmonization of environmental legislation of Ukraine and EU Directives requires a separate study.

Unlike other Central European Countries, Ukraine's integration into European Union is not a matter of the near future. Nevertheless, the harmonization of Ukrainian environmental legislation with the EU Directives, including the EU Water Framework Directive, is an important component for the development of the national legislation process.

Table 13.5-1: Schedule for Approximation of Ukraine's Legislation to EU Legislation

Name of National Law, Regulations	Related EU Directive	Proposed Period of Adjustment (years)	Proposed Date of Coming in Force
Water Code of Ukraine	Principles of the EC Water Policy (draft, 4/12/96)	10	2010
On Reduction of Waste of Nitrates in Agriculture	On Protection of Waters from Pollution by Nitrates from Agricultural Sources (91/676/EEC)	3	2003
On Integrated Pollution Prevention and Control	On Pollution Caused by Certain Dangerous Substances, Discharged into Water Bodies (76/464/EEC)	5	2005
On Municipal Wastewater Treatment	On Urban Wastewater Treatment (91/271/EEC)	3	2003
On Water for Human Consumption	On Water Quality for Human Consumption (80/778/EEC, COM(94), 612 final – 95/10(SYN))	3	2003
On Amendments to the List of Industrial Parts of Fishery Water Bodies (Parts Thereof), approved by the Resolution of the CMU # 552 of May 22, 1996;	On Surface Water Quality Necessary to Support Fish Life (78/659/EEC)	2	2002
Regulations on Detergents	Directive on Detergents (73/404/EEC, 73/405/EEC)	3	2003

**STRENGTHENING THE IMPLEMENTATION OF NUTRIENT
REDUCTION MEASURES AND TRANSBOUNDARY
COOPERATION IN THE DANUBE RIVER BASIN**

**FIVE YEAR NUTRIENT REDUCTION
ACTION PLAN**

SUMMARY REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000



**International Commission for
the Protection of the Danube River**

UNDP/GEF Assistance



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COUNTRY LISTS OF PRIORITY PROJECTS PROPOSED FOR “FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLANS”

1 INTRODUCTION

The Summary Report is an integral component for the preparation of the GEF/UNDP funded project entitled "Strengthening Implementation of Nutrient Reduction Measures and Transboundary Co-operation in the Danube River Basin". The basic task of this preparatory work is to prepare a qualified material basis for the elaboration of a complete Danube Regional Project for submission to the GEF Council.

The purpose of this summary report is to provide an overview and assessment of the basic materials, data and information available for the elaboration of comprehensive "Five Years National Nutrient Reduction Action Plans" on national level for all DRB countries.

The Country Reports, based on contributions from national consultants follows the structure of the "national reports" and provides country specific data and information for each of the Danube River Basin. The "country specific information" is structured as follows:

- (1) Verification of Data and Information on Nutrient Emissions / Loads
- (2) Identification of Measures for Nutrient Reduction from Diffuse Sources
- (3) Assessment of the Anticipated Nutrient Reduction from Diffuse Sources
- (4) Identification of Projects Ready for Implementation
- (5) Assessment of the Anticipated Nutrient Reduction from Point-Sources
- (6) Summary of Main Country Specific Particularities

2 SUMMARIZING CONCLUSIONS

2.1 Verification of Data and Information on Nutrient Emissions / Loads

Most of the data and information required to be reviewed and verified have been identified in official reports, updated statistical documents and previously developed projects. However, at this stage of the project development, data on nutrients loads/emissions are not yet available in some areas. The revision of data and information on nutrient emissions/ loads performed by the Danube countries has taken into consideration nutrient mass balance, with main emphasis on diffuse pollution, nutrient transport, wetlands and losses of nutrients in water systems.

Generally, the countries considered that diffuse pollution sources include direct discharges of private households (not connected to sewers), storm water overflow, direct discharge of manure, base flow (percolation of human waste, agriculture land), erosion run-off from forests, air depositions and ground water flow. However, agricultural production and livestock farming represent the main diffuse sources of pollution.

The agricultural diffuse pollution contribution is large and can be controlled best by regulatory measures. The range of measures necessary can be seen in the regulations on the “Prevention of Pollution from Agriculture adopted by Helsinki Commission” (1998).

The present farming system, known as "conventional farming", has produced progressively negative social and economic results and serious environmental damages upon its vital resources, i.e. water and soil, and, consequently, upon bio-diversity as a genetic basis as well as on human health.

synergetic effects, about which little is known at this point (we must note also the fact that in several sectors,

The negative effects of fertilization are a long term problem. Danube countries cannot afford to delay implementation of nutrient reduction measures.

agriculture is both polluted and polluting), we shall begin to understand the severity of the situation.

The first conclusion is that there have been no significant changes in the diffuse pollution loads on the territory of the

Danube River Basin since 1998. In many parts of the region, industry and agriculture are still in recession while the first signs of improvement have become visible only since 1999.

Second, the data show that fertilizers were used on a small scale. The unbalanced fertilization and the deficit in the main nutrients have been detrimental to both crop production and soil fertility, which adversely influenced the basin's environmental situation.

2.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The urgent measures proposed by the countries of the Danube River Basin to be implemented with a view to nutrient reduction refer to the improvement of both legal and institutional framework.

Moreover, public awareness raising and strengthening public participation in nutrient reduction initiatives are both seen as priorities.

In order to achieve maximum nutrient load reduction within their share of the Danube River Basin, the countries have identified measures for nutrient control and reduction from diffuse sources that mainly address policy and legislation-related actions, institutional strengthening and capacity building.

Proposed Measures for Nutrient Reduction from Diffuse Sources

	D	A	CZ	SK	H	SLO	HR	BiH	YU	BG	RO	MD	UA
creation / harmonization of legislation	x	x	x	x	x		x	x			x		
delimitation of "sensitive water areas"	x		x	x	x		x						x
watershed management	x									x	x		
P-free detergents					x	x	x	x		x			
soil conservation	x		x	x		x			x	x		x	
good agricultural practice		x	x	x				x	x	x	x		
wetland restoration		x								x	x	x	x

Animal production and manure application to fields are important for the economies of many Danube countries, but they are also the biggest contributors to diffuse sources of water pollution.

There is a growing consensus among policy makers of the Danube countries that command and control environmental regulations stifle the efficiency and innovation by heterogeneous plants to adopt a uniform abatement strategy. Plants are allowed to develop pollution control strategies that replace or modify specific regulatory requirements on the condition that these strategies improve their environmental performance. Germany is an example of a Danube country where voluntary, site-specific performance standards exist which can give the plants regulatory flexibility to meet the standards in unconventional ways.

Further, it appears that watershed management is an attractive concept for Danube countries with economies in transition. For some countries, such as Romania and Bulgaria, the implemented watershed approach, which basically relies on stakeholder involvement, could in principle improve coordination between agencies and jurisdictions with water quality responsibilities, help set priorities for action on a systematic basis, promote cost-effective control policies and targeting of funds, further public participation and public-private partnerships. The latter may be particularly important in the Danube transition economies, where funds for environmental programs are severely limited and the involvement of affected stakeholders essential for identifying critical problems and building support for program activities.

Some Danube countries (Germany, the Czech Republic, Slovakia, Slovenia, Yugoslavia, Bulgaria and Moldova) have already initiated actions leading to nutrient reduction that are based on the need to implement soil conservation measures.

Developing a culture of enforcement, compliance, and cooperation that supports implementation is considered by the Danube transition countries likely to be critical when pollution control is involved.

Protecting the environment, safeguarding human health and promoting effective agricultural practices go hand-in-hand.

The introduction of P-free detergents has been already taken into consideration by most of the countries. In addition, the need to develop a code of good practice, covering matters such as periods when land

application of fertilizers is inappropriate and the conditions for land application of fertilizers near watercourses have been taken into consideration by the policy makers of the whole basin. Examples of such countries include: Austria, Slovakia, Bosnia-Herzegovina, Yugoslavia, Bulgaria and Romania.

Finally, the identification of vulnerable areas regarding the Nitrates Directive and the new proposal on the methods of control of biological degradability of active substance detergents will soon bring the countries of Danube River Basin in line with EU standards.

2.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

Most countries have found it difficult to make estimates, but it is assumed that noticeable nutrient reduction from diffuse sources might be recorded once the required measures and actions have been implemented. As a consequence of the recent economic development of the countries in the region, mainly through the extension of cultivated agricultural areas and the intensification of farming, a future increase in nutrient emission can be expected.

However, if the proposed urgent measures are introduced during the year 2001, visible effects in terms of nutrient content reduction can be expected in the year 2005.

The anticipated nutrient reduction from diffuse sources is estimated to reach high values in countries such as Yugoslavia (25% for N and P) or average values as 10% of N for countries such as the Czech Republic, Slovakia, Romania and Ukraine.

A designation of vulnerable areas and the implementation of the required forms of farming in these areas will bring the countries of the basin in line with EU requirements. The nutrient pollution reduction in waters will mostly be of local character. Programs aimed at revitalizing landscape, streams, small wetlands constructing etc. will also contribute to improving the environmental situation in the Danube River Basin.

Anticipated Nutrient Reduction from Diffuse Sources

	N reduction		P reduction	
	(%)	[kt N]	(%)	[kt P]
D	n.a.	n.a.	n.a.	n.a.
A	n.a.	n.a.	n.a.	n.a.
CZ	10	n.a.	3	n.a.
SK	10	n.a.	10	n.a.
H	20	n.a.	20	n.a.
SLO	n.a.	n.a.	n.a.	n.a.
HR	n.a.	n.a.	n.a.	0,239
BiH	n.a.	n.a.	n.a.	n.a.
YU	25	n.a.	25	n.a.
BG	n.a.	n.a.	n.a.	n.a.
RO	13,3	13,4	15,5	1,7
MD	n.a.	50	n.a.	5
UA	10	n.a.	10	n.a.

n.a. - not available

2.4 Identification and Assessment of Proposed Priority Projects

(1) Quality of provided data

At this stage, all the thirteen DRB countries have provided "draft national lists of priority projects" which are supposed to be ready for implementation in the coming 5-year period and can be considered as a reasonable basis for the elaboration of comprehensive "Five Year National Nutrient Reduction Action Plans".

The "draft lists of priority projects" have been prepared by the national consultants usually in close co-ordination and co-operation with the concerned national ministries and authorities.

The "lists of priority projects" are mainly based on and derived from the list of projects compiled in the "Danube Action Pollution Reduction Programme", developed within the framework of the DRPRP in June 1999 and updated within the framework of this project.

According to the requirements of the TOR, the national consultants had explicitly to take into account the projects included in the EMIS/EG - Joint Action Programme, which is currently under preparation.

As a first conclusion it can be stated that both (i) the structure and completeness of the “lists of priority projects”, and (ii) the quality, completeness, accuracy and reliability of the particular project data are significantly different from country to country.

Countries that provided relatively complete project lists, respectively relatively complete project data for the identified priority projects include Austria, the Czech Republic; Hungary; Germany, Moldova; Romania; Slovenia and Yugoslavia.

The “national lists of priority projects” of these countries can be considered as a profound basis for further elaboration of comprehensive “Five Year National Nutrient Reduction Action Plans”.

The “project lists” provided by the other countries show significant gaps which can be summarized as follows:

- ⇒ Incomplete data on expected nutrient reduction - particularly Bosnia-Herzegovina, Croatia, Ukraine, (partly Hungary regarding BOD and COD);
- ⇒ Inadequate data on project specific investment requirements - all DRB countries have eventually provided investment cost figures for more or less all proposed priority projects; in the majority of the counties it is obvious that the cost estimates need partial, respectively substantial up-date;
- ⇒ Incomplete data regarding differentiation by baseline and incremental cost (as required for GEF co-financing) - particularly Bulgaria, Slovakia, Slovenia, Yugoslavia;
- ⇒ Incomplete data regarding adequate project funding schemes - particularly Bosnia- Herzegovina, Bulgaria, Croatia, Slovakia, Ukraine.

For these countries, the list of identified projects itself or the particular project data need partially substantial improvement. Especially as long as a clearly defined project sponsor and an appropriate funding scheme is not available, a project cannot really be considered in the short-term as a candidate project for a “National Nutrient Reduction Action Plan”.

(2) Summarized Results

The composition of the “national project lists” and the details of the identified priority projects can be seen from the annexed county tables (Annex II).

An overall summary with full information on the priority projects, as identified by the national consultants in the framework of this study, is compiled in Table 2.4-1.

A summary of the structure of the priority projects by country is compiled in Table 2.4-2.

A summary of the structure of the priority projects by sector is compiled in Table 2.4-3

(a) Investment Requirements

According to the available data provided by the national reports, the total investment requirements for the 13 DRB countries amount to about EUR 4402 million.

The structure of the identified investment requirements by sector is as follows:

	Municipal Sector	Industrial Sector	Agricultural Sector	Wetlands	Total
No of Projects	157	44	21	23	245
Million EUR	3,702	267	113	323	4404
(%)-Structure	84%	6%	3%	7%	100

The structure of the identified investment requirements by country is as follows:

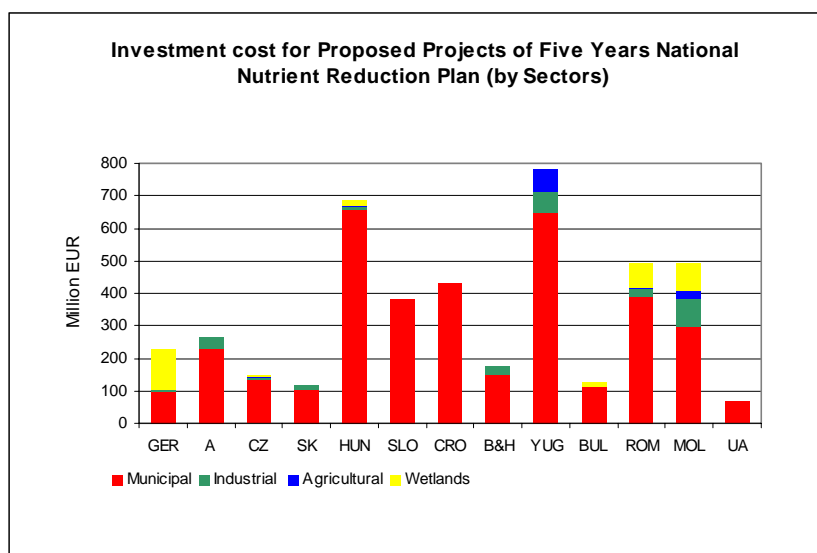
	GER	A	CZ	SK	HU	SLO	CRO	B&H	YU	BUL	RO	MOL	UA	TOT
No of Proj.	11	4	12	20	24	24	11	12	40	21	25	31	10	245
Mill. EUR	231	264	147	118	687	384	433	176	785	125	493	493	67	4,404
(%)	5	6	3	3	16	9	10	4	18	3	11	11	1	100

Countries with the highest identified investment requirements of more than EUR 500 million include Yugoslavia and Hungary.

Countries with the lowest identified investment requirements of less than EUR 200 million include Ukraine, Slovakia, the Czech Republic (small DRB area), Bulgaria and B&H.

The most of the countries have basically derived their “national project list” from the list of projects already identified in the “Action Pollution Reduction Programme” (elaborated within the framework of the DRPRP, 1999).

Taking into account the reduced number of projects compiled in the “draft national project lists” the identified investment requirements of about EUR 4.4 billion seem rather reasonable in comparison to the investment requirements of about EUR 5.6 billion as identified in the framework of the “Danube Action Pollution Reduction Programme” in 1999.



(b) Project Funding

According to the data provided by the national reports, the anticipated composition of project funding for all DRB countries is as follows:

Funding component:	Million EUR	(%) – Structure
National funding contribution	1716	39
International loans:	1163	26
International grants:	662	15
Not secured funding components:	861	20
Total	4404	100

The country-specific composition of project funding can be seen from Table 2.4-2.

- The following seven countries could provide a more or less complete funding scheme for the proposed priority projects to be completed within the coming 5-year period: Austria, Germany, Hungary, Moldova, Romania, Slovenia and Yugoslavia.
- Countries in which funding is not secured for the majority of the proposed priority projects include B-H, Croatia, Ukraine.
- In the other countries (Bulgaria, the Czech Republic, Slovakia) portions between 30% and 70% of the identified investment requirements are at the present stage of knowledge supposed to be secured; the rest remains to be raised.

(c) Assessment of the Anticipated Nutrient Reduction from Point Sources

According to the available data provided by the national reports, the total nutrient reduction anticipated with the implementation of the proposed priority point source projects should be in the range of:

- N: 58 500 tons/year;
- P: 12 100 tons/year;
- BOD: 276 000 tons/year;
- COD: 525 000 tons/ year

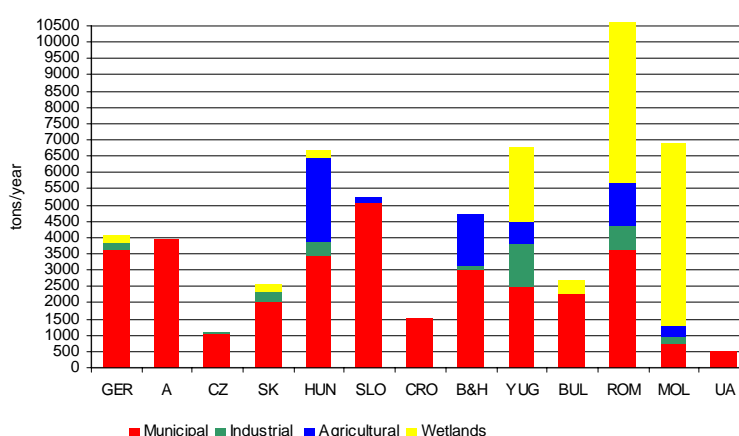
The composition of the anticipated nutrient reduction by sector is approximately as follows:

Nutrient Reduction	Municipal Sector	Industrial Sector	Agricultural Sector	Wetlands	Total
No of Projects	157	44	21	23	245
N (t/y)	33 300	3 400	6 700	16 600	58 500
P (t/y)	5 500	3 700	1 100	1 800	12 100
BOD (t/y)	221 000	39 700	9 500	5 900	276 000
COD (t/y)	398 900	78 700	15 000	32 400	525 000

The composition of the anticipated nutrient reduction by countries is compiled in Table 2.4-2.

It has to be mentioned at this point that the BOD and COD data in particular are still preliminary, because in some countries they have not yet been determined completely or correctly for some or even the majority of the identified projects.

Anticipated Reduction of Nitrogen from Proposed Projects of Five Years National Nutrient Reduction Plan (by Sectors)



Anticipated Reduction of Phosphorus from Proposed Projects of Five Years National Nutrient Reduction Plan (by Sectors)

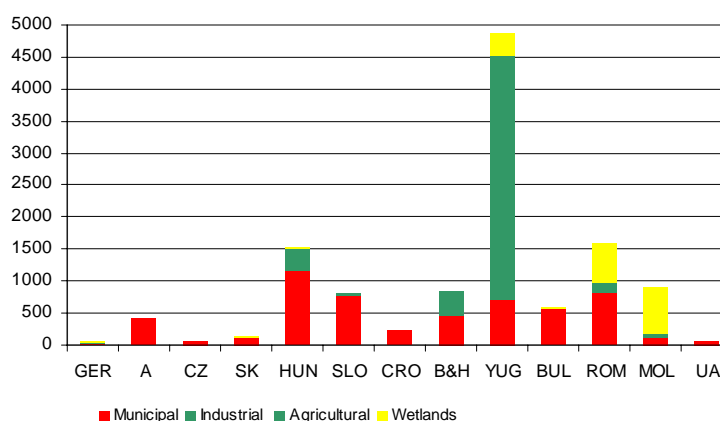


TABLE 2.4-1

SUMMARY OF PRIORITY PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLANS

Country	Sector	No of Projects	Expected Reduction				Investment Cost			Funding Scheme		
			N tons/y	P tons/y	BOD tons/y	COD tons/y	Total Inv. mil EUR	Increment mil EUR	Baseline mil EUR	National mil EUR	Int. Loan mil EUR	Int. Grant mil EUR
Austria	Municipal	3	3,950	404	5,740	12,028	231.0	207.0	24.0	231.0	0.0	0.0
	Industrial	1	0	0	5,500	4,500	33.0	7.0	26.0	33.0	0.0	0.0
	Agricultural	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Wetlands	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	4	3,950	404	11,240	16,528	264.0	214.0	50.0	264.0	0.0	0.0
B&H	Municipal	5	3,005	450	7,689	14,802	147.0	10.0	137.0	0.0	0.0	0.0
	Industrial	6	125	53	963	2,159	27.1	9.3	17.9	0.0	0.0	0.0
	Agricultural	1	1,570	350	0	0	2.3	0.7	1.6	0.0	0.0	0.0
	Wetlands	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	12	4,700	853	8,652	16,961	176.4	20.0	156.5	0.0	0.0	0.0
Bulgaria	Municipal	17	2,308	562	19,448	34,718	111.9	0.0	0.0	6.5	0.0	23.0
	Industrial	1	0	0	299	655	0.0	0.0	0.0	0.0	0.0	0.0
	Agricultural	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Wetlands	3	375	37	0	0	13.5	0.0	0.0	0.0	0.0	7.5
	Total	21	2,683	599	19,747	35,373	125.4	0.0	0.0	6.5	0.0	30.5
Croatia	Municipal	11	1,509	239	15,310	34,424	433.4	134.3	299.1	2.3	9.9	0.0
	Industrial	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Agricultural	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Wetlands	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	11	1,509	239	15,310	34,424	433.4	134.3	299.1	2.3	9.9	0.0
Czech Republic	Municipal	6	1,010	58	1,228	93	133.7	46.9	86.8	56.2	21.4	13.9
	Industrial	4	61	1	18	26	5.1	0.9	4.2	3.2	0.5	0.5
	Agricultural	1	20	3	0	0	5.3	4.2	1.1	3.5	0.9	0.9
	Wetlands	1					2.6	1.3	1.3	1.3		1.3
	Total	12	1,091	62	1,246	120	146.7	53.3	93.4	64.2	22.8	16.6
Germany	Municipal	7	3,620	13	75	511	98.3	88.4	9.9	98.3	0.0	0.0
	Industrial	2	260	40	0	780	6.3	1.2	5.1	6.3	0.0	0.0
	Agricultural	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Wetlands	2	211	21	0	0	126.7	84.7	42.0	126.7	0.0	0.0
	Total	11	4,091	74	75	1,291	231.3	174.3	57.0	231.3	0.0	0.0
Hungary	Municipal	16	3,455	1,153	0	0	658.2	68.2	91.8	260.8	180.1	213.8
	Industrial	1	420	6	0	0	5.9	2.9	3.0	2.0	3.9	0.0
	Agricultural	5	2,600	340	0	0	7.2	4.8	2.5	2.0	0.0	3.6
	Wetlands	2	233	23	0	0	15.4	13.3	2.1	2.1	0.0	13.3
	Total	24	6,708	1,522	0	0	686.7	89.2	99.4	266.9	184.0	230.7
Moldova	Municipal	15	784	119	248	458	296.7	17.8	279.3	88.6	102.0	106.0
	Industrial	11	167	36	27	74	84.7	4.4	74.9	27.8	34.1	22.8
	Agricultural	3	350	25	20	70	26.5	2.5	23.9	8.5	8.8	9.2
	Wetlands	2	5,600	725	1,300	230	85.0	4.2	80.8	25.5	31.8	27.8
	Total	31	6,901	905	1,595	832	492.9	28.9	458.9	150.4	176.7	165.8
Romania	Municipal	10	3,644	823	53,521	61,154	392.9	119.8	274.5	124.4	175.0	93.5
	Industrial	7	688	3	2,947	4,110	22.0	10.1	12.0	17.3	4.7	0.0
	Agricultural	3	1,374	150	3,343	2,206	3.7	1.3	2.4	2.9	0.5	0.3
	Wetlands	5	6,154	615	0	0	73.9	12.3	61.6	32.0	32.0	9.9
	Total	25	11,860	1,591	59,811	67,470	492.5	143.5	350.5	176.6	212.2	103.7
Slovakia	Municipal	13	2,001	125	12,968	25,458	103.4	10.3	21.0	43.0	3.3	1.3
	Industrial	4	348	0	641	1,690	14.2	2.3	5.8	2.3	1.4	2.1
	Agricultural	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Wetlands	3	225	23	0	0	0.9	0.0	0.0	0.0	0.0	0.2
	Total	20	2,574	147	13,609	27,148	118.4	12.6	26.8	45.3	4.7	3.6
Slovenia	Municipal	23	5,053	786	27,836	45,440	382.5	4.6	0.0	328.2	44.2	10.0
	Industrial	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Agricultural	1	180	28	980	1,600	1.7	1.5	0.0	0.0	0.0	0.0
	Wetlands	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	24	5,233	814	28,816	47,040	384.2	6.1	0.0	328.2	44.2	10.0
Ukraine	Municipal	10	486	65	677	621	67.2	16.6	50.6	5.3	0.0	0.0
	Industrial	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Agricultural	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Wetlands	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	10	486	65	677	621	67.2	16.6	50.6	5.3	0.0	0.0
Yugoslavia	Municipal	21	2,486	700	76,280	169,212	646.0	0.0	0.0	137.0	441.0	68.0
	Industrial	7	1,347	3,571	29,345	64,710	68.5	0.0	0.0	17.0	34.5	17.0
	Agricultural	7	640	242	5,133	11,074	65.8	0.0	0.0	20.1	30.5	15.2
	Wetlands	5	2,320	350	4,600	32,200	5.0	0.0	0.0	0.5	2.5	2.0
	Total	40	6,793	4,863	115,358	277,196	785.3	0.0	0.0	174.6	508.5	102.2
All Countries	Municipal	157	33,311	5,495	221,020	398,919	3702.1	723.9	1274.0	1381.7	976.9	529.5
	Industrial	44	3,416	3,710	39,741	78,704	266.7	38.1	148.9	108.9	79.0	42.4
	Agricultural	21	6,734	1,138	9,476	14,950	112.6	15.0	31.5	37.0	40.7	29.2
	Wetlands	23	15,118	1,794	5,900	32,430	323.0	115.8	187.8	188.1	66.3	62.0
	Total	245	58,579	12,136	276,136	525,004	4404.3	892.8	1642.2	1715.7	1162.9	663.1

TABLE 2.4-2
SUMMARY OF PRIORITY PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLANS
(BY COUNTRIES)

Country	No of Pro-jects	Expected Reduction								Investment Cost		Funding Scheme				Funding Scheme			
		N		P		BOD		COD		Mill EUR	(%)	National Funding	Internat. Loan	Internat. Grant	Total	National Funding	Internat. Loan	Internat. Grant	Total
		tons/y	(%)	tons/y	(%)	tons/y	(%)	tons/y	(%)			Mill EUR	Mill EUR	Mill EUR	Mill EUR	(%)	(%)	(%)	(%)
A	4	3,950	7	404	3	11,240	4	16,528	3	264	6	264	0	0	264	100	0	0	100
BIH	12	4,700	8	853	7	8,652	3	16,961	3	176	4	0	0	0	0	0	0	0	0
BUL	21	2,683	5	599	5	19,747	7	35,373	7	125	3	7	0	31	37	5	0	24	30
CRO	11	1,509	3	239	2	15,310	6	34,424	7	433	10	2	10	0	12	1	2	0	3
CZ	12	1,091	2	62	1	1,246	0	120	0	147	3	64	23	17	104	44	16	11	71
GER	11	4,091	7	74	1	75	0	1,291	0	231	5	231	0	0	231	100	0	0	100
HUN	24	6,708	11	1,522	13	0	0	0	0	687	16	267	184	231	682	39	27	34	99
MOL	31	6,901	12	905	7	1,595	1	832	0	493	11	150	177	166	493	31	36	34	100
ROM	25	11,860	20	1,591	13	59,811	22	67,470	13	493	11	177	212	104	493	36	43	21	100
SK	20	2,574	4	147	1	13,609	5	27,148	5	118	3	45	5	4	54	38	4	3	45
SLO	24	5,233	9	814	7	28,816	10	47,040	9	384	9	328	44	10	382	85	12	3	100
UA	10	486	1	65	1	677	0	621	0	67	2	5	0	0	5	8	0	0	8
YUG	40	6,793	12	4,863	40	115,358	42	277,196	53	785	18	175	509	102	785	22	65	13	100
TOTAL	245	58,579	100	12,136	100	276,136	100	525,004	100	4,404	100	1,716	1,163	663	3,542	39	26	15	80

TABLE 2.4-3
SUMMARY OF PRIORITY PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLANS
(BY SECTORS FOR ALL DRB COUNTRIES)

Sector	No of Pro-jects	Expected Reduction								Investment Cost		Funding Scheme				Funding Scheme			
		N		P		BOD		COD		Mill EUR	(%)	National Funding	Internat. Loan	Internat. Grant	Total	National Funding	Internat. Loan	Internat. Grant	Total
		tons/y	(%)	tons/y	(%)	tons/y	(%)	tons/y	(%)			Mill EUR	Mill EUR	Mill EUR	Mill EUR	(%)	(%)	(%)	(%)
Municipal	157	33,311	57	5,495	45	221,020	80	398,919	76	3,702	84	1,382	977	530	2,888	37	26	14	78
Industrial	44	3,416	6	3,710	31	39,741	14	78,704	15	267	6	109	79	42	230	41	30	16	86
Agricultural	21	6,734	11	1,138	9	9,476	3	14,950	3	113	3	37	41	29	107	33	36	26	95
Wetlands	23	15,118	26	1,794	15	5,900	2	32,430	6	323	7	188	66	62	316	58	21	19	98
Total	245	58,579	100	12,136	100	276,136	100	525,004	100	4,404	100	1,716	1,163	663	3,542	39	26	15	80

ANNEX I COUNTRY REPORTS

- 1. GERMANY**
- 2. AUSTRIA**
- 3. CZECH REPUBLIC**
- 4. SLOVAKIA**
- 5. HUNGARY**
- 6. SLOVENIA**
- 7. CROATIA**
- 8. BOSNIA-HERZEGOVINA**
- 9. YUGOSLAVIA**
- 10. BULGARIA**
- 11. ROMANIA**
- 12. MOLDOVA**
- 13. UKRAINE**

1 GERMANY

1.1 Verification of Data and Information on Nutrient Emissions / Loads

The analysis of the existing data shows that immission loads for nutrients in the German part of the river Danube, calculated from regularly monitored water quality data, reach a level of around 85 000 t N and 4000-6000 t P per year. Especially phosphorus loads have been decreased very dramatically for the last twenty years but also nitrogen loads show a decreasing trend for the last years. Emission values vary according to the method applied for their evaluation. An investigation of Behrendt (1999) mentions about 130 000 t N and 5300 t P for the years 1993 to 1997. The major part of the nutrient input derives from diffuse sources. For nitrogen, the diffuse input reaches 80 % with 60 % stemming from groundwater and around 10 % from drainage. For phosphorus, 70% of the input is provided by diffuse sources with 35% stemming from erosion, 15% from surface flow and 10 % from groundwater. Concerning point sources, the major part originates from municipal wastewater, industrial input can be neglected.

For the year 1996, the use of mineral fertilizers amounts about 220 000 tN/a and 70 000 tP/a. Generally, the application of mineral fertilizers decreased, for the Bavarian part of the Danube River Basin while the use of nitrogen dropped since 1989 from 119 kg/ha to 80 kg/ha (1997). The organic fertilizer application declined for the last 5 years, too.

Most of the 9 135 000 inhabitants are connected to sewage system (Bavaria part: 91%, 1998). The wastewater treatment plants show a high degree of elimination for nutrients (Bavarian part: 75% for P and 45% for N (1998)).

1.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

Measures for nutrient reduction are based on legislation given by EU-guidelines and water acts of the German Republic (framework conditions) and the German Federal States.

In order to reduce nutrient input to the Danube basin, a number of measures have been already taken and some important targets have been achieved. The input of nutrients has been decreased e.g. by elimination of these substances on wastewater treatment plants and by imposing legal restrictions for phosphates in detergents.

Further targets are (i) the consequent applying of legal instruments for nutrient input reduction, (ii) the maintenance and upgrading of wastewater sewage systems to reduce nutrients from point sources and, (iii) the stimulation of new approaches for reducing nutrients from diffuse sources.

Some approaches concerning diffuse sources are to reduce nutrient input by (1) applying extensive and ecological farming, (2) using modern technologies to determine fertilizers needed and to minimize the losses by fertilizing, (3) identifying and defining protection areas e.g. river banks, sensible regions where restrictions for agricultural activities have to be required, and (4) protecting landscape from erosion. In addition, the capability of ecosystems to keep and transform nutrients can be strengthened by river and wetland renaturation.

Germany is introducing flexibility in implementation of these measures, within the frame of a close cooperation between water managers, farmers and researches. First, a common consensus on the importance of nutrient reduction must be founded. Methods have to be developed on how to reduce nutrients in a efficient and cost-effective way e.g. by pilot studies and through permanent training and consulting on the state of art.

Instruments to initiate and continue this process include the (1) promotion of methods for nutrient reduction, and (2) financial support for farmers and for research, education and consulting. In the German part of the Danube River Basin, different action programs make use of these instruments e.g. the "Bayerische Kulturlandschaftsprogramm".

Besides these programs aiming mostly at agricultural methods, measures that are oriented at rivers and wetlands are also undertaken. River management plans lead to a development in a sustainable way e.g. by

river renaturation or riverbank protection. These measures have also to be applied in a cooperative way and to be agreed by all groups of interest.

In general, measures for nutrient reduction of diffuse sources have to be an integrated part of the overall plans for land use and development.

1.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The measures just undertaken and planned in the future for nutrient reduction of diffuse source will lead to a decrease of nutrient input. However, the complex nature of processes makes difficult to quantify this nutrient reduction. It is anticipated that the whole process will last over 10 to 20 years and only long-term changes are to be expected.

1.4 Identification of Projects Ready for Implementation

The identified projects which are currently under implementation or supposed to be ready for implementation in the coming 3 years are compiled and characterized in Annex 6.4.

The total investment requirements of the 11 identified priority projects is EUR 231 million; their composition by sectors is as follows:

- 8 municipal projects with investment requirements of EUR 98.3 million,
- 2 industrial projects with investment requirements of EUR 6.3 million;
- no agricultural point-source project;
- 2 wetland projects with investment requirements of EUR 126.7 million;

In addition to these 11 point-source projects Germany is going to spent about EUR 1.0 million per year in the DRB area of Germany for measures related to reduction of nutrient emissions in the agricultural / land use sector (buffer zone program, etc).

Regarding project funding it is assumed that the required funds will fully be covered by national sources.

1.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

For the 12 identified projects the anticipated nutrient reduction is stated in detail in Annex II-1 and can be summarized as follows:

- N: 4091 tons/year;
- P: 74 tons/year;
- BOD: 75 tons/year;
- COD: 1291 tons/year;

The composition of the anticipated nutrient reduction by sectors is compiled in Section 1.6(2).

1.6 Summary of Main Country Specific Particularities and Conclusions

(1) Main particularities regarding “non point source” issues

The verification of data shows that especially phosphorus loads have been decreased very dramatically for the last twenty years but also nitrogen loads show a decreasing trend for the last years.

Generally, the application of mineral fertilizers decreased, for the Bavarian part of the Danube River Basin while the use of nitrogen dropped since 1989 from 119 kg/ha to 80 kg/ha (1997). The organic fertilizer application declined for the last 5 years, too.

It is obvious that the efforts undertaken by Germany in reducing nutrient emissions from diffuse sources of pollution are mainly based on a flexible approach which allow the polluters to voluntarily agree with the suggested measures. It is considered that the major part of the nutrient input derives from diffuse sources.

Germany suggests measures to reduce nutrient input from diffuse sources which include the use of (1) extensive and ecological farming, (2) modern technologies to determine fertilizers amounts, (3) protection areas e.g. river banks, sensible regions where restrictions for agricultural activities have to be required, and (4) protecting measures against soil erosion.

(2) Main particularities regarding “point source” projects

Germany is one of the countries which provided a complete project list and a complete set of project data regarding investment requirements and funding schemes for the priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects can be summarized as follows:

Table 1.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	7	3620	13	75	511	98.3
Industrial point sources	2	635	40	0	780	6.3
Agricultural point sources	0	0	0	0	0	0
Wetlands	2	211	21	0	0	126.7
Total	12	4091	74	75	1291	231.3

It is assumed that the required funds of about EUR 231 million will fully be covered by national sources.

In addition to the 11 point-source projects Germany is going to spent about EUR 1.0 million per year in the DRB area of Germany for measures related to reduction of nutrient emissions in the agricultural / land use sector (buffer zone program, etc).

2 AUSTRIA

2.1 Verification of Data and Information on Nutrient Emissions / Loads

In Austria requirements for urban wastewater treatment (i.e. all plants > 50 p.e.) are fixed in the First Emission Ordinance BGBl. In this ordinance quality standards for wastewater treatment plants for e.g. phosphorous or nitrogen are fixed. The treatment of industrial wastewater is performed by internal industrial wastewater treatment plants or together with urban wastewater in urban wastewater treatment plants. The requirements for the indirect discharge are as well laid down in the sector specific emission ordinances and in the Ordinance for Indirect industrial WasteWater Emissions BGBl.

The following tables provide relevant statistical figures on wastewater treatment in Austria.

Table 2. 1-1: Population

Country total popul.	Emission coefficient		Population not connected to sewerage (1)	Population connected to sewerage*			
	kg N/ inh/y (2)	kg P/ inh/y (2)		Without treatment	Mech. Step	Biolog. Step*	Tertiary step
8,038,200	3.4	0.37	1,486,059 (1)	11,500	41,500	6,499,141	n.a.

Source: Federal Ministry of Agriculture Forestry Environment and Water management: BMLFUW: „Gewässerschutzbericht 1999“, Table 4.8, p.92

Note: (1) This figure means not connected to public sewers, these inhabitants are connected to smaller waste water treatment plants, cess pools or other facilities.

(2) values also include N and P discharges of small and medium served enterprises, served by urban waste water treatment plants, as emission coefficient has been calculated by dividing loads from the waste water treatment plants through number of inhabitants served by those facilities.

The following table presents the loads (t/a) of urban wastewater treatment plants into receiving waters in Austria 1998.

Austria 1998	BOD₅-Load	COD-Load	N-Load	P-Load
Urban waste water treatment plants	t/a	t/a	t/a	t/a
Plants with biological treatment	17,206	62,848	21,804	2,412
Plants with mechanical treatment	919	1,944	242	43
Total	18,125	64,792	22,046	2,455

Source: Federal Ministry of Agriculture Forestry Environment and Water management: BMLFUW: „Gewässerschutzbericht 1999“

Finally, the next table presents the comparison for the years 1981, 1991, 1995, 1998 in terms of wastewater treatment plants in Austria.

Austria	1981		1991		1995		1998	
Urban waste water	Pers.	%	Pers.	%	Pers.	%	Pers.	%
Connected to sewer system	4,374,547	57.9	5,544,833	71.0	5,987,105	75.7	6,552,141	81.5
Small sewer systems	1,219,321	16.1	762,732	9.8	659,768	8.3	519,961	6.5
Cess pools	1,530,610	20.3	1,386,894	17.8	1,192,459	15.1	917,730	11.4
Others	428,567	5.7	113,638	1.5	68,564	0.9	48,368	0.6
Without sewer system, sum	3,178,498	42.1	2,263,264	29.0	1,920,791	24.3	1,486,059	18.5
Total	7,533,045	100	7,808,097	100	7,907,896	100	8,038,200	100

Source: Federal Ministry of Agriculture Forestry Environment and Water management: BMLFUW: „Gewässerschutzbericht 1999“

In 1998 in Austria 6,552,141 inhabitants were connected to sewers. Among them 6,540,641 were connected to a wastewater treatment plant (WWTP), 11,500 were connected to the sewerage system but without WWTP. The total population in Austria is 8,038,200 from them 1,486,059 Austrian inhabitants were not connected to a public sewer system which equals to a percentage of 18.5 %. This percentage of 18.5% comprises 6.5% who are connected to a small waste water treatment plants, 11.4 % to cess pools and 0.6 % to other facilities.

The following table shows the agricultural area in Austria and types of crops, (chemical fertilisers in kg N or P/ha/year).

Table 2.1-2: Agricultural land

Surface ha 1997	<u>Culture</u>	Culture	Culture	Runoff coefficient
ha	Type of crop	Kg N/y	Kg P /ha/y	
259,800	Wheat	*	++	
57,800	Rye	*	++	
260,600	Barley	*	++	
40,100	Oats	*	++	
188,300	Maize	*	++	
23,500	Potatoes	*	++	
51,600	Sugar beet	*	++	
3,422,449	Sum of agricultural land	42	7.3	

Total of agricultural land (including grassland): 3,422,449 mio. ha (1997)

Without extensive grassland (e.g. alpine meadows): 2,417,324 mio. ha (1997)

(Source: Federal Ministry of Agriculture, Forestry, Environment and Water Management, Report „Austria's Agriculture, Forestry and Water Management 1998“)

Note: * N-chemical fertiliser: 143,818 tons (1997)

++ P –chemical fertiliser: 24,942 tons (1997)

(Source: Federal Ministry of Agriculture, Forestry, Environment and Water Management, Report „Grüner Bericht“, Table 4.9, 1998“)

Recommendations for fertilising of crops exist, statistical figures on actual fertilisation per crop are not available. The average application of chemical fertiliser per ha of agricultural land in 1997 was in terms of N 42 kg/ha and in terms of P 7.3 kg/ha of the total agricultural land.

Finally, the emission coefficients and the number of animals in Austria are presented in the next table.

Table 2. 1-3: Livestock units

Inventory of animals 1997	<u>Number (1998)</u>	Number of animal in GVE (1 GVE = livestock unit with 500 kg alive)	Emission coefficient	Emission coefficient
			Kg N/head/y	Kg P/head/y
1. pigs	3,810,310			
2. cows	882,994			
3.cattle total	2,171,681			
4.horses	75,347			
5.sheep	360,812			
6.poultry*	13,539,693			
7. others				

Source: Federal Ministry of Agriculture, Forestry, Environment and Water Management, Report „Güner Bericht 1998“, Tables 3.15

* Number of chicken

Sum of manure N of all livestock: 169,750,000 kg (1995)

Sum of manure P: 37,755,000 kg (1995)

Sum of agricultural land (1995): 3,470,570 ha

Manure N/year and ha: 48.9 kg/y/ha (1995)

Manure P/year and ha: 10.9 kg/y/ha (1995)

Source: "Bodenschutz in Österreich, Edit: A. Köchl, Federal Ministry of Agriculture and Forestry 1997, p. 189 and the Report Grüner Bericht 1998.

The manure application is comparatively low in Austria with other EU countries.

2.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

Austria is very actively involved in restoring wetland and floodplain areas where feasible and possible.

The (1995) "Austrian Programme for the promotion of a sound environmental friendly and extensive natural resources protecting agriculture" (ÖPUL) shall be substituted by the further advanced programme "ÖPUL 2000".

2.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

Due to the measures already imposed in wastewater purification and by encouraging environmentally friendly agriculture and due to the comparatively very low figures in nutrient application and livestock density, in Austria, no really considerable further reductions of nutrient input in Austrian waters will be achievable.

Significant efforts to quantify the effects of the measures introduced in agriculture and also, most important, of the natural and non-avoidable existing background-loads shall be undertaken in the near future.

2.4 Identification of Projects Ready for Implementation

The identified point-source projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterized in Annex 2.4.

The total investment requirements of the 4 identified projects are EUR 264 million; the composition by sectors is as follows:

- 3 municipal projects with investment requirements of EUR 231 million;
 - * WWTP Vienna (extension and upgrade of N / P removal);
 - * WWTP Linz-Asten (extension and upgrade of N / P removal);
 - * WWTP Graz (extension and upgrade of N / P removal);
- 1 industrial project with investment requirements of EUR 33 million;
- no agricultural point-source projects;
- no wetland point-source projects.

Regarding project funding it is assumed that the required funds will fully be covered by national sources.

2.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

For the four identified point-source projects in the municipal and industrial sectors the anticipated annual nutrient reduction is stated in detail in Annex II-2 and can be summarized as follows:

- N: 3950 tons/year;
- P: 404 tons/year;
- BOD: 11240 tons/year;
- COD: 16528 tons/ year;

The composition of the anticipated nutrient reduction by sectors is compiled in Section 2.6(2).

2.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “diffuse” projects

Austria is one of the few Danube countries, which is already taken measures leading to nutrient reduction and control through various programs on promotion of a sound environmental friendly and extensive natural resources protecting agriculture". In addition, Austria is very active in restoring and conserving wetlands and vulnerable areas.

(2) Main particularities regarding “point source” projects

Austria is one of the countries which provided a complete project list and a complete set of project data regarding investment requirements and funding schemes for the priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects can be summarized as follows:

Table 2.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	3	3950	404	5740	12028	231.0
Industrial point sources	1	0	0	5500	4500	33.0
Agricultural point sources	0	0	0	0	0	0
Wetlands	0	0	0	0	0	0
Total	4	3950	404	11240	16528	264.0

It is assumed that the required funds of about EUR 264 million will fully be covered by national sources.

3 CZECH REPUBLIC

3.1 Verification of Data and Information on Nutrient Emissions / Loads

Analysis of data information on nutrient loads is based on available data in 1999, from official sources of information as the Statistical yearbooks, WRI databases prepared in National water protection project and other sources used by WRI.

The data presented in the tables 1-3 are based on estimation of the real nutrient run-off into surface and ground waters. Total N and P production calculated from specific production and number of inhabitants has a decreasing tendency, in accordance with the assumed wastewater treatment plants efficiency.

The estimated nutrient discharge from both large municipal point sources and small diffuse municipal sources is 13,735 t/y of N and 1,587 t/y of P.

Czech Republic considers that farmland nutrient balances are influenced by many factors apart of the basic inputs and outputs, which can include hydrology, climate and geographic conditions, as well as weather in particular years.

Within the Morava River basin it is assumed that about 30-50 % of N and 2-5 % P balance surplus, calculated for the representative year 1996, will represent run-offs into waters.

Table 3.1-1: Population

Total population of Morava river basin in CZ	Emissions Coefficients		Population not connected to sewerage	Population connected to sewerage				
	kg N/inh/y	kg P/inh/y		Inh.	mechanical step	biological step	tertiary step	
							N	P
2 700 000	6,2	0,73	710 000	1 990 000	1850 000	300 000	50 000	

Table 3.1-2: Loads-Agricultural Land

Surface ha	Culture	Consumption of fertilisers		Runoff coefficient
		kg N/ha/y	kg P/ha/y	
909500	Arable land	64,5	14,6	
15000	Vineyards			
110000	Meadows			
78000	Pasture land			

Table 3.1-3: Number of Livestock

Inventory of animals	Number	Specific Emission	
		kg N/head/y	kg P/head/y
1. pigs	1382500	9,4	2,2
2. cows	165000	41,5	1,1
3. cattle	273000	41,5	1,1
4. horses	6000	48	1,3
5. sheep	19500	8,9	1,8
6. poultry	8627500	0,9	0,3

3.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

According to the Statistical Yearbook, application of industrial fertilizers is decreased from 98,8 kg N/ha/y (1988) to 64,5 kg N/ha/y (1998), and from 68,4 kg P/ha/y (1988) to 14,4 kg P/ha/y (1998). In the same period, the number of breeding farm animals has been significantly reduced and the quantity of applied farmyard manure diminished as well. An additional decrease of these inputs is not expected. On contrary, favorable economic situation could have been resulting in a slight increase of applied fertilizers. It is obvious that the response of fertilization decrease is a long-term process that may have been outlasting for a few tens of years.

A favorable impact on the nutrient run-off reduction is expected after the designation of vulnerable areas and implementation of the required forms of farming in these areas. The nutrient pollution reduction in waters will mostly be of local character. The revitalization programs of landscape, streams, small wetlands constructing etc. will help to improve mainly the ecological situation in their neighborhood.

One of the problems still pertaining in some areas is water erosion, transporting into streams, together with soils, high concentrations of nitrates and partly of phosphorus as well.

A schedule of the intended extent of anti-erosion measures for the following 5 years as well as calculation of nutrient reduction due to these measures is difficult to elaborate, without detailed research and investigation.

Presently, the amount of P in detergents is regulated by the "Voluntary agreement on gradual decrease of impact of detergents on the environment" (1995) which has been concluded between the Ministry of the Environment of the Czech Republic and the Czech corporation of producers of soaps, detergents and cleaning agents. Further decrease of P emissions from detergents depends on negotiations between the involved partners.

3.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The total reduction of nutrient out flow from agricultural land is assumed as 10% of N and 3% of P. As the main focus of both Czech State Environmental Policy and the EU directives are on large localities, for the next five years period, from the category of diffuse sources of pollution from small municipalities and scattered farms it cannot be expected any nutrient reduction.

3.4 Identification of Projects Ready for Implementation

The identified priority projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterized in Annex 3.4.

The total investment requirements of the 11 identified projects (including not further specified "small scale municipal projects") are EUR 144 million; their composition by sectors is as follows:

- 6 municipal projects with investment requirements of EUR 92 million, (other "small scale municipal projects with investment requirements of EUR 42 million);
- 4 industrial projects with investment requirements of EUR 5,1 million,
- 1 agricultural project with investment requirements of EUR 5,3 million,
- 1 Wetlands Program (24 actions concerning wetland restoration) for EUR 2,6 million.

Czech Republic has identified a number of 24 actions concerning wetland restoration or similar activities together for about EUR 2.6 million as an integral part of the five year Joint Action Programme. Details on nutrient reduction effects after the implementation of these projects are subject of further studies.

Regarding project funding it is expected that national funds, 16% by international loans and about 11% by international grants will cover about 44%; the funding of the residual 30% is not yet secured.

3.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

For the identified priority projects the anticipated nutrient reduction is stated in detail in Annex II-3 and can be summarized as follows:

- N: 1091 tons/year;
- P: 62 tons/year;
- BOD: 1246 tons/year;
- COD: 120 tons/year;

The composition of the anticipated nutrient reduction by sectors is compiled in Section 3.6(2).

In addition significant nutrient reduction is in the future expected from the application of the EU Directive 91/272/EEC which imposes waste water treatment on all municipalities with more than 2000 PE and increased treatment requirements on municipal pollution sources in “designated sensitive areas”. As the designation of sensitive areas is only in the stage of preparation, the expected effects will probably not become evident before 2005.

3.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

Analysis of data information on nutrient loads has been performed based on available data in 1999, using official sources of information and documents. As other Danube countries, total N and P production calculated from specific production and number of inhabitants has also recorded a decreasing tendency during last years.

Czech Republic considers that farmland nutrient balances are influenced by many factors, which can include hydrology, climate and geographic conditions, as well as weather in particular years.

A specific characteristic of this country is related to the effect of the possible favorable economic situation, which can be resulting in a slight increase of applied fertilizers. Therefore, the response of fertilization decrease is a long-term process that may have been outlasting for a few tens of years.

Czech Republic proposes various methods aiming to nutrient reduction. Designation of vulnerable areas and implementation of the required forms of farming in these areas will bring the country in line with EU requirements. The nutrient pollution reduction in waters will mostly be of local character. The revitalization programs of landscape, streams, small wetlands constructing etc. will help to improve mainly the ecological situation in their neighborhood.

Other particularities is given by the effects of water erosion, transporting into streams, together with soils, high concentrations of nitrates and partly of phosphorus as well.

A schedule of the intended extent of anti-erosion measures for the following 5 years as well as calculation of nutrient reduction due to these measures is difficult to elaborate without detailed research and investigation.

(2) Main particularities regarding “point source” projects

Czech Republic is one of the countries which provided a more or less complete project list and set of project data regarding investment requirements, implementation schedule and funding scheme for the priority projects to be implemented in the coming five year period.

The primary characteristics of the 12 identified priority projects can be summarized as follows:

Table 3.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	6	1010	58	1228	93	133,7
Industrial point sources	4	61	1	18	26	5,1
Agricultural point sources	1	20	3	0	0	5,3
Wetlands	1	not yet assessed				2,6
Total	12	1091	62	1246	120	146,7

The development of the anticipated nutrient reduction can be summarised as follows:

Table 3.6-2: Development of anticipated Nutrient Reduction

Sector	Nutrient load 1998		Nutrient load 2005		Reduction 1998-2005	
	N (t/y)	P(t/y)	N (t/y)	P(t/y)	N (%)	P(%)
Municipal point sources	13735	1587	12725	1530	8	4
Industrial point sources	215	35	154	34	28	3
Agricultural point sources	159	16	139	13	14	3
Sub-total	14109	1638	13018	1577	8	4
Agricultural non-point sources	22900	150	20600	145	10	3
Total	37009	1788	33618	1722	10	4

4 SLOVAKIA

4.1 Verification of Data and Information on Nutrient Emissions / Loads

Emissions from diffuse sources of pollution in Slovakia can be divided as emissions coming from population not connected to sewerage system, from agricultural land (by erosion) and from livestock. Table 4.1-1 contains information on population and emissions coefficients for N and P coming out from inhabitants not connected to sewage system. Different coefficients are given for inhabitants connected to water works, but not to sewerage system (emission coefficients are supposed to be higher) than those for inhabitants not connected neither to water works nor to sewerage system).

Table 4.1-1: Population

Country total population	Emissions coefficients		Population not connected to sewerage	Population connected to sewerage			
	kg N /inh/y	kg P/inh/y*		without treatment	Mechanical step	biological step	tertiary step
5 398 657				96030	29100	2784870	
	2,19	0,69	1 550 000 inh. (Inhabitants connected to water works but not to sewage system)				
	0,44	0,13	938 657 inh. (inhabitants connected neither to water works or sewage system)				

* - Phosphorus from detergents included

Table 4.1-2 presents data on main type of crops cultivated in Slovakia with corresponding areas and amount of nitrogen and phosphorus applied on particular lands. The values of nutrients from both organic and artificial fertilizers applied have been considered. Runoff coefficients have been estimated as 20 % of applied nitrogen and 2 % of applied phosphorus. The average amount of nutrients applied on agricultural land in Slovak Republic is 48,74 kg of nitrogen and 8,0 kg of phosphorus (for period 1998-99).

Table 4.1-2: Agricultural Land

Surface (ha)	Culture	Runoff coefficient			
		kg N/ha/y	kg P/ha/y	kg N/ha/y	kg P/ha/y
870 449	Cereals in total, of which:				
415 708	- Wheat	77,61	8,0	15,5	0,16
34 369	- Rye	43,13	3,6	8,6	0,07
252 885	- Barley	53,55	5,8	10,7	0,12
19 641	- Oats	32,79	3,8	6,6	0,08
118 230	- Grain maize	88,06	5,0	17,6	0,10
34 657	Legume in total	13,59	5,6	2,7	0,11
29 332	Potatoes in total	117,22	19,4	23,4	0,39
37 667	Sugar – beet	95,79	14,8	19,2	0,30
142 351	OIL - PLANTS IN TOTAL, OF WHICH:				
61 155	- Rape	95,64	9,0	19,1	0,18
67 126	- Sunflower	52,4	4,9	10,5	0,10
3 556	- Soya	52,4	4,9	10,5	0,10
2 450	- Poppy seeds	37,09	7,4	7,4	0,15
1 455	Flax	29,64	3,8	5,9	0,08
1 019	Tobacco	14,45	13,3	2,9	0,27
40 516	Market vegetables	76,19	3	15,2	0,06
6 173	Feeding root - crops	54,00	3,5	10,8	0,07

Surface (ha)	Culture			Runoff coefficient	
	Type of crop	kg N/ha/y	kg P/ha/y	kg N/ha/y	kg P/ha/y
162 009	FODDER ON ARABLE LAND ANNUAL, OF WHICH				
119 318	Unripe and ensilage maize	74,42	5,1	14,9	0,10
152 011	<i>Lasting more years</i>	15,98	1,7	3,2	0,03
28 377	Vineyards	22,33	4,0	4,5	0,08
19 017	Orchards	21,07	7,7	4,2	0,15
1 031	Hop-gardens	107,3	28,7	21,5	0,57

Runoff coefficients are 20 % of applied N and 2 % of applied P to be in line with methodology used in National Reviews 1998, Part C: Water Quality

One important information is that in the last years, the amounts of nitrogen and phosphorus applied on agricultural land are lower than their real need for cultivation of crops. The study performed by Central Control and Testing Institute of Agriculture (CCTIA) shows the need of an additional 23-kg N/ha nitrogen application and 6-kg P/ha. The difference of required nutrient for crops were provided by the soil.

Table 4.1-3 contains information on number of animals that are breeding in Slovakia with their corresponding emission coefficients for Nitrogen and Phosphorus.

Table 4.1-3: Number of Livestock

Inventory of animals*	Number (1998)	Emission Coefficient	
		kg N/head/y	Kg P/head/y
1. pigs	1 593 000	0,094	0,022
2. cows	284 000	¹⁾	¹⁾
3. cattle	421 000	0,415	0,083
4. horses	10 000	no emission coefficient available	no emission coefficient available
5. sheep	326 000	0,089	0,018
6. poultry	13 117 000	0,009	0,003
7. others			

* no waste water treatment plant provided

¹⁾ No emission coefficient especially for cows, only for cattle in general

The estimated total amount of nitrogen and phosphorus coming from diffuse sources of pollution is presented in the table below.

	N 1000 t/y	P 1000 t/y]	Note
Erosion	6,1	0,24	Emission coefficients for released N and P by erosion given by Bedrna (1985) were used. From the given range 0,5 – 15 kg N/ha and 0,01 – 0,20 kg P/ha the following data were used, taking into account low amount of fertilisers used in the last decade: N : 2,5 kg /ha P : 0,1 kg /ha
Washing-out	24,0	0,39	It was assumed that 20 % of applied N and 2 % of P on agricultural land is washing out. In the figures given for N and P, the release from animals is already included as in the data from CCTIA total amounts of N and P applied on agricultural land from both organic and artificial fertilisers are included.
Population connected to water works, but not connected to sewerage system	3,4	1,07	
Population connected neither to water works, or sewerage system	0,4	1,82	
Total	33,8	1,82	

4.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The most important measures for nutrient reduction from diffuse sources of pollution are prepared mainly in accordance with transposition and implementation of European Union legislation. The basic document in the field of approximation process is the „National Programme for transposition of Aquis Communautaire“. In addition, requirements resulting from the governmental priority related to the EU accession process has also been transformed as „National Environmental Action Plan II“ (1999), with particular tasks to transpose and implement EU legislation.

In addition to the recent approved Law on fertilizers, Slovakia proposes the following measures that are supposed to become effective in the forthcoming period of five years, with the purpose to reduce nutrient emissions from diffuse sources:

- (1) Preparation of Governmental Decree on protection of water resources against pollution from agriculture
- (2) Development and implementation of the Code of good agricultural practices with purpose to reduce pollution caused by nitrates
- (3) Defining criteria for identification of water pollution by nitrates from agricultural sources (in relation to Nitrates Directive)
- (4) Identification of vulnerable areas regarding the Nitrates Directive
- (5) Development of Action Programme in vulnerable areas to ensure protection of waters against pollution from agriculture (in relation to Nitrates Directive)
- (6) Establishment of a „Soil Service“ which should serve as advisory unit in the field of utilization and protection of soils. It should cooperate with relevant institutions with purpose to protect environment
- (7) Establishment of „State Inspection for Soil Protection“ as a new institution under MSM SR to control legislative measures for soil protection enforcement.

Moreover, Slovakia, through the Ministry of Economy is preparing a new proposal on the methods of control of biological degradability of active substance detergents.

4.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The assessment of the nutrient reduction from non-point sources of pollution is considered difficult to be carried out during the period of economic transformation as it is recognized the influence of reduced financial means on the implementation of the necessary measures to decrease nutrient release.

There is a large need of investments to ensure the increase of share of the population connected to sewerage system (now, only 54 % of total population is connected).

In the last decade, the consumption of artificial fertilizers decreased rapidly (app. 38,3 kg N/ha and 9,6 kg P/ha of agricultural land), but on long-term is expecting an increase of this amount up to 90 kg N/ha. The amount of applied artificial fertilizers in the future is also strongly dependent on financial situation of agricultural enterprises.

Slovakia encourages the beneficial application of the code of good agricultural practices in relation to the release of nutrients from agricultural land.

With all these measures being implemented in the forthcoming five years, the amount of nutrients from diffuse sources of pollution can be lowered by 10 %. More significant effects can be observed after longer periods of time, as most of the planned activities are due to the year 2002 and full implementation needs some additional time.

4.4 Identification of Projects Ready for Implementation

The list of priority projects supposed to be ready for implementation in the coming five years is presented in Annex 4.4. The elaboration of this list is based on:

- Projects included in the Joint Action Programme, which is under preparation under EMIS/EG at this time
- Final draft of Up-dated National Action Plan for Danube River Basin, containing priorities of both Ministry of Environment and Ministry of Soil Management regarding projects of construction/reconstruction/expansion of sewer systems and waste water treatment plants
- The National Environmental Action Plan, approved in December 1999, containing the list of particular measures to achieve objectives set up for the water management sector in SR

Regarding data on investments and funding status it is expected that the partly existing information gaps can be filled through information directly provided by the authorities or companies, responsible for project realisation.

The total investment requirements of the 20 identified projects are EUR 118 million; their composition by sectors is as follows:

- 13 municipal projects with investment requirements of EUR 103 million,
- 4 industrial projects with investment requirements of EUR 14 million,
- no agricultural project;
- 3 wetland projects with investment requirements of EUR 0,9 million, (of which two projects “Integrated Management in Olšavica River Basin” and “Floodplain Meadow Restoration in the Lower Morava River” are already implemented and the third project “Wetland Restoration in Laborec River Basin” is prepared, but financial sources not yet secured).

Regarding project funding it is expected that about 38% will be covered by national funds, 4% by international loans and about 3% by international grants; the funding of the residual 55% is not yet secured.

4.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

Regarding municipal sector, the nutrient emissions have either been known from wastewater quality monitoring data, which are stored in Slovak Hydro-meteorological Institute or have been estimated by a standardized method, based on per capita emission coefficients.

In discharged wastewater from industrial sources, nitrogen and phosphorus is measured only in case of significant emissions. This is the reason why the total amount of discharged N and P from industry is not given in Annex II-4.

The expected reduction of BOD, COD, nitrogen and phosphorus has been estimated on the basis of planned measures in the particular source of pollution. If estimation of expected reduction is higher than the present discharge, the reason is primarily that the expansion of the sewer system is usually planned for a higher number of people connected to the wastewater treatment plant.

The anticipated nutrient reduction from the identified point source projects and the composition by sectors is compiled in Section 4.6 (2) and can be summarized as follows:

- N: 2574 tons/year;
- P: 147 tons/year;
- BOD: 13609 tons/year;
- COD: 27148 tons/ year;

4.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

Emissions from diffuse sources of pollution are considered in Slovakia as emissions coming from population not connected to sewerage system, from agricultural land (by erosion and washing up) and from livestock. Two important particularities of the country are related to the amounts of nitrogen and phosphorus applied on agricultural land that are lower than their real need for cultivation of crops and the initiative to implement soil conservation measures.

The most important measures for nutrient reduction from diffuse sources of pollution are prepared mainly in accordance with transposition and implementation of European Union legislation.

Slovakia is so far the only one country of the Danube river basin that has a recent approved Law on fertilizers. In addition, development and implementation of the Code of good agricultural practices with purpose to reduce pollution caused by nitrates is having a high priority.

Finally, the identification of vulnerable areas regarding the Nitrates Directive and the new proposal on the methods of control of biological degradability of active substance detergents bring Slovakia in line with EU standards.

With all these measures being implemented in the forthcoming five years, the amount of nutrients from diffuse sources of pollution can be lowered by 10 %.

(2) Main particularities regarding “point source” projects

Altogether Slovak Republic could provide a relatively complete set of project data regarding investment requirements, implementation schedules (and partly funding schemes) for the identified priority projects to be implemented in the coming five year period. It is expected that the existing data gaps can be filled through information directly provided by the authorities or companies, responsible for project realisation.

The primary characteristics of the identified priority projects, which are envisaged to be implemented within the coming period of five years in Slovakia, can be summarized as follows:

Table 4.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	13	2001	125	12968	25458	103.4
Industrial point sources	4	348	0	641	1690	14.2
Agricultural point sources	0	0	0	0	0	0.0
Wetlands	3	226	23	0	0	0.9
Total	20	2574	147	13609	27148	118.4

5 HUNGARY

5.1 Verification of Data and Information on Nutrient Emissions / Loads

The revision of data and information on nutrient emissions/ loads performed by Hungary has been accomplished taking into consideration (i) the nutrient mass balance with main accent on diffuse pollution, nutrient transport, wetlands and losses of nutrients in water systems, along the Danube and, (ii) the functioning of the Black Sea ecosystems, with regard to the nutrient discharges.

The updated data and information are presented in table 5.1-1, 5.1-2 and 5.1-3.

Table 5.1-1. Population

Country total population 1998	Emissions coefficients		Population not connected to sewerage	Population connected to sewerage *			
Inh	Kg N/inh/y	Kg P/inh/y	inh	without treatment	Mechanical step	Biological step	Tertiary step
10,135,000			4,358,000	81,833,000	231,634,000	245,386,000	11,762,000

Source: Housing Statistics and Public Utilities 1998, Central Statistical Office

* Data refer to waste water discharge expressed in m³

Table 5.1-2: Agricultural Land

Surface	Culture			Runoff coefficient
Ha	Type of crop	kg N/ha/y	kg P/ ha/y	
1,183,000	Wheat			
1,023,000	Maize			
370,000	Barley			
67,000	Rye			
194,000	Others			
2,837,000	Total			
1,766,000	Of which fertilized area	133		

Source: Statistical Yearbook of Agriculture 1998, Central Statistical Office

Table 5.1-3: Number of Livestock

Inventory of animals*	Number	Emission Coefficient	
Type	Heads	Kg N /head/y	kg P/ head /y
1. pigs	5,479,000		
2. cows	407,000		
3. cattle	873,000		
4. horses	70,000		
5. sheep	909,000		
6. poultry	30,557,000		
7. others			

Source: Statistical Yearbook of Agriculture 1998, Central Statistical Office

* no wastewater treatment plant provided

The evolution of the of total fertilizer usage per hectare of arable land, garden, orchard and vineyard at the world scale and Hungary is presented in the table below:

Country	1992	1993	1994	1995	1996
World total	87	84	85	89	89
Austria	177	175	168	158	152
Germany	239	224	242	234	234
Hungary	38	41	56	49	54

The assessment of amount of fertilizers used in Hungary between 1992-1996 is presented in the next table:

Fertilizer use	1992	1993	1994	1995	1996
Total quantity in 1000 t	189	207	280	247	270
Use on arable land, for 1 ha kg/ha	38	41	56	49	54
Out of which:					
N kg/ha	30	32	45	38	40
P kg/ha	4	5	5	6	7
K kg/ha	4	4	6	5	7

5.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The identified measures for nutrient reduction from diffuse sources by Hungary, which are supposed to become effective within the forthcoming period of 5 years are based on the following concerns:

- introduction of P-free detergents;
- improvement of national policies and legislation regarding utilization of fertilizers and livestock waste;
- approximation of national legislation to relevant EU legislation and standards.

The National Environmental Programme of Hungary in relation to the nutrient reduction from diffuse sources defines two major measures:

- (1) The wastewater treatment in the region of nutrient sensitive waters should be at least 3rd degree.
- (2) The nutrient emission into surface waters should be reduced below 20% in comparison with the recent level.

Introduction of P-free detergents measure is not yet included in the National Environmental Programme of 1997-2006 neither in environmental, nor in the economic chapters.

5.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The assessment of the anticipated annual potentials of nutrient reduction has been difficult to be carried out by Hungary due to the lack of data.

However, the implementation of the following projects in the agricultural sector will lead at a reduction of minimum 2,000-t/year N provided by non point sources of pollution:

- Introduction of EU-conform and environmentally protective pig fattening technology, in Mosonmagyaróvár region;
- Agriculture originated pollution minimization in the floodplain of Tisza river;
- Establishment of agro- and nature-conservation training centers in the Kőrös-Maros National Park;
- Central-Danube Valley organic farming, nutrient control, wetland rehabilitation;
- Babócsa Organic farming in the Dráva floodplain.

5.4 Identification of Projects Ready for Implementation

The identified priority projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterized in Annex II-5.

The total investment requirements of the 24 identified priority projects are EUR 687 million; their composition by sectors is as follows:

- 16 municipal projects with investment requirements of EUR 658 million,
- 1 industrial project with investment requirements of EUR 5.9 million,
- 5 agricultural project with investment requirements of EUR 7.2 million,
- 2 wetland projects with investment requirements of EUR 15.4 million.

Regarding project funding it is expected that about 39% will be covered by national funds, 27% by international loans and about 34% by international grants.

5.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The anticipated nutrient reduction for the 24 identified priority projects is stated in detail in Annex 5.4 and can be summarized as follows:

- N: 6708 tons/year;
- P: 1522 tons/year;
- BOD: - (figures not available);
- COD: - (figures not available);

The composition of the anticipated nutrient reduction by sectors is compiled in Section 5.6(2).

5.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

The revision of data and information on nutrient emissions/ loads performed by Hungary has taking into consideration the nutrient mass balance, with main accent on diffuse pollution, nutrient transport, wetlands and losses of nutrients in water systems.

Specific for Hungary is the increase of the fertiliser usage per hectare of arable land, garden, orchard and vineyard for the last eight years.

The identified measures for nutrient reduction from diffuse sources by Hungary, which are supposed to become effective within the forthcoming period of 5 years include the introduction of P-free detergents and improvements of national policies and legislation regarding utilisation of fertilisers and livestock waste.

Another particularity of Hungary is given by the measure to introduce wastewater treatment in the region of nutrient sensitive waters.

It is expected that the implementation of the nutrient reduction measures in the agricultural sector will lead to a reduction of minimum 2,000-t/year N.

(2) Main particularities regarding “point source” projects

Hungary is one of the countries which provided a complete project list and set of project data regarding investment requirements, implementation schedule and funding scheme for the identified priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects which are envisaged to be implemented within the coming period of five years in Hungary can be summarized as follows:

Table 5.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	16	3455	1153	-	-	658.2
Industrial point sources	1	420	6	-	-	5.9
Agricultural point sources	5	2600	340	-	-	7.2
Wetlands	2	233	23	-	-	13.3
Total	23	6708	1522	-	-	686.7

At the time being there are no figures on anticipated reduction of BOD and COD.

6 SLOVENIA

6.1 Verification of Data and Information on Nutrient Emissions / Loads

The verification of data and information were performed based on the estimates of the ad-hoc expert group of Slovenia. Although some measurements exist, the current monitoring procedures do not contain rules to allow measurements of Nitrogen and Phosphorus.

To facilitate the interpretation, Slovakia used the same values for one pollution equivalent (PE) as it is reported elsewhere in the literature, e.g. the Haskoning report of 1999 as indicated below:

1 PE (of municipality origin) is:

- 60 g BOD5/day => 25 kg BOD5/year
- 150 g COD/day => 50 kg COD/year
- g N/day => 5 kg N/year
- 2.5 g P/day => 1 kg P/year

It is also considered necessary to implement a new regulation on the responsibilities of large polluters to measure apart of BOD and COD content, also N and P.

For situations when part of data on BOD and COD were not reliable, the calculations were based on the population of the localities, adding measured or estimated values of the industrial load. An asterisk denotes such values (*).

The data are presented in the Tables 6.1-1, 6.1-2, 6.1-3 below.

Table 6.1-1: Population

Country Total population in the DRB	Emissions Coefficients		Population not connected to sewerage	Population connected to sewerage			
	Kg N/nh/y	Kg P/inh/y		without treatment	Mechanical step	biological step	tertiary step
87.7% of total	5	1	56% =	13 % =	16% =	15% =	0% =
1,754 000			982 240	228 020	280 640	263 100	0

Table 6.1-2: Agricultural Land

Surface (ha) in the DRB	Culture			Runoff coefficient
	Type of crop	kg N /ha/y	kg P/ ha / y	Total Outflow / Total Precipit.
234 230	Fields	N/A	N/A	estimate 0.55 whole DRB
15 500	Vineyards	N/A	N/A	estimate 0.55 whole DRB
37 220	Orchards	N/A	N/A	estimate 0.55 whole DRB
310 430	Meadows	N/A	N/A	estimate 0.55 whole DRB
154 230	Pastures	N/A	N/A	estimate 0.55 whole DRB
868 980	Forests	N/A	N/A	estimate 0.55 whole DRB
130 210	Other	N/A	N/A	estimate 0.55 whole DRB
1 750 810	Total			estimate 0.55 whole DRB

Table 6.1-3: Number of Livestock

Inventory of animals*	Number in the Republic of Slovenia (factor 0.90 for DRB)	Emission Coefficient	
		kg N /head/y	kg P/ head / y
1. pigs	116 658	N/A	N/A
2. cows	381 846	N/A	N/A
3. cattle	N/A	N/A	N/A
4. horses	10 312	N/A	N/A
5. sheep	22 972	N/A	N/A
6. poultry	1 419 884	N/A	N/A
7. others			

* no waste water treatment plant provided

6.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

As a consequence of EU accession process, Slovenia is already introducing EU market rules in terms of P-free detergent use.

Slovenia proposes measures to improve the national policies and legislation regarding utilization of fertilizers and livestock waste.

The Slovenian transposition of the EU Nitrates Directive states that total Nitrogen application on 1 ha of land could be less than 210 kg N/year. This maximum allowable value is further limited on water protection zones according to the type of the crop, e.g. maize 170 down to 80 kg N/year for 1 ha of land for wheat.

These lower limits shall also be taken into consideration on the country level once the forthcoming Water Act will come into force.

Slovenia already initiated actions to elaborate the code of proper best agricultural practices for achieving a sustainable agriculture.

It is expected that the national legislation shall be harmonized with the EU legislation within 2-3 years, while the full compliance time for some directives will be extended up to the year 2011 (IPPC) or even 2015 (UWWTD).

6.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The assessment of the nutrient reduction measures has been performed with the view that EU approximation will bring positive changes but with long waiting periods to be able to properly valuing them.

As it has been already presented in some earlier studies (e.g. Haskoning, 1992 and 1993) Slovenia considered that there would be extremely difficult to reduce the present diffuse loads.

One reason is given by the fact that 50% of Slovenia's population live in settlements below 2000 PE, and almost 70 % below 10 000 PE. As the Urban Wastewater Treatment Directive calls for centralized treatment, the number of PE connected to WWTP's will be much higher, which will, in turn, negligibly reduce diffuse pollution, but, significantly, increase point-sources pollution. Any attempt in agriculture to compensate for this increase in point-source pollution will mean great financial, logistic and management burden for Slovenia.

6.4 Identification of Projects Ready for Implementation

The list of projects that are supposed to be ready for implementation in the coming 5 years is presented in Annex II-6. The elaboration of this list of projects is mainly based on the up-dated Action Pollution Reduction Programme of the DDPRP and a selection of the most feasible and best-prepared projects (with complete project files, adequate funding schedules, and ready for implementation) been considered:

The total investment requirements of the 24 identified projects are EUR 384 million; their composition by sectors is as follows:

- 23 municipal projects with investment requirements of EUR 383 million,
- no industrial project;
- 1 agricultural project with investment requirements of EUR 1,7 million;
- no wetland project.

Regarding project funding it is expected that about 85% will be covered by national funds, 12% by international loans and about 3% by international grants.

6.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The overall anticipated nutrient reduction from the identified point source projects and the composition by sectors is stated in the compilation presented in section 6.6 (2) and can be summarized as follows:

- N: 5233 tons/year;
- P: 814 tons/year;
- BOD: 28816 tons/year;
- COD: 47040 tons/ year;

6.6 Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

The verification of data and information were performed based on the estimates of the ad-hoc expert group of Slovenia, with some constraints related to the current monitoring procedures which do not contain rules to allow measurements of Nitrogen and Phosphorus.

As a consequence of EU accession process, Slovenia is already introducing EU market rules in terms of P-free detergent use.

Slovenia proposes also measures to improve the national policies and legislation regarding utilisation of fertilisers and livestock waste. Moreover, Slovenia already initiated actions to elaborate the code of proper best agricultural practices for achieving a sustainable agriculture.

The assessment of the nutrient reduction measures has been performed with the view that EU approximation will bring positive changes but with long waiting periods to be able to properly valuing them.

(2) Main particularities regarding “point source” projects

Altogether Slovenia provided a complete project list and set of project data regarding investment requirements, implementation schedules and funding schemes for the identified priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects which are envisaged to be implemented within the coming period of five years in Slovenia can be summarized as follows:

Table 6.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	23	5 053	786	27 836	45 440	382,5
Industrial point sources	0	0	0	0	0	0.0
Agricultural point sources	1	180	28	980	1 600	1,7
Wetlands	0	0	0	0	0	0.0
Total	24	5 233	814	28 816	47 040	384.2

7 CROATIA

7.1 Verification of Data and Information on Nutrient Emissions / Loads

Croatia was not the part of the Nutrient Mass Balance Project within the Danube Program.

The analysis/verifications of the data and the information on nutrient emissions/loads has been performed for population and livestock unit, as most of the necessary data for agricultural land do not yet exist.

Moreover, data about emissions of Phosphorus and Nitrogen need to be collected which it will take some time and supplementary investigations.

However, it was possible that some data that refer to the type of crop production, by specific crop production, in tons in 1997, to be reviewed. Tables 1 and 3 contain some information that were collected and reviewed.

Table 7.1-1: Population

Country total population	Emissions Coefficients		Population not connected to sewerage	Population connected to sewerage			
	Kg N/inh/y	Kg P/inh/y		without treatment	mechanical step	biological step	tertiary step
3 250 000	4,0	0,9	1 583 100	1 475 600	45 700	145 600	-

Table 7.1-2: Agricultural Land

Surface ha	Culture			Runoff Coefficient
	Type of crop	kg N/ha/y	kg P/ha/y	
	n.a	n.a	n.a.	

Table 7.1-3: Number of Livestock

Inventory of animals*	Number (1998)	Emission Coefficient	
		kg N/head/y	kg P/head/y
1. pigs	1 333 449	8,0	
2. cows	232 694		
3. cattle	377 307		
4. horses	10 075		
5. sheep	157 287	8,0	
6. poultry	8 736 791	0.7	
7. others	-		

- total – with and without treatment

7.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

In accordance with the National Pollution Control Plan of Croatia, the proposed measures include:

- Preservation of the water resources quality
- Reduction of the pollution sources
- Strengthening of the monitoring system inclusively for accidental pollution.

For the next five years, Croatia proposes the necessary measures for nutrient reduction that include (i) introduction of P-free detergents, (ii) improvement of national policies and legislation regarding utilization of fertilizers and livestock waste, and (iii) approximation of national legislation to relevant EU legislation, respectively EU-standards.

7.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

During the last decade, the use of plant protection agents has decreased, not due to ecological reasons, but exclusively because of the economic constraints.

It seems that visible nutrient reduction from diffuse sources might take place only once the required measures and actions will be implemented.

7.4 Identification of Projects Ready for Implementation

The identified priority projects, which are supposed to be ready for implementation in the coming 5 years, are compiled and characterized in Annex II-7.

The total investment requirements of the 11 identified priority projects are EUR 433 million; their composition by sectors is as follows:

- 11 municipal projects with investment requirements of EUR 421 million (including EUR 256 million for implementation of biological treatment in Zagreb, 1500000 PE):
 - * Čakovec (extension of WWTP for tertiary treatment);
 - * Varazdin (reconstruction works and sludge treatment);
 - * Koprivnica (secondary and tertiary treatment for 90000 PE);
 - * Zagreb (biological treatment for 1500000 PE);
 - * Sisak, Karlovac (preparatory works);
 - * 5 other smaller WWTPs
- no industrial projects;
- no agricultural projects;
- no wetland projects.

Industrial, agricultural and wetland projects could not yet be identified because these projects need commitment from other authorities which is not to be obtained in the short term.

Regarding project funding the figures presented in Annex 7.4 are just for ongoing projects, respectively contracted values. For the majority of the projects there are no adequate funding schemes available.

7.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The anticipated nutrient reduction for the identified priority projects is stated in detail in Annex 7.4 and summarized in Section 7.6(2).

As nutrient reduction figures are not available for all of the identified priority projects, the provided figures do not fully represent the actual nutrient reduction.

7.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

Specific for Croatia is the fact that it has not been part of the Nutrient Mass Balance Project within the Danube Program. Most of data are not available and the analysis/verifications of the data and the information on nutrient emissions/loads has been performed only for population and livestock units.

In accordance with the National Pollution Control Plan of Croatia, the proposed measures include:

- Preservation of the water resources quality
- Reduction of the pollution sources
- Strengthening of the monitoring system, inclusively for accidental pollution.

For the next five years, Croatia proposes the necessary measures for nutrient reduction that include (i) introduction of P-free detergents, (ii) improvement of national policies and legislation regarding utilization of fertilizers and livestock waste, and (iii) approximation of national legislation to relevant EU legislation, respectively EU-standards.

It has been difficult to make estimates, but it is assumed that noticeable nutrient reduction from diffuse sources might be recorded once the required measures and actions will be implemented.

(2) Main particularities regarding “point source” projects

Up to now, there is no formalized, respectively officially agreed program or plan for nutrient reduction projects in Croatia.

There is a relatively clear priority schedule and implementation program for WWTP in the municipal sector; (but not for the industrial and the agricultural sector, and not for wetlands).

The primary characteristics of the identified priority projects which are envisaged to be implemented within the coming period of five years in Croatia can be summarized as follows:

Table 7.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	11	1509	239	15310	34424	433.4
Industrial point sources	0	0	0	0	0	0
Agricultural point sources	0	0	0	0	0	0
Wetlands	0	0	0	0	0	0
Total	11	1509	239	15310	34424	433.4

Even these priority projects in the municipal waste water sector cannot be considered as really committed, as there are no committed funding schemes for the majority of the identified projects.

According to the provided data there are no figures for the anticipated nutrient reduction for the majority of the identified projects.

8 BOSNIA - HERCEGOVINA

8.1 Verification of Data and Information on Nutrient Emissions / Loads

In comparison with similar previous revisions of data on emissions and loads, for this project, Bosnia - Herzegovina presented a full picture of all rivers belonging to the Danube river basin on its territory.

However, since the system of monitoring and assessment has not been yet re-established and therefore the up-dated values are not yet available, the data and information on nutrient emissions/loads represent estimations from the pre-war period.

Moreover, Bosnia - Herzegovina included recorded data on nutrient content at the mouths of main rivers into Sava river to be considered for transboundary pollution analysis within the framework of this present project.

The data on total nitrogen and phosphorus content measured in monitoring stations that are not up-dated are presented in the following table:

No	River	COD (t/y)	BOD5 (t/y)	Total N (t/y)	Ortho P (t/y)
1.	Una	32.777	14,000	-	600
2.	Vrbas	52.305	22,500	2,600	95
3.	Bosna	29.601	14,200	6,540	270
4.	Drina – downstream of Visegrad	33.726	9,500	-	135

At present about 88.61 % or 3,348 734 inhabitants of the total B&H population lives in the Danube river basin. Data for the share of Danube river basin related to pre-war and present population are summarized in the Table 8.1-1, with emissions coefficient calculated per capita and year.

Table 8.1-1: Population

The population in the DRB	Emissions Coefficients		Population not connected to sewerage system (65 %)	Population connected to sewerage system			
				without treatment	Mechanical step	biological step	Tertiary step
4,010 467*	0.78	0.23	2,606 804	933,663	-	470,000	0
3,348 734**	N/a	n/a	2,176 677	896,881	-	15,500	0

* population in 1991, within Danube River Basin

** population from post-war period (assessment)

Most of the data required to fill up the Tables 8.1-2 and 8.1-3 were not yet available. Data given (agricultural areas and number of livestock) refers to the entire territory of B&H.

Table 8.1-2: Agricultural Land

Surface (ha)	Culture			RunoffCoefficient
	Type of crop	kg N/ha/y	kg P/ha/y	
1,055,000	Ploughed fields and gardens	n/a	n/a	n/a
100,000	Orchards	n/a	n/a	n/a
4,000	Vineyards	n/a	n/a	n/a
383,000	Meadows	n/a	n/a	n/a
1,542,000	Total arable land	n/a	n/a	n/a
866,000	Pastures	n/a	n/a	n/a
7,000	Fish ponds, pools and reeds	n/a	n/a	n/a
873,000	Total uncultivable land	n/a	n/a	n/a
2,415,000	Total agricultural area	n/a	n/a	n/a

Source: Unpublished data of the two entity statistic institutes

Table 8.1-3: Number of Livestock

Inventory of Animals*	Number (B&H , 31.12.1997)	Emission coefficient	
		kg N/head/y	Kg P/head/y
1. pigs	372,654	n/a	n/a
2. cows	574,102	n/a	n/a
3. cattle	417,704	n/a	n/a
4. horses	56,807	n/a	n/a
5. sheep	580,493	n/a	n/a
6. poultry	3,362 488	n/a	n/a
7. others	n/a	n/a	n/a

* no waste water treatment plant provided

Only a very small number of inhabitants are served by sewerage system (up to 35 %), mostly located in larger municipalities. All other settlements do not have any sewerage system or connection to wastewater treatment plants. The increase of number of settlements having access to sewerage and treatment facilities is considered as being a priority by the government. As an example, two newly constructed wastewater treatment plants are already in operation. Also, the rehabilitation of those wastewater treatment plants that were damaged in the past represents a concern for the policy makers.

8.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The nutrient content of waters of B&H provided by the diffused sources of nutrient emissions is mainly from the agricultural production and livestock farming.

As a consequence of recent economic development of the country mainly through both the extension of cultivated agricultural areas and intensification of farming, a future increase of nutrient emission can be expected.

The current legal framework related to water and environmental concerns, which can be considered as the most appropriate measure to control and reduce nutrient is mainly out-dated and does not allow the harmonization to the relevant EU legislation.

Although, at the state level, new pieces of legislation are in the process of preparation, there are still no instruments available to both control and enforce the necessary measures in reducing nutrient emissions. One example can be given by the existence of the only one recorded Detergent Production Factory – DITA located in Tuzla which produces P-free detergents, in spite of the fact that there are many other producers which are not yet part of the evidence in the water and environmental registers.

The urgent measures proposed by Bosnia - Herzegovina to be implemented include:

- Creation of various relevant legal regulations and rules in accordance to EU legislation referred to the use of various chemical products in agriculture;
- Introduction and use of relevant standards for production/use of various chemical products in agriculture;
- Introduction and use of relevant standards for production/use of various chemical products in agriculture;
- Setting up of relevant institutions to be responsible for enforcement of legal instruments and standards;
- Establishment of an inspection system to enforce the legal requirements;
- Promotion of sanitation measures of all centralized farms and construction of wastewater treatment plants on farms in parallel;
- Development and implementation of relevant regulations related to the production of phosphorus-free detergents.

8.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

Taking into consideration the necessity of development of the required legal framework, which can allow the introduction of nutrient control and reduction measures, it is understandable that the first results concerning the reduction of emissions/loads pollutants will be visible after the implementation period of the proposed urgent measures.

Under these conditions, if the predicted urgent measures shall be introduced during the year 2001, one can expect reduction of nutrient emissions in the after-coming period. If it is assumed that the adoption and implementation of regulations and standards will be within the next two years, then visible effects of nutrient content reduction can be expected in the year 2005.

However, improvement of the economic situation of the country can already be seen especially in the field of agriculture and stock farming. As the activities in the field of agriculture and livestock farming are recently intensified, the nutrient content will record higher levels. This concern is going to be taking into consideration and included in the proposed urgent measures of B&H.

Generally, it can be assumed that the condition of transboundary rivers, considering pollution impacts in general, is better than the assessed conditions in the previous period. However, figures showing the expected nutrient reduction are not available at the moment.

8.4 Identification of Projects Ready for Implementation

The Long Term Protection Program finalized in 1991 (just before the war started) proposed different activities that were supposed to be implemented within a period of 18 years. At that time, the expected investment cost for the defined priority projects to be implemented within the next five years period was as following:

River basin	Investment cost (Million EUR)
Una-Sana	210
Vrbas	460
Bosna	480
Sava	105

Up to now, there is no formalized, respectively officially agreed investment programme or action plan for nutrient control/reduction projects in B&H.

The most urgent priority projects which should be implemented within the coming period of five years are compiled in Annex II-8.

The total investment requirements of the 12 identified priority projects is EUR 176 million; the composition by sectors is as follows:

- 5 municipal projects with investment requirements of EUR 147.0 million;
- 6 industrial projects with investment requirements of EUR 27.1 million;
- 1 agricultural project with investment requirements of EUR 2.3 million;
- no wetland project.

Even these projects with total investment requirements of about EUR 156 million cannot be considered as really committed, as for most of the projects, adequate implementation and funding schedules are not yet available.

8.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

Since data on current nutrient emissions are not really known for most of the discharge points, and since available data are mainly based on pre-war measurements, it is actually not possible to assess the anticipated nutrient reduction correctly.

The anticipated nutrient reduction from the implementation of the identified priority projects (which can due to the incomplete data actually not be considered as the total nutrient reduction) is compiled in detail in Annex 8.4 and summarized in section 8.6(2).

8.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

Bosnia - Herzegovina reviewed recorded data on nutrient content for all main rivers located within the Danube basin share. However, at this stage of the project development, most of the data required are not yet available.

Agricultural production and livestock farming represent the main diffuse sources of pollution. However, the large diffuse pollution provided by the lack of treatment facilities for 65% of the population living in the country imposed new priorities for the policy makers, in relation to the construction of new wastewater treatment plants or the rehabilitation of those plants that were damaged in the past.

The current legal framework related to water and environmental concerns is mainly out-dated and does not allow the harmonization to the relevant EU legislation.

The introduction of P-free detergents has been already taken into consideration.

The urgent measures proposed by Bosnia - Herzegovina to be implemented in relation to the nutrient reduction concern refer to improvements of both legal and institutional framework.

As a consequence of recent economic development of the country mainly through both the extension of cultivated agricultural areas and intensification of farming a future increase of nutrient emission can be expected. However, if the predicted urgent measures shall be introduced during the year 2001, visible effects of nutrient content reduction can be expected in the year 2005.

(2) Main particularities regarding “point source” projects

Up to now, there is no formalized, respectively officially agreed investment programme or action plan for nutrient control/reduction projects in B&H.

The primary characteristics of the identified priority projects which are envisaged to be implemented within the coming period of five years in B&H can be summarized as follows:

Table 8.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	5	3005	450	7689	14802	147.0
Industrial point sources	6	125	63	963	2159	27.1
Agricultural point sources	0	1570	350	0	0	2.3
Wetlands	1	0	0	0	0	0
Total	12	4700	863	8652	16961	176.4

Even these most urgent priority projects, with total investment requirements of about EUR 176 million, cannot be considered as committed, as even for these projects, adequate implementation schedules and funding schemes are not yet available.

At the time being, there are no reliable data on the existing situation of nutrient emissions, respectively the anticipated nutrient reduction from the implementation of proposed “point source” projects. Thus the above stated figures do due to missing data actually not represent the total nutrient reduction of the proposed priority projects

9 YUGOSLAVIA

9.1 Verification of Data and Information on Nutrient Emissions / Loads

Yugoslavia verified the data and information on nutrient emissions/loads that were collected before the year 1992. This is justified by the fact that the data collected after this period present a particular character of uncertainty. In addition, it is considered that the data from the period up to 1992 reflect more realistically the situation for the planning period covered by Phase II of the Strategic Action Plan for the Danube River.

Table 9.1-1: Population

Country total population living in DRB	Emissions coefficients		Population not connected to sewerage	Population connected to sewerage in the DRB			
	Kg N/inh/y	Kg P/inh/y		without treatment	mechanical step	biological step	tertiary step
9 016 000	4.0	0.95	6 039 000	2 400 000	80 000	447 000	50 000

Note:

The consumption of detergents in the FR YU DRB is 52 000 t/y or about 6 kg/cap/y.

The production of P-free detergents is not practiced yet. It is estimated that 1 400 t/y of Phosphorous emission comes from detergents.

This amount is included in the data of municipal wastewater emission.

Table 9.1-2: Agricultural Land

Surface	Type of crop	Applied fertilizers (kg/ha/y)				Runoff Coefficient (see remarks)	
		Mineral	Manure	mineral	manure	kg/ha/y	kg/ha/y
(ha)		Nitrogen	N	P	P	N	P
850 000	Wheat	25	25	12.0	10.0		
1 350 000	Maize	30	25	14.0	10.0		
160 000	Sunflower	15	15	7.0	6.5		
55 000	Sugar beat	90	15	30.0	6.5		
17 000	Rye	20	10	4.0	4.0		
200 000	Vegetables	25	15	7.5	6.5		
100 000	Grapes, Fruits	20	15	7.5	6.5		

Remarks:

- (1) In the YU Part of DRB there are: Arable land 4 680 000 ha (60% cultivated for the crop);
- (2) Natural pastures – 1 011 900 ha; Forested land – 2 707 000; Water bodies – 137 000 ha; Unspecified land – 348 900 ha;
- (3) About 2 600 000 ha of arable land lie in the flat area where vertical component of runoff dominates;
- (4) Due to low consumption of fertilizers there is 25-30 % deficit of Nitrogen in the soil. The largest portion of Phosphorous is adsorbed by unsaturated soil;
- (5) There is no data on the runoff (export) coefficients for specified crop, but the average export coefficients for N and P estimated on the basis of N and P mass flow for several rivers (exactly defined watersheds) are: 1 - 1.5 (kg N/ha/y) and 0.15 - 0.25 (kg P/ha/y) respectively;
- (6) The emission of Nitrogen and Phosphorous from diffuse pollution sources in the YU Part of DRB is about 15 000 tons N/y and 2000 tons P/y respectively.

Table 9.1-3: Number of Livestock

Inventory of animals (no waste water treatment plant provided)	Number	Emission Coefficient (average)	
		Kg N/head/y	Kg P/head/y
Pigs (breeding in the larger farms)	1 200 000	7.15	2.68
Pigs (small private livestock, individual households)	3 000 000	5.36	2.05
Cows (breeding in the larger farms)	150 000	26.60	11.6
Cows (small private livestock, individual households)	500 000	20.00	8.62
Cattle (breeding in the larger farms)	150 000	38.40	38.00
Cattle (small private livestock, individual households)	1 120 000	28.10	28.70
Horses	90 000	No data	No data
Sheep (small private livestock, individual households)	2 500 000	No data	No data
Poultry (breeding in the larger farms)	12 000 000	0.42	0.22
Poultry (small private livestock, individual households)	15 000 000	0.32	0.15

Remarks :

- (1) The emission coefficient for animals breeding in small private livestock and individual households is lower due to the different feeding practice
- (2) Manure is usually discharged into lagoons and after enough period of maturation is used for application on the land
- (3) A neglecting portion of manure directly reaches watercourses.

9.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The nutrient emissions from diffuse sources do not present significant values to justify the implementation of severe measures. As estimated, the total emission of nitrogen and phosphorous from diffuse sources are about 14 -15 000 t/y and 1600 – 2000 t/y, respectively.

The reduced emissions are due to the effects of using, on most of the arable land (85%), of the good agricultural practices (soil care, using of manure rather than mineral fertilizers, adjusting of the periods of soil application manure, etc.). As the consequence, nutrients run off from the largest part of arable land is minimized to the lowest level.

However, in the plain region, the run-off is low and nutrients are transformed or adsorbed by the soil. The small part of it reaches the recipients.

The consumption of fertilizers in FR of Yugoslavia in the last then years has severely decreased. In this period it is just one third of what it was before the year 1990. As estimated, the uptake of nutrients by plants overcomes the consumption by 25%.

The proposed measures for nutrient reduction from diffuse sources include:

- (1) Continuation of the use of good agricultural practices
- (2) Controlling of the use of mineral fertilizers, particularly in the slope areas
- (3) Forestation in order to decrease erosion

9.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The effects of measures for nutrient reduction from diffuse sources could be observed on the long-term basis. Comparing with nutrient emission data, an improvement could be recorded by decreasing erosion i.e. by afforesting measures implemented in the areas of excessive erosion. It is estimated that the current emission could be decreased for about 25%.

9.4 Identification of Projects Ready for Implementation

Yugoslavia provided a complete project list and set of project data regarding investment requirements, implementation schedule and funding schemes for the identified priority projects to be implemented in the coming five year period.

The identified priority projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterized in Annex II-9.

The total investment requirements of the 40 identified priority projects are EUR 783 million; the composition by sectors is as follows:

- 21 municipal projects with investment requirements of EUR 646 million,
- 7 industrial projects with investment requirements of EUR 68.5 million,
- 7 agricultural project with investment requirements of EUR 65.8 million,
- 5 wetland projects with investment requirements of EUR 5 million.

Regarding project funding it is expected that about 22% will be covered by national funds, 65% by international loans and about 13% by international grants.

9.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The overall anticipated nutrient reduction from the identified point source projects and the composition by sectors is stated in the compilation presented in Section 9.6 (2) and can be summarized as follows:

- N: 6793 tons/year;
- P: 4863 tons/year;
- BOD: 115358 tons/year;
- COD: 277196 tons/ year.

9.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

Yugoslavia considered that the data and information on nutrient emissions/loads recorded before the year 1992 reflect more realistically the situation for the planning period subject to the Strategic Action Plan for the Danube River.

One significant particularity of Yugoslavia is related to the current reduced nutrient emissions from diffuse sources with values of about 14 -15 000 t N/y and 1600 – 2000 t P/y, respectively.

The reduced emissions are due to the effects of using, on most of the arable land (85%), of the good agricultural practices (soil care, using of manure rather than mineral fertilizers, adjusting of the periods of soil application manure, etc.). As the consequence, nutrients run off from the largest part of arable land is minimized to the lowest level.

As in other countries, the consumption of fertilizers, in the last ten years, has severely decreased. In this period it is just one third of what it was before the year 1990.

The proposed measures for nutrient reduction from diffuse sources include:

- (1) Continuation of the use of good agricultural practices
- (2) Controlling of the use of mineral fertilizers, particularly in the slope areas
- (3) Forestation in order to decrease erosion

The effects of measures for nutrient reduction from diffuse sources could be observed on the long-term basis. Comparing with nutrient emission data, an improvement could be recorded by decreasing erosion i.e. by afforesting measures implemented in the areas of excessive erosion. It is estimated that the current emission could be decreased for about 25%.

(2) Main particularities regarding “point source” projects

Yugoslavia provided a complete project list and set of project data regarding investment requirements, implementation schedule and funding schemes for the identified priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects can be summarized as follows:

Table 9.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	21	2 486	700	76 280	169 212	646.0
Industrial point sources	7	1 347	3 571	29 345	64 710	68.5
Agricultural point sources	7	640	242	5 133	11 074	65.8
Wetlands	5	2 320	350	4 600	32 200	5.0
Total	40	6 793	4 863	115 358	277 196	785.3

If these extraordinary high anticipated nutrient reduction figures could really be realized the implementation of the proposed point source projects in Yugoslavia would lead to a significant reduction of nutrient emissions and nutrient loads in the DRB.

10 BULGARIA

10.1 Verification of Data and Information on Nutrient Emissions / Loads

The verification of the data and information on nutrient emissions in Bulgaria implied initially the organization of data and information provided by various specific institutions on the river basin basis. This exercise made possible the separation, with some kind of uncertainty, at this time of the development of the project, of the independent contributions of both diffuse and point sources of pollution. However, the precise correction of nutrient mass balance with main accent on diffuse pollution, nutrient transport, wetlands and losses of nutrients in water systems along the Danube on the Bulgarian territory was not possible at this stage.

Therefore, the data and information relating to agricultural and municipal sectors were updated for the year 1998. The evaluation of nutrient emissions/loads is presented in the tables 10.1-1, 10.1-2 and 10.1-3.

The updated data on the total number of the population in the Danube river basin on the Bulgarian territory, the emissions coefficients, the number of the population connected and not connected to sewerage are given in Table 10.1-1.

Table 10.1-1: Population

Country total population-Danube RB		Emissions Coefficients		Population not connected to sewerage	Population connected to sewerage			
Inhabitants		Kg N/inh/y	Kg P/inh/y	inhabitants	Without treatment	Mechanical step	Biological step	Tertiary step
Zone A	137 744			71 214	66 530	-	-	-
Zone B	408 795			236 868	159 276	-	77 592	-
Zone C	1545 417			426 484	53 427	26 608	1 016 218	22 680*
Zone D	411 029			204 750	86 229	-	120 050	-
Zone E	560 047			272 372	209 020	13 655	65 000	-
Zone F	189 277			132 015	15 338	-	41 924	-
Zone G	645 911			350 371	198 964	-	96 576	-
Total	3 898 220	4,015	0,913	1 694 074	788 784	40 263	1 417 360	22 680*
100%				43,47%	35,11% **	1,79%**	63,09%**	1,0%**

Source: NSI, MRDPW

* WWTP- Samokov, not yet under operation

** 35,11% of the population connected to sewerage; the share of the population connected to sewerage is 66,53% of the total population in the Danube catchment

The percentage of the population, which is not connected to sewerage, is 43,47% within the Danube river catchment area. The amount of wastewater of 35,11% of the population connected to sewerage is discharged without treatment while 1,79% is treated using only mechanical step and 63,09% is biologically treated. There is a small portion of only 1% of the total wastewater that is treated using tertiary stage.

The expressed data for the population, which refer to nitrogen and phosphorus emissions are as follows:

Average parameters „pollution production“ of one person in one day or one year	BOD5		Total N		Total P	
	g/inh/day	kg/inh/year	g/inh/day	kg/inh/year	g/inh/day	kg/inh/year
Adopted in Bulgaria	54	19,71	11	4,015	1,44	0,526
European (often used)	60	21,90	11	4,015	2,50	0,913

The structure of the agricultural sector by type of activity and production in 1997 and 1998 is considered to be almost the same. On a national level, the crop production has the biggest share 63,9%. Next to this is the livestock production with 16,2% and mixed (crop and livestock) with 6,1%.

The updated information, concerning the agricultural land use and the types of crops are presented in Table 10.1-2.

Table 10.1-2: Agricultural Land

Surface (ha)	Culture			Runoff coefficient
	Type of crop	kg N/ha/y	kg P/ha/y	
584 203,6	Wheat			
105 547,3	Barley			
353 846,0	Maize			
325 292,9	Sunflower			
104,1	field tomatoes			
35 821,9	Grapes			

Source: NSI, MoAF

In Bulgaria there are several regions with well-developed agriculture, such as Dobrich, Pleven, Silistra, Russe, Veliko Tarnovo, Vratza, Razgrad, Montana.

Therefore, the fertilization of the cultivated land is of great importance for the agricultural output and the nutrient balance. The imbalance fertilization and deficit of the main nutrients have been detrimental to both crop production and soil fertility, that adversely influenced the country's environmental situation (see the table below).

Average Use of Mineral Fertilizers (in tons) – Country Bulgaria:

Year	NPK- total	Kg/ha	N	kg/ha	P205	kg/ha
1981	1056369	226,98	511761	109,94	419688	90,16
1995	142127	30,69	129545	27,60	12426	2,68
1996	164894	35,61	151883	32,36	12824	2,76
1997	163922	36,47	145773	32,49	16275	3,58
1998	113146	24,11	97497	20,77	8900	1,89
30.06.1999	111972		107662		3328	

Source: Ministry of Agriculture, Annual report 1999.

The high cost of chemical treatment of soil impeded improvements or amelioration work during past 6 years. According to MoAF data, before 1998, only some 7.7% of the areas under crops was treated with phosphorous fertilizers, 5.9% with nitrogen fertilizers and a bare surface of 0.2% experienced potassium treatment.

The Nutrients Balance shows the values indicated in the table below:

Years	Balance Elements	N	P205
		(in 1000 t)	(in 1000 t)
1986-1990	Exported with crop exports	272	104
	Imported with fertilizer imports	441	230
	Balance	+ 169	+ 126
1991-1995	Exported with crop exports	205	102
	Imported with fertilizer imports	165	23
	Balance	- 40	- 79
1996	Exported with crop exports	120	70
	Imported with fertilizer imports	152	13
	Balance	- 32	- 57
1998	Exported with crop exports	184	92
	Imported with fertilizer imports	97	9
	Balance	- 77	- 83

Source: Ministry of Agriculture, Annual report 1999.

Regarding the livestock production in 1998, both animal numbers and production were increased (sheep and buffalo numbers being an exception to the trend) against 1997, but comparing with 1989/1990 the numbers show several fold decrease.

The number of animals bred in small family farms has been increasing in recent years. The number of livestock ranges - 1 to 3 cows, and 5 to 10 sheep.

Based on the research work carried out by the Soil & Science Institute „N. Pushkarov“ it is shown that the solid and liquid wastes from cattle (cows, calves, and buffaloes) constitute 8% of the animal weight and they are at rate of 1,66:1. Presuming that the average weight of a cow is 500 kg, one cow should deliver daily 25 kg solid and 15-kg liquid wastes. The solid and liquid wastes from a pig constitute 7% of its weight i.e. for a 100 kg pig the wastes will be 7 kg/day in relation 0,62:1, etc. The average annual load per an animal (N & P) is given in the table below.

Type of animal	Quantity of manure (tons/year)	Total Nitrogen (TN) (kg/head/year)	Total Phosphorous (TP) (kg/head/year)
Cow	14,6	66,3	17,83
Pig	2,5	16,0	6,45
Sheep	1,0	5,0	0,87
Hens	0,054	0,6	0,32

Source: Research publication of Soil Science Institute „N. Pushkarov“

The updated information, concerning inventory of animals, their number and emission coefficient is presented as Table 10.1-3.

Table 10.1-3: Number of Livestock

Inventory of animals* (*no WWTP provided)	Number	Emission Coefficient	
		kg N/head/y	kg P/head/y
1. pigs	610 049	16,0	6,45
2. cows	220 960	66,3	17,83
3. sheep	1 045 736	5,0	0,87
4. poultry	7 101 697	0,6	0,32

Source: NSI, MoAF

10.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

To achieve the largest nutrient loads reduction within the border of its Danube share, Bulgaria identified measures for nutrient control and reduction from diffuse sources that mainly address (i) the policy and legislation related actions, (ii) institutional strengthening and capacity building, and (iii) public awareness raising and strengthening public participation in nutrient reduction initiatives.

The identified preventive measures that are supposed to be implemented during the next 5 years include:

- (1) Improvement of national policies and legislation regarding utilization of fertilizers and livestock waste and approximation of national legislation to relevant EU legislation and standards through the following measures:
 - Development and enforcement of the effluent limits/emission standards;
 - Adoption and enforcement of the Regulation on the protection of water from pollution with nitrates from agricultural origin;
 - Improvement of soil conservation measures;
 - Improvement of water and soil monitoring systems on non point sources of pollution;
 - Establishment of necessary data bases for assessment of nutrients related parameters and indicators with the MOEW Water Directorate;

- Development of a river bank erosion monitoring system and analysis of the causes of erosion (mainly related to river-bank deforestation);
 - Adaptation of the EU methodology for assessment of non point sources of pollution for the Bulgarian conditions;
 - Implementation of the National Plan for the development of agriculture and rural areas;
 - Development of the Geographic Information System, aimed to support and to facilitate the management process;
- (2) Institutional strengthening and capacity building through the following measures:
- Training of the experts from the different stakeholders groups on topics such as river basin management and nutrients control and reduction, and establishment of the training center in Veliko Tarnovo;
 - Development and enforcement of guidance for the application of the agro-environmental schemes (including: guidelines on fertilizer (organic & inorganic) application rates to individual crops; guidelines on crop rotation; guide-lines/rules on preventive application of manure/slurry; guidelines on proper on-farm manure storage/composting, etc.);
 - Development and enforcement of guidelines for river basin management;
 - Development and implementation of guidelines for the measurement and calculation of total emission of nutrients by source;
- (3) Public awareness raising and strengthening public participation in nutrient reduction through the following measures:
- Organization of a targeted public awareness campaigns;
 - Development of a regional agri-environmental scheme for sustainable development and efficient management of agricultural activities (including organic agriculture, manure storage, erosion control etc.);
 - Development of a pilot projects for implementation of alternative methods (construction of artificial wetlands) for households wastewater treatment in the small towns and villages;
 - Development of a pilot project for wetlands restoration;
 - Development of a pilot project for changes of the consumer practices (including introduction and use of phosphate free detergents).

10.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

At this stage, it is very difficult to evaluate the nutrient loads and their expected reduction. However, the anticipations for improvement of the arable land fertilization in the coming 5 years are not very optimistic. Therefore, on the Bulgarian territory of the Danube river basin, only insignificant changes are expected in the coming 5 years.

The most important beneficial expected changes are related to those obtained as a result of the creation and implementation of new legislation harmonized with EU legislation. Moreover, the institutional strengthening will also contribute to positive changes concerning the nutrient reduction measures.

10.4 Identification of Projects Ready for Implementation

The elaboration of the „list of projects, which are supposed to be ready for implementation in the coming 5 years“ was made in close co-operation with EMIS/EG and in full compliance with the national program for priority construction of urban WWTP's with more than 10 000-population equivalent. The identified projects are compiled in Annex II-10.

The national priority ranking for completion, rehabilitation, upgrade, update and construction of new urban WWTPs, is based on a "point score method" with scores calculated according to the set up criteria, and the adoption of respective weighing factors.

The investment cost for construction of priority WWTP's is determined by the chief designers of the sites (if a detailed design exists) and updated bills of quantities. For sites, which do not have detailed designs, the costs were based on parameters, following the methodology of the Institute on Water Quality and Waste Management at the Technical University in Vienna, published in the "Guide on strategies for waste water management" from 1996.

The total investment cost is extracted from the National Programme for Priority Construction of Urban Wastewater Treatment Plants.

The investment cost of the 21 identified priority projects which are envisaged to be implemented within the coming period of five years is about EUR 125 million; their composition by sectors is as follows:

- 17 municipal projects with investment requirements of EUR 112 million;
- 1 industrial projects with not yet identified investment requirements;
- no agricultural projects;
- 3 wetland projects with investment requirements of EUR 13.5 million;
(the rehabilitation of two priority wetlands will be done under the Danube Partnership Programme with the financial support of World Bank/GEF).

Data on project funding (regarding national and international composition) have not been provided, because adequate information is not available at the time being.

The anticipated funding components from international funding sources are mainly addressed to EU/ISPA. The national contributions will mainly be covered by the National Environmental Protection Fund and by the State Budget.

10.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The expected results in terms of pollution/nutrient reduction (BOD, COD, N and P) are based on the information provided by the EMIS/EG.

If the identified projects will be implemented according to the designs and will be operated and maintained properly within the next 5 years, the anticipated reduction of the N and P total loads is about 30% and of the BOD₅ load about 50-60%.

The anticipated nutrient reduction for the identified projects is stated in detail in Annex 10.4 and can be summarized as follows:

- N: 2683 tons/year;
- P: 599 tons/year;
- BOD: 19747 tons/year;
- COD: 35373 tons/year;

The composition of the anticipated nutrient reduction by sectors is compiled in Section 3.6(2).

10.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding "non-point source" issues

The verification of the data and information on nutrient emissions in Bulgaria performed for the year 1998 shows that the structure of the agricultural sector by type of activity and production in 1997 and 1998 is considered to be almost the same. On a national level, the crop production has the biggest share 63,9%. Next to this is the livestock production with 16,2% and mixed (crop and livestock) with 6,1%.

The use of fertilizers was very small. The imbalance fertilization and deficit of the main nutrients have been detrimental to both crop production and soil fertility, which adversely influenced the country's environmental situation. In addition, the high cost of chemical treatment of soil impeded improvements or amelioration work during past 6 years.

Regarding the livestock production in 1998, both animal numbers and production were increased against 1997, but comparing with 1989/1990, the numbers show several fold decreases.

To achieve the largest nutrient loads reduction within the border of its Danube share, Bulgaria identified measures for nutrient control and reduction from diffuse sources that mainly address policy and legislation related actions, institutional strengthening and capacity building. Moreover, public awareness raising and strengthening public participation in nutrient reduction initiatives are both seen as priorities. A specific particularity for Bulgaria, concerning nutrient reduction actions is given by the need to implement soil conservation measures.

On the Bulgarian territory of the Danube river basin, only insignificant changes are expected in the coming 5 years. The most important beneficial expected changes are related to those obtained as a result of the creation and implementation of new legislation harmonized with EU legislation.

(2) Main particularities regarding “point source” projects

Up to now, there is no formalized, respectively officially agreed investment program or action plan for nutrient reduction projects in Bulgaria.

There is, however, a relatively clear priority schedule and implementation program for WWTP in the municipal sector; (but not for the industrial and the agricultural sector, and not for wetlands).

The primary characteristics of the identified priority projects that are envisaged to be implemented within the coming period of five years can be summarized as follows:

Table 10.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	17	2308	562	19448	34718	111.9
Industrial point sources	1	0	0	299	655	0
Agricultural point sources	0	0	0	0	0	0
Wetlands	3	376	37	0	0	13.5
Total	21	2683	599	19747	35373	125.4

Even these priority projects with total investment requirements of about EUR 125 million cannot be considered as really committed, as there are no committed funding schemes for the identified projects.

11 ROMANIA

11.1 Verification of Data and Information on Nutrient Emissions / Loads

According to the Romanian legislation, the contribution of the diffuse sources to the pollution in the nutrient balance is provided by (i) direct discharges of private households (not connected to sewers), (ii) storm water overflow, (iii) direct discharge of manure, (iv) base flow (percolation of human waste, agriculture land), (v) erosion run-off from forests and others, (vi) air depositions and, (vii) ground water flow.

The diffuse pollution is derived from the population not connected to the sewerage network (60.1%) which represents 13.7 mil. inh. Using the emission factors and taking into consideration that 10% of the diffuse emissions reach the water receiver, the population related diffuse nutrient pollution is 4.93 thou tons Nitrogen per year and 0.89 thou. tons Phosphorus per year.

Table 11.1-1: Population

Country total population in D.R.B.	Emissions coefficients		Population not connected to sewerage	Population connected to sewerage 9.1 mil.			
	kg N/inh/yr	kg P/inh/yr		Without treatment	Mechanical step	Biological step	Tertiary step
22.8 mil.	3.6	0.65	13.7 mil.	2.3713	1.2312	5.4948	-

The weight of diffuse pollution in the total emissions from the population target is represented in the next table:

Population	Total		Point discharges		Diffuse pollution	
	1000 tons/yr	%	1000 tons/yr.	%	1000 tons/yr.	%
Nitrogen	30.83	100	25.9	83.9	4.93	16.1
Phosphorous	5.3	100	4.41	83.2	0.89	16.8

The diffuse pollution for the industry is considered to be quite small (5%) as the most relevant food processing industry is connected to the municipal wastewater treatment plant.

Source	N 1000 tons/year	P 1000 tons/year	% of total	
			N	P
Agricultural land diffuse pollution (inorganic fertilizers)	5.9	2.5	11.7	59.6
Manure application and waste from agriculture	44.68	1.68	88.3	40.4
Total	50.6	4.2		

The total nutrient emissions are about 100 Thou. tons Nitrogen per year and 11 Thou. tons Phosphorus per year. The weight of the nitrogen diffuse pollution is about 56% while in the case of phosphorous 46%.

Table 11.1-2: Agricultural Land

Surface ha (mil.)	Culture nutrient application (1993-1997)					Run-off coefficient
	Type of crop	N	N	P	P	
		Total	Kg/ha	Total	Kg/ha	Nitrogen 0.02 Phosphorous 0.05
17.9	Maize, wheat, rye, barley etc.	293 KT	26.9	50.2 KT	5.4	

Table 11.1-3: Number of Livestock

Inventory of animals* (mil.)	Number (mil.)	Emission coefficient	
		Kg N/head/yr	Kg P/head/ yr
1. pigs	7.8	6.57	1.4
2. cows	-	-	-
3. cattle	3.5	44.2	7.65
4. horses	-	-	-
5. sheep	10.0	6	1.5
6. poultry	70.0	0.2	0.1
7. others	-	-	-

* no waste water treatment plant provided

In the total emissions of Nitrogen, agriculture represents 57%, population 30.9% and industry 12.1%. For Phosphorous, the weight of target groups in the total emission is as follows: agriculture 51%, population 48.3% and industry 0.7%.

The table below presents the overview of the total nutrient emissions in Romania:

Sector	Nitrogen			Phosphorus		
	Point	Diffuse	Total	Point	Diffuse	Total
Population	25.9	4.93	30.83	4.41	0.89	5.3
Industry	11.4	0.60	12.0	0.076	0.004	0.08
Agriculture	6.2	50.6	56.8	1.4	4.2	5.6
Total	43.5	56.13	99.63	5.89	5.09	10.98

Taking into consideration the relevance of the diffuse pollution attention should be paid to the agriculture that has a weight of 90% in the case of Nitrogen and 82% in the case of Phosphorous.

In spite of the drastic reduction in the use of fertilizers in Romania, the positive effects on the Danube Delta are not yet evident. It is considered that the reduction on the measured Nitrogen loads on the delta is not yet very evident. One assumption is related to the potential reservoir role played by the ground water in the whole basin. In addition, the large number of inhabitants, which are not adequately connected to the treatment facilities, is considered as the main cause of pollution.

Based on the DWQM, the difference between immission and emission values is considered in the case of nitrogen to be primarily caused by denitrification, and to a much lesser extend by a similar retention as with phosphorous. Phosphorous retention is believed to be related to sedimentation and temporal storage in the sediments of the P – absorbed by suspended solids. It is considered, with some risk of uncertainties, that the floodplains in the Romanian Danube basin are capable of retaining an average of the amount of Phosphorous that is of the same order of magnitude as the current yearly emissions. This value corresponds with the difference between the total P load at the border between Yugoslavia and Romania (33 thou. tons per year) and the entrance of the Danube Delta (22 thou. tons per year).

Romania considers the role of Iron Gate reservoir to be significant in relation to the retention of Phosphorus content and increase of Nitrogen load. This would mean a retention of 27% or about 6 thou. P per year and an increase of Nitrogen concentration with about 0.5 mgN/l, which would mean that 80 thou.N per year, is added. The undecided justification of this phenomenon is currently based on the Nitrogen fixation by blue/green algae.

Among the processes that influences the nutrient reduction, the role of wetlands play a significant position during both summer and winter seasons.

In a WWTP study „Evaluation of wetlands and flood plains areas in the Danube river basin“ (1999) the capacity for removal is estimated at 100 kg N/ha/yr and 10 kg P/ha/yr. For Romania this would mean a removal of 80 thou. tons N/year and 8 thou. tons P/year.

11.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

Romania proposes a substantial programme of associated measures related to (a) the improvement of national legislation, and (b) insurance of its approximation with the EU legislation and standards.

(a) First, the improvement of national policies and legislation regarding utilization of fertilizers and livestock waste takes into consideration three main areas: (i) legislation, (ii) institutional development and, (iii) investments promotion.

(i) The legal framework will be improved with regulations related to (1) waste management and control, (2) norms for maximum allowable number of capita in the livestock's farms, and (3) norms for manure application.

(ii) The improvements of the institutional framework will take into consideration the strengthening of the institutional capabilities to facilitate (1) the implementation of the water management multipurpose approach in order to ensure an integrated water and land management, in order to protect the sensitive areas and to ensure the conditions for BAT/BEP implementation, and (2) establishment of a framework for control and limiting the inorganic fertilizer application.

(iii) On the investment encouragement side, the necessary ingredients include (1) development and implementation of the agricultural run-off source pollution reduction plan as part of a Programme concerning the introduction and development of an environmental sound and sustainable agricultural products and practices, (2) programs for individual environmentally sound wastewater management for rural areas, (3) environmentally friendly landfills with phosphorous salts, and (4) pilot/ demo projects of Best Environmental Practice (BEP) implementation in the agriculture.

(b) Second, the approximation of national legislation to relevant EU legislation and standards will include (1) on short term, transposition of the Urban Waste Water Directive (91/271/EEC) and of Nitrate Directive (91/676/EEC), and (2) on medium term, the implementation of the European Water Framework Directive (COM 97/49-97/614, 98/76).

11.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

As a very rough estimation, a reduction of at least 10% for the nitrogen total diffuse (agriculture) reduction could be anticipated and for phosphorous which is related more with the erosion a decrease of around 20%. That means 5 thou tons N/year and 0.84 thou. tons P/year a supplementary reduction by buffer zones.

Beside of the wetland/flood plain restoration measures, one of the most important action aiming to decrease the run-off from the agricultural lands is to set-up buffer zones for erosion/ run-off limitation (this buffer zones could include the forestation zones, too).

In total, taking into account the effects of wetlands, flood plains, buffer zones, control of the nutrient application, etc. the following diffuse pollution reduction from agriculture could be anticipated:

- N: 13.4 thousand tons /year
- P: 1.7 thousand tons /year

This reduction represents a decrease by 13.4% N and 15.5% P from the total actual emissions.

Romania considers that it might take several years before the effects of reduced fertilizer use become effective in the river load, mainly due to the changes of the ground water base flow and the role of the ground water as a large stock of nitrates. If the yearly flow of Danube divided over the surface area of the whole basin represents 200 mm, the amount of ground water stocked may represent several meters (hydraulic residence in ground water reservoirs is estimated between 10-30 years).

In addition, the erosion – run-off may have caused dramatically changes because many hectares of arable land are overgrown by weeds due to the economical crisis in agriculture. The cumulative effect of elimination of fertilizer use and the weed growth could significantly reduce the erosion run-off almost by 95%.

11.4 Identification of Projects Ready for Implementation

For the elaboration of a draft list of projects supposed to be ready for implementation in the coming 5 years the following criteria have been considered:

- (i) financial viability;
- (ii) environmental effectiveness (based on Environmental Impact Assessment);
- (iii) preparedness/readiness (availability of feasibility study, quality of project documents)

The projects identified on this basis are compiled and characterized in Annex II-11.

The total investment requirements of the 25 identified priority projects are EUR 492.5 million; their composition by sectors is as follows:

- 10 municipal projects with investment requirements of EUR 392.2 million,
- 7 industrial projects with investment requirements of EUR 22 million,
- 3 agricultural project with investment requirements of EUR 3.7,
- 5 wetland projects with investment requirements of EUR 74 million.

Regarding project funding it is expected that about 60% will be covered by national funds, 32% by international loans and about 8% by international grants.

11.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

Excluding the wetland projects, the anticipated nutrient reduction from the identified point source projects can be summarized as follows:

- N: 5706 tons/year;
- P: 975 tons/year;
- BOD: 59811 tons/year;
- COD: 67470 tons/ year;

From the implementation of the proposed wetland projects an additional reduction of about 6000 tons/a of N and about 600 tons/a of P is anticipated.

Excluding wetland projects the dominating improvements are expected from the municipal sector (80%); followed by the industrial sector (17%) and the agricultural sector (3%).

In terms of cost efficiency, the relatively small investment in the agricultural sector has to be considered as very rational.

The composition of the anticipated nutrient reduction by sectors is compiled in Section 11.6(2).

11.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

The first particularity of Romania is related to the approach of considering the diffuse pollution sources as being provided by diversified causes which include: direct discharges of private households (not connected to sewers), storm water overflow, direct discharge of manure, base flow (percolation of human waste, agriculture land), erosion run-off from forests and others, air depositions and, ground water flow.

In the total emissions of Nitrogen, agriculture represents 57%, population 30.9% and industry 12.1%. For Phosphorous, the weight of target groups in the total emission is as follows: agriculture 51%, population 48.3% and industry 0.7%.

As other countries, Romania also recorded a drastic reduction in the use of fertilisers.

In addition, Romania considers that among the nutrient reduction measures, Iron Gate reservoir and the existence of wetlands can play a significant role in relation to the retention or increase of Nitrogen and Phosphorus contents.

Romania proposes a substantial programme of associated measures related to the improvement of national legislation, and insurance of its approximation with the EU legislation and standards. One important initiative is considered to be the proposal to develop the code of good agricultural practices.

A reduction of at least 10% for the nitrogen and around 20% for phosphorous is anticipated by Romania, which in total can lead to 13.4 thousand tons N /year and 1.7 thousand tons P/yr.

(2) Main particularities regarding “point source” projects

Romania is one of the countries which provided a more or less complete set of project data regarding investment requirements, implementation schedules and funding schemes for the identified priority projects to be implemented in the coming five year period.

The primary characteristics of the identified priority projects which are envisaged to be implemented within the coming period of five years in Romania can be summarized as follows:

Table 11.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	10	3644	323	53 521	61 154	392.9
Industrial point sources	7	688	3	2 947	4 110	22.0
Agricultural point sources	3	1 374	150	3 343	2 208	3.7
Wetlands	5	6 154	615	0	0	73.9
Total	25	11 860	1 591	59 811	67 470	492.5

Regarding project funding it is expected that about 60% will be covered by national funds, 32% by international loans and about 8% by international grants.

12 MOLDOVA

12.1 Verification of Data and Information on Nutrient Emissions / Loads

In 1998, the total number of population not connected to the sewerage in the Moldovan part of the Danube River basin was quite large: 938,802 inh. (85.55%).

The total emission of nutrients resulted from population has been estimated based on the population statistics, N and P emission coefficient (9 kgN/day or 3.3 kgN/year per inhabitant for Nitrogen and 2.4 gP/day or 0.9 kgP/year per inhabitant for Phosphorus) and characteristics of sewerage system and wastewater treatment.

Therefore, the nutrient load from population on the Moldovan part of the Danube River basin could be estimated as follows:

- Nitrogen - as 3.3 kgN x 1096464 inhabitants = 3.62 thousand tons;
- Phosphorus - as 0.9 kgP x 1096464 inhabitants = 0.99 tons.

Table 12.1-1: Population

Population	Total	Population not connected to sewerage	Population connected to sewerage
Urban	306863	159876	146987
Rural	78900601	778152	11449
Total (urban and rural)	1096464	938028	158436
Share (%)		85.55	14.45

Source: National Review. Moldova. Technical Report. Social and Economic Analysis.

Danube Pollution Reduction Programme. PCU. UNDP/GEF. 1998

The input nutrients from population into surface water is assessed as being for Nitrogen - 0.5 thousand tons and for Phosphorus - 0.1 thousand tons while into groundwater is assessed as being for Nitrogen - 3.1 thousand tons and for Phosphorus - 0.8 thousand tons.

Most of the industrial and agro-industrial enterprises are still not operated. Therefore, the nutrients load from industrial wastewater treatment plants at wineries, dairies, sugar refinery plants and some others is estimated as being not significant- 47.4 tons of Nitrogen and 8.5 tons of Phosphorus.

Moldova is mainly an area with very active erosion processes, due to intensive agricultural practices, combined with specific natural features that provoke a massive loss of fertile soil (5 mln tons per year agricultural land on the Danube river basin share) and nutrients. In general, for Moldova, the average losses of nutrients with eroded soil are estimated at 34 kgN/ha and 18 kgP₂O₅/ha per year.

According to the results of the Nutrient Balance Study (1996), on average, 7.5 tons of soil are washed away from one hectare of arable land and perennial plantations, and 1.5 tons/ha from grassland.

In 1998, the nutrient loads due to soil erosion constituted about 7 thousand tons Nitrogen and 3 thousand tons Phosphorus.

The nutrient load from main crops on arable lands constituted 26,1 thousand tons of Nitrogen and 4,7 thousand tons of Phosphorus in 1998 as it presented in the Table 12.1-2.

Table 12.1-2: Agricultural Land (1988)

Type of crop	Harvest, tons	N Content, %	P Content, %	N load tons	P load tons
Sugar-beet	710000	0.33	0.07	2 343	497
Cereals	650000	3	0,5	19500	3 250
Vegetables	240000	0,2	0,025	480	60
Grapes	220000	0,25	0,025	550	55
Fruits	150000	0,25	0,025	375	37,5
Potatoes	85000	0,2	0,025	170	21,3
Sunflower	65000	4	1,1	2 600	715
Soybean	2200	3	0,8	66	17,6
Total	2122200			26084	4653

The application of mineral fertilizers decreased drastically within the last years. According to the data presented in Statistical Guide Agriculture, in 1998 in Moldova 2,76 thousand tons (active component) of mineral fertilizers have been applied. Out of this amount 2,71 thousand tons were nitric fertilizers and 0,05 tons of phosphate fertilizers.

According to assessment made in Nutrient Balance Study (1996), on average 17,5 % of the nitrogen and 1,5 % of phosphorus from the amounts applied as mineral fertilizers end up in the surface waters. Considering gaseous losses of N-compounds from mineral fertilizers applied on arable lands is on average 7,5 %, in 1998 the nutrient loads into surface waters originating from mineral fertilizer application was for Nitrogen - 0,4 thousand tons and for Phosphorus - 0,0007 tons.

Considering that (1) nutrient input on agricultural land from manure (in 1998 estimated at 86,2 thousand tons) constitutes 0.45% N and 0.13% P, (2) 20% of nitrogen is lost in gaseous form and, (3) applying the runoff coefficients of 30% for N and 20% for P, the nutrient load on surface waters originating from organic fertilizer could be assessed as for Nitrogen - 0,29 thousand tons and for Phosphorus - 0,09 thousand tons.

Currently, in Moldova exist very few cattle-breeding farms, pig farms and poultry at the public sector. Most of domestic animals (65%) belong to the private sector.

In 1998 from animal husbandry, Nitrogen load constituted 18.8 thousand tons, including 6.6 thousand tons from public sector and Phosphorus load - 4.8 thousand tons, including 1.7 thousand tons from public sector (livestock indexes in the Moldovan part of the Danube River basin are presented in Table 12.1-3).

Table 12.1-3: Number of Livestock

Index	Cattle		Pigs		Horses		Sheep goats		Domestic Birds	
Total Number	250000		430000		25600		520000		4320500	
Excrement rate t/head/year	* 9		* 1.6		* 9		* 0.7		* 0.02	
Amount of manure, k/t	2250		688		230,4		364		86,41	
Content in manure	N	P	N	P	N	P	N	P	N	P
%	* 0.39	* 0.12	* 0.57	* 0.15	* 0.35	* 0.08	* 0.92	* 0.16	* 2.22	* 0.40
Nutrient Load, k/t	8.78	2.7	3.92	1.03	0.81	0.18	3.35	0.58	1.92	035
Total N (k/tons)	18.78									
Total P (k/tons)	4.84									

Source: Nutrient Balance for Danube River Countries. Draft Report from Moldova. 1996

12.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

The existing legal framework in Moldova does not impose yet the identification of areas vulnerable to water pollution from agricultural sources of nitrates. However, nitrate pollution of groundwater is a serious problem in Moldova while the agricultural run-off is not considered to be a significant factor.

In addition, the need to develop a code of good practice, covering matters such as periods when land application of fertilizers is inappropriate and the conditions for land application of fertilizers near watercourses, has not been yet taken into consideration by the policy makers.

The sources of water pollution due to agricultural practice include mainly the following causes:

- Lack of adequate water treatment and manure storage facilities;
- Absence of regulation imposing the maximum permissible number of animals per hectare. Cattle, goats and sheep often graze in forests;
- Reduced proportion (35%) of scientifically grounded crop rotation to be implemented;
- Deficit of separation zones between forests and agricultural lands which impede the proper management of both, i.e. natural afforestation actions;
- The often use of contaminated water (dry saline residue) for irrigation.

Moldova proposed agricultural pollution reduction measures aiming at the water protection objectives in (i) the designation of agricultural lands (e.g. riverbanks), (ii) the suitability of water used for irrigation and, (iii) handling and application of agro-chemicals. In addition, soil conservation represents a special concern.

The proposed measures include:

- Constructing storage and treatment facilities for manure;
- Establishing sewerage systems of appropriate type in rural area;
- Implementing wetland conservation and restoration programmes;
- Introducing a specific program on lands that serve as buffer strips and buffer zones for protection of water resources;
- Introducing land use restriction on highly eroded lands;
- Completing the afforestation programme and permanent vegetable cover;
- Sustainable fertilizers application;
- Developing the organic farming methods;
- Introducing soil conservation measures to reduce agricultural run-off.

12.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

The anticipated nutrient reduction from diffuse sources is estimated to reach a value of 320 tons for Nitrogen and 20 tons for Phosphorus taking into consideration the effects of the national pollution reduction projects review.

Second, as a result of implementation of Afforestation Programme (planting trees that would serve as buffer strips and buffer zones in the selected areas on the lower Prut) will contribute to a reduction of 195 tons of Nitrogen and 20 tons of Phosphorus.

Finally, as a consequence of the application of Soil Conservation Programme (land use restrictions on highly eroded lands and appropriate crop rotation on upper Prut), the anticipated nutrient reduction is assessed to be 80 tons of Nitrogen and 5 tons of Phosphorus.

12.4 Identification of Projects Ready for Implementation

The identified priority projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterised in Annex II-12.

The total investment requirements of the 31 identified projects are EUR 492.9 million; their composition by sectors is as follows:

- 15 municipal projects with investment requirements of EUR 247 million,
- (other small scale municipal projects with investment requirements of EUR 50 million);
- 11 industrial projects (plus not further specified small scale projects) with investment requirements of EUR 84.7 million,
- 3 agricultural projects (plus not further specified small scale projects) with investment requirements of EUR 26.6 million;
- 2 wetland projects (plus not further specified small scale projects) with investment requirements of EUR 85.0 million.

Regarding project funding it is expected that about 31% will be covered by national funds, 36% by international loans and about 34% by international grants.

12.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The anticipated nutrient reduction for the 31 identified point source projects (and the not further specified small scale projects) is stated in detail in Annex II and can be summarized as follows:

- N: 6901 tons/year;
- P: 891 tons/year;
- BOD: 1595 tons/year;
- COD: 832 tons/ year;

The composition of the anticipated nutrient reduction by sectors is compiled in Section 12.6(2).

12.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

Moldova is mainly an area with very active erosion processes due to intensive agricultural practices, combined with specific natural features that provoke a massive loss of fertile soil (5 million tons per year agricultural land on the Danube river basin share) and nutrients.

The application of mineral fertilizers decreased drastically within the last years.

The existing legal framework in Moldova does not impose yet the identification of areas vulnerable to water pollution from agricultural sources of nitrates. However, nitrate pollution of groundwater is a serious problem in Moldova while the agricultural run-off is not considered to be a significant factor.

In addition, the need to develop a code of good practice, covering matters such as periods when land application of fertilisers is inappropriate and the conditions for land application of fertilisers near watercourses, has not been yet taken into consideration by the policy makers.

Moldova proposed agricultural pollution reduction measures aiming at the water protection objectives in the designation of agricultural lands, constructing storage and treatment facilities for manure, establishing sewerage systems of appropriate type in rural area and implementing wetland conservation and restoration programmes.

The anticipated nutrient reduction from diffuse sources is estimated to reach the highest values within the whole Danube river basin, taking into consideration (i) the effects of the national pollution reduction projects, (ii) implementation of Afforestation Programme, and (iii) the application of Soil Conservation Programme.

The anticipated nutrient reduction is assessed to be 50,000 tons of Nitrogen and 5,000 tons of Phosphorus.

(2) Main particularities regarding “point source” projects

Moldova provided a more or less complete project list and set of project data regarding investment requirements, implementation schedule and funding scheme for the identified priority projects to be implemented in the coming five year period.

The primary characteristics of the 31 identified priority projects can be summarized as follows:

Table 12.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	15	784	119	248	458	296.7
Industrial point sources	11	167	36	27	74	84.7
Agriculture	3	350	25	20	70	26.6
Wetlands	2	5600	725	1300	230	85.0
Total	31	6901	905	1595	832	492.9

Regarding project funding it is expected that about 31% will be covered by national funds, 36% by international loans and about 34% by international grants.

13 UKRAINE

13.1 Verification of Data and Information on Nutrient Emissions / Loads

The most important sources of diffuse pollution in Ukrainian part of the Danube river basin include crop production, animal farming and households unconnected to sewer systems.

The revision of data and information was facilitated by the assessment carried out in previous studies (Monitoring and Assessment of Water Quality of Latorytsia/Uzh river basins, Selected Measures in the Danube river basin).

As a conclusion, updated statistical data shows that there are not significant changes in the diffuse pollution loads on the territory of Ukraine since 1996. The industry and agriculture in Ukraine are still in recession while the first signs of improvement became visible only since few months due to the Decree of President on Land privatization.

The approximations for pollution loads are made with assumption that the share of the Danube river basin is 5.4% of total territory of Ukraine. The Latorytsia and Uzh river basin occupies 0,81 % of territory of Ukraine.

Diffuse pollution from arable lands was estimated with emission factors considering soil type, area, slopes, etc. The emissions factors in the Latorytsia/Uzh River Basins are presented below:

River basin	Year	Emission N Kg/ha/year	Emission P, Kg/ha/year
Latorytsia, total	1992	0.59	0.19
Latorytsia, total	1996	0.56	0.19
Latorytsia, total	1997	0.58	0.19
Latorytsia, total	1998	0.59	0.19
Uzh, total	1992	0.19	0.07
Uzh, total	1996	0.20	0.07
Uzh, total	1997	0.20	0.07
Uzh, total	1998	0.21	0.07

Ukraine made estimates for 1992 and 1998 for Nitrogen and phosphorus loads from arable land in the Latorytsia and Uzh river basin as a whole and its tributaries as presented in the next table:

River basin	N, kg per year		P, kg per year	
	1992	1998	1992	1998
Uzh	31186	33963	10569	10502
Latorytsia	188609	189244	59740	59910
total	219795	223207	70309	70412
Danube basin	1450647	1486558.62	464039.4	468943.92

The updated data on the total number of the population in the Danube river basin on the Ukrainian territory are given in the next table.

Table No. 13.1-1: Population connected to the sewer system in the Ukrainian Part of the Danube River Basin

Country total population	Emissions coefficients		Population connected sewerage not to	Population connected to sewerage			
	kg N /inh/y	kg P/inh/y		without treatment	mechanical step	biological step	tertiary step
3010000	1,8	0,4	55%	45	55%	55%	none

The updated information concerning the agricultural land use and the types of crops are presented in table 13.1-2.

Table 13.1-2: Agricultural land

Surface ha	Culture		
	Type of crop	kg N /ha/y	kg P/ ha / y
894850	Arable lands		
138734	Perennial plants		
262004	Hayfields		
446766	Pastures		
1742354	Total agricultural lands	0.45	1.21

The updated information, concerning inventory of animals, their number and emission coefficient is presented as table 13.1-3.

Table 13.1-3. Number of Livestock

Heads of animals, total * (1999)	Number	Emission Coefficient	
		kg N /head/y	kg P/ head / y
1. pigs	536.05	10.01	1.94
2. cows	316.49	3.75	2.70
3. cattle	372.02	3.75	2.70
4. sheep	108.86	13.44	14.44
5. poultry	6957.41	0.81	1.02

* no waste water treatment plant provided

13.2 Identification of Measures for Nutrient Reduction from Diffuse Sources

Ukraine considers that reduction of nutrient pollution from diffuse pollution should be addressed through various measures including (i) the strengthening of institutional capacity of controlling and regulating bodies, dealing with environmental issues, (ii) introduction of environmentally sound agricultural practices, (iii) establishing the buffer zones of streams and tributaries of the Danube rivers, (iv) assessment and implementation measures for solid waste management and wastewater treatment in rural settlements, and (v) education of general public.

The following measures are proposed:

- Inventory of diffuse pollution sources in the Ukrainian part of the Danube river basin
- Strengthening the institutional capacity of environmental, municipal and agricultural entities
- Establishing the Farmer Training Centers in Uzhgorod, Chernisvtsi, Ivano-Frankivsk and Izmail to introduce principles of organic farming.
- Implementation of Buffer Zones along Rivers of the Danube River Basin
- Public Awareness on Nutrient Reduction and Reduction of Domestic Wastes
- Wetland Conservation in Lower Danube

13.3 Assessment of the Anticipated Nutrient Reduction from Diffuse Sources

Ukraine assumes that implementation of proposed measures will result in anticipated reduction of diffuse nutrient load by 10% during five years, and will prevent pollution when economy will start recovering from recession.

13.4 Identification of Projects Ready for Implementation

The identified priority projects that are supposed to be ready for implementation in the coming 5 years are compiled and characterized in Annex II-13.

The total investment requirements of the 10 identified projects are EUR 67 million; their composition by sectors is as follows:

- 10 municipal projects with investment requirements of EUR 67 million;
- no industrial projects;
- no agricultural projects;
- no wetland projects;

Even these priority projects cannot be considered as really committed, as project funding is not yet secured.

13.5 Assessment of the Anticipated Nutrient Reduction from Point-Sources

The anticipated nutrient reduction for the 10 identified municipal point-source projects is stated in detail in Annex II - 13 and can be summarized as follows:

- N: 486 tons/year;
- P: 65 tons/year;
- BOD: 677 tons/year;
- COD: 621 tons/ year;

13.6 Summary of Main Country Specific Particularities

(1) Main particularities regarding “non-point source” issues

The most important sources of diffuse pollution in Ukrainian part of the Danube river basin include crop production, animal farming and households unconnected to sewer systems.

The revision of data and information was facilitated by the assessment carried out in previous studies and the updated statistical data shows that there are not significant changes in the diffuse pollution loads on the territory of Ukraine since 1996. The industry and agriculture in Ukraine are still in recession while the first signs of improvement became visible only since few months due to the Decree of President on Land privatization.

Ukraine considers that reduction of nutrient pollution from diffuse pollution should be addressed through various measures including the strengthening of institutional capacity of controlling and regulating bodies, introduction of environmentally sound agricultural practices, establishing the buffer zones of streams and tributaries of the Danube rivers, assessment and implementation measures for solid waste management and wastewater treatment in rural settlements, and education of general public.

One particularity of Ukraine is related to the emphasis on the wetland conservation measures proposed in Lower Danube.

Ukraine assumes that implementation of proposed measures will result in anticipated reduction of diffuse nutrient load by 10% during five years, and will prevent pollution when economy will start recovering from recession.

(2) Main particularities regarding “point source” projects

The 10 municipal point-source projects supposed to be ready for implementation within the coming 5 year period have investment requirements of about EUR 67 million.

Even these priority projects cannot be considered as really committed, as project funding is not yet secured.

The primary characteristics of the identified priority projects can be summarized as follows:

Table 13.6-1: Primary Characteristics of the Identified Priority Projects

Sector	No of Projects	Expected Nutrient Reduction (tons/year)				Investment Cost (Million EUR)
		N	P	BOD	COD	
Municipal point sources	10	486	65	677	621	67.2
Industrial point sources	0	0	0	0	0	0.0
Agricultural point sources	0	0	0	0	0	0.0
Wetlands	0	0	0	0	0	0.0
Total	10	486	65	677	621	67.2

ANNEX II

COUNTRY LISTS OF PRIORITY PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLANS

- 1. GERMANY**
- 2. AUSTRIA**
- 3. CZECH REPUBLIC**
- 4. SLOVAKIA**
- 5. HUNGARY**
- 6. SLOVENIA**
- 7. CROATIA**
- 8. BOSNIA-HERZEGOVINA**
- 9. YUGOSLAVIA**
- 10. BULGARIA**
- 11. ROMANIA**
- 12. MOLDOVA**
- 13. UKRAINE**

ANNEX II - 1: GERMANY

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

EXISTING SITUATION			
Sector	Emission Source /	Nutrient Emissions	
	Hot spot	N tons/y	P tons/y
	Total Municipalities	24,420	1,410
Ind.			
	Total Industry	1,270	100
Agr.			
	Total Agriculture	100,000	3,300
Wetl.			
	Total	125,690	4,810

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme		
		N tons/y	P tons/y	BOD tons/y	COD tons/y	Total Inv. mil EUR	Increment. mil EUR	Baseline mil EUR		National mil EUR	Int. Loan mil EUR	Int. Grant mil EUR
1	Mergelstetten - Brenz	110	5	40	140	9.7	8.7	1.0	2000	9.7		
2	Leutkirch - Eschach, Iller	64		1	9	4.6	4.1	0.5	2001	4.6		
3	Zweckverband Obere Iller, Sonthofen	145	5	33	326	7.4	6.7	0.7	2000	7.4		
4	Munchen I - Isar	2,704	3	1	36	28.6	25.7	2.9	2002/03	28.6		
5	Munchen II - Isar	500				20.0	18.0	2.0		20.0		
6	Zweckverband Starnberger See - Isar	60				22.9	20.6	2.3	2000	22.9		
7	Zweckverband Chiemsee - Inn	37				5.1	4.6	0.5	2000	5.1		
7	Subtotal	3,620	13	75	511	98.3	88.4	9.9		98.3	0.0	0.0
	Others											
7	Total Municipalities	3,620	13	75	511	98.3	88.4	9.9		98.3	0.0	0.0
1	ESSO AG Ingolstadt	15			20	0.6	0.1	0.5	2002	0.6		
2	WNC - Nitrochemie GmbH Aschau / Inn	245	40		760	5.7	1.1	4.6		5.7		
2	Subtotal	260	40	0	780	6.3	1.2	5.1		6.3	0.0	0.0
	Others											
2	Total Industry	260	40	0	780	6.3	1.2	5.1		6.3	0.0	0.0
0	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Others											
0	Total Agriculture	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
1	Floodplains next to Ingolstadt	113	11			101.3	78.8	22.5		101.3		
2	Mouth of Isar	98	10			25.4	5.9	19.5		25.4		
2	Subtotal	211	21	0	0	126.7	84.7	42.0		126.7	0.0	0.0
	Others											
2	Total Wetlands	211	21	0	0	126.7	84.7	42.0		126.7	0.0	0.0
11	Total	4,091	74	75	1,291	231.3	174.3	57.0		231.3	0.0	0.0

ANNEX II - 2: AUSTRIA

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

EXISTING SITUATION			
Sector	Emission Source /	Nutrient Emissions	
	Hot spot	N	P
		tons/y	tons/y
Mun.			
	Total Municipalities		
Ind.			
	Total Industry		
Agri.			
	Total Agriculture		
Wetl.			
	Total	0	0

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme		
		N	P	BOD	COD	Total Inv.	Increment.	Baseline		National	Int. Loan	Int. Grant
		tons/y	tons/y	tons/y	tons/y	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil EUR
1	Wien - HKA - extension and upgrade of NP removal	2,000	0	5,500	10,000	146.0	131.0	15.0		146.0		
2	Linz - Asten - extension and upgrade of NP removal	770	64	0	1,278	48.0	43.0	5.0		48.0		
3	Graz - extension and upgrade of NP removal	1,180	340	240	750	37.0	33.0	4.0		37.0		
3	Subtotal	3,950	404	5,740	12,028	231.0	207.0	24.0		231.0	0.0	0.0
-	Others											
3	Total Municipalities	3,950	404	5,740	12,028	231.0	207.0	24.0		231.0	0.0	0.0
1	PCA Fine Paper Hallein	0	0	5,500	4,500	33.0	7.0	26.0		33.0		
1	Subtotal	0	0	5,500	4,500	33.0	7.0	26.0		33.0	0.0	0.0
-	Others											
1	Total Industry	0	0	5,500	4,500	33.0	7.0	26.0		33.0	0.0	0.0
	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Others											
	Total Agriculture	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Others											
	Total Wetlands	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
4	Total	3,950	404	11,240	16,528	264.0	214.0	50.0		264.0	0.0	0.0

ANNEX II - 3: CZECH REPUBLIC

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

Existing Situation				1998	
Sector	Emission Source / Hot Spot	Nutrient Emissions			
		N	P		
		tons/y	tons/y		
Mun.	WWTP Brno	692	31		
	WWTP Uherske Hradiste	93	9		
	WWTP Hodonin	50	7		
	WWTP Prostějov	112	6		
	WWTP Prerov	100	9		
	WWTP Breclav	74	9		
	Total Hot Spots	1,121	72		
	Others	12,614	1,516		
	Total Municipalities	13,735	1,587		
Ind.	WWTP TOMA Otrokovice	59	1		
	Tanex Vladislav	10	0		
	Snaha Brtnice	1	0		
	Paper Mill Prudka	0	0		
	Total Hot Spots	70	1		
	Others	146	34		
	Total Industry	215	35		
Agr.	Pig Farm Gigant Dubnany	50	5		
	Total Hot Spots	50	5		
	Others	109	11		
	Total Agriculture point sources	159	16		
Wetl					
	Total	14,109	1,638		

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS														
No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme				
		N	P	BOD	COD	Total Inv.	Increment.	Baseline		National	Int. Loan	Int. Grant		
		tons/y	tons/y	tons/y	tons/y	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil EUR		
		tons/y	tons/y	tons/y	tons/y	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil EUR		
1	Extension of WWTP	417	15	40		46.1	18.8	27.3	2005	17.1	19.8	9.1		
2	Reconstruction of technology in WWTP	65	1	34		5.8	3.9	1.9	2005	3.6	1.1	1.1		
3	Intensification and extension of WWTP	10	2			2.7	2.5	0.2	2005	1.7	0.5	0.5		
4	Reconstruction of WWTP	42				15.2	3.3	11.9	2003	15.2	0.0	0.0		
5	Reconstruction of WWTP	63	3	59		10.1	7.4	2.7	2004	10.1	0.0	0.0		
6	Reconstruction and Intensification of WWTP	36	3	25	93	11.7	11.0	0.7	2002	8.5	0.0	3.2		
6	Sub-total	633	24	158	93	91.6	46.9	44.7		56.2	21.4	13.9		
	Others	377	34	1,070		42.1		42.1						
6	Total Municipalities	1,010	58	1,228	93	133.7	46.9	86.8		56.2	21.4	13.9		
1	Intensification of WWTP	39			8	2.8	0.5	2.3	2004	2.1	0.3	0.4		
2	Reconstruction of WWTP and remedial measures	6		1	4	0.4	0.1	0.3	2005	0.4				
3	Reconstruction of WWTP and remedial measures	0		0	3	0.8	0.2	0.6	2005	0.6	0.1	0.1		
4	Reconstruction of WWTP			18	11	0.2	0.1	0.1	2003	0.1	0.1	0.0		
4	Sub-total	45	0	18	26	4.2	0.9	3.3		3.2	0.5	0.5		
	Others	16	1			0.9		0.9						
4	Total Industry	61	1	18	26	5.1	0.9	4.2		3.2	0.5	0.5		
1	Remedial measures and slurry reduction	20	3			5.3	4.2	1.1	2005	3.5	0.9	0.9		
1	Sub-total	20	3	0	0	5.3	4.2	1.1		3.5	0.9	0.9		
	Others													
1	Total Agriculture point sources	20	3	0	0	5.3	4.2	1.1		3.5	0.9	0.9		
0	Sub-total	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0		
	Wetlands Program (24 projects/activities)					2.6	1.3	1.3	2005	1.3		1.3		
1	Total Wetlands	0	0	0	0	2.6	1.3	1.3		1.3	0.0	1.3		
12	Total	1,091	62	1,246	120	146.7	53.3	93.4		64.2	22.8	16.6		

ANNEX II - 4: SLOVAKIA

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

EXISTING SITUATION				PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
Sector	Emission Source / Hot Spot	Nutrient Emissions		No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme		
		N	P			N	P	BOD	COD	Total Inv.	Increment.	Baseline		National	Int. Loan	Int. Grant
		tons/y	tons/y			tons/y	tons/y	tons/y	tons/y	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil EUR
Mun.	Kosice	624	90	1	Expansion of WWTP-2nd stage	405	18	1,596	3,110	20.2	4.8	15.4	2002	16.6	3.3	1.3
	Banska Bystrica	471	68	2	Reconstruction and expansion of WWTP	424	47	3,720	7,700	13.1			2002	9.7		
	Nitra	442	64	3	Finalisation of WWTP	287	32	2,041	3,613	13.1			2002	4.0		
	Liptovsky Mikulas	397	27	4	Reconstruction of sewage works, intensification of WWTP	258	3	253	612	6.8						
	Ruzomberok	225	14	5	Intensification of WWTP	22	1	975	1,986	0.1			2002/05			
	Topolcany	221	32	6	Intensification of WWTP	144	3	299	408	0.9			2000			
	Michalovce	207	30	7	Intensification of WWTP	135	3	1,142	2,251	2.6			2002	1.3		
	Humenne	164	24	8	Expansion of WWTP	106	2	867	1,586	11.1	5.5	5.6	2002	5.6	0.0	0.0
	Trencin-right side	64	4	9	Sewage works and WWTP	57	3	819	1,692	10.6			2005	-		
	Roznava	62	7	10	Expansion of WWTP	40	1	359	776	0.5			2005			
	Svidnik	30	3	11	Sewage works and WWTP	27	1	446	849	10.9			2002	5.8		
	Banska Stiavnica	23	3	12	Construction of WWTP and sewer collector	53	5	256	526	9.1			2002			
	Cadca	62	18	13	Reconstruction and expansion of WWTP and sewer system	41	6	197	350	4.4			2002			
	Subtotal	2,992	382	13	Subtotal	2,001	125	12,968	25,458	103.4	10.3	21.0		43.0	3.3	1.3
	Others	7,439	1,101		Others											
	Total Municipalities	10,431	1,483	13	Total Municipalities	2,001	125	12,968	25,458	103.4	10.3	21.0		43.0	3.3	1.3
Ind.	Istrochem Bratislava	280		1	Construction of biological WWTP	175		641	1,690	8.2	2.3	5.8	2002	2.3	1.4	2.1
	Povaz. Chemical Plants (1)	122		2	Reconstruction of WWTP	92				0.5						
	Biotika Slovenska Lupca (1)	102		3	Expansion of WWTP by anaerobic stage	81				3.4			2000			
	Chemko Strazske (2)	51		4	Reconstruction of sewerage system					2.1			2005			
	Subtotal	555	0	4	Subtotal	348	0	641	1,690	14.2	2.3	5.8		2.3	1.4	2.1
	Others				Others											
	Total Industry	555	0	4	Total Industry	348	0	641	1,690	14.2	2.3	5.8		2.3	1.4	2.1
Agr.																
	Subtotal			0	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Others				Others											
	Total Agriculture			0	Total Agriculture	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
Wetl.				1	Integrated Management in Olšavica River Basin	30	3			0.1			2000 /05			0.1
				2	Floodplain Meadow Restoration in the Lower Morava River	45	5			0.1			2000 /05			0.1
				3	Wetland restoration in Laborec River basin	150	15			0.7						
				3	Subtotal	225	23	0	0	0.9	0.0	0.0		0.0	0.0	0.2
					Others											
				3	Total Wetlands	225	23	0	0	0.9	0.0	0.0		0.0	0.0	0.2
1) as N-NH4		2) as N-anorg														
	Total	10,986	1,483	20	Total	2,574	147	13,609	27,148	118.4	12.6	26.8		45.3	4.7	3.6

ANNEX II - 5: HUNGARY

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

EXISTING SITUATION			
Sector	Emission Source / Hot Spot	Nutrient Emissions	
		N	P
		tons/y	tons/y
Mun.	Budapest North	524	103
	Budapest South	715	50
	Budapest Central	3,490	200
	Szeged	900	166
	Gyor	423	63
	Szolnok	200	49
	Debrecen	544	321
	Szekesfehervar	257	36
	Tatabanya	43	53
	Dunaujvaros	160	25
	Sopron	67	42
	Szekszard	106	36
	Salgotarjan	120	41
	Godollo	n/a	n/a
	n/a	n/a	n/a
	Veszprem/Northern Bakony	164	44
	Subtotal	7,713	1,229
	Others	0	0
	Total Municipalities	7,713	1,229
Ind.	NITROKEMIA Balatonfuzfo	836	12
	Subtotal	836	12
	Others	0	0
	Total Industry	836	12
Agr.	Mosonmagyarovar	300	70
	Tisza	1,000	200
	Koros	500	100
	Duna	2,500	500
	Babocsa	200	50
	Subtotal	4,500	920
	Others		
Agr.	Total Agriculture	4,500	920
Wetl.	Danube-Drava, Gemenc	400	100
	Mouth of Bodrog	400	100
	Subtotal	800	200
	Others		
	Total Agriculture	800	200
Total		13,849	2,361

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme		
		N	P	BOD	COD	Total Inv.	Increment	Baseline		National	Int. Loan	Int. Grant
		tons/y	tons/y	tons/y	tons/y	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil EUR
1	Extention + upgrade to III.	308	183			32.3	16.1	16.1	1997-1999	16.1	16.1	
2	Extention + upgrade to III.	203	122			27.9	25.1	2.8	1998-2000	13.9	14.0	
3	New waste water treatment plant	900	140			407.0			2001-2007	107.0	150.0	150.0
4	Extention + upgrade to III. + sewerage	600	250			68.0			2001-2006	23.0	0.0	45.0
5	Extention + upgrade to III.	273	43			12.7	6.3	6.3	2001-2002	12.7		
6	WWTP with biological treatment	100	30			6.0	3.0	3.0	1995-1999	1.5	0.0	1.4
7	WWTP I grade	300	150			0.7	0.3	0.4	1995-1998	0.4		
8	Extention + upgrade	160	25			15.0			1999-2000	15.0		
9	Extention + upgrade to III.+ sludge treatment	30	40			8.0			1999-2001	8.0		
10	Upgrade + nutrient removal	53	23			10.6	3.2	7.4	1999-2001	7.4		3.2
11	Upgrade + nutrient removal	40	30			9.0	3.6	5.4	2000-2002	5.4		3.6
12	Upgrade + nutrient removal	80	20			3.3	1.3	2.0	2000-2003	2.0		1.3
13	WWTP + regional sewerage	80	20			23.4	4.7	18.7	2000-2001	18.7		4.7
14	WWTP + regional sewerage	128	37			11.3	2.3	9.0	2004	9.0		2.3
15	Kerka-Mura watershed sewerage + WWTP	100	20			11.1	1.7	9.4	2004	9.4		1.7
16	WWTP + regional sewerage	100	20			11.9	0.6	11.3	1999-2001	11.3		0.6
16	Subtotal	3,455	1,153	0	0	658.2	68.2	91.8		260.8	180.1	213.8
	Others											
16	Total Municipalities	3,455	1,153	0	0	658.2	68.2	91.8		260.8	180.1	213.8
1	Reconstruction of the WWT system of the Nitrokemia Co.	420	6			5.9	2.9	3.0	2004	2.0	3.9	
	Subtotal	420	6	0	0	5.9	2.9	3.0		2.0	3.9	
	Others											
	Total Industry	420	6	0	0	5.9	2.9	3.0		2.0	3.9	0.0
1	Introduction of EU-conform and environmentally protective fattening technology in a pigfarm for 1,300 sows	200	50			0.7	0.5	0.2	2004	0.7		
	Agriculture originated pollution minimization in the floodplain of Tisza River	100	20			0.5	0.3	0.2	2004	0.5		
	Establishment of agro- and nature conservation training centers in the Koros-Maros National Park	200	50			3.0	2.7	0.3	2004	0.3		2.7
	Rational farming for decreasing nutrient inputs in the DRB in Hungary	2,000	200			1.4	0.9	0.5	2000	0.5		0.9
	Organic farming in the Drava floodplain	100	20			1.7	0.4	1.3	2004			
5	Subtotal	2,600	340	0	0	7.2	4.8	2.5		2.0	0.0	3.6
	Others											
5	Total Agriculture	2,600	340	0	0	7.2	4.8	2.5		2.0	0.0	3.6
1	Danube-Drava region wetland rehabilitation programme	120	12			6.4	5.4	1.0	2004	1.0		5.4
	Reduction of pollution by rehabilitation of wetlands in the mouth of Bodrog	113	11			9.0	7.9	1.1	2005	1.1		7.9
	Subtotal	233	23	0	0	15.4	13.3	2.1		2.1	0.0	13.3
	Others											
2	Total Agriculture	233	23	0	0	15.4	13.3	2.1		2.1	0.0	13.3
24	Total	6,708	1,522	0	0	686.7	89.2	99.4		266.9	184.0	230.7

ANNEX II - 6: SLOVENIA

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

EXISTING SITUATION			
Sector	Emission Source / Hot Spot	Nutrient Emissions	
		N	P
		tons/y	tons/y
Mun.	Maribor (3rd stage)	1000	200
+	Liubljana (3rd stage)	1925	385
+	Murska Sobota (3rd stage)	225	45
+	Celje	350	70
	Rogaška Slatina	60	12
+	Lendava	225	45
+	Krško	100	20
	Breice	50	10
	Velenje (upgrading)	250	50
+	Sevnica	50	10
+	Vrhnika	100	20
+	Trbovlje	90	18
+	Bohinjska Bistrica	55	11
+	Radovljica	150	30
+	Kranjska Gora	33	7
+	Trinje	100	20
+	Litija	95	19
+	Zagorje	85	17
+	Hrastnik	55	11
+	Dravograd	45	9
+	Mislinja	13	3
+	Slovenj gradec	100	20
+	Ptuj (3rd st.)	525	105
	Subtotal	5,681	1,137
	Others		
	Total Municipalities	5,681	1,137
Ind.			
	Subtotal		
	Others		
	Total Industry		
Agr.			
	Podgrad/Gornja Radgona	200	40
	Subtotal	200	40
	Others		
	Total Agriculture	200	40
Wetl.			
	Total	5,881	1,177

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme		
		N	P	BOD	COD	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil EUR
	2nd stage % / 3rd stage %	tons/y	tons/y	tons/y	tons/y							
1	WWTP - 300.000 PE (3rd st.)	900	140	4,900	8,000	52.0			2002	35.5	6.5	10.0
2	WWTP - 420.000 PE (3rd st.)	1,733	270	9,433	15,400	109.5			2004	109.5	0.0	0.0
3	WWTP - 45.000 PE (3rd st.)	203	32	1,103	1,800	9.2			2004	9.2	0.0	0.0
4	WWTP - 70.000 PE (3rd st.)	315	49	1,715	2,800	20.8	4.6		2003	10.7	10.1	0.0
5	WWTP - 12.000 PE (3rd st.)	54	8	294	480	16.0			2005	16.0	0.0	0.0
6	WWTP - 45.000 PE (3rd st.)	203	32	1,103	1,800	13.0			2001	13.0	0.0	0.0
7	WWTP - 20.000 PE (3rd st.)	90	14	490	800	11.0			2006	8.5	2.5	0.0
8	WWTP - 10.000 PE (3rd st.)	45	7	245	400	5.5			2006	4.3	1.2	0.0
9	WWTP - 50.000 PE (3rd st.)	225	35	1,225	2,000	16.5			2004	11.5	5.0	0.0
10	WWTP - 10.000 PE (3rd st.)	45	7	245	400	5.5			2006	4.3	1.2	0.0
11	WWTP - 20.000 PE (3rd st.)	90	14	490	800	20.4			2006	20.4	0.0	0.0
12	WWTP - 18.000 PE (3rd st.)	81	13	441	720	7.1			2006	5.7	1.4	0.0
13	WWTP - 11.000 PE (3rd st.)	50	8	270	440	5.0			2005	3.3	1.7	0.0
14	WWTP - 30.000 PE (3rd st.)	135	21	735	1,200	10.0			2005	6.7	3.3	0.0
15	WWTP - 6.500 PE (3rd st.)	30	5	159	260	9.6			2003	6.9	2.7	0.0
16	WWTP - 20.000 PE	30	4	490	800	11.8			2006	11.8	0.0	0.0
17	WWTP - 19.000 PE (3rd st.)	86	13	466	760	7.5			2006	6.0	1.5	0.0
18	WWTP - 17.000 PE (3rd st.)	77	12	417	680	6.7			2006	5.4	1.3	0.0
19	WWTP - 11.000 PE (3rd st.)	50	8	270	440	4.3			2006	3.5	0.8	0.0
20	WWTP - 9.000 PE (3rd st.)	41	6	221	360	4.8			2004	3.4	1.4	0.0
21	WWTP - 2.500 PE (3rd st.)	12	2	61	100	1.3			2004	0.9	0.4	0.0
22	WWTP - 20.000 PE (3rd st.)	90	14	490	800	10.7			2004	7.5	3.2	0.0
23	WWTP - 105.000 PE (3rd st.)	473	74	2,573	4,200	24.3			2006	24.3	0.0	0.0
23	Subtotal	5,053	786	27,836	45,440	382.5	4.6	0.0		328.2	44.2	10.0
	Others											
23	Total Municipalities	5,053	786	27,836	45,440	382.5	4.6	0.0		328.2	44.2	10.0
0	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Others											
0	Total Industry	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
1	Pig Farm	180	28	980	1,600	1.7	1.5		2000			
1	Subtotal	180	28	980	1,600	1.7	1.5	0.0		0.0	0.0	0.0
	Others											
1	Total Agriculture	180	28	980	1,600	1.7	1.5	0.0		0.0	0.0	0.0
0	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Others											
0	Total Wetlands	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
24	Total	5,233	814	28,816	47,040	384.2	6.1	0.0		328.2	44.2	10.0

ANNEX II - 7: CROATIA

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

EXISTING SITUATION			
Sector	Emission Source / Hot Spot	Nutrient Emissions	
		N tons/y	P tons/y
Mun.	Cakovec	22	7
	Varazdin	140	60
	Koprivnica	29	9
	Zagreb	4,400	110
	Sisak	240	60
	Karlovac	320	80
	Subtotal	5,151	326
	Others	0	0
	Total Municipalities	5,151	326
Ind.			
	Subtotal	0	0
	Others		
	Total Industry	0	0
Agr.			
	Subtotal	0	0
	Others		
	Total Agriculture	0	0
Wetl.			
	Total	5,151	326

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme		
		N tons/y	P tons/y	BOD tons/y	COD tons/y	Total Inv. mil EUR	Increment. mil EUR	Baseline mil EUR		National mil EUR	Int. Loan mil EUR	Int. Grant mil EUR
1	WWTP of Cakovec and nearby towns					7.3	2.2	5.1	2005			
2	Reconstruction of WWTP of Varazdin	132	1	1,162	1,779	12.0	6.0	6.0	2002			
3	WWTP of Koprivnica			604	806	10.8	5.4	5.4	2003			
4	Central WWTP of Zagreb	1,320	220	10,438	29,743	256.0	76.8	179.2	2005			
5	The sewerage and the WWTP of Sisak	48	2	700	919	60.0	18.0	42.0				
6	Sewerage and WWTPs of Karlovac and Duga Resa	9	16	2,026	1,177	50.0	15.0	35.0				
7	Sewerage and WWTP of Vinkovci			190		12.0	3.6	8.4	2003		9.9	
8	WWTP of Velika					1.0	0.3	0.7	2010	1.5		
9	Sewerage and WWTP of Garesnica					2.4	0.1	2.2				
10	WWTP of Velika Gorica					2.2	1.1	1.1				
11	WWTP of Nasice - I phase					1.1	0.3	0.8	2001	0.8		
11	Subtotal	1,509	239	15,120	34,424	414.8	128.9	285.9		2.3	9.9	0.0
	Others			190		18.7	5.5	13.2				
11	Total Municipalities	1,509	239	15,310	34,424	433.4	134.3	299.1		2.3	9.9	0.0
	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Others											
	Total Industry	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Others											
	Total Agriculture	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Others											
	Total Wetlands	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
11	Total	1,509	239	15,310	34,424	433.4	134.3	299.1		2.3	9.9	0.0

ANNEX II - 8: BOSNIA-HERCEGOVINA

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

EXISTING SITUATION			
Sector	Emission Source / Hot Spot	Nutrient Emissions	
		N	P
		tons/y	tons/y
Mun.	Tuzla	481	144
	Sarajevo	621	176
	Banja Luka	712	214
	Bijeljina		
	Brcko		
	Subtotal	1,814	534
	Others		1
	Total Municipalities	1,814	535
Ind.	Chlorine Alkaline Complex - Tuzla	42	74
	Pulp and paper industry-Maglaj		
	Coke and Chemical Industry	20	-
	Cellulose and Viscose Factory		
	Iron work-Zenica	114	-
	Pulp and Paper Production		
	Subtotal	176	74
	Others		
	Total Industry	176	74
Agr.			
	Subtotal	0	0
	Others		
	Total Agriculture	0	0
Wetl.			
	Total	1,990	609

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
No	Proposed Projects	Expected Reduction				Investment Cost			Implementation period	Funding Scheme		
		N	P	BOD	COD	Total Inv.	Increment	Baseline		National	Int. Loan	Int. Grant
		tons/y	tons/y	tons/y	tons/y	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil EUR
1	Construction of regional sewage system Tuzla-Lukavac with central WWTP for municipalities and industry.	1,080	160	1,539	4,142	58.0	2.9	55.1	2004			
2	Rehabilitation and reconstruction of sewage and industrial WWTP for Sarajevo municipality	1,015	150	6,150	10,660	15.0	3.0	12.0	2005			
3	Construction of regional sewerage system Banja Luka with central WWTP for municipality and industry	910	140			50.0	2.5	47.5	2005			
4	Construction of sewerage system in Bijeljina with central WWTP for municipality and industry					12.0	0.6	11.4	2004			
5	Construction sewerage system Brcko with central WWTP for municipality and industry					12.0	1.0	11.0				
5	Subtotal	3,005	450	7,689	14,802	147.0	10.0	137.0		0.0	0.0	0.0
	Others											
5	Total Municipalities	3,005	450	7,689	14,802	147.0	10.0	137.0		0.0	0.0	0.0
1	Reconstruction of pre-treatment WWTP in Chlorine Alkaline Complex in Tuzla	26	53	632	1,631	2.2	0.4	1.8				
2	Rehabilitation and reconstruction of WWTP in "Natron" Maglaj					3.0	1.5	1.5				
3	Reconstruction of pre-treatment WWTP for Coke and Chemical Industry Lukavac	2	-	284	344	2.8	0.6	2.2				
4	Reconstruction and improvement of WWTP of "Incel" Banja Luka					3.5	1.8	1.8				
5	Reconstruction of industrial WWTP for DD "Zeljezara" Zenica	97	-	47	184	1.6	0.8	0.8				
6	Construction of waste water treatment plant for "Celpak" Prijedor					14.0	4.2	9.8				
6	Subtotal	125	53	963	2,159	27.1	9.3	17.9		0.0	0.0	0.0
	Others											
6	Total Industry	125	53	963	2,159	27.1	9.3	17.9		0.0	0.0	0.0
1	Construction of WWTP for pigs breeding farm in Brcko	1,570	350			2.3	0.7	1.6				
1	Subtotal	1,570	350	0	0	2.3	0.7	1.6		0.0	0.0	0.0
	Others											
1	Total Agriculture	1,570	350	0	0	2.3	0.7	1.6		0.0	0.0	0.0
0	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Others											
0	Total Wetlands	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
12	Total	4,700	853	8,652	16,961	176.4	20.0	156.5		0.0	0.0	0.0

ANNEX II - 9: YUGOSLAVIA

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

EXISTING SITUATION			
Sector	Emission Source / Hot Spot	Nutrient Emissions	
		N tons/y	P tons/y
Mun.	City of Belgrade (Central)	5840	1,314
	City of Novi Sad (Left Bank)	988	298
	City of Nis	826	289
	City of Pristina	570	148
	Zrenjanin	975	226
	Vrbas-Kula (REG)	547	151
	Leskovac	295	132
	Krusevac	333	79
	Cacak	410	139
	Sabac	287	113
	Vranje	286	92
	Subotica (*)	696	187
	Uzice	222	62
	Zajecar	205	55
	Senta (CW)	238	55
	Bor	145	43
	Pirot	240	56
	Rozaje	38	12
	Blace	48	15
	Kolasin	35	7
	Mojkovac	19	5
	Subtotal	13,243	3,478
	Others		
	Total Municipalities	13,243	3,478
Ind.	IHP 'Prahovo'	570	4,760
(**)	HI "Zorka"-Sabac	1465	-
	FAK "Lepenka"	27	10
	FOPA	-	-
	PK "Beograd"	355	47
	Thermopower Plant 'Obilic'	-	-
	RTB 'Bor'	38	-
	Subtotal	2,455	4,817
	Others		
	Total Industry	2,455	4,817

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme		
		N	P	BOD	COD	Total Inv.	Increment	Baseline		National	Int. Loan	Int. Grant
		tons/y	tons/y	tons/y	tons/y	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil EUR
1		876	260	31,536	70,080	215.0			5	45.0	155.0	15.0
2		148	60	5,657	12,571	52.5			5	14.5	34.0	4.0
3		124	60	5,302	11,782	45.0			3	9.0	33.0	3.0
4		86	30	3,563	7,918	39.5			5	8.5	11.0	20.0
5		160	47	3,932	8,322	37.5			4	7.5	28.0	2.0
6		90	32	3,390	7,183	34.0			4	8.0	24.0	2.0
7		44	26	2,874	6,386	25.2			3	5.0	17.7	2.5
8		50	16	2,779	6,176	23.6			3	4.7	16.9	2.0
9		62	28	2,466	5,480	23.6			4	4.7	16.9	2.0
10		43	24	1,912	4,249	17.5			3	3.5	12.5	1.5
11		43	18	1,853	4,117	17.5			4	3.5	12.5	1.5
12		550	36	3,600	8,322	32.8			3	6.6	24.7	1.5
13		33	12	1,399	3,285	14.0			3	2.8	10.0	1.2
14		31	11	1,315	2,922	14.0			4	2.8	10.0	1.2
15		36	11	1,261	2,803	7.5			2	1.5	4.5	1.5
16		22	9	1,258	2,796	14.0			4	2.8	10.0	1.2
17		36	11	1,225	2,722	14.0			4	2.8	10.0	1.2
18		6	3	355	788	5.7			3	1.1	3.4	1.2
19		38	3	310	657	7.5			3	1.5	4.5	1.5
20		5	2	175	390	2.8			3	0.6	1.2	1.0
21		3	1	118	263	2.8			3	0.6	1.2	1.0
21	Subtotal	2,486	700	76,280	169,212	646.0	0.0	0.0		137.0	441.0	68.0
	Others											
21	Total Municipalities	2,486	700	76,280	169,212	646.0	0.0	0.0		137.0	441.0	68.0
1	P - Fertilizers	200	3,500	285	2,000	2.5			2	0.5	1.0	1.0
2	Chemical Industry	750	8	220	560	2.0			2	0.5	1.0	0.5
3	Card Board	17	8	940	3,450	6.0			4	1.5	3.0	1.5
4	Wood \$ Paper	30	14	11,200	28,000	8.0			4	2.5	4.0	1.5
5	Food Processing Ind.	300	34	12,700	23,700	9.0			4	2.5	5.0	1.5
6	Coal Mining & Processing	30	4	3,500	6,100	11.0			4	2.0	3.0	6.0
7	Cu Mining & Flotation	20	3	500	900	30.0			5	7.5	17.5	5.0
7	Subtotal	1,347	3,571	29,345	64,710	68.5	0.0	0.0		17.0	34.5	17.0
	Others											
7	Total Industry	1,347	3,571	29,345	64,710	68.5	0.0	0.0		17.0	34.5	17.0

ANNEX II - 9: YUGOSLAVIA
PROJECT LIST FOR NATIONAL NUTRIENT REDUCTION ACTION PLAN

EXISTING SITUATION			
Sector	Emission Source / Hot Spot	Nutrient Emission	
		N	P
		tons/y	tons/y
Agr.	DD IM "Neoplanta" (DP)	183	68
	FS "Surcin"- Surcin	128	48
	DD "Carnex-Farmakop"-Vrbas	128	48
	DP PIK "Varvarinsko Polje"	91	34
	DP "1. Decembar"-FS "Nimes"	73	27
	FS "D. Markovic"	73	27
	Centre for farms and agricultural wastes		
	Subtotal	676	252
	Others		
	Total Agriculture	676	252
Wetl.	Danube - Monostorski Rit		
	Sava - Obedska Bara		
	Sava - Zasavica		
	Tisa - Ludos Lake		
	Danube - Koviljski Rit		
		0	0
		0	0
	Total	16,374	8,547

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
	Project / Hot Spot	Expected Reduction				Investment Cost			Imple- mentation period	Funding Status		
		N	P	BOD	COD	Total Inv.	Increment	Baseline		National	Int. Loan	Int. Grant
		tons/y	tons/y	tons/y	tons/y	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil EUR
1		173	65	1,387	2,993	16.0			4	4.5	8.0	3.5
2		121	46	971	2,095	12.0			4	4.0	5.0	3.0
3		121	46	971	2,095	12.0			4	4.0	5.0	3.0
4		87	33	694	1,497	9.0			4	2.5	4.5	2.0
5		69	26	555	1,197	8.0			4	2.5	4.0	1.5
6		69	26	555	1,197	8.0			4	2.5	4.0	1.5
7						0.8			2	0.1	0.0	0.7
7	Subtotal	640	242	5,133	11,074	65.8	0.0	0.0	26.0	20.1	30.5	15.2
	Others											
7	Total Agriculture	640	242	5,133	11,074	65.8	0.0	0.0		20.1	30.5	15.2
1		500	100	1,000	7,000	1.0			2004	0.1	0.5	0.4
2		200	20	400	2,800	0.8			2003	0.1	0.4	0.3
3		120	10	200	1,400	0.4			2003	0.0	0.2	0.2
4		500	120	1,000	7,000	1.8			2004	0.2	0.9	0.7
5		1,000	100	2,000	14,000	1.0			2004	0.1	0.5	0.4
5	Subtotal	2,320	350	4,600	32,200	5.0	0.0	0.0		0.5	2.5	2.0
	Others											
5	Total Wetlands	2,320	350	4,600	32,200	5.0	0.0	0.0		0.5	2.5	2.0
40	Total	6,793	4,863	115,358	277,196	785.3	0.0	0.0		174.6	508.5	102.2

(*) Enlarging of existing WWTP and upgrading it for N & P removal
The investment cost for upgrading of sewerage systems and pretreatment of industrial wastewaters are not accounted
CW - civil works are completed 80%

(**) 1) The data concern on the period before 1992 when Industry was operated by 90% of full capacity
2) As the industrial production was severely decreased after the year 1992, the pollution emission in the period 1994-97 was 55-65% lower than presented in the table
3) Not all industries discharge wastewater directly into recipients. A part of it is retained in storages, retention basins or lagoons

ANNEX II - 10: BULGARIA

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

EXISTING SITUATION			
Sector	Emission Source / Hot Spot	Nutrient Emissions	
		N	P
		tons/y	tons/y
Mun	Sofia	3,284	1,030
	Veliko Tarnovo	408	82
	Gorna Oriahovitza-Liaskovetz	289	47
	Montana	489	98
	Pleven	487	138
	Dobrich	178	21
	Gabrovo	295	52
	Razgrad	184	33
	Troyan	309	51
	Vratza	435	65
	Samokov	291	73
	Lovech	346	72
	Sevlievo	248	57
	Popovo	169	42
	Stragitza	23	5
	Dulovo	49	5
	Isperih	48	8
	Subtotal	7,532	1,879
	Other	2,260	564
	Subtotal	9,792	2,443
Ind	Sugar factory Gorna Orihovitza	37	5
	Subtotal	37	5
	Others	22	5
	Total Industry	59	10
Agr	Subtotal		
	Others		
	Total Agriculture		
Wetl.	Wetlands Restoration and Pollution Reduction Project		
	Kalimok and Brushlen Marshes(2 000ha)		
	Belene wetland complex		
	Subtotal		
	Others		
	Total Wetlands		
	Total	9,850	2,453

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme		
		N	P	BOD	COD	Total Inv.	Increment.	Baseline		National	Int. Loan	Int. Grant
		tons/y	tons/y	tons/y	tons/y	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil EUR
1	Municipal WWTP-Sofia	1,036	135	4,819	5,670	26.5			2,003	3.5		23.0
2	Municipal WWTP-Veliko Tarnovo	131	40	1,696	2,413	9.0			2,006	3.0		
3	Municipal WWTP-Gorna Oriahovitza-Iyaskovetz	63	24	1,584	2,614							
4	Municipal WWTP-Montana	160	49	2,308	4,950	17.7			2,006			
5	Municipal WWTP - Pleven	93	59	1,346	2,984	2.0			2,003			
6	Municipal WWTP-Dobrich					1.0			2,002			
7	Municipal WWTP-Gabrovo		15	91	209	2.0			2,003			
8	Municipal WWTP-Razgrad		0	34		1.0			2,004			
9	Municipal WWTP-Troyan	150	30	1,794	3,796	9.2			2,005			
10	Municipal WWTP-Vratza	214	37	412	1,335	2.0			2,004			
11	Municipal WWTP-Samokov	130	57	1,300	3,079	2.0			2,002			
12	Municipal WWTP-Lovech	119	44	1,382	2,927	9.3			2,004			
13	Municipal WWTP-Sevlievo	136	42	1,194	1,962	12.5			2,005			
14	Municipal WWTP- Popovo	52	24	913	1,891	13.8			2,006			
15	Municipal WWTP- Stragitza	3	1	77	91	0.9			2,002			
16	Municipal WWTP-Dulovo	11	2	241	390	2.0			2,002			
17	Municipal WWTP-Isperih	10	3	257	407	1.0			2,002			
17	Subtotal	2,308	562	19,448	34,718	111.9	0.0	0.0		6.5	0.0	23.0
	Others											
17	Total Municipalities	2,308	562	19,448	34,718	111.9	0.0	0.0		6.5	0.0	23.0
1	Industrial' WWTP-Sugar			299	655							
	Subtotal	0	0	299	655	0.0	0.0	0.0		0.0	0.0	0.0
	Others											
	Total Industry	0	0	299	655	0.0	0.0	0.0		0.0	0.0	0.0
0	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
	Others											
	Total Agriculture	0	0	0	0	0.0	0.0	0.0		0.0	0.0	0.0
1	Wetlands Restoration and Pollution reduction project											
	Kalimok and Brushlen Marshes (2000ha)	375	37									
	Belene wetland complex											
	Subtotal	375	37	0	0	13.5	0.0	0.0		0.0	0.0	7.5
	Others											
	Total Wetlands	375	37	0	0	13.5	0.0	0.0		0.0	0.0	7.5
21	Total	2,683	599	19,747	35,373	125.4	0.0	0.0		6.5	0.0	30.5

EXISTING SITUATION			
Sector	Emission Source / Hot spot	Nutrient Emissions	
		N tons/y	P tons/y
Mun.			
	Bucharest	5,363.0	944.0
(n)	Craiova	1270	158
(n)	Braila	420	66
(n)	Galati	746	92
(e)	Zalau	130	28
(e)	Resita	202	41
(d)	Campulung	83	12
(d)	Deva	209	42
(d)	Timisoara	992	173
(r)	Iasi	368	60
	Subtotal	9783	1616
	Others		
	Total Municipalities	9783	1616
Ind.			
(e)	Antibiotice Iasi	12	0
(n)	Arpechim Pitesti	92	4
(e)	Somes Dej	130	-
(e)	Oltchim Rm.Valcea	548	-
(e)	Fibrex Savinesti	831	-
(eT)	Romfosfochim	11	3
(ex)	Integrata Arad	400	-
	Subtotal	2024	7
	Others		
	Total	2024	7
Agr.			
(ex)	Consuin Ulmeni	472	118
(n)	Suinprod Independenta	323	81
(n)	Comsuin Beregsau	818	204
	Subtotal	1613	403
	Others		
	Total	1613	403
Wettl.			
	Total	13,420	2,026

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme		
		N tons/y	P tons/y	BOD tons/y	COD tons/y	Total Inv. Mill EUR	Increment Mill EUR	Baseline Mill EUR		National Mill EUR	Int. Loan Mill EUR	Int. Grant Mill EUR
1	WWTP Bucharest	1840	500	40000	48000	288.5	86.5	203.0		55.0	147.0	86.5
2	WWTP Craiova	597	63	660	864	32.0	1.6	30.4	2005	20.0	10.0	2.0
3	WWTP Braila	126	26	3220	3750	21.9	6.6	15.3	2006	15.0	5.0	1.9
4	WWTP Galati	224	37	4355	4540	29.5	8.9	20.7	2005	20.0	8.0	1.5
5	WWTP Zalau	39	11	108	146	7.0	3.5	3.5	2002	4.0	2.0	1.0
6	WWTP Resita	85	22	126	127	3.5	3.2	0.4	1998/00	2.5	1.0	-
7	WWTP Campulung	38	7	228	238	1.5	1.4	0.2	2005	1.5	-	-
8	WWTP Deva	86	21	150	156	5.6	5.0	0.6	2000	3.0	2.0	0.6
9	WWTP Timisoara	444	101	3284	2561	1.5	1.4	0.2	2000	1.5	-	-
10	WWTP rehabilitation	165	35	1390	772	1.9	1.7	0.2	2000	1.9	-	-
10	Subtotal	3644	823	53521	61154	392.9	119.8	274.5		124.4	175.0	93.5
	Others											
10	Total Municipalities	3644	823	53521	61154	392.9	119.8	274.5		124.4	175.0	93.5
1	WWTP	8	0	12	19	1.8	0.9	0.9	2005	1.8	-	-
2	WWTP	28	1	368	486	13.9	7.0	7.0	2005	10.0	3.9	-
3	WWTP	91	-	468	1243	0.6	0.3	0.3	2004	0.6	-	-
4	WWTP	110	-	442	748	0.7	0.2	0.5	2003	0.7	-	-
5	WWTP	166	-	905	1222	1.2	0.6	0.6	2004	1.2	-	-
6	Area reconstruction	5	2	-	-	2.8	0.6	2.2	2005	2.0	0.8	-
7	WWTP	280	-	752	392	1.0	0.5	0.5	2004	1.0	-	-
	Subtotal	688	3	2947	4110	22.0	10.1	12.0		17.3	4.7	0.0
	Others											
7	Total Industry	688	3	2947	4110	22.0	10.1	12.0		17.3	4.7	0.0
1	WWTP	330	35	172	78	1.0	0.5	0.5	2005	1.0	-	-
2	WWTP	226	32	433	330	0.8	0.2	0.6	2004	0.8	-	-
3	WWTP agricultural turning of zooth. waste at Ronsuin Peris	573	82	2738	1798	0.6	0.2	0.4	2005	0.6		
		245				1.3	0.4	0.9		0.5	0.5	0.3
3	Subtotal	1374	150	3343	2206	3.7	1.3	2.4		2.9	0.5	0.3
	Others											
3	Total Agriulture	1374	150	3343	2206	3.7	1.3	2.4		2.9	0.5	0.3
1	Balta Potelu	1024	102			12.3	2.0	10.3	2005	5.0	5.0	2.3
2	Area of Bulg. Danube	750	75			9.0	1.5	7.5	2005	4.0	3.0	2.0
3	Island Balta Greaca	2700	270			32.4	5.4	27.0	2010	15.0	15.0	2.4
4	Calarasi	750	75			9.0	1.5	7.5	2005	4.0	3.0	2.0
5	Iower Prut	930	93			11.2	1.9	9.3	2005	4.0	6.0	1.2
5	Subtotal	6154	615	0	0	73.9	12.3	61.6		32.0	32.0	9.9
	Others											
5	Total Wetlands	6154	615	0	0	73.9	12.3	61.6				

ANNEX II - 12: MOLDOVA

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

Existing Situation				PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
Sector	Emission Source / Hot Spot	Nutrient Emissions		No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme		
		N	P			N	P	BOD	COD	Total Inv.	Increment.	Baseline		National	Int. Loan	Int. Grant
		tons/y	tons/y			tons/y	tons/y	tons/y	tons/y	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil EUR
Mun.	Town Cahul	1	11	1	Cahul WWTP	52	11	20	33	53.8	2.9	50.9	2003	19.1	17.0	17.7
	Town Ungheni	14	8	2	Ungheni WWTP	55	12	22	29	57.7	2.9	55.1	2001	17.2	15.3	25.0
	Town Comrat	n/a	n/a	3	Comrat WWTP	50	9	18	24	11.7	0.6	12.3	2004	3.8	4.4	3.5
	Town Ciadir-Lunga	1	n/a	4	Ciadir-Lunga WWTP	57	11	13	17	8.9	0.5	8.5	2003	2.7	3.7	2.5
	Town Edineti	4	n/a	5	Edineti WWTP	65	7	12	9	4.5	0.2	4.3	2004	1.4	1.7	1.5
	Town Falest	1	n/a	6	Falesti WWTP	46	5	8	18	15.4	0.8	14.6	2003	5.5	6.0	3.9
	Town Vulcanesti	0	1	7	Vulcanesti WWTP	35	4	15	20	8.2	0.4	7.8	2002	2.9	2.9	2.4
	Town Nisporeni	n/a	n/a	8	Nisporeni WWTP	30	4	12	21	15.2	0.8	14.4	2002	4.6	5.5	5.1
	Town Taraclia	1	n/a	9	Taraclia WWTP	35	4	11	18	7.6	0.6	6.3	2004	2.1	3.2	2.3
	Town Glodeni	1	n/a	10	Glodeni WWTP	45	5	9	14	8.8	0.4	8.3	2003	2.6	3.5	2.6
	Town Leova	1	3	11	Leova WWTP	20	4	15	30	5.8	0.2	5.2	2003	1.8	2.2	1.8
	Town Briceni	1	n/a	12	Briceni WWTP	45	6	14	26	8.9	0.5	8.4	2001	2.7	3.5	2.7
	Town Cupcini	0	n/a	13	Cupcini WWTP	15	3	12	29	12.2	0.6	11.6	2003	3.7	4.5	4.0
	Rascani: village Costesti	5	n/a	14	Rascani: Costesti WWTP	15	2	12	27	7.2	0.4	6.8	2002	2.2	2.6	2.4
	Town Cantemir	n/a	n/a	15	Cantemir WWTP	20	3	11	24	20.8	1.0	19.8	2001	6.3	6.0	8.6
	Subtotal	30	23	15	Subtotal	584	89	203	338	246.7	12.8	234.3		78.6	82.0	86.0
	Others	493	120		Others	200	30	45	120	50.0	5.0	45.0		10.0	20.0	20.0
	Total Municipalities	523	143	15	Total Municipalities	784	119	248	458	296.7	17.8	279.3		88.6	102.0	106.0
Ind.	Town Falesti	1	0	1	Falesti WWTP	20	4	4	12	7.5	0.4	7.1	2003	2.3	3.2	2.0
	Town Lipcani	1	0	2	Lipcani WWTP	15	3	3	9	8.0	0.4	7.6	2004	2.4	3.5	2.1
	Town Ocnita	1	0	3	Ocnita WWTP	12.0	3	2	9	6.5	0.3	6.2	2003	2.0	2.5	2.0
	Village Cucoara	1	0	4	Cucoara WWTP	5	1	1	4	4.5	0.2	4.3	2005	1.4	1.6	1.5
	Village Congaz	1	0	5	Congaz WWTP	4	1	0	1	5.5	0.2	5.3	2004	1.7	2.4	1.4
	Village Cociulea	1	0	6	Cociulea WWTP	4	1	0	1	7.0	0.4	6.7	2003	2.1	2.9	2.0
	Village Cioc-Maidan	1	0	7	Cioc-Maidan WWTP	3	0.7	0	1	7.5	0.4	7.1	2002	2.3	3.4	1.8
	Village Mereseni	1	0	8	Mereseni WWTP	3	1	0	1	6.0	0.3	5.7	2002	1.8	2.2	2.0
	Town Glodeni	0	n/a	9	Glodeni WWTP	14	3	2	5	3.5	0.2	3.3	2003	1.1	1.3	1.1
	Town Briceni	0	n/a	10	Briceni WWTP	20	5	3	8	4.2	0.2	4.2	2001	1.3	1.5	1.4
	Town Cupcini	0	n/a	11	Cupcini WWTP	30	6	5	9	4.5	0.2	4.3	2004	1.4	1.6	1.5
	Subtotal	7	2	11	Subtotal	117	26	20	59	64.7	3.2	56.1		19.8	26.1	18.8
	Others	40	7		Others	50	10	7	15	20.0	1.2	18.8		8.0	8.0	4.0
	Total Industry	47	9	11	Total Industry	167	36	27	74	84.7	4.4	74.9		27.8	34.1	22.8

ANNEX II - 12: MOLDOVA

LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

Existing Situation			
Sector	Emission Source / Hot Spot	Nutrient Emissions	
		N	P
		tons/y	tons/y
Agri.	Soil erosion	6,999	3,000
	Fertilizers use	1	0
	Land use	26,084	4,653
	Animal husbandry	18,780	4,840
	(incl. public sector)	6,573	1,694
	Subtotal	51,864	12,493
	Others	24,300	7,500
	Total Agriculture	76,164	19,993
Wetl.			
	Total	76,734	20,145

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
	Project / Hot Spot	Expected Reduction				Investment /Cost			Imple- mentation period	Funding Status		
		N	P	BOD	COD	Total Inv.	Increment.	Baseline		National	Int. Loan	Int. Grant
		tons/y	tons/y	tons/y	tons/y	mil EUR	mil EUR	mil EUR		mil EUR	mil EUR	mil Eur
1	Afforestation Programme	195	2	5	20	3.5	0.3	3.2	2001/02	1.1	1.3	1.1
2	Soil Conservation Programme	80	5	5	20	8.0	0.9	7.1	2003/04	2.3	3.0	2.7
3	Construction of manure treatment facilities (Carpineni, Lipcani, Cazaclia, Larga)	45	13	5	20	7.0	0.8	6.1	2002/03	2.1	2.5	2.4
3	Subtotal	320	20	15	60	18.5	2.0	16.4	0	5.5	6.8	6.2
	Others	30	5	5	10	8.0	0.5	7.5		3.0	2.0	3.0
3	Total Agriculture	350	25	20	70	26.5	2.5	23.9		8.5	8.8	9.2
1	Lower Prut	800	75	250	35	5.0	0.4	4.6	2002	1.5	1.8	1.8
2	Lower Yalpugh River valley	4,800	530	800	150	55.0	2.8	52.2	2005	16.5	20.0	18.5
2	Subtotal	5,600	605	1,050	185	60.0	3.2	56.8		18.0	21.8	20.3
	Others		120	250	45	25.0	1.0	24.0		7.5	10.0	7.5
2	Total Wetlands	5,600	725	1,300	230	85.0	4.2	80.8		25.5	31.8	27.8
31	Total	6,901	905	1,595	832	492.9	28.9	458.9		150.4	176.7	165.8

ANNEX II - 13: UKRAINE
LIST OF PROJECTS PROPOSED FOR FIVE YEAR NATIONAL NUTRIENT REDUCTION ACTION PLAN

EXISTING SITUATION			
Sector	Emission Source / Hot Spot	Nutrient Emissions	
		N tons/y	P tons/y
Mun.	Uzhgorod WWTP	585	57
	Chernivtsi WWT facilities	130	44
	Izmail	4	29
	Mukachevo WWTP	256	11
	Vilkovo		
	Vilkovo		
	Vilkovo		
	Kilia		
	Reni Sea Port		
	Kolomyia	14	0
	Subtotal	989	142
	Others		
	Total Municipalities	989	142
Ind.			
	Subtotal	0	0
	Others	12	7
	Total Industry	12	7
Agri.			
	Total Agriculture		
Wetl.			
	Total	1,001	148

PROJECTS READY FOR IMPLEMENTATION IN THE COMING 5 YEARS												
No	Proposed Projects	Expected Reduction				Investment Cost			Imple- mentation period	Funding Scheme		
		N tons/y	P tons/y	BOD tons/y	COD tons/y	Total Inv. mil EURO	Increment. Million EUR	Baseline Million EUR		National Million EUR	Int. Loan Million EUR	Int. Grant Million EUR
1	Uzhgorod WWTP	293	29	218	392	25.0	7.5	17.5	2000/05	1.0		
2	Chernivtsi WWT facilities	65	22	318	0	4.7	0.9	3.8	2000/05	1.9		
3	Izmail WWTP	0	9	31	58	12.4	6.2	6.2	2000/05	1.5		
4	Mukachevo WWTP	128	6	111	171	3.0	1.0	2.0	2000/05	0.5		
5	Vilkovo flood protection					8.5	0.4	8.1	2000/05			
6	Vilkovo sewerage system					2.4	0.1	2.3	2000/05			
7	Vilkovo WWT facilities					6.5	0.3	6.2	2000/05	0.4		
8	Kilia flood protection					1.9	0.1	1.8	2000/05			
9	Reni Sea Port WWT facilities					2.8	0.1	2.7	2000/05			
10	Kolomia WWTP- mud processing											
10	Subtotal	486	65	677	621	67.2	16.6	50.6		5.3		
	Others											
10	Total Municipalities	486	65	677	621	67.2	16.6	50.6		5.3		
	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0		
	Others											
	Total Industry	0	0	0	0	0.0	0.0	0.0		0.0		
	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0		
	Others											
	Total Agriculture	0	0	0	0	0.0	0.0	0.0		0.0		
	Subtotal	0	0	0	0	0.0	0.0	0.0		0.0		
	Others											
	Total Wetlands	0	0	0	0	0.0	0.0	0.0		0.0		
10	Total	486	65	677	621	67.2	16.6	50.6		5.3		

**STRENGTHENING THE IMPLEMENTATION OF NUTRIENT
REDUCTION MEASURES AND TRANSBOUNDARY
COOPERATION IN THE DANUBE RIVER BASIN**

**REINFORCEMENT OF NGO ACTIVITIES
IN PROJECT IMPLEMENTATION AND
AWARENESS RAISING**

SUMMARY REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000



**International Commission for
the Protection of the Danube River**

UNDP/GEF Assistance



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ABBREVIATIONS

DEF	Danube Environmental Forum
DRB	Danube River Basin
DRPC	Convention for the Protection and Sustainable Use of the Danube River
DW	Danube Watch - Magazine
GEF	Global Environment Facility
ICPDR	International Commission for the Protection of the Danube River
NGO	(environmental) non-governmental organisation
NIS	New Independent States of the former Soviet Union (here: Moldova, Ukraine)
PMTF	Programme Management Task Force (part of the ICPDR)
PRP	(Danube) Pollution Reduction Programme of UNDP/GEF
REC	Regional Environmental Centre, Szentendre (H)
SGP	Small Grants Programme
TF	(Danube) Task Force of the Environmental Programme for the Danube River Basin
UNDP	United Nations Development Programme
WWF	World Wide Fund for Nature

1 INTRODUCTION

Since 1992, the European Community has - through its Phare and Tacis programmes (Strategic Action Plan Implementation Programme), and the UNDP/GEF, in particular through its Danube Pollution Reduction Programme (1997-1999) - supported and facilitated the development and implementation of pollution abatement and environment rehabilitation projects in the Danube River Basin as well as of the Danube River Protection Convention.

A change came with the entering into force of the Convention in October 1998 and the installation of its Permanent Secretariat on the one hand, and the end of the UNDP/GEF PRP Programme and the EU-Phare and Tacis supports (October 2000) on the other. In order to ensure an efficient implementation of the Danube Strategic Action Plan and the Pollution Reduction Programme, a new GEF assistance is under preparation for the 2001-2005 period; a second part of this assistance will support similar activities in the Black Sea region.

This document is part of the preparation of a ***Danube Regional Project***, which in turn forms part of the Black Sea Basin Programmatic Strategy aimed at sustainable human development in the Danube River Basin by reinforcing the capacities of the participating countries for effective regional co-operation, protection of international waters and sustainable management of natural resources and bio-diversity. This Danube Regional Project serves to strengthen the capacities of the ICPDR Secretariat in providing a regional approach for nutrient pollution reduction.

One of the immediate objectives of the Danube Regional Project has been defined as “***awareness raising and reinforcement of NGO participation***” in water management, trans-boundary pollution control and environmental protection.

In close communication with the ICPDR Secretariat and the Focal Points, as well as with the Country Programme Co-ordinators, public participation has been assessed in three of its aspects:

- The existing NGO structures (especially the Danube Environment Forum)
- Small Grants Programme
- Public awareness activities, including the magazine “Danube Watch” and the homepages of Danube PCU and ICPDR

For all three aspects, the objective of this project was to:

- ✓ evaluate previous GEF-funded activities
- ✓ prepare a concept for future public participation with the specification of the three themes' components.

During the assessment, available documents (reports, concepts) on past and present projects and programmes were evaluated. Further, various meetings were held with the ICPDR Permanent Secretariat and the Danube PCU in Vienna, with the Regional Environmental Center for Central and Eastern Europe in Szentendre (H) and its local offices in Ljubljana (Slovenia) and Bucharest (Romania), as well as with the Speakers of the Danube Environmental Forum (DEF) and WWF International - Danube Carpathian Programme. During field visits in Slovenia and Romania, NGO projects financed under the UNDP/GEF Danube PRP-Small Grants Programme were visited. The present report was prepared by Zinke Environment Consulting for Central and Eastern Europe, Vienna. Overall project guidance and support was provided by the ICPDR Permanent Secretariat.

2 EVALUATION OF THE SMALL GRANTS PROGRAMME

2.1 General Results

Within the UNDP/GEF Danube Pollution Reduction Programme, a Small Grants Programme (SGP) was implemented by the "*Regional Environmental Centre for Central and Eastern Europe*" in Szentendre (H). Increasing public awareness and public participation was one of the main objectives of the PRP, and the provision of small grants to the NGO/Private sector was considered an efficient way to reach this goal.

The REC is a special institution initiated by the US government and established in 1991 to facilitate the institutional development of the NGO community in Central and Eastern Europe. The REC receives various (mostly governmental) grants and distributes them through competitive calls to NGOs, usually via its national offices located in all CEE countries. Over the years, the REC has built up comprehensive expertise in managing NGO support projects, both as a well-known and appreciated NGO partner and a reliable partner for donors. Through its national offices, the REC is able to have close and direct contact with NGOs during the entire project cycle. The REC often translates special donor requests into NGO language and vice-versa - NGO reports into donor language (e.g. from Hungarian into English).

The main goal of the UNDP/GEF PRP 1998-99 Small Grants Programme was to reinforce NGO participation on community-based pollution reduction measures and awareness-raising projects. The SGP should also strengthen small local NGOs and community initiatives.

Out of the 11 eligible countries, eight were chosen by the Danube PRP for this SGP (i.e. no SGP projects were awarded to CZ, SK and H, apart from D and A). UNDP/GEF provided a total of \$ 200,000, i.e. up to \$ 25,000 per country: For the NIS countries Moldova and Ukraine, UNDP/GEF funds were directly given to the UNDP offices. For the six CEE countries, namely Slovenia, Croatia, Bulgaria, Romania, Bosnia-Herzegovina and FR Yugoslavia, the REC ran the programme. Maximum available grant per NGO project was \$ 5,000.

The REC provided comprehensive reports about the results of its UNDP/GEF SGP. The consultant visited both the REC headquarter as well as the country offices in Slovenia and Romania where a detailed look and personal visit to various project sites could be accomplished. Both countries were chosen as examples (one small and rich country from the upper Danube basin; one large, poor country from the lower basin), and within both countries, detailed project information was gained and two field projects were visited in each.

Grant proposals were invited by the REC and guidelines were issued with May 15, 1998 set as the deadline for submission. Local Advisory Boards in each of the 6 countries received and evaluated 98 project proposals, out of which - due to limited funds - only 55 projects (approx. nine per country, varying from \$ 800 to \$ 5,000) were selected on the basis of general NGO criteria and specific PRP criteria, as prepared by the REC. The funded activities can be connected to the following environmental fields:

- ✓ Environmental education and awareness raising to develop sensitive and active local people
- ✓ Integration of biological and landscape diversity objectives into water management
- ✓ Integration of biodiversity objectives into agriculture
- ✓ Monitoring of environmental quality
- ✓ Restoration, maintenance and conservation of key ecosystems (mainly wetlands) and species
- ✓ Promotion of sustainable rural development (eco-farming and -tourism)

Out of the 55 funded projects, the REC lists:

- ✓ 24 projects on awareness raising and education (mostly in BG and SLO)
- ✓ 17 projects on nature protection in the Danube watershed (mostly in HR)
- ✓ 8 projects on water quality research (mostly in B-H)
- ✓ 3 projects on water quality monitoring
- ✓ 3 projects on policy making (in SLO and YU).

Number of awarded projects by sector and country:

Sector	Slovenia	Croatia	Bosnia-Herz.	Yugoslavia	Bulgaria	Romania
Awareness Raising	7	3	2	3	4	5
Nature protection	2	4	4	1	2	4
Research			5	2	1	
Policy Making	1			1	1	
Monitoring				2	1	
Total	10	7	11	9	9	9

The projects started in summer/fall 1998 and ended by fall 1999.

2.2 Results from Slovenia

This was the first country visited by the public participation consultant. Ten projects proposed by Slovenia received from the REC grants from UNDP/GEF funds, with seven focusing on public awareness, two on nature protection and one on policy making.

The NGO community in Slovenia is well developed but suffers from major financial constraints (key donor organisations have suspended their support), which has forced the vast majority of NGOs to be rather passive. In addition, transboundary issues and co-operation are not yet a major concern. Therefore, institutional development of the NGO community on transboundary environment issues is critically needed.

During the trip, four projects were reviewed off site and another two were visited on site.

- ◆ **Project D08029 Revitalisation of the Krupa River Area:** This is located in a karst mountain area in south-eastern Slovenia where a big river source had for decades been polluted by PCBs stemming from a condensator plant. This news was shocking for the local people relying on good water quality. However, no direct health impact could apparently be verified. After the site had been cleaned some years ago, the SGP project (\$ 2,000 for the NGO "Tourist Society Semic") aimed at improving local public awareness about the uniqueness of the nature area and the sensitive karst water system (multi-lingual info brochure with 3,000 copies; 18 tables built to illustrate a new learning pathway along the river), but also included the cleaning of the Krupa river banks. This helped to change the image of the area from a contaminated site to an attraction for tourists and a nice area to live in. The project helped to establish a new NGO "Ecological Society Semic" and to further improve cooperation of local people on water protection (e.g. accelerated construction of a sewage collector system).
- ◆ **Project D08035 What kind of tourism do we want on Kolpa river:** Kolpa river forms the border between Slovenia and Croatia and is largely still intact (national park project on Slovenian side), but subject to illegal sewage disposal and intensive recreational activities. The NGO "Fishing Society Crnomelj" used the \$ 2,500 from SGP to increase the local awareness: From June to September 1998, seven littered areas along rivers banks were cleaned and a public awareness campaign was started to prevent further degradation (via national TV, local radio and newspaper). 200 posters and 2,000 info brochures were spread. A list of illegal sewage spots was given to the environment inspectorate, which resulted both in stopping a few of them and in contacts with the local industry. Yet, no complete improvement can be reported.
- ◆ **Four other projects reviewed during individual meetings at the REC office:** The "Water Detective" project is a most remarkable initiative which invites primary school kids (6-14 years) to make simple *research and art on water* and to report about it in papers, drawings and poems (published in local media). About 10,000 pupils from 140 schools (= 1/3 of Slovenia!) have already participated. SGP helped with \$ 3,000 to publish a booklet for teachers (100 pages, colour print, 2,000 copies), which was delivered to all primary schools in Slovenia.

The "Building Wetlands for Waste Water Treatment" project promotes constructed wetlands in rural areas. For \$ 1,000 SGP support, two workshops informed over 100 people about this technology and

construction projects were initiated in four villages. However, only one village is currently ready to build a constructed wetland because there is yet no governmental incentive for this kind of waste water treatment.

The "Four Seasons" project was supported with \$ 3,000 to organise training workshops for 100 teachers and agricultural students on water management, which were held at a perma-culture farm. Topics included river revitalisation, water on a perma-culture farm, water quality monitoring etc.

The project "Internal Inspection and Certification of Organic Farms" financed with \$ 5,000 the introduction of an independent organic farms certification (IFOAM control system) in Slovenia. In 1998, 12 inspectors were trained and 25 farms applied, out of which 13 received the status of organic farms and 8 became farms in conversion. Today, the control system is fully operating. By the summer of 2000, 600 farms had already been certified and the first markets opened in Ljubljana and Maribor with products from those farms certified in 1998. In this case, the benefit for nutrient reduction is most evident and sustainable.

2.3 Results from Romania

Romania was the second country visited. It has much more wide-spread and prominent environment pollution problems. Nine SGP projects were financed, five of them dealing with public awareness and four with nature protection. Due to the big travel distances, only two projects could be visited:

- ◆ **Project D05039 "Children and the Danube"**: The "Al. Borza Naturalist Foundation" in Braila in eastern Romania works for the protection and revitalisation of the Lower Danube floodplains (little Braila island). For the SGP support of \$ 4,000, this group organised various ecological camps (including training of students to do environment education with children), a seminar "Hope for Danube" (where 300 kids hold a trial for the Danube) and water quality monitoring of the Danube and Braila city. Further, funds were used to produce small info bulletins (1,000 copies distributed to kids) and a book entitled "Only one Danube" (220 pages; 1,000 copies distributed to schools). As project effects, seven "Eco Clubs" were founded involving up to 500 children and teachers from various schools, and the NGO became the city's resource center for environmental education.
- ◆ **Project D05022 "Involvement of Civil Society in Developing a Wetland Protection Plan for north-west Dobrogea"**: With \$ 3,060 received, the ECOS Youth Organisation from Tulcea (entrance of the Danube delta) could launch new co-operation between the local authorities and people, aimed at reducing local pollution and at better protecting several large Danube wetlands upstream of the delta (part of the Green Danube Ecological Corridor). Altogether 40 actions were organised, including education programmes with young students from local villages, the printing and distribution of a wetland booklet (1,000 copies - 800 distributed), various local meetings, field trips, press releases etc. The SGP support also helped to raise other matching funds.

2.4 Results from Moldova

The short evaluation report indicates that the SGP started in September 1998 and that 28 project proposals were submitted to UNDP Moldova, where a Local Advisory Board of knowledgeable experts made recommendations to the UNDP Resident Representative. Five projects were eventually accepted (awards were 4 x \$ 4,600 and one \$ 4,050) which started in December 1998 and ended in July 1999.

The five projects were focusing on awareness raising among the local people (e.g. via map, video film, photo exhibition, brochures, pupil competition; educational CD-ROM for schools on the local fauna, TV/Radio/newspaper reporting; opinion polls, round-table discussions, an Environmental Guide promoting eco-tourism) but also on some concrete work (cleaning of the Prut river springs, tree planting, water quality monitoring). Local environment and health authorities as well as the Ministry for Environment were closely involved but the projects also helped to establish new links to business and research institutions. The existing NGOs were strengthened, and even new NGOs were established. In spring 1999, each granted NGO planted 400 trees in its project area, and in a NGO meeting on 8 November 1999, the NGO community was informed about the achievements, problems and experiences of this SGP.

2.5 Evaluation

The brief survey and intensive visits helped to identify the various strengths and weaknesses of the SGP programme. It is possible – although not very correct - to extrapolate the experiences of these example SGP projects to the entire list of projects supported by the UNDP/GEF SGP:

Strengths

- It seems that UNDP/GEF funds were used most efficiently: The amount of activities and outputs is very impressive for the very small amount of money received. This can be explained by the voluntary work that most NGO do and by their efforts to make the most out of the available support.
- Environmental education programmes, especially the training of teachers, have multiplying and lasting effects.
- Co-operation with the local media also increased public information/awareness and supported the credibility/strength/standing of the NGO in the eyes of the local public.
- All projects have some kind of environmental awareness objective, which secures a dissemination of environmental information and more sustainable impacts (e.g. change of behaviour).
- A number of projects were in fact co-funded, which made a bigger and/or more complex project feasible.

Weaknesses

- Too little funds per project were directed to concrete "pollution reduction" activities.
- Criteria to produce concrete pollution reduction were not strongly advocated in the call phase.
- There are limits on NGOs' capacity and competence in implementing concrete action (e.g. activities which require legal permits, large funds, long negotiation processes, complex technical problems).
- The available time for this SPG was sometimes too short to achieve more comprehensive results.
- The PR for the actual donor (UNDP/GEF) was very weak.
- It was diplomatically unfortunate that three Danube basin countries were not eligible for this SGP.

Conclusion

- This SGP can be considered very successful; the available funds were in most cases spent in a very efficient way, with sustainable benefits.
- In terms of direct nutrient reduction, only a few projects could be listed (e.g. conversion of farms, cleaning of river banks) but all projects have indirect effects built in in terms of awareness raising, education and initiation of nutrient reduction projects. Regrettably, none of the projects produced a quantitative figure of such success.
- There is a need and opportunity in various projects to build up on the work done before in order to materialise and extend the beneficial outputs.
- Investing in NGO activities is in most cases very cost-efficient, since NGOs work close to the problem and to the target audience, their office costs and fees are very small; they have all possibility for flexible contacts. The failure rate is small and so are the potential financial losses.
- NGOs need to be better informed in advance about the background and objectives of the SGP.
- Selection criteria should be further developed (specified) and communicated when issuing the call for submission and should then become part of the contract and reporting.
- While many projects were already designed and executed with good PR work, future projects need to have special media components to better spread information about the environmental action.
- All Danube Basin countries are in need of such NGO projects; a future SGP should involve both the countries in transition as well as Germany and Austria where a complementing SGP should be established via domestic or "western" sources (GEF is not eligible).

3 EVALUATION OF NGO STRUCTURES UNDER THE DANUBE ENVIRONMENT FORUM (DEF)

3.1 Background

The involvement of NGOs in environmental policies in the Danube Basin dates back to the governmental conference in Sofia in September 1991 when Danube governments, donor organisations and NGOs met to discuss and launch the "Environmental Programme for the Danube River Basin". While NGOs were later excluded from the preparatory process of the Danube Protection Convention, a few of them were invited to participate in the Danube Task Force (WWF, IUCN, Equipe Cousteau and the Regional Environmental Center which later stopped being considered as NGO).

The need to establish something like a basin-wide NGO network or platform was soon realised and then followed up both by the NGO community, the REC and the Danube PCU (UNDP). There were problems associated with the fact that the NGO community was a very young, dynamic and largely inexperienced group, while the top-down efforts of installing one partner body for the Task Force (rather than having e.g. one NGO representative per country, resulting in 13 TF members) failed. Also, the TF was considered by some NGOs as a governmental forum, which they did not want to support in general (e.g. NGO critique of a lack of governmental policy towards sustainable development or true public participation; also: controversy over the Gabčíkovo hydrodam).

UNDP/GEF then funded several NGO consultation workshops which were organised via the REC in June 1992 in Bratislava (where a support for a so-called NGO Danube Forum was not granted by the NGO community), via WWF Austria & Global 2000 in September 1993 in Vienna (calling the TF to grant two seats for eastern NGOs) and via the NGO Danube Forum/Ecologist Youth of Romania on 17-20 February 1994 in Sinaia (RO) where eventually three interim NGO representatives were elected. At the 5th Task Force meeting in Regensburg (D) in July 1994, CEE NGO representatives together with western NGO representatives used the first opportunity since Sofia 1991 to raise their critical voice against a narrow-scope draft of the Danube Strategic Action Plan that according to them lacked broad ecological goals (this was appreciated by several delegations and helped to improve the draft SAP).

A major step forward was achieved in October 1994 at the Danube NGO International Meeting (supported by UNDP and the Danube Task Force) in Mikulov (CZ) when 31 NGO representatives agreed to the establishment of the "**Danube Environment Forum (DEF)**". Following this, the elected three DEF speakers were invited to Task Force meetings but over time failed to secure sustainable, competent participation and communication (this was partly due to the absence of follow-up baseline support to the DEF by UNDP/GEF after 1996). In 1995, NGO focal points in the Czech Republic, Slovakia, Croatia, Romania, Moldova and Ukraine organised meetings to promote NGO collaboration. On 1 December 1995, the DEF board met in Budapest to prepare the **1st General Assembly**, which was held on 15-17 February 1996 in Kosice (Slovakia) with 75 participants from 51 Danube basin NGOs. After that, however, the activities of the DEF speakers receded and by 1997, there was no more activity within the DEF.

3.2 Reinforcement of NGO Cooperation in the DRB

Within the Danube PRP, a new effort was undertaken to reinforce and develop the NGO community in the region. This firstly focused on the national NGO communities and started with the training of NGO facilitators (10-19 March 1998 in Baden/A), who conducted from April to June 1998 national NGO consultation workshops (each 2 days long). They were organised by the REC in 11 Danube Basin countries and involved altogether 212 NGO representatives out of which five to eight NGO representatives per country were nominated to take part in the PRP National Planning Workshops, and three to four NGO representatives were nationally nominated and invited to the DEF Regional Consultation Meeting held in Szentendre (H) on November 12-14, 1998.

On this occasion, the 39 participants agreed to **re-establish** the NGO platform named "**Danube Environment Forum**". Again, three speakers were elected (for the upper, middle and lower Danube Basin parts) and an **Interim DEF Secretariat** became established in Bratislava at the office of the NGO Daphne. The speakers, together with the Secretariat, prepared the crucial institutional development steps (secretary; e-mail conference; new logo; project proposals for baseline funding submitted to PCU/UNDP). On March 18-19, 1999, the **first DEF Board meeting** was held in Bratislava, which prepared the DEF statute, the DEF registration, the national DEF structure and fund raising; this meeting was again funded by UNDP/GEF.

In April 1999, the official legal registration of DEF as an international organisation under the Slovak law was initiated (founding members were Daphne/SK, Union for the Morava River/CZ and Distelverein/A) which was accomplished in October 1999 (*Memorandum of Foundation of DEF*).

At the ICPDR-PMTF meeting on 12 June 1999, three project proposals on DEF institutional strengthening, public awareness raising and wetland restoration were presented (they later became part of the Project Brief for the Preparation of the GEF Danube Regional Project!). In November 1999, the DEF submitted its formal application to the ICPDR for being granted "observer" status, which was accepted at the ICPDR meeting on 22-23 November 1999 in Sinaia/RO.

3.3 Situation of the DEF today

In 1999, another fifteen NGOs from ten Danube countries applied for DEF membership and ten were granted it by the DEF Board at the DEF Strategy Meeting in Bratislava on March 6-7, 2000 (meeting funded by the Austrian Federal Chancellery).

Today, the **DEF has 13 members representing 11 Danube Basin countries** (i.e. in all except Hungary and Moldova). Another five NGOs have requested membership (status April 2000). In **six countries**, DEF also disposes of approved **DEF National Focal Points** (Austria, the Czech Republic, Slovakia, FR Yugoslavia, Romania, Ukraine), for another five (B-H, BG, HR, D, SLO) this is under preparation during 2000. In Slovakia, Yugoslavia and Romania, there exist already active DEF networks with each more than ten local NGOs that benefit from the DEF information service provided by the Secretariat in Bratislava.

Except for the mentioned meetings and the invitation of DEF speakers to UNDP/GEF PRP or ICPDR meetings (e.g. at the Hernstein workshops, PMTF and Steering Group meetings, to the Ad-hoc Expert Group on River Basin Management), DEF has yet no institutional financial support; and all expenses such as registration, secretariat and communication are covered by the Secretariat, Speakers and DEF members. Still, efforts are under way to make possible the first general Assembly in 2000 (planned in Galati/RO).

Apart from WWF, DEF is the only relevant NGO in the Danube Basin that works on regional level on environment (water). It is recognised within the NGO community but yet not well known especially among NGOs working in other fields than water and nature. It is a fact that until today only very few NGOs in the region work on international level and that the importance of e.g. transboundary pollution problems posing a task for local NGOs became only evident with the Tisza accidental spills in early 2000.

Until this day, the DEF has not been able to establish national links in Hungary and Moldova. Hungary is a special case because a few NGO leaders with their negative experience of the early 1990s top-down NGO involvement process still today dominate the opinion about the DEF, the EPDRB and ICPDR. However, recent communication indicates that the DEF could enlist Hungarian and Moldovian members by the end of 2000.

The participation of NGO representatives at the 11 PRP National Planning Workshops in 1998 strengthened the participatory and communication process with governmental bodies. Representatives from local communities and science also contributed to an open assessment of environmental problems, policy objectives and measures to be undertaken. Participating NGOs also expressed their satisfaction with these workshops and their outcome. The only country where these workshops and NGO involvement were not successful is Hungary: For many years already, a few prominent Hungarian NGO leaders have not favoured the Danube regional process.

Further, it should be mentioned that a few NGO representatives (DEF, WWF) attended the two successful Danube Transboundary Analysis workshops in January and May 1999 in Hernstein (A).

3.4 Other NGO Involvement

To assess if and how NGO participation and awareness raising were reinforced by the UNDP/GEF Pollution Reduction Project, a Questionnaire was distributed to the national consultants asking them to respond to the following questions :

1. During the DPRP there were several activities related to public participation. In what respect did each government in the DRB notice an (beneficial ?) impact from this? (was it through NGO participation in national workshops, through the Small Grants Programme or through the involvement of the DEF?)

Replies from most countries state that NGO participation in the National Workshops was viewed as a very positive experience (e.g. as a second, independent opinion, provision of new facts). Moreover, the SGP proved to be a successful contribution towards to increasing NGOs' level of expertise and local public awareness/environmental education activities.

2. What possibilities and needs do the governments suggest in order to improve public participation in the future? In particular, what should new NGO programmes focus on more (e.g. local field activities, public awareness raising via the media, direct cooperation of specific NGOs with government authorities on specific projects).

Based on the answers to this question, it seems that funds are the only limiting factor rather than knowledge or lack of cooperation with NGOs. It was felt as a pity that very rewarding NGO ideas and initiatives are not better supported. Future NGO SGP should focus on concrete local field activities and public awareness raising (e.g. introduction of phosphorus-free detergents), also to demonstrate the importance of local communities in solving global problems. Interest was also expressed in improving the involvement of NGOs and the public in governmental decision-making processes.

3.5 Conclusion

- It can be stated that the UNDP/GEF PRP in 1998/99 helped to raise awareness among a large number of national NGOs regarding the Danube Basin environmental problems and the role and tasks of the Danube Convention and its ICPDR.
- UNDP/GEF funds were decisive in re-institutionalising the DEF but were insufficient to sustain it. The DEF (through its elected speakers and Secretariat) was able to then establish itself as a legal body with elected speakers, board, secretariat, national representation in most Danube countries and various policy work. However, when viewed against the large NGO community and NGO competence available in the region, the DEF still seems to be weak in its structure, membership, communication and policy work (not forgetting that it has officially existed for less than a year only!).
- The **future development** of DEF still depends on outside funding (e.g. UNDP/GEF) which should focus on the following priorities:
 - ✓ Institutional development of DEF (more members, more internal and external communication, better information service by the secretariat, better communication and co-ordination of speakers, board & national focal points, more concrete outputs);
 - ✓ Strengthening the local NGO community interest in the Danube Basin policy issues, aiming at bilateral co-operation with the DEF international structure via national DEF Focal Points and their projects (awareness raising, education, wetlands, hot spots etc.) including annual national NGO meetings;
 - ✓ Promotion of the development and submission of NGO projects to the UNDP/GEF Small Grants Programme, i.e. the DEF should invite both its National Focal Points and the national NGO community to prepare respective proposals for nutrient reduction (e.g. via wetland restoration);

- ✓ Strengthening the DEF policy work through regular DEF board meetings and General Assemblies, the enlisting of DEF experts for Danube issues as well as active DEF participation at ICPDR meetings, workshops and training;
- ✓ Public awareness raising within in the general public (local people) about the needs for local and transboundary water management, pollution prevention and mitigation, wetland conservation and restoration;
- ✓ Competent DEF engagement in important regional issues, e.g. Tisza spills (BMTF), Lower Danube Green Corridor, GEF Strategic Partnership etc.

4 EVALUATION OF PUBLIC AWARENESS RAISING

4.1 Background

The distribution of information and the raising of public awareness has not yet been a prominent activity of the Danube programmes since 1991. There have been a few press releases for the media (e.g. on the occasion of the signing of the Danube SAP in December 1994) but no real PR campaign. The most relevant activities were

- the release of the quarterly bulletin "*Danube Watch*" since December 1994
- the establishment of web-pages by the Danube PCU (www.rec.org/DanubePCU) and by the ICPDR (www.icpdr.org/DANUBIS)
- the request expressed to NGOs to engage in public awareness raising which has lately been indirectly successful through the NGO Small Grants Programme (1998-1999)

4.2 Evaluation of previous Public Awareness Raising Activities

4.2.1 Danube Watch

"*Danube Watch* - The Magazine of the Environmental Programme for the Danube River Basin" was launched in December 1994 by the Danube PCU. It is an independent quarterly magazine of 16 A4 pages bringing stories of mostly 1-3 pages on a whole range of environmental issues within the region with a focus on activities under the EPDRB and the ICPDR as well as on local issues related to environmental policy, protection, pollution and restoration (mostly written by journalists). Information is also brought to the reader in the form of interviews, statements by national government officials, local special authorities and NGOs. In other words, a big portion of the DW is written by involved officials and experts.

In 1995, a special brochure called "*Action for a Blue Danube*" presented the Environmental Programme for the DRB and its first results (24 pages).

After being published first in black and blue until June 1997, a re-launched DW in March 1998 appeared in a full colour version with shorter stories (still 16 pages).

In 1999, a new tender resulted in a change of publisher and a change of the design but a continuation of the content concept (June 1999).

With the 2/2000 issue (expected in September), the funding of *Danube Watch* by EU-Phare Programme and the UNDP/GEF will cease. How the magazine will be sustained beyond that point remains to be decided. The support for single issues by national donors, as in the case of no. 1/1999, funded by the Austrian Federal Chancellery, could be a bridging solution but cannot secure a regular publication of the magazine.

Danube Watch can be ordered free of charge from the Danube PCU and the ICPDR Secretariat. It is presently (July 2000) mailed to 6,400 addresses reaching an estimate of 10,000 readers:

- ✓ 7% government authorities and administration,
- ✓ 27% international organisations and IFIs,
- ✓ 25% R & D, professional training and universities
- ✓ 11% private individuals and NGOs,
- ✓ 17% civil engineers, scientists etc.).

It is obvious that *Danube Watch* reaches quite efficiently the specific target audience of the DRPC and ICPDR as well as a broader range of persons and institutions.

Since 1999, DW has also been published on the homepage of the Danube PCU (www.rec.org/DanubePCU) which will be incorporated into the ICPDR homepage (<http://www.icpdr.org/Danubis>) in fall 2000.

Danube Watch is the only available environmental magazine in and for this European region. This indicates its importance as a - largely independent - information source especially for regional issues and for the ICPDR (especially since 1998).

Danube Watch has a very positive image in the region as an interesting, attractive and instructive source of information. Readers to whom it is mailed respond unusually positive to the publisher.

Self-financing of Danube Watch

Several efforts have been undertaken over the past years and in particular since 1999 to sell advertising space to make the magazine financially independent and sustainable. For independent financing, ten full-page advertisements would need to be sold. However, potential advertisers have expressed very little interest, much below the minimum funds required for self-financing..

Reasons:

- The overall number of copies distributed and read is too small for companies doing advertisement. Potential donors such as banks, airlines, insurance and business companies have shown no interest.
- DW is still a special magazine through which the general public cannot be reached. Even though it is non-scientific, its content is relevant only for a restricted audience and not attractive for most local people (even if national editions would be produced);
- The region and sectors addressed cannot be well reached by business groups through such advertisements; experience gained over the past years has shown that direct lobbying and personal communication is more effective for these companies than public advertisements.

As a second alternative for the raising of funds, those interested in the magazine were contacted and asked if they could secure the publication of the magazine. An informal survey conducted by the publisher and Danube PCU/ICPDR has indicated that

- single readers would not be ready to pay as much (e.g. via paid order) as needed to simply cover the administration of these payments
- the governments in the region do not have respective budgets to share the cost of a regular publication (more than one issue is not feasible).

Therefore, for the coming years, the benefit of having and spreading *Danube Watch* in the region cannot be secured from sources within the region.

Recommendations to improve Danube Watch

The fact of another re-launch of *Danube Watch* in 2001 should be used to undertake further activities towards0 improving the magazine, namely

- ✓ Development of a general **magazine concept** including the magazine structure (e.g. pre-fixed cover stories, special pages for the ICPDR Secretariat, governments, NGOs, a news page, ICPDR President's comment, updated calendar of events, contact addresses etc.).
- ✓ The **parallel publication** on the **ICPDR homepage** should be continued as a *complementing* publication form to expand its outreach. However, the electronic version cannot replace the print version because the latter is received by a broader and more interested readership (the internet will for many years to come remain a very uncommon tool in downstream countries).
- ✓ A DW "**Readers Online Forum**" should be established via an **inter-active chat-page**: given that the issues appear at rather long time intervals, the internet should be used to establish more short-term communication among the readers.
- ✓ The **sub-title of the magazine** should be changed/updated from "*Magazine of the EPDRB*" to e.g. "*Magazine of the International Commission for the Protection of the Danube River*".
- ✓ The **distribution of the magazine** should be improved: mailing lists should be reviewed and updated and new readers should be included (e.g. from Romania, Moldova, Ukraine), the overall distribution concept should be re-assessed (e.g. via the central government, the DEF Focal Point, or one contracted student).

- ✓ While it seems reasonable to have the editorial team located in Austria near the ICPDR, it should be financially advantageous to **re-locate** the **printing** from Vienna to a less expensive transition country, e.g. to printing companies in Bratislava, Brno or Győr.
- ✓ **Special DW editions** could be produced to address certain reader groups or refer to certain events/occasions, e.g. national editions with many or all texts translated; an issue targeting children or high school or college students to complement a public awareness campaign; an issue presenting very obvious results of projects funded from the Small Grants Programme, etc.

4.2.2 Homepage

There are currently two internet addresses under which Danube region information can be found:

- The homepage of the Danube PCU (www.rec.org/DanubePCU)

This is a comprehensive source of information covering all subjects and activities undertaken within the EPDRB over the last years. It brings broad or in-depth information about

- The Danube Protection Convention including the ICPDR
- The organisation, structure and institutions under the EPDRB
- The Geography and Nature of the DRB
- Publications and Projects under the EPDRB (list and summary of implemented projects)
- News and events
- Useful links

As the EU-Phare programme is ending its support, the Danube PCU office will be closed in October 2000 and this homepage will consequently be closed by the end of 2000 and incorporated into the ICPDR homepage.

- ICPDR homepage: <http://www.icpdr.org/DANUBIS>

This is presently mainly serving as an **intranet system** for ICPDR members, containing many "confidential" data (e.g. various national data, reports, meeting minutes etc.). The information provided to external users is presently almost non-existing, even though there are important chapters listed:

- Legislation
- News and events
- Administration
- Agriculture
- Disasters, accidents, risks: provides a lot of information from the Elbe and Rhine rivers!
- Information
- Pollution
- Water

The sensitivity of no-public-accessibility presumably stems from "pre-Aarhus Convention" times when many governments and authorities were (still are!) not used to or reluctant to open their files to inform the general public. With the Aarhus Convention ("on Access to Information, Public Participation in Decision-Making, and Access to Justice in Environmental Matters") and the EU Guidelines for Public Information in force, a substantial change of the ICPDR's access-to-information policy is overdue. The IC has on its agenda the revision of the homepage with a larger part of information to be publicly available ("Access Rights Concept" from July 2000) and is expected to improve the situation in the coming months. From October 2000 on, the ICPDR will incorporate the homepage of the Danube PCU (www.rec.org/DanubePCU) and integrate it into the Danubis homepage.

4.2.3 Other Public Awareness Activities

Apart from the already mentioned activities, two project components from the Pollution Reduction programme contributed essentially to awareness raising :

- The organization of National Planning Workshops using target-oriented methodology and a participatory approach,
- The implementation of community-based projects with the financial support of the GEF Small Grants Programme.

National Planning Workshops conducted in 1998 in the frame of the Pollution Reduction Programme in each of the central and downstream Danube countries, contributed in an essential manner to public awareness raising. In each national workshop, 30 to 40 experts from ministries, local governments, scientific institutions and national NGOs participated, carrying the message of pollution reduction and environmental protection to their respective departments, institutions and to the general public. At the decision making level, ministers, vice-ministers and directors were involved in the organization of National Workshops. Statements, interviews and speeches were brought by the mass media to a large audience.

The preparation, publication and implementation of community-based projects under the GEF Small Grants Programme has contributed equally to public awareness raising. Calls for submission of project proposals were publicly launched to all NGOs in the participating countries. The implementation of projects was reported by the local press, informing a large public about the initiatives taken by local NGOs to assure environmental protection and pollution control. Some projects were conceived for raising public awareness on specific environmental problems.

Conclusion

National Workshops and the implementation of the Small Grants Programme were essential elements to reinforcing public awareness at the grass-root level as well as the decision making level.

Training programmes, workshops and the implementation process for the future Small Grants Programme should contain special components for “applied public awareness raising” through frequent and regular information of the public on “success stories” related to environmental protection, pollution control and especially on nutrient reduction projects.

5 CONCEPT PAPER FOR NGO ACTIVITIES, SMALL GRANTS PROGRAMME AND PUBLIC AWARENESS

The overall idea is to increase public involvement in basin-wide nutrient reduction measures, including practical (replicable!) and community-based projects, education and training, monitoring and control or policy programmes. Awareness raising can effectively contribute to expanding the local perception of transboundary and regional issues and even boost the global understanding of environmental problems and solutions.

5.1 Concept for Small Grants Programme

Based on the discussions with the REC headquarter, the REC local offices in Slovenia and Romania as well as with the DEF speakers, WWF and local NGOs, it seems that benefits from SGP can be increased if the programme incorporates the following ideas:

- More substantial SGP projects by increasing the maximum grants and time to each 15-20,000 \$: This will improve the relevance/capacity of each project and importance of possible outputs/ benefits/ impact e.g. for nutrient pollution aspects.
- Two project phases within the new SGP, with each lasting about 18 months, with experience from the first SGP phase used for the second phase: A small-grants project should not run beyond a maximum of two years. However, thanks to the long period of the new UNDP/GEF programme, two SGP phases can be implemented.
- The project calls should rather be issued on regional level, giving preference to the best ideas having the potential of producing basin-wide model results: As the issues tackled are not of essentially local or national character, there is no need to restrict the SGP to an even allocation of funds to all countries. The tender and the proposals should also reflect the character of the programme - both are regional.
- Each project proposal should be submitted in English and should indicate an English-speaking contact person: This will help to overcome the language constraints that many NGOs have while in fact English is not essential for the actual progress of most projects but only for its international communication.
- Preference should be given to SGP projects dealing with important model hot spots of nutrient pollution and transboundary aspects: While this should not be an exclusive condition (there may be excellent project proposals e.g. on diffuse nutrient pollution), the SGP should focus on the most prominent regional pollution problems. Many NGOs are already working on hot spot problems, others are open and interested in re-orienting their activities in this direction. In each project, the transboundary character of the pollution problem should be addressed, either by involving partners from neighbouring countries or by raising the awareness on the transboundary aspect from a national perspective.
- The projects selected and awarded should have demonstration and model character for the DRB. As the Danube PRP has shown (especially in its Transboundary Analysis), there are many similarities among local pollution problems and the constraints and barriers to overcome. The SGP offers an opportunity to *implement small-scale, low-tech measures* having significant pollution reduction effects, such as the introduction and expansion of organic farming, manure handling methods, constructed wetlands for rural sewage treatment, wetland restoration, more efficient pollution control and monitoring etc. For the end of the SGP, it is therefore important to summarise and widely spread the results gained and to share the practical experience with other parts of the DRB faced with similar problems (see below). This SGP may even become a policy guideline for governments looking for inexpensive ways to reduce their local and transboundary pollution problems.
- Identification of SGP project indicators able to measure the benefits/success in terms of nutrient reduction: It is important to give preference to those project proposals having developed and built-in indicators not only for direct pollution reduction measures (e.g. treatment of sewage; improvement or change of production processes) but also indirect indicators through education, training and awareness-raising projects (e.g. monitor the educated/trained persons' daily behaviour prior and after; count the media reports and the reached audience over time; count new contacts to the polluting industry).

- Multi-stakeholder co-operation projects (one NGO together with e.g. industry, community, government agency): While the previous SGP already had many such projects, the role of cross-sectoral communication and co-operation should be further strengthened in this part of Europe. In this respect, NGOs are still considered as low-importance stakeholders, whose innovative spirit/motivation and proactive role is not sufficiently recognised. On the other hand, such "promoted" co-operation can also improve the competence of NGOs on the technical level.
- Thorough pre-information of the SGP through national NGO meetings: This will deal both with the new SGP and its conditions and with more general, basic information about the relevance of the DRPC, the ICPDR, the DEF, the causes and effects of water pollution and the national and international efforts to mitigate them. The series of these meetings in all Danube countries would secure a higher general awareness about why this Danube SGP exists and what the NGO community can do and is invited to do. The meeting should end with a "project idea stock exchange" to foster new NGO contacts and better NGO project proposals.
- Project administration should secure:
 - Information about the SGP (pre-information meeting, call with submission procedures)
 - Contacting to the national NGO communities
 - Selection and awarding procedure (this should include one representative from ICPDR and WWF as independent bodies; DEF member organisation may want to also submit projects and should therefore not be involved at this level)
 - Contracting and reporting
 - Advise to NGOs on administrative aspects
 - SGP administration and reporting to ICPDR
- Project quality assurance service should be provided by a SGP co-ordinator who communicates with the NGO contact person and visits each selected project during the implementation phase. This is to support NGOs in solving various problems (technical, administrative, co-operation) and to secure a good orientation and progress of each SGP project with respect to the regional objectives. As the SGP experience has shown, such a service is needed and could happen both during the submission phase, at half way through the implementation and possibly also in the final reporting stage. This person would link between the ICPDR, the SGP implementing agency and the NGO community on non-administrative aspects.
- Final international presentation event where e.g. the five best projects would be presented to the public, the media and governments: It is assumed that many national and local governments would benefit from the results and experiences made in some of the practical projects. Due to the constraints of most government budgets in the Danube Basin, such small-scale but efficient pollution reduction and stakeholder co-operation projects would serve as models for other parts of the country and the Danube Basin. The time and location of the event could be linked to a regular ICPDR meeting.
- A complementing SGP should be initiated in Germany and Austria to also raise the local awareness about transboundary pollution problems in the upper part of the Danube Basin, which still substantially contributes to the nutrient loads of the Danube. The fact that GEF cannot support projects in these EU countries should not prevent similar nutrient reduction projects from being implemented there. The possible financial sources, size and character of the SGP and the number of projects supported should be assessed in winter 2000/2001 by the two country delegations. The ICPDR Secretariat, WWF and DEF may be involved in the SGP preparation and project selection.

5.2 Concept for DEF Activities

The institutional strengthening and capacity building of the NGO community in the Danube River Basin should focus on the structure of the Danube Environmental Forum.

Justification:

1. The DEF is one of the very few NGO networks in this region of Europe and it is the only one directly linked to the Danube Convention/ICPDR. Article II (DEF Objectives) of its "Memorandum of Foundation" provides the following definition of its objectives:

- a) *"to promote international support to the future sustainable development of the Danube River region on issues such as biodiversity, land use, environmental education, etc.;*
- b) *as the NGOs representative body to ensure future NGOs participation in the International Commission for the Protection of the Danube River structures and other Danube institutions;*
- c) *to promote sustainable financial mechanisms ensuring permanent NGOs representation in the Danube Rive-related governmental programs."*

2. NGOs, and in particular the DEF with its combined regional and local member structure, secure through their involvement in the ICPDR activities a high level of public information and public participation between the DRPC/ICPDR and the general public. Public awareness raising on specific environmental issues is one of the key objectives of all environmental NGOs, and consequently of the DEF. Therefore, the strengthening of the DEF will increase the capacities of the ICPDR in awareness raising and public information.

The support of the UNDP/GEF Danube Regional Project should therefore focus on **capacity building** to secure better NGO co-operation, communication and representation:

- ✓ Institutional development of DEF: It should support the main institutions and actors of the DEF to secure baseline funding and improve their efficiency and outputs, and specifically:
 - **DEF Secretariat:** improved service capacity for DEF members, other NGOs, ICPDR and the general public (information center for all persons and institutions interested in gaining information about the DEF work and access to NGO resources)
 - **DEF Speakers:** improved capacities to co-operate internally and with ICPDR
 - **DEF National Focal Points:** improved capacities to communicate with other local NGOs
 - **DEF meeting bodies:** regular meetings of DEF board and General Assembly.
- ✓ Public awareness raising (education, information and monitoring) is needed within the NGO community in the Danube basin and within the general public (local people) about the needs for local and transboundary water management, pollution abatement, wetland conservation and restoration. This should become a key activity especially of the DEF National Focal Points, as they can - from an independent side - complement governmental activities to tackle pollution and water protection problems. Unlike the Small Grants Programme, which will necessarily focus on *local* point issues (hot spots) and will, therefore, not address nation-wide issues, the DEF with its National Focal Points should run more general, *nation-wide* public awareness raising campaigns.
One simple activity of the DEF should be a regular publication of information via the "**Danube Watch**" magazine (via a special DEF page). The same applies to a **DEF homepage** which is already under preparation.
- ✓ Policy work: stronger involvement in the ICPDR and its working groups; more competent engagement in important regional issues (water-related environment sector); capacity building in local NGO communities; provision of experts, expert statements, studies and data (e.g. monitoring).

5.3 Concept for Public Awareness

The new UNDP/GEF Programme offers for the first time the possibility to link and complement various awareness raising activities under a joint umbrella. It is therefore proposed that public awareness raising activities should be conducted on various levels which can be partly interconnected. A special role is assigned to the NGO community, whose public awareness activities should be strengthened and more oriented to the nutrient pollution problem:

- Via the Danube Watch magazine: The “DW” magazine could increase its attractiveness since it is a unique and important source of information for the region. For the future, further development steps should include:
 - ✓ Development and implementation of a new **Danube Watch concept** (magazine contents, production/printing/distribution) that would be prepared by the new publisher (new contract) in co-operation with the ICPDR Secretariat; the objective is a closer link to the GEF nutrient reduction programme and in particular to other awareness-raising activities (e.g. Small Grants Program, folder, homepage, DEF awareness campaign)
 - ✓ Production of new, partly **Specialised Issues** of Danube Watch
 - ✓ Introduction of a specialized “**DEF/NGO Forum**” in Danube Watch
 - ✓ Installation of a DW “**Readers Online Forum**” on the ICPDR homepage (possibly as a link to the publishers homepage where the DW web-page will be established)
- Via the ICPDR homepage: Open access to information and decisions helps to create accountability and to support sound environmental policies. The recent improvement of the Danube PCU homepage and the upcoming inclusion into the ICPDR homepage will increase the number of its “visits” and potential users. Therefore, the homepage has a good potential to meet information and awareness-raising needs.

The installation of a homepage makes sense only if it provides substantial information. So far, the ICPDR homepage is not accessible to the broad public and restricts simple and useful information from the Danube region contained in various new studies and data. This refers, for instance, to the UNDP/GEF PRP whose outputs are in fact attractive documents which will satisfy many needs of public interest and which have no reason to be kept internal (regardless of the fact that there is also a more complicated possibility to get a copy from the ICPDR Secretariat). As long as such information is not shown to the public, its support for such international donor programmes will remain very low (see e.g. the ongoing critique of Hungarian NGOs).

For the future, i.e. with the start of the new UNDP/GEF programme at the latest, this has to be radically changed. It is hoped that the incorporation of the Danube PCU homepage will result in the immediate availability of most of the information not yet available on that homepage. Second, all new ICPDR documents which have already been approved for publication by the ICPDR body should then be published:

- ✓ General information about the geography and nature of the Danube Basin
- ✓ Information about the Danube Protection Convention, the ICPDR and its bodies
- ✓ Information about other legal frameworks including the EU Water Framework Directive
- ✓ Results from the projects conducted under the EPDRB including the Phare-SIP and the UNDP/GEF PRP (there is a tremendous amount of important and useful information from this programme in particular)
- ✓ Regularly updated calendar of events
- ✓ Regularly updated information about important issues such as the Tisza pollution spills, the Steering Group and Expert Working Group meetings (contact, mandate, tasks, annual reports, meeting minutes), the new UNDP/GEF Small Grants Program
- ✓ “Danube Watch” including its newly suggested “Readers Online Forum”
- ✓ Links to ICPDR members and observers (e.g. WWF, DEF)

- Via a new ICPDR information folder: This could be a concise coloured leaflet (e.g. A 1 or A2 folded to A4 size; 40% photos and maps) which would briefly inform about the mandate, tasks and activities of the ICPDR and its various bodies, on the Danube Protection Convention and the overall environmental situation in the Danube River Basin.

This would be produced for the following target groups:

- ✓ For guests and correspondence between the ICPDR and national government focal points;
- ✓ At conferences, meetings, workshops where the ICPDR gives presentations;
- ✓ At public events organized or co-organized by the ICPDR.

The production of **national versions** may be appropriate but should rather become a (self-funded) task of the national government. Also, it could become part of the national public awareness raising campaigns run by DEF, in which case a degree of customization would be needed (some local issues to be included).

- Via the Small Grants Programme: This would include
 - ✓ a series of information workshops at the beginning of the SGP in each of the 11 eligible countries which would use half a day on raising the awareness of the national NGO community about the environmental pollution problems, Danube Convention, the ICPDR, DEF, the UNDP/GEF programme. It is assumed that over 300 NGOs would be addressed and directly informed through expert speeches, papers and other illustrative material that they would be able to use for their various activities.
 - ✓ through the implementation of the SGP's local projects aimed at nutrient reduction activities. It is expected that these very concrete local activities would be communicated to the media and the local public, and at the end of the SGP to the international media to be invited to the SGP final event.
- Via an NGO campaign conducted by the Danube Environment Forum National Focal Points: As the DEF is the only region-wide network (apart from the ICPDR) which is committed to raising public awareness on the Danube environmental problems, it is the appropriate institution to run such a campaign. However, the DEF is still weak in its professional experience in the actual *campaigning* sector, i.e. how to develop and implement an international campaign. It is therefore suggested that a professional public awareness/communication expert should consult, train and support the DEF national focal points.

The campaign topics would focus on nutrient pollution and its monitoring/mitigation/reduction/prevention, with a mix of basin-wide aspects (e.g. transboundary river and pollution management, EU accession process and its implications) and national issues (e.g. on changing intensive agriculture, promoting constructed wetlands in rural areas, cleaning an important river stretch). Unlike the SGP, this campaign would have a more *national* character addressing the governmental efforts (water protection, bilateral and multilateral agreements, environmental education programmes etc.), the daily behaviour of consumers and model activities of the industry.

The campaigns are expected to run for two years, plus a six-month preparatory period and two months for wrapping up and evaluation. The public awareness/communication expert will cooperate with 3 local campaigners (e.g. two pollution experts, one PR/education person) working at the DEF national focal point. There should be a **regional campaign meeting** prior to the start of the campaign, involving two representatives from all DEF national focal points, to jointly prepare, harmonise and co-ordinate the overall campaign.

6 PROGRAMME COMPONENTS FOR THE GEF DANUBE REGIONAL PROJECT

6.1 Component Small Grants Programme (SGP)

- **Small Grants Programme** for implementation in two phases, \$ 1,000,000 each:
 - Eligible: all environmental NGOs from 11 Danube Basin countries (CZ, SK, H, SLO, HR, B-H, YU, BG, RO, MD and UA)
 - Maximum grant per project: \$ 20,000
 - Expected results: about 50 projects per call (theoretically appx. 4 per DRB country)
 - Administration by sub-contractor/implementing agency: 10 to 15% of the budget

Sub-Total SGP

\$ 2,000,000

Suggested Timing for the SGP:

2001	July:	SGP preparation
	September:	Pre-information meetings in 11 countries and call for submission
	November:	Phase 1 submission, selection, awarding
	December:	Contracting
2002	January:	Phase 1 projects start
	February:	First quality assurance visits
	October:	2 nd quality assurance meetings
2003	June:	Finalisation of Phase 1
	August:	Evaluation of project results
	October:	First regional SGP presentation event
	November:	Phase 2 call for submission
2004:	January:	Submission, selection, awarding
	February:	Contracting
	March:	Phase 2 projects start
	April:	First quality assurance visits
	December:	2 nd quality assurance meetings
2005:	September:	Finalisation of Phase 1
	October:	Evaluation of project results
	November:	Finalisation of SGP
	December:	2 nd regional presentation event

- **Recruitment of International/National Experts** for project evaluation and programme coordination preparation (\$ 106,000):
Travel: 4 visits to 4 projects in 11 countries (\$ 40,000):

Sub-Total :

\$ 146,000

- **National Pre-Information meeting**

Invitation (REC lists!) sent out to all NGOs known to work on water and environment issues, brief introduction into the meeting and request to think about potential projects .

Day 1:	noon	Arrival of participants
	14:00	Introduction to Pollution problems of the DRB
		Information about the Danube Protection Convention, ICPDR, GEF program
		Response by the government (national activities)
		Response by the DEF (national focal point)
		Report about previous SGP (including presentation of 2 model projects)
Day 2:	9:00	The new SGP - objectives, structure/timing, criteria Discussion
		"SGP Stock-exchange": possibility to discuss project ideas and aspects both with other NGOs and with representatives from the ICPDR and SGP implementing agency
	13:00	end and departure

Sub-Total (50 NGO representatives, 1 night, 2 meals and meeting facility): **\$ 55,000**

- **“End of SGP” evaluation meeting**

Invitation to all NGOs who participated in the SRP and to cooperating Government agencies to evaluate the results of the SGP and to develop follow-up initiatives (programmes and financial support) :

Sub-Total : 50 participants, 1 night, 2 meals and meeting facility: \$ 44,000

TOTAL Cost for 5 years : \$ 2,245,000

6.2 Component DEF Structure Development

DEF institutional support

Secretariat	secretary, office costs, web page	\$ 18,000
Speakers (3)	part-time office work (10 h/week), travel	\$ 27,000
Board	room; accommodation, meals & travel for 12 persons	\$ 10,000
General Assembly	accommodation, meals and travel for 40 persons	\$ 15,000
National Focal Points	11 countries (not in D, A): fees and office; organi- zation of annual national NGO meetings	<u>\$ 40,000</u>
	Per year	\$ 100,000

TOTAL Cost for 5 years : \$ 500,000

6.3 Component Public Awareness

6.3.1 Danube Watch magazine

Cost of one edition, including preparation, editorial work, printing and mailing : \$ 15,000

Sub-Total for 5 years : **\$ 300,000**

6.3.2 ICPDR homepage with DEF/NGO page

To be developed and maintained by ICPDR

6.3.3 New ICPDR information Folder

Production of information folder (organisation, editorial work, folder design, selection of photos, adoption of maps, preparation for print etc.):

\$ 15,000

Printing of 3x10,000 copies (2001, 2003, 2005) :

\$ 20,000

Sub-Total for 5 years:

\$ 35,000

6.3.4 DEF public awareness campaign

National and intern. public awareness/communication experts :

\$ 146,000

Travel:

\$ 40,000

1 regional co-ordination meeting: 2 DEF persons/country, 2 days

\$ 14,000

11 national campaigns:

\$ 280,000

Development and production of awareness raising materials

\$ 420,000

Sub-Total cost for 5 years:

\$ 900,000

TOTAL Cost for 5 years :

\$ 1,235,000

6.4 Overview of Programme Components

6.1. Component Small Grants Programme:

\$ 2,245,000

6.2. Component DEF Structure Development:

\$ 500,000

6.3. Component Public Awareness:

\$ 1,235,000

**STRENGTHENING THE IMPLEMENTATION OF NUTRIENT
REDUCTION MEASURES AND TRANSBOUNDARY
COOPERATION IN THE DANUBE RIVER BASIN**

**DEVELOPMENT OF PROCESS, STRESS REDUCTION
AND ENVIRONMENTAL STATUS INDICATORS TO
MONITOR NUTRIENT REDUCTION AND ITS EFFECTS
IN THE DANUBE RIVER AND THE BLACK SEA**

REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000



**International Commission for
the Protection of the Danube River**

UNDP/GEF Assistance



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1 INTRODUCTION

This Summary Report is an integral component for the preparation of the GEF/UNDP funded project entitled “Strengthening Implementation of Nutrient Reduction Measures and Transboundary Cooperation in the Danube River Basin”. The basic task of this preparatory work is to prepare a qualified material basis for the elaboration of a complete “Danube Regional Project” to be submitted to the GEF Council.

The purpose of this report is to provide an overview of the international water indicators, in line with emerging GEF policies - process, stress reduction and environmental status indicators, which will be used to track the short and long-term impacts of this project, prior and after the implementation of nutrient reduction action plan, within the Danube river basin.

The log frame of the project has been specifically designed in a way that lends itself to the straightforward identification of relevant process, stress reduction, and environmental status indicators.

The attributes identified as important in assessing the key indicators are:

- (i) relevance
- (ii) precisely defined and scientifically credible
- (iii) easy to detect, record and interpret
- (iv) sensitive to stress on the water pollution management, ecological or social systems or responsive to changes in time and/or space.

The evaluation of effectiveness of the project activities and outputs will depend on whether indicators have successfully been limited to the key areas of sustainability, how they have been defined, the amount of information they hold potentially, and only lastly, what survey and data collection methods are used.

Using indicators give a means of:

- (i) measuring progress and identifying policy needs, as baselines to measure change from a certain date or state, or as targets to reflect tangible performance objectives
- (ii) assessment of the gap between the current state and a reference state, and of effectiveness of measures which have been taken

The proposed indicators are divided in primary and actual indicators, given an estimation of whether they could be applied in the process of implementing of project activities.

2 PROCESS INDICATORS

In the context of the forthcoming Danube regional project (DRP) process indicators are quantitative measures against which aspects of policy reforms can be measured. The use of process indicators allows assessment of the significance of the procedures, activities or measures leading to the development of the legal and institutional frame for transboundary co-operation within the Danube river basin in implementing pollution control and nutrient reduction measures.

The main process indicators, which can be used to monitor the effects of legal and institutional reforms that are going to take place on the national and regional levels as a result of performing the proposed activities, include:

2.1 Implementation of international conventions

A range of national, bilateral, regional, and international agreements and conventions attempts to protect the Danube's aquatic ecosystem by establishing obligations for individual or joint effort compliance. The Danube River Protection Convention is the most significant legal frame for cooperation of the contracting parties to assure environmental protection of ground and surface waters in the Danube river basin. Out of 13 countries in the Danube river basin, eleven states and the European Commission have signed, and most of them have ratified the Danube River Protection Convention (DRPC) which came into force in October 1998.

The effective participation of actors involved in defining national priorities, in implementing regional and basin wide measures, and in ensuring adequate transboundary co-operation is considered as process indicators. In addition, this indicator can monitor the underlying processes leading to the DRPC implementation and evaluate the effectiveness of measures taken during the implementation process.

The proposed indicators can monitor the effectiveness of the efforts taken by the Danube countries to implement and to develop the necessary mechanisms for effective implementation of the Convention. The indicators can identify:

- (i) what is changing (transboundary co-operation improved, institutional and legal reform in place, etc)
- (ii) why is it changing (improve environmental quality status, etc)
- (iii) why is it important (increase quality of life, etc)
- (iv) what can be done about it (introduce good agricultural practices, create nutrient reduction mechanism, etc).

There are many ways of organising this type of indicators: according to the DRPC objectives, (sustainable water use, biodiversity conservation, benefit sharing, etc), by article of the DRPC (issue) or simply as a comparison over time (biological indicators are far more effective if they are measured against a baseline). The baseline can be set up having in mind the time of the DRPC's final ratification, before major interference by industrial or agricultural sector or as agreed by the countries, through a set of characteristics for the basin.

2.2 Implementation of bilateral or multilateral agreements

This indicator measures capacity of the Danube countries to implement the bilateral or multilateral agreements and assesses future requirements. Examination of the set of national reports, recommendations and actions, which will focus on measures taken for the implementation of those agreements, will indicate response indicators employed by countries in the preparation of these reports and suggest areas where capacity-building is required or strengthened.

2.3 Development and implementation of new policies, legislation and mechanism for compliance

There is a great body of laws, regulations and protocols on the national level. Environmental and water pollution control, fishing, shipping, and the protection of critical habitat are well regulated by most of the Danube countries. However, the complexity of these regulations, insufficient financing, fragmentation of institutional responsibilities, low national commitments, institutional weakness, conflict among parties, ambiguities in jurisdiction, and lack of enforcement capacity impede the implementation of their legal provisions. In addition, regionally, there are only very few structures which have the mandate, political authority, financial resources, or implementation capacity to enforce or carry out multiparty agreements.

The development of adequate national and regional legislation and the existence of compliance mechanism will facilitate measuring of project progress.

2.4 Use of compliance schedule as a policy tool in the new water legislation

At least until recently, governments across Danube transition countries had an implicit “take-it-easy” approach on enterprises, many of which were prohibited from borrowing and subject to other uneconomic restrictions. This has led to the authorities’ inability to impose penalties or set prices for environmental goods and services at economic levels to achieve acceptable emissions, and to enterprises’ indifference to operating with a valid permits. Instead, two approaches have been taken, investment co-financing and compliance schedules. There are several advantages linked to the use of compliance schedule which refer to the increased flexibility for polluters, provide opportunities for least cost solutions to compliance, reduced regulatory agency burden to implement and defining options for addressing past pollution damages.

As the transition countries are still favourable to the regulatory tradition, the indicators will measure:

- (i) Creation of the institutional capacity to design programs of compliance
- (ii) Introduction of a credible enforcement system
- (iii) Existence of adequate tools for monitoring
- (iv) Use of non-compliance fines
- (v) Inspection resources available to detect violations

2.5 Introduction of legal and institutional reforms in transition countries

How far Danube countries have advanced in the preparation of legal and institutional environmental reforms closely parallels their economic and political development. However, in most transition countries in the Danube basin, the legislative and institutional reform process is not complete.

Since 1989, many changes have occurred in environmental legislation as a result of political and economic reforms and changes in ownership structures. Some countries changed nearly the whole set of environmental legislation immediately after 1989 as a result of the need to substantially change the approach towards environmental protection. The intention was to create a comprehensive, co-ordinated legal system that could allow application of cross-media regulations and new environmental protection instruments, such as EIA, compliance schedules and market-based economic incentives. The new policy instruments, both legal and financial, required developing and enacting a comprehensive environmental law. Broader implementation of financial instruments (realistic resource prices, pollution charges and fines, product charges, taxes on natural resources and tradable permits) require still more progress.

2.6 Improvement of institutional capabilities river basin committees

For the transition countries in the Danube River Basin, efficient and equitable allocation of waters, supply oriented physical actions which refer to water resources infrastructures and corresponding operating rules and sustainable financing options represent a challenging task for the policy makers and planners to foresee in time and adopt the social structures of water resources development, in the complex of rapidly transition context.

One of these structures are River Basin Committees which can co-ordinate the efforts of all those involved and represent all interests within a sub-basin which use the water resource and contribute to water pollution. This will lead to the improvement of the water quality and use, through increased decentralisation, democratisation and sustainable financing in the water sector. The purpose of River Basin Committees is to serve as a forum for co-ordinating the policies of integrated management of the basin water resources, avoiding the water users' conflict of interests, establishing priorities in the achievement of the water pollution abatement investments, ensuring public participation in decision making, and encouraging new developments aimed at increasing the water use sustainability. The number of river basin committees, which will be created in the Danube countries and which are effectively working is a proposed measurable process indicator.

2.7 Establishment of inter-ministerial mechanisms for nutrient reduction

The inter-ministerial mechanism for pollution control and nutrient reduction shall be created at the national level by most of the Danube countries. Based on the existence of such national structures, the effects of implementing project activities can be quantitatively monitored.

2.8 Improve achievements of the ICPDR/ Expert Groups and Working Groups

With the view to strengthen regional cooperation, in response to the DRPC provisions, the Danube countries have established the International Commission for the Protection of the Danube River (ICPDR). The ICPDR establishes the institutional frame for pollution control and the protection of water bodies and it sets also a common platform for sustainable use of ecological resources and integrated river basin management.

The Expert Groups established within ICPDR can take actions to identify and agree measures and propose strategies and approaches for implementation of pollution control and nutrient reduction, which will reduce emissions to the Danube River and Black Sea.

2.9 Adoption and implementation of EU legislation

Environment community policies are grounded on the concept of sustainable development, by integrating environment policies in the sector development policies of Member States.

To join the European Union (EU), the transition countries need to harmonise their legislative and institutional framework with EU requirements. Harmonisation is an effective way to improve the state of the environment in the Danube river basin. Further, the transition countries have not yet addressed harmonisation among themselves, limiting co-operation to bilateral agreements and conventions.

The Danube accession countries have committed into a process aiming the adoption of the environment *Acquis Communautaire*, as well as the creation of institutions required for its implementation and enforcement. The Program for the Adoption of the Environment *Acquis Communautaire* refers to the achievement of measures leading on short and medium term to the harmonization of national legislation with that existing in European Union, as well as the institutional development required to implement the environment legislation at the national level. The results of programs for harmonization of the environment legislation can be evaluated at the national level as one of the major impact of the project.

2.10 Adoption and implementation of National Environmental Action Plan

Danube countries have applied either strategic oriented (top-down) or action oriented (bottom-up) approaches when developing their environmental policy documents. The majority of countries started with the preparation of the strategic, long-term environmental policy papers and followed with action-oriented plans (Bulgaria, Czech Republic, Hungary, Romania, and Slovakia). Other countries (Slovenia) prepared an action-oriented environmental program.

The Danube countries are engaged in a number of national or donors financed activities that are directly related to the developing of national environmental action plans that address the Danube issues. Each country will elaborate, update and implement a National Environmental Action Plan (NEAP) or a Strategic Action Plan (SAP), which will specifically address domestic problems and propose pollution control and nutrient reduction measures.

The relevant national policy documents (i.e. environmental strategy studies, action plans and programs), concentrate on the following issues: environmental policy development, implementation mechanisms, institutional strengthening, and improvement of legislative and regulatory framework, investment priorities and international co-operation.

NEAP/SAP represents a planning instrument which approaches the main environment concerns in line with those international conventions whereupon each individual country is part, as well as with the environment European Directives.

Currently NEAP is up-graded in line with the Program for the Adoption of the *Acquis*, turning this way into a basic element to meet the conditions required by the European Union integration.

2.11 Introduction of new principles and approaches

Integrated water resources management

A consensus has emerged that a more comprehensive approach to water resources management is needed -- one that is cross-sectoral, integrates ecological and development needs, and is based on holistic analyses of the carrying capacity of the water environment. In this approach, the river basin, groundwater system, coastal area, or large marine ecosystem typically serves as a management unit on which to base changes in the way that sectoral development activities are conducted and how priority environmental interventions are made. Such a comprehensive approach that integrates actions across sectors is new to most transition countries, difficult to implement, and even harder to achieve when actions must be co-ordinated among countries.

Integration of environmental requirements into economic policies

Current Danube countries policy promotes both environmental improvement and economic development. With the view that economic growth leads inevitably to increased environmental pollution, development of feasible methods for national economic policies that would more fully measure the environmental aspects of changes in productivity, assets, and welfare resulting from economic growth is one of the priority of the governments in Danube river basin.

This proposed indicator can measure the effects of:

- (i) the linkages between voluntary international environmental standards (e.g. ISO 14000) and expansion of (or barriers to) international trade and effects on environmental quality
- (ii) the effects of pollution control expenditures on national income and economic growth in each of the Danube countries
- (iii) the relationship between environmental performance and profitability at the plant level including the impact of alternative approaches to achieving environmental compliance involving technology innovation and pollution prevention methods.

Polluter and beneficiary pays principle

In addition to drafting new and comprehensive environmental legal acts, the Danube countries are modernising their environmental regulations by eliminating gaps and improving the consistency of existing regulations. Framework environmental acts and their amendments include such principles as polluter pays, prevention and precautionary, beneficiary pays, etc. However, many of them remain just a declaration of intent and are not properly enforced.

In addition, EU environmental policy is an essential component of the Internal Market and takes into account the keeping of high environment standards by enforcing the broad accepted principles in the field and namely the material polluter liability, the prevention pollution at source and the assignment of liabilities of economic and social players involved at local, regional and national level. The beneficiary of water/environmental service must pay for the service.

The transition countries government's interest in this policy tool is motivated by the need:

- (i) to encourage polluters to find low-cost or no-cost control measures to improve their environmental performance
- (ii) to generate revenues for environmental fund
- (iii) to send a clear signal that the country is following the international trend to place environmental policy on a polluter/beneficiary pay principle.

Innovative economic instruments (system of incentives and fines)

Direct environmental protection instruments include environmental standards, restrictions, compliance schedules, and permits. The countries mainly use monetary penalties to enforce environmental legislation. However, the concept of economic instruments (charges and fees) has not yet been fully implemented in the Danube transition countries. Environmental charges, fees and fines are generally more widely used than taxes. A few countries have adopted incentive financial instruments on a limited basis.

The proposed indicator is referring to the number of economic instruments introduced at the national level by the Danube countries.

Improvement of local communities/NGO participation, dissemination, communication and involvement in the decision making process

To ensure full participation and ownership of the programme by the Danube countries, in particular River Basin Management Plans and implementation of EU Water Framework Directive, ongoing consultations through open forum meetings with government representatives, district and local officials, and the public are strongly encouraged. In addition, direct dialogues and negotiations between private sector, non-governmental interests, and governmental representatives in the region will be an important aspect of the programme, to generate undertakings with tangible results. The number of NGO and the number of public hearings organised at the country level during permitting process may reflect a positive effect of the proposed project.

3 STRESS REDUCTION INDICATORS

In the context of the forthcoming Danube Regional Project, stress reduction means events, measures and actions which lead to actual reduction in pressure on the aquatic systems of the Danube river basin and on the Black Sea.

Bearing in mind what a regional Danube project can achieve, the most essential stress reduction issues and related stress reduction indicators can be outlined as follows:

3.1 Rehabilitation, upgrading and new construction of municipal WWTPS

Primary and actual stress reduction indicators:

- Aggregated “population equivalent” (pe) and anticipated annual reduction of N, P, BOD₅ AND COD (t/year) of existing municipal WWTP, brought into appropriate operation by rehabilitation measures;
- Aggregated “population equivalent” (pe), and anticipated annual reduction of N, P, BOD₅ AND COD (t/year) of existing WWTP, upgraded in terms of nutrient elimination technology;
- Aggregated “population equivalent” (pe), and anticipated annual reduction of N, P, BOD₅ AND COD (t/year) of newly constructed WWTPS (split by mechanical, biological and advanced treatment technology).

In the case of adequate design and capacity the rehabilitation of existing WWTPS are usually the most cost effective measures with regard to nutrient reduction.

The implementation of advanced N+P elimination technology is in the majority of the middle and down stream DRB countries very critical, as the significantly higher operation cost lead usually to cost covering tariffs which are currently hardly to afford by the poorer segments of the population.

As the construction of new WWTPS has to take into account the criterion of affordability, a phased implementation with stepwise increasing treatment/effluent standards is usually the most appropriate strategy in the majority of the middle and down stream DRB countries.

The potential EU accession countries have (with certain transition periods) in any case to fulfill the requirements of the EU urban wastewater treatment directive.

According to the data provided by the draft “Five Year National Nutrient Reduction Action Plans” for the 13 DRB countries, the 156 proposed municipal WWTP projects have investment requirements of about EUR 3.4 billion and the following anticipated annual nutrient reduction:

- ⇒ N: 31 500 (t/year)
- ⇒ P: 7 400 (t/year)
- ⇒ BOD₅: 181 000 (t/year)
- ⇒ COD: 351 000 (t/year).

3.2 Rehabilitation, upgrading and new construction of industrial WWTPS

Actual stress reduction indicators:

- Anticipated annual reduction of n, p, BOD₅, cod (t/year) from rehabilitation and upgrading of existing WWTPS, and construction of new WWTPS.

According to the data provided by the draft “five year national nutrient reduction action plans” the 44 proposed industrial WWTP projects have investment requirements of about EUR 267 million and the following anticipated annual nutrient reduction:

- ⇒ N: 3 400 (t/year)
- ⇒ P: 3 700 (t/year)
- ⇒ BOD5: 39 700 (t/year)
- ⇒ COD: 78 700 (t/year).

The rehabilitation and construction of industrial WWTP are usually very cost-effective measures with regard to phosphorus and cod reduction; in addition they usually achieve significant reduction of particular toxic substances.

3.3 Rehabilitation, upgrading and new construction of point-source related agricultural WWTPS

Primary and actual stress reduction indicators:

- Number of different categories of animals (cattle, pigs, etc) connected to appropriate agricultural WWTPS;
- Anticipated annual reduction of N, P, BOD5, COD (t/year) from rehabilitation / upgrading of existing WWTP and new construction of WWTP.

According to the data provided by the draft “five year national nutrient reduction action plans” the 21 proposed point-source related agricultural projects have investment requirements of about eur 113 million and the following anticipated annual nutrient reduction:

- ⇒ N: 6 700 (t/year)
- ⇒ P: 1 100 (t/year)
- ⇒ BOD5: 9 500 (t/year)
- ⇒ COD: 14 900 (t/year).

The rehabilitation and construction of point-source related agricultural WWTP are usually very cost effective point-source measures with regard to reduction of nitrogen.

3.4 Restoration or new creation of wetlands

Primary and actual stress reduction indicators:

- Area (ha) of restored or newly created wetlands;
- Anticipated annual reduction of N, P, BOD5, COD (t/year) from restoration of existing wetlands and creation of new wetlands;

According to the data provided by the draft “Five Year National Nutrient Reduction Action Plans” the 22 proposed wetland projects have investment requirements of about EUR 113 million and the following anticipated annual nutrient reduction:

- ⇒ N: 6 700 (t/year)
- ⇒ P: 1 100 (t/year)
- ⇒ BOD5: 9 500 (t/year)
- ⇒ COD: 15 000 (t/year).

The restoration and creation of wetlands are usually the most cost effective point-source measures with regard to reduction of nitrogen.

3.5 Implementation of surface water related protected areas and adequate buffer zones between agricultural areas and surface water bodies

Primary stress reduction indicators:

- Creation of surface water related protected areas (ha), (split by degree of protection);
- Creation of agricultural buffer zones along surface waters (length in km).

Actual stress reduction (measured in actual nutrient load reduction in surface waters) cannot be assessed in general terms.

3.6 Implementation of agricultural management reforms aiming at appropriate, respectively reduced utilisation of agro-chemicals and manure

Primary stress reduction indicators:

- Reduction of utilised chemical fertilisers (t/ha/year), (split by main crop categories);
- Reduction of utilised manure (t/ha/year), (split by main crop categories);
- Reduction of utilised pesticides (t/ha/year), (split by main crop categories).

Actual stress reduction (measured in actual nutrient load reduction in surface waters) cannot be assessed in general terms.

3.7 Shut down of polluting production sites, respectively modernisation of outdated production technologies

Primary and actual stress reduction indicators:

- Cases of shut down of polluting production sites (factories, mines, etc)
- Anticipated annual reduction of N, P, BOD₅ and COD (t/year).

Actual stress reduction (measured in actual nutrient load reduction in surface waters) cannot be assessed in general terms, but can be done on a case to case basis.

3.8 Phase-out of phosphorus containing detergents

Primary stress reduction indicators:

- Reduction of phosphorus components from utilisation of detergents / washing powders (kg /capita/year).

Actual stress reduction (measured in actual nutrient load reduction in surface waters) cannot be assessed in general terms. A rough assessment can be done on the basis of the number of population connected to centralised sewerage systems and municipal WWTPS with different effluent standards.

3.9 Better enforcement of wastewater discharge permits in compliance with specified discharge parameters

Primary stress reduction indicators:

- Number of discharge permits in compliance with appropriately specified discharge parameters.

Actual stress reduction (measured in actual nutrient load reduction in surface waters) cannot be assessed in general terms.

4 ENVIRONMENTAL STATUS INDICATORS

Environmental status indicators are information tools. They summarise data on complex and sometimes conflicting environmental issues to indicate the overall status and trends of Danube ecosystem. In the context of implementation of the proposed project activities, they can be used to assess national performance and to signal key issues to be addressed through policy interventions and other actions.

These indicators gauge the usefulness of nutrient reduction measures to human populations and aquatic ecosystem and assess the sustainability of use. Much of the utility value of water pollution control and nutrient reduction measures will be country-specific. However, indicators might track those elements of Danube ecosystem that - because they are traded on international markets or provide transboundary life-support services - are of regional or global importance. Two categories of environmental status indicators are proposed to measure the impacts of implementing nutrient reduction measures within the Danube river basin:

- (i) indicators measuring ecosystem goods
- (ii) indicators measuring ecosystem services.

4.1 Indicators measuring ecosystem goods

Human-caused changes in ecosystems generally result in a decrease of population sizes of many species, and an increase in populations of a few others. Both increases and decreases in comparison to the postulated baseline are significant and are sensitive measures for changes in the state of the biodiversity in a country, region or for a global comparison.

Ecosystem structure variables are most promising because they can offer a lot of information on the state of ecosystems over large areas. Identifying key-ecosystem structure variables that can indicate if the ecosystem is functioning correctly or not can capture many aspects of quality. For example, a measure of quality might be the total number of well-specified habitat types observed within a sample area.

Each country can choose its own, appropriate, bio-geographic or ecosystem-specific and standardised core set of quality variables. The core set can be gradually established by starting with a basic set of easily affordable measurable quality variables, providing a picture of the overall national or regional biodiversity state.

The indicators can measure the:

- ⇒ Water quality (water as an ecosystem good having economic value, to be used for water supply for various purposes)
- ⇒ Species risk
- ⇒ Percent of wild species with known medicinal uses
- ⇒ Biological diversity
- ⇒ Ecosystem communities

4.2 Indicators measuring ecosystem services

These include ecological processes that provide "life support" services to humans and environment, such as soil conservation and watershed protection. Also, this indicator provides an impression of the biodiversity losses or gains at the Danube ecosystem level as a result of industrial and agricultural activities and increased nutrient load.

- ⇒ Percent of transboundary waters with increased water quality river class
- ⇒ Percent of transboundary watershed area assessed as "low risk of environmental pollution"
- ⇒ Self-regenerating and man-made area as percentage of total area with reference to wetlands restoration
- ⇒ Annual land use change from self-regenerating area into agriculture
- ⇒ Share of rivers dammed or channelled in order to reduce erosion and agricultural run-off as the percent of the whole river per country
- ⇒ Amount of agricultural area lost in 10 years due to pollution and erosion as percentage of agricultural area brought into agriculture in the same period, per country

4.3 Standard Operational Procedure for Monitoring of Benthic Macroinvertebrates in the frame of Transnational Monitoring Network

The main purpose of the SOP for monitoring of the benthic macro invertebrates in the frame of the Trans National Monitoring Network was to find common methods for sampling, analysis, numerical evaluation and presentation for bio monitoring that can be applied over the entire Danube river basin. The SOP covers macro invertebrates only and is focused on the numerical evaluation for the system of saprobity by means of the Saprobic Index. This system is adopted for the internationally agreed sampling stations and does not apply necessarily to national monitoring networks. Other biological groups of aquatic ecosystem are excluded like algae, water plants, fish, birds and mammals as well as river related (semi) terrestrial systems of riparian vegetation and flood plains. However, it is recognised that these elements are an integral part of the river ecosystem. So the macro invertebrates sampling and biological assessment is a first step in the development of a more comprehensive ecological assessment of river quality.

The SOP covers sampling (choice of sampling site, period of sampling, frequency, sampling device), collections, preservation, transport, taxa identification, quality assurance and quality control, numerical evaluation and classification/presentation of results.

The most of Danubian countries are interesting in the revising of the set of bioindicators.

- In Germany, the activities on the Danube are co-ordinated by Bayerisches Landesamt für Wasserwirtschaft (Water Research Institute for Bavaria). The List of the Water Organisms Taxa published in 1990 contains general information of the water organisms, the way of evaluation of abundance, calculation of saprobic index and other needed information. The list has 4246 records – organisms – from many selected aquatic organisms.
- In Austria, the revised list of benthic fauna has been recently published. Austria has a long experience with biological assessment of water quality that is compiled in the Fauna Aquatica Austriaca, a comprehensive species inventory of Austrian aquatic organisms with ecological notes. On a routine basis macro invertebrates, phyto-benthos and ciliates are sampled in rivers and the Saprobic Index is calculated. Results are classified and presented in yearbooks in geographical form with a colour coding or river reaches. Furthermore a far more detailed and complex evaluation is applied for specific purposes in which the aquatic ecosystem is thoroughly described for abiotic and biotic components.

- In Bulgaria, saprobity is determined by Pantle & Buck index for the Transnational Monitoring Network (TNMN) sites only. The German DIN norm is used to calculate the Saprobic Index. Also quality classes are defined for macro zoobenthos species diversity (Shannon), matching degree and dominating degree. In the national network a biotic index is in use which is adapted from the Irish Q-value. Every 5 kilometres of a river is assessed. The biological quality is divided into 10 classes. This method has been chosen for its cost-effectiveness and relative ease in required determination skills.
- In Czech Republic, there is a long tradition in using the saprobity system for routine monitoring of rivers, just like in Austria. Regular measurements are made from the sixties in the national monitoring network. Since 1975 a more detailed assessment is made. Besides routine monitoring some projects are executed. At the moment a biological monitoring prediction model for macro invertebrates (called 'Perla' (a stonefly species) is being developed following the RIVPACS approach. This model can make a prediction on the natural reference community at a certain site when some abiotic features are known. The prediction is based on a database with target communities, which is nearly completed. The actual sampled community at that site can then be compared to the predicted one. The difference is a measure for the extent of ecological stress. For the river Morava, a Danube tributary, a survey of population species diversity of fish and benthos is included.
- In Hungary a biotic index has been developed in the past, adjusted from the western European biotic indices. However this assessment is not supported by the government and hence not implemented into a routine monitoring practice for rivers. For TNMN the Saprobic Index is based on indicators outline by Gulyas (1998).
- Slovenian water authorities use the Saprobic Index method (Pantle & Buck, modified by Zelinka & Marvan) for bio monitoring. The index and classification is based on the examination of periphyton and macro invertebrates at the sampling site. (Sampling according to ISO 7828(E), 1985, ISO 8265(E), 1988). A basis for Slovenian biological evaluation of the water quality of running waters are the as complete as possible species identification of organisms composing the communities, their semi-quantitative determination (abundance scale 1-3-5) as well as the knowledge of their ecology. In some cases it may become appropriate to complement the Saprobic Index with a personal evaluation of specific conditions of the water and the riverbed.

4.4 Preliminary set of indicators for the Danube River Basin

4.4.1 Existing sets of indicators in the Danube River Basin

Within the framework of the International Commission for the Protection of Danube River (ICPDR) and the Monitoring, Laboratory and Information Management Expert Group (MLIM/EG), some years ago, an inventory was made amongst Danube countries on water quality classification methods. These methods were compared with the current practices in some EU-countries. Basic conclusion of that comparative analyses was that the applied surface water quality standards forming the basis of classification of water bodies in the different riparian countries are not compatible and as a consequence of the differences in principles and values, the regular classifications of the countries can not be compared directly and can not be used for basin-wide considerations.

Biological monitoring and assessment of water quality in Danube river basin has a fairly long tradition, especially with respect to system of saprobity. However, the monitoring and assessment by the system of saprobity can be done in several ways and allows some variation between countries, like the biological group that is considered, different saprobic index values and valences for one species, the method of sampling, counting of individuals and calculation of the Saprobic index.

Besides the saprobity system some other developments on bio monitoring are going on in Danube river basin. Biological assessment can consist of many aspects because of the complexity of the aquatic ecosystem and presence of several biotic components or groups that indicate different aspects. Therefore, from the point of view of living parts of the river ecosystem the following aspect can be distinguished:

- bacteriological assessment (Faecal coliformes or *Escherichia coli*, *Salmonella*, saprophytes);
- assessment of trophic status (i.e. chlorophyll-a concentration, phytoplankton species composition);
- ecotoxicological assessment by means of bioassays in the laboratory (acute and chronic test with crustaceans (*Daphnia magna*), algae (*Scenedesmus quadricauda*), and fish, Microtox, Toxkits like Rototox, Thamnotox). But also accumulation laboratory experiments and field measurements and i.e. measurement of PCB in fish in river Morava;
- saprobiological assessment using phytobenthos (periphyton), macroinvertebrates (macrozoobenthon), phytoplankton.

4.4.2 Preliminary set of indicators for the Danube River Basin

Most Danube countries apply the Saprobic index for evaluation and presentation of water quality based on macroinvertebrates (macrozoobenthon) for the running watercourses. Various indices and class limit values are in use. The species indicator list varied also, due to country specific additions or modifications. The saprobity is often classified in 5 classes (x,o,b,a,p), but the water quality classification by means of the Saprobic index in 4 main classes, in some cases completed with 3 in-between classes giving a total of 7 classes.

Based on the available information and recommendations of projects for the Danube River Basin and in line with new proposed European Water Framework Directive, some communities of organisms have been compiled.

Running water courses are covered by the communities of benthic fauna - macrozoobenthos (macroinvertebrates, zoobenthos, zoobenthon), benthic flora – periphyton (phytobenthos) and macrovegetation (water macrophytes). This groups of water organisms are a good indicators of a long term changes in the river, as well as the indicators of pollution point sources. Their use for the assessment of biotic conditions is spreaded in most of Danube countries. Stagnant waters (e.g. large reservoirs, riparian lakes) should be monitor from the plankton (phytoplankton and zooplankton) and macrophytes point of view. This biological assessment system reveals a measure for the ecosystem stress due to organic substances and related oxygen consumption. The saprobity system uses species-specific indicator values, which indicates the tolerance for organic load. Measurements of water fauna and flora should be based on the qualitative (species diversity) and quantitative (abundance or relative (estimated) abundance) investigation.

The applied taxonomic level of identification is governed by the objectives of the biomonitoring. It is recommended to perform identification of taxa at species level whenever possible. However, for distinct groups determination literature and keys may not cover species level for all orders, families or genera.

For calculation of the Saprobic Index often an estimate of the abundance is sufficient. When this method is applied the exact number of individuals per species in the sample is not known and cannot be used for other purposes. It is advised to count in principle real numbers. Afterwards it is still possible to make a classification in abundance. Obtained data can be processed by the calculation of Saprobic Index and assessed by the agreed classification scheme.

The presentation of the ecological status as a result of monitoring biological quality elements is to be presented into 5 classes. The next table present a proposal for classification of Saprobic Index of natural rivers in Danube basin.

Class	I	II	III	IV	V
ecological status	high	good	moderate	poor	bad
Saprobic Index	< 1.8	1.81-2.3	2.31-2.7	2.71-3.2	>3.2

The preliminary set of indicators contains about 6 000 aquatic organisms corrected and modified according to the published sources of references. The organisms have been divided to five groups: zoobenthos (macroinvertebrates, macrozoobenthon), periphyton (phytobenthos), phytoplankton, zooplankton and water macrovegetation (water macrophytes).

Bioindicator study performed in Yugoslavia in the frame of UNEP/Habitat BTF and ICPDR on 23-28 August 1999 is a good contribution to the knowledge of benthic macroinvertebrates of the Yugoslavian stretch of the river Danube as well as the accumulation capacity of the benthic species, mainly mussels.

Primarily the results on bioaccumulation should be considered as excellent. Based on the outcome of concentration of the mercury, PAHs and PCBs in the mussels' samples it can be said that the results are in a good correlation with the concentration of the mentioned pollutants in sediment. Two mussel species have been analyzed from the accumulation of pollutant point of view. *Anodonta anatina* was more frequent organisms than *Sinanodonta woodiana*.

The analyses of the pollutants in the benthic organisms will be included into the program of the Joint Danube Survey. In addition, the next phase of the Trans National Monitoring Network of the Danube River Basin will include analyses of the organic and inorganic pollutants in the biota.

As for the species diversity the number of identified taxa at the individual sites ranged from 6 to 21 depending on the pollution and substrate condition as well. Mainly the snails and mussels have been found in the investigated stretch of the Danube.

Beside the species diversity, additional data are needed for presentation or/and classification of the biological status. For calculation of Saprobic Index an estimate of abundance is sufficient. When field estimates of certain species of groups have been made, they should be proportionally added to the species that are positively identified and counted.

Because of the differences in the biogeochemical characteristics of the Danube river itself and in the related sub-catchments of the tributaries along the Danube, it is important to monitor and characterise the specific biotic and abiotic compartments in the particular areas. Differences in the biodiversity of the aquatic life and in the chemical composition of the abiotic compartment sediment call for reliable information on the specific characteristics.

Effective water quality management requires appropriate monitoring programme to identify significant pollutants affecting the health of the aquatic life and limiting the intended water uses, particularly public water supplies. The appropriate monitoring programme should provide reliable, quality assured (checked and verified), validated data: (a) on the abundance of different aquatic organisms, biological population, on the biodiversity in the aquatic ecosystem; (b) on the type of the pollutants affecting, harming the aquatic life and intended water uses; and (c) on the concentrations of these pollutants in the different compartments, matrices in the aquatic environment. Implementation of the monitoring programme should provide these data in the selected matrix at all representative sampling sites/positions with appropriate sampling frequency allowing quality/pollution assessment, pollutant load calculation in space and time.

It is very important to distinguish the natural background and the anthropogenic input in the case of pollutants also occurring naturally, to establish baseline levels for man-made (synthetic) pollutants and to evaluate pollution trends in space and time. Establishment of historical trends, comparison of pollutant concentrations in samples collected at present and in the past, requires availability of appropriate samples (reference materials) on long-term basis.

There is a need to establish the biological sample bank for the Danube river basin, where the biological reference samples will be collected at representative sites of the selected areas of the river basin. The samples will be preserved and kept in the sample bank for the following purposes: (a) for later scientific (i.e., taxonomic) revision and comparative purposes, according to newly arising questions; (b) organs of selected organisms, (e.g., mussels, fishes) will be freeze-dried, grounded, homogenised for chemical analysis, to be used as biological reference materials; (c) education and training; and (d) quality assurance.

The collected samples will be appropriate for estimating long term environmental changes and will include types of samples representing:

- communities (the sample contains species assemblages) such as phytoplankton, zooplankton and periphyton,
- species (species are sorted, taxa are separated) such as benthon and fish.

The selection of referential sites will include:

- undisturbed (unpolluted) sites indicating high biodiversity and characterised by clear water indicator taxa, representing high quality, reference conditions for ecological status assessment, and
- sites representing special pollution situation.

The characteristics of the processed samples will be documented, archived in a computerised data bank, the processed, preserved sample and/or the selected individuals of different species will be put in the sample bank and stored there in such a way that the sample bank can serve the request of the participating laboratories for five years at least.

After sample collection and preparation, the biological specimen sample bank will be used for education, training purposes for biologists in the Danube river basin as capacity building.

It will be also particularly important to prepare specific organisms (species) unique in the Danube river basin in addition to the common species, with contribution from the biologists of individual Danube countries.

ANNEX 9 Danube / Black Sea Basin Strategic Partnership

Addressing Transboundary Priorities in the Danube/Black Sea Basin:

A Strategic Partnership

Introduction:

The GEF, its Implementing Agencies, the European Community and others are working together to assist the 17 countries in the Danube/Black Sea basin in addressing their top priority transboundary waters issues. The GEF Secretariat, UNDP, the World Bank and UNEP, in consultation with other key donors, the International Commission for the Protection of the Danube River, the Black Sea Commission and the Danube and Black Sea Secretariats/PIU, have prepared this strategy paper in order to:

- Describe the collaboration among the Implementing Agencies, funding partners and Danube/Black Sea basin countries in the first “GEF Strategic Partnership” to a geographic area in the International Waters focal area;
- Inform the GEF Council on the approach being taken by the GEF Implementing Agencies in the Danube/Black Sea basin;
- Provide a framework for interagency and inter-governmental cooperation and coordination in addressing transboundary issues in the Danube/Black Sea basin;
- Help to leverage and coordinate additional inputs to the region from other donors;
- Provide guidance and orientation for the development of the Danube and Black Sea GEF Regional Projects;
- Serve as a tool to assure coherence between donor activities and the policies and strategies of the respective Conventions;
- Provide guidance to assure coherence between donor activities and the objectives and work programs of the respective Secretariats;
- Establish a common agreement among the countries and Agencies for objectives and programmatic indicators that will be utilized to measure progress over the five year program.
- Support the efforts of EU accession countries in the Danube/Black Sea basin to comply with EU Water Directives (nitrate, phosphate) and the forthcoming Water Framework Directives.

This basin-wide, multi-stakeholder collaboration is needed to accelerate on-the-ground implementation of measures and to consolidate gains made in jointly reversing nutrient over-enrichment and toxics contamination of the Danube/Black Sea basin (see Annex 2) under the Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-Based Activities. The participating countries have the opportunity to shorten by one-half the time frame for significant environmental improvements that have taken 2-3 decades to accomplish for other transboundary waterbodies in Europe and North America. This draft was shared and discussed with the countries at the recent Black Sea basin-wide Stocktaking meeting as part of preparing their collaborative projects for consideration by the GEF Council in May, 2001.

Objectives and Programmatic Indicators:

Objective 1:

In support of the implementation of the Black Sea Strategic Action Plan and the "Common Platform for Development of National Policies and Actions for Pollution Reduction under the Danube River Protection Convention", and taking into account the mandate of the Sofia and Bucharest Conventions, Danube/Black Sea basin countries adopt and implement policy, institutional and regulatory changes to reduce point and non-point source nutrient discharges, restore nutrient ‘sinks’, and prevent and remediate toxics “hot spots”.

Indicators: By 2005, 100% of participating countries introduce one or more policy or regulatory measures (including phosphorus-free detergents) to reduce nutrient discharges in the agricultural, municipal, or industrial sectors, to restore nutrient sinks (wetlands, flood plains), and to prevent and remediate toxics “hot spots”, and 50% adopt multiple measures, towards goals of maintaining 1997 levels of nutrient inputs to the Black Sea, and substantially reducing toxics contamination in the basin.

Objective 2:

Countries gain experience in making investments in nutrient reduction and prevention and remediation of toxics “hot spots”.

Indicators: 100% of participating countries implement one or more investments in agricultural, municipal, land use or industrial sectors for nutrient discharge reduction, nutrient sink restoration, and prevention and remediation of hot spots of toxic substances, some with GEF assistance, by 2005 to accompany expected baseline investments.

Objective 3:

Capacity of the Danube and Black Sea Convention Secretariats is increased through permanent status, sustainable funding, and development of international waters process, stress reduction and environmental status indicators adopted through Convention processes.

Indicators: PCU/PIU functions evolve into Convention Secretariats (Danube already in place; Black Sea effective September 2000); payments of contributions by all contracting parties made for 2000 and pledged for the period beyond project duration; nutrient control, toxics reduction and ecosystem indicators assessing processes in place, stress reduction, and environmental status, are developed, harmonized and adopted for reporting to Secretariat databases by 2005.

Objective 4:

Country commitments to a cap on nutrient releases to the Black Sea at 1997 levels and agreed targets for toxics reduction for the interim, and possible future reductions or revisions using an adaptive management approach after 2004 are formalized into specific nutrients control and toxics discharge protocol(s) or Annex(es) to the respective Conventions or via other legally binding mechanisms.

Indicators: Countries adopt protocols or annexes to their two conventions and/or develop legally binding “Action Plans” regarding nutrients and toxics reduction commitments as part of their obligations under the Global Programme of Action for Protection of the Marine Environment for Land-Based Activities by 2005 towards agreed goal to restore the Sea to 1960’s environmental status. For the Danube, such a commitment will be contained in the revised Nutrient Reduction Plans (coherent with the ICPDR Joint Action Programme) and developed in accord with the application of the relevant EU Water Directives.

Objective 5:

Implementing Agencies, the European Union, other funding partners and countries formalize nutrient and toxics reduction commitments into IA, EU and partner regular programs with countries.

Indicators: Regular programs of IA’s and EC support country nutrient and toxics reduction commitments during 2000-2005 as part of expected baseline activities and incorporate them into CCF (UNDP), GPA Office Support (UNEP), CAS (WB), and EU (Accession support) by 2005.

Objective 6:

Pilot techniques for restoration of Danube/Black Sea basin nutrient sinks and reduction of non-point source nutrient discharges through integrated management of land and water resources and their ecosystems in river sub-basins by involving private sector, government, NGO’s and communities in restoration and prevention activities, and utilizing GEF Biodiversity and MSP projects to accelerate implementation of results.

Indicators: All countries in basin begin nutrient sink restoration and non-point source discharge reduction by 2005 through integrated river sub-basin management of land, water and ecosystems with support from IA’s, partners and GEF through small grants to communities, biodiversity projects for wetlands and flood plain conservation, enforcement by legal authorities and holistic approaches to water quality, quantity and biodiversity of aquatic ecosystems.

The Danube/Black Sea Basin: A Strategic Partnership

To accomplish the objectives summarized above aimed at addressing Danube/Black Sea basin pollution reduction, with particular attention to nutrients and toxic substances, in the most efficient and coordinated manner possible, the GEF and its Implementing Agencies are proposing a strategic programme of capital investments, economic instruments, development and enforcement of environmental law and policy, strengthening of public participation, and monitoring of trends and compliance. The programme would include both GEF and non-GEF (EC, EBRD, IA regular programs, etc.) elements.

Operationally, within the GEF International Waters and Biodiversity focal areas, the interagency Strategic Partnership proposed for the Danube/Black Sea basin includes eight principal elements:

Elements of the Strategic Partnership:

1. *A GEF Black Sea Regional Project implemented in cooperation with the Black Sea Commission;*
2. *A GEF Danube River Basin Regional Project implemented in cooperation with the International Commission for the Protection of the Danube River (ICPDR);*

UNDP and UNEP propose to develop and jointly implement these two regional capacity building projects aimed at addressing transboundary environmental degradation in the Danube/Black Sea basin through policy and legal reform, public awareness raising, and institutional strengthening. Each project will be operated through or closely linked to the respective Black Sea and Danube Secretariats in Istanbul and Vienna. The two projects will each focus on the following areas within the Danube and Black Sea convention countries, with the GEF lead agency shown for each:

- a) Actions to revise and/or create legally binding nutrients and toxics reduction protocols/action plans to the Black Sea Convention in accordance with the Global Programme of Action to Protect the Marine Environment from Land Based Activities (UNEP). For the Danube, strategies and measures for nutrient reduction will be reflected in the ICPDR Action Plan, which will be endorsed and thus become legally binding to the contracting Danube countries under the Danube River Protection Convention (UNDP).
- b) Activities to develop and implement policies and legislation aimed at addressing sectoral causes of nutrient and toxics releases, such as phosphate detergent phase-out, agricultural reform, cleaner production in industry, etc. (UNDP);
- c) Policy and legislative reforms aimed at promoting the protection and restoration of critical nutrient sinks, particularly wetlands and floodplains (UNDP);
- d) Strengthening of the institutional capacities of the Black Sea and Danube Secretariats to build in long-term capacity to understand, address and monitor levels and impacts of transboundary nutrients and toxics (UNDP);
- e) Public awareness raising in support of basin-wide nutrient and toxics reduction efforts (UNDP);
- f) Harmonization of water regulatory standards (in line with EU regulations and new Convention protocols, where applicable) among the Danube/Black Sea basin countries to include similar nutrient and toxics reduction provisions (UNDP);
- g) Development of Black Sea and Danube River basin Monitoring and Evaluation indicators harmonized among countries for process, stress reduction and environmental status indicators (UNDP);
- h) Strengthening of the Information System to allow interactive information exchange and update and development of public area for specific topics of nutrient reduction (UNDP);
- i) Support to further development of NGO activities at national and regional level (UNDP);

- j) Establishment of Small Grants Fund to reinforce community based actions for nutrient reduction with particular attention to agricultural reform projects, wetland restoration and use of lagoons for nutrient reduction (UNDP);
- k) Feasibility studies for a nutrients emission trading system at the national and regional levels. The Black Sea project will coordinate an overall study for the Black Sea basin as a whole while the ICPDR/KfW will carry out a study specific to the Danube River Basin towards the possibility of developing economic instruments for nutrient management in the Danube River Basin (UNDP).

3. *The World Bank-GEF Partnership Investment Facility for Nutrient Reduction*

The Partnership will finance incremental costs associated with the reduction of nutrient loads and discharges into the Danube River, its tributaries, the Black Sea and other rivers which feed it. Three types of projects (or combination thereof) would be eligible for financing under the Partnership:

- a) Wetland restoration or creation, that reduce nutrients discharge or loads;
- b) Reform and improvement of agriculture and land management practices with impact on nutrient use and/or diffuse discharges through run-off;
- c) Wastewater treatment in small communities (normally with a population less than 100,000) and small industries or large ones if opportunity exists.

The Partnership would finance specific components of World Bank or bilateral financed projects. Baseline costs would be covered by a combination of national financing, a World Bank --- or other IFI --- loan and grant funds from other sources. The GEF financed component would leverage additional funds (including national funds) in at least a 1:2 ratio against the amount of the GEF grant. Self-standing GEF-financed projects without a corresponding World Bank loan or bilateral financing could be also considered, in exceptional cases, if important policy reforms would be accomplished by the GEF grant or where national funding, in cash and in-kind, is at least as large as GEF funding (i.e. 1:1 ratio).

Eligible projects must have: (i) the endorsement of the country's GEF focal point; (ii) be included in the country's Black Sea or Danube National Environmental Program and selected as a priority investment; (iii) form part of the Regional Environmental Program, as approved by the respective Commission; and (iv) the proposing country be up to date on contributions to the Black Sea and/or Danube Secretariat(s). This would include an explicit recognition from the countries that the transboundary control of nutrients is a priority issue in their NEAP/NAPs.

As in the case of all GEF financed projects, eligible projects will be prepared, appraised and implemented under the same terms as a regular World Bank project and subject to the standard World Bank review process before being submitted to the GEF Secretariat. Therefore, institutional requirements, sustainability, financial, economic, social and environmental conditionality normally required in World Bank projects would also apply to Partnership projects.

Whenever a project has additional global benefits, such as biodiversity preservation (i.e. through the recovery of a Ramsar site), the existence of such additional benefits would be a positive factor, but not constitute an eligibility criteria, even though it could lead to additional incremental GEF resources. In any case, nutrient removal is the essential eligibility condition for all projects.

The World Bank is preparing the Partnership Investment Facility for Nutrient Reduction proposal for consideration at the May, 2001 meeting of the GEF Council. A figure of approximately \$60 million would be reserved for nutrient reduction investments under the Strategic Partnership as described above. Additional contributions will be solicited from bilateral donors. If approved, the World Bank could then vet projects directly through the GEF Secretariat without having to bring each separate project to Council. Two concepts, Bulgaria Wetland Restoration and Romanian Agricultural Reform, have already been approved as likely components of the investment programme. The GEF Secretariat would review and approve projects based on the criteria summarized above.

The World Bank will also promote the Investment Partnership, the investments it supports and the Strategic Partnership in its country dialogues, include the Black Sea and Danube perspectives in relevant World Bank Country Assistance Strategies (CASs) as they are updated, and promote policies that address nutrient reduction as part of country dialogues. These activities will be closely coordinated with related and supporting activities planned under the Black Sea and Danube Regional Projects.

4. The GEF Dnieper Basin Environment Programme (DBEP):

The Dnieper River transports some 20,000 tons of nitrogen annually to the Black Sea, further exacerbating the Black Sea's eutrophication problem. A GEF project to assist the riparian countries of the Dnieper River (Russia, Belarus and Ukraine) in the development and implementation of a Transboundary Diagnostic Analysis and a Strategic Action Programme for the Dnieper River basin was approved by GEF in March, 1998 and commenced full implementation in September, 2000. Inter alia, the project will assist the Dnieper basin countries in identifying, prioritizing and addressing both point and non-point sources of nutrient and toxics pollution to the Dnieper and the downstream Black Sea, through legal, policy and institutional reforms and priority investments. The GEF Dnieper project is designed to enable full coordination of project activities with the Danube/Black Sea basin Strategic Partnership.

5. Georgia: World Bank GEF Agricultural Development Project II

The overall development objective of the project is to increase agricultural production sustainably, while reducing pollution of natural resources. The project includes reforms targeting prevention of nutrient releases. It represents the first phase of a ten-year Program, to be implemented in three phases, for the reform of on-farm agricultural and environmental practices. Under phase one, GEF would support the costs of implementing measures aimed at improving on-farm environmental practices, such as storage and management of manure water quality monitoring, which over the long term would reduce nutrients from entering the Black Sea.

6. GEF Biodiversity and Medium-Sized Projects in the Danube/Black Sea basin

GEF Biodiversity and Medium Sized Projects in the Danube/Black Sea basin to address nutrients and toxics hot spots and nutrient sinks, test different approaches and catalytically accelerate on-the-ground results. These include:

Biodiversity Projects:

Integrated Coastal Management Project, Georgia (World Bank; WP entry 7/98)

Danube Delta Biodiversity, Romania (World Bank; WP entry 4/92)

Biodiversity Conservation in the Azov-Black Sea Ecological Corridor, Ukraine (World Bank; WP entry 1/98)

Danube Delta Biodiversity, Ukraine (World Bank; WP entry 4/92)

Integrated Biodiversity Conservation and Wetland Management for the Mid-Pripyat River and Floodplains (UNDP, PDF-A)

Integrated Management of the Carpathian River Basins (GEF project concept, OP12)

Medium-Sized Projects:

Transfer of Environmentally Sound Technology (TEST) to Reduce Transboundary Pollution in the Danube River Basin (UNDP; MSP concept approved by GEF December, 1999; brief approved by GEF August, 2000; implementation commenced February, 2001; UNIDO as Executing Agency)

Building Environmental Citizenship to Support Transboundary Pollution Reduction in the Danube: A Pilot Project in Hungary and Slovenia (UNDP; MSP approved November, 1998; implementation commenced April, 2000; Regional Environment Centre as Executing Agency)

7. Nutrient control and reduction Projects executed by European Bank for Reconstruction and Development (EBRD) under the new GEF 'Expanded Opportunities for Executing Agencies':

EBRD's main focus is to identify bankable investment projects together with supporting activities to facilitate these investments. EBRD contributes to pollution reduction in the Danube and Black Sea Basin by financing projects particularly in the municipal and industrial sectors, and by applying environmental appraisal procedures and international environmental standards to all of the Bank's operations in the region.

Danube Pollution Reduction Programme: Financing of Pollution Reduction Projects by Local Financial Intermediaries (IA: UNDP):

The main objective of the project is to facilitate principally small and medium sized private sector investment projects in the industrial and agricultural sector. The project would identify mechanisms, using the Bank's local financial intermediaries within the relevant countries to provide to the private sector financial resources, including loans and GEF grants for eligible components for the reduction of pollutants that are responsible for the degradation of the aquatic environment in the Danube River Basin and the Black Sea. Considering the pilot character of the investments, the proposed project will initially concentrate on Slovenia.

8. Accelerated implementation of environmental management programs for mining related "hot spots" identified by the Danube SAP and TDA.

This activity would support accelerated actions to address "hot spots" in the Danube River Basin and other basins associated with mining operations and tailing ponds. This would allow for targeted investments, consistent with ICPDR proposed actions for prevention and control of accidental pollution, to improve emergency warning systems, develop preventive management programs and undertake selected priority investment actions. The activity would complement ongoing UNEP and EU activities to support the development and implementation of medium and long-term preventive measures for management of operating, decommissioned and abandoned tailing dams at priority "hot spots" in the Danube River Basin. This would provide a mechanism to enhance joint efforts in the Tisza River basin and other areas where similar "hot spots" exist and there is a significant need for improved preventive management programs.

Non-GEF Activities which support the Strategic Partnership:

European Union

The European Union is a major political and financial actor in the Central and Eastern European and NIS area mainly through its enlargement and NIS relations' policies.

The enlargement of the EU to the ten candidate countries of Central and Eastern Europe will involve:

- The adoption and implementation by these countries of the EU environmental legislation and standards as a prerequisite for their entry into the Union
- The financial assistance by the EU to these countries toward the development of the infrastructures necessary for the implementation of the EU legislation

The financial assistance will involve primarily the pre-accession financial instruments PHARE and ISPA.

In March 1998 the Commission, the World Bank and the EBRD signed a Memorandum of Understanding on pre-accession financing. This was updated in March 2000 to take account of the new pre-accession financial instruments (ISPA and SAPARD) and to extend co-operation to cover the NIS countries.

The Memorandum includes commitments to:

- Co-ordinate project implementation;
- Implement co-financing projects jointly which foster the adoption of the EU legislation;
- Identify future co-financing opportunities which could foster accession;
- Be as flexible as possible with the delivery of the grants.

The PHARE-funded Large Scale Infrastructure Facility (€250 million for 1998-99) was developed to co-finance accession-related projects in transport and environment with the international financing institutions (IFIs). Realising that environmental projects would take much longer to put together than transport ones, DG Environment of the European Commission co-operated with the World Bank to develop a pipeline of viable projects to enable environment to take a reasonable share of the new Facility, screening all projects for accession relevance. The result was a substantial list of environmental co-financing projects for 1998 and 1999 (50% of the total Facility).

The **ISPA** instrument has some €500 million a year to spend on environmental infrastructure investment over the period 2000-06. The minimum size of projects is normally €5 million, and there is money for project preparation. Although the ISPA Regulation does not formally require co-financing with the IFIs, this is greatly encouraged. ISPA needs a project pipeline, while the grants could make it easier for the IFIs to lend to the accession countries.

DG ENV is developing a Priority Environmental Investment Programme for Accession (**PEPA**), which aims to develop investment strategies, priorities and a project pipeline for all Community sources of finance and potentially non-Community such as the World Bank. World Bank officials have participated actively at a number of meetings to promote this project.

The EU has concluded Partnership and Cooperation Agreements with each one of the Newly Independent States. In this context it is providing financial assistance through the use of the TACIS programme. The new TACIS Regulation foresees greater assistance on environmental pre-investment activities.

To date Phare and Tacis have contributed about €18 million to the Black Sea Environment Programme and about €8 million to the Danube Environment Programme. The latest €4.6 million Tacis programme to the BSEP is ending in 2000. It gave support to the Black Sea Implementation Unit and to BSEP Activity Centers in Georgia, Russia and Ukraine.

Under the new Tacis Regional Programme 2000 currently under preparation the European Commission is planning on a €12 million Black Sea Investment Support Programme for 2001-2003. The overall objectives of this programme will be :

Investment support

Co-financing with IFIs of pilot investments yielding significant environmental benefits. These might include the following in particular:

- Waste water treatment (including nutrient removal)
- End of pipe industrial discharge treatment (including upstream industrial facilities and oil terminals)
- Grants to new industrial facilities designed to minimise polluting discharges
- Landfills to replace marine waste dumping
- Prevention/remediation of oil spills from shipping
- Construction of harbour facilities

The investments should be available for all riverine countries and would include up-stream as well as coastal sites. Tacis should provide both technical assistance, including project preparation, and investment grants in the form of interest subsidies or otherwise.

Institutional support

Continuation of the work of the Black Sea Commission is of crucial importance for concerted action of the riparian countries to tackle the problems of the Black Sea.

Support may also be included to the three Activity Centres in order to fulfill the regional coordinating role for which they have also been designated . These are:

- Batumi, Georgia: biodiversity monitoring and development of strategy;
- Odessa, Ukraine: water quality monitoring and development of strategy;
- Krasnodar, Russia: coastal zone management.

EU is also anticipating a project on Nutrient Management in the Danube River Basin and its impact on the Black Sea (total cost 3,5 million €) as part of its 5th Framework Programme.

It will be important to seek the close cooperation of the EU programmes in the Danube and Black Sea areas with those of the GEF, the World Bank, the EBRD etc. so that synergies can be found in the execution of these programmes.

European Bank for Reconstruction and Development (EBRD)

EBRD has carried out pre-investment regional and sector studies in the Danube River Basin and technical co-operation projects in Hungary and Romania. The Bank's main focus is to identify and to promote investment projects together with supporting activities to facilitate these investments. The Bank attaches particular importance to promoting environmentally orientated operations in line with its mandate, both through "stand-alone" operations with primarily environmental objectives, such as upgrading of waste water management and solid and hazardous waste management, and also by financing environmental improvements in the industrial often as part of a larger-scale restructuring and modernization investment.

EBRD municipal environmental infrastructure projects under implementation:**Municipal Utilities Development Programme (MUDP) I and II, Romania:**

Water and wastewater sector loans to two programmes covering 6 and 10 cities, respectively. As well as improving the water quality of the Danube River and the Black Sea, the municipal infrastructure investments will also bring the water companies in line with EU environmental standards.

Maribor water and waste-water BOT project, Slovenia:

Loan to finance construction of a wastewater treatment plant in Maribor, Slovenia's second largest city. The project will have a major positive impact on the water quality of the Drava River.

Budapest Waste Water Services, Hungary:

The Bank has invested in the partly privatised Budapest Municipal Sewerage Company (BMSC). BMSC has subsequently developed an environmental action plan which will bring the facilities into compliance over time with both Hungarian and EU environmental standards.

Zaporozhia-Water Utility Development & Investment Programme, Ukraine:

The project is financing investments in the water supply and waste-water sector and enhancing the financial and operational performance of Vodokanal, the municipally owned water and waste-water company of Zaporizhia. The project will reduce discharges of untreated waste water into the Dnieper river and, ultimately, the Black Sea.

Brno-Modrice Waste-Water Treatment Plant, Czech Republic:

Loan to the water utility of the city of Brno to finance the extension and upgrading of the Brno-Modice waste-water treatment plant and part of the city's sewerage network, contributing to the further reduction of the pollution of the River Svratka.

Zagreb landfill rehabilitation, Croatia:

EBRD has funded the rehabilitation of one of the largest uncontrolled landfills in Europe to bring the landfill in line with EU environmental standards. The project includes a leachate collection and treatment facility to prevent discharge into the Sava River, a tributary to the Danube.

EBRD municipal environmental infrastructure projects under preparation:

- Sofia Water, Bulgaria
- Zagreb Waste-water treatment plant, Croatia
- Municipal Environment Loan Facility, Romania
- Sevastopol Water, Ukraine
- Municipal Utilities Development Programme, Ukraine

EBRD industrial projects under implementation:**Slovalco Aluminium Smelter, Slovak Republic:**

EBRD made a loan and took equity to enable the company to complete the construction and operation of a new smelter and to shut down inefficient and polluting aluminium smelters and plants. Slovalco is now in full compliance with EBRD's environmental covenants and is a "zero emission plant", with all process waters being recycled and no wastewater discharges being discharged from the site.

Ambro/Sical, Romania:

An EBRD loan to Ambro to modernise its pulp and paper production facilities is also resulting in improvements in environmental conditions at the plant, including improvements in the treatment of black liquor, waste-water and sludge.

Further examples of EBRD-supported industrial projects under implementation in the water and wastewater management sector in the Danube catchment area are:

- Egis (pharmaceutical industry), Hungary
- Borchodchem (chemical industry), Hungary
- TVK (chemical industry), Hungary
- Petrom (petro-chemical industry), Romania
- Somatra zink smelter, Copca Mica, Romania
- ALRO aluminium smelter, Slotina, Romania
- Phoenix copper smelter, Baia Mare, Romania
- Policolor (print and ink factory), Bukarest, Romania, and Ruse, Bulgaria
- PIRDOP copper smelter, Bulgaria
- Sodi (Solvay-processing), Bulgaria
- Celhart (pulp and paper), Bulgaria.

The Bank has also undertaken environmental investments in the agribusiness sector focusing, typically, on the control of waste-water discharges, the improvement of waste-water treatment and the protection of groundwater.

UNDP Country Cooperation Frameworks/Regional Cooperation Frameworks

UNDP is supporting the Strategic Partnership through interventions under both its Environment and Governance focus areas. Under Environment, during the pilot phase Danube and Black Sea projects UNDP provided over \$2 million in support to Danube/Black Sea basin issues through projects such as:

- Ukraine: Improving Environmental Monitoring Capacity (\$1.099 million; 1995-1999)
- Ukraine: Environmental Impact Assessment Demonstration (\$138,000; 1997-2000)
- Russia: Water Quality Evaluation and Prediction in Areas Affected by the Chernobyl Accident (\$278,000; 1997-2000).
- Georgia: Capacity Building for the Ministry of Environment (\$620,000; 1998-2000)

The Danube/Black Sea Basin Strategic Partnership has a strong focus on facilitating legal, policy and institutional reform in support of transboundary pollution reduction. These new laws, policies and institutions can only be effective if they have the appropriate level of trust, legitimacy and credibility in civil society. In addition, as has been the case in the West, environmental protection is being propelled more and more by public demand. UNDP is supporting the empowerment of individuals and NGOs with skills and information to increase their involvement in the environmental policymaking and enforcement processes. During the Danube and Black Sea pilot phase programs, UNDP provided assistance totaling nearly \$6 million to the Black Sea basin countries in support of governance, democracy and public participation. Sample projects included:

- Regional Umbrella Program to Support Democracy, Governance and Participation in Europe and the CIS (\$2.153 million, 1997-1999)
- Moldova: Governance and Democracy: Strengthening the Judicial and Legislative Systems (\$1.739 million, 1996-1999).
- Georgia: Capacity Building for the Ministry of the Environment (\$0.620 million, 1998-2000).
- Regional Programme on the Environment and Development (\$1.8 million, 1997-1999). National Agenda 21's, policy reforms, institutional strengthening, public participation and networking, strengthening of inter-sectoral cooperation.

In addition, through the GEF Small Grants Programme in Turkey, UNDP supported a survey of monk seals and their habitats along the Black Sea coast, a coastal management programme in the Black Sea province of Trabzon, and a small scale Waste Water and Sanitation Project in the town of Hacimahmutlu.

Through its ongoing support to Environment and Governance in the Central European and CIS countries, UNDP will continue to provide the framework for successful implementation of the key reforms envisioned under the Strategic Partnership. During the five year period of the programme, UNDP will support, inter alia, the following projects which support the goals of the Strategic Partnership:

- Implementing Local Agenda 21's in Turkey: Phase II (includes 3 Black Sea provinces of Trabzon, Samsun and Zonguldak); ~\$100,000.
- Turkey: National Programme for Environmental Management and Sustainable Development (includes efforts to combat desertification); \$100,000.
- Management Planning for Conservation of Fen Mire Biodiversity in Belarus (Dnieper River Basin), \$143,000.
- Ukraine: Promoting and Strengthening Horizontal Cooperation (supports Ukraine's process of triple transition to statehood, democracy and a market-oriented economy by acquainting Ukrainian government officials and policymakers with relevant reform experiences in other countries of the region, Asia and Latin America); \$65,000.
- Support to Economic, Social and Administrative Reforms in Ukraine (aimed at facilitating the implementation of the government's economic, social and administrative reform programme by providing timely and effective expertise to develop and implement policy reform initiatives); \$704,000.
- Czech Republic, Slovakia and Slovenia: National Capacity Building for Sustainable Development (institutional strengthening, integration of SD principles into selected sectoral policies and programmes, enhancing SD awareness); \$300,000.

In addition, the GEF SGP will increase its links with the Black Sea Environment Programme through projects in the Biodiversity and International Waters focal areas. 7 of 33 recently submitted project concepts have direct relevance to Black Sea environmental issues, including protection of the Mersin Fish (*Huso*), a threatened species; raising public awareness to prevent Black Sea pollution; and a small size waste water treatment project in Samsun.

Other Programs:

- World Wildlife Fund: Lower Danube Green Corridor
- Preparation of an Annex to the Danube River Protection Convention for the protection of ecosystems and nature conservation

Future Considerations Under the Strategic Partnership.

Two activities not addressed in this Strategic Partnership will be considered in more detail at a later date and initiated under the Black Sea Regional Project. The first is the Black Sea-Bosphorus Straits-Mediterranean Sea Marine Electronic Highway (MEH) Feasibility Study, and the second an International Waters Fisheries Component. Regarding the MEH, the Black Sea GEF project identified shipping as a transboundary issue and mechanisms needed to support environmental management, and the Secretariat is in a position to set environmental management shipping guidelines, but this effort lends itself to a private sector initiative. A Black Sea transboundary fisheries component will also be considered and integrated into the Strategic Partnership, once selected preparatory activities have been completed by the Black Sea Regional Project.

Annex 1

Transboundary Issues in the Danube/Black Sea Basin

It is widely agreed that regional scale eutrophication driven by excess nutrient inputs, primarily from riverine sources, is the major transboundary issue impacting the Danube/Black Sea basin. As a result of the pollution source inventory conducted during the preparatory work for the Black Sea Strategic Action Plan, it has been possible to gather data on the inputs of dissolved nitrogen and phosphorus compounds to the Black Sea (as of 1995). To the best of our knowledge¹, some 14% of total nitrogen are from Bulgaria, 27% from Romania, 12% from Ukraine, 10% from the Russian Federation, less than 1% from Georgia, 6% from Turkey and about 30% from the non-coastal countries (Austria, Belarus, Bosnia and Herzegovina, Croatia, Czech Republic, Former Yugoslavia, Germany, Hungary, Moldova, Slovakia, Slovenia). In the case of phosphorus, the figures are Bulgaria, 5%; Romania, 23%; Ukraine, 20%; Russia, 13%; Georgia 1%; Turkey 12% and 26%, for the remaining countries, a similar story to that of nitrogen.

According to the GEF Operational Strategy (p.48-49), the GEF strategy is to meet the agreed incremental costs of:

Implementing measures that address the priority transboundary environmental concerns.

Control of land-based sources of surface and groundwater pollution that degrade the quality of international waters....High priority is also placed on abatement of common contaminants such as nutrients,...

The Black Sea Strategic Action Plan states (p.10):

29. A Black Sea Basin Wide Strategy, negotiated with all states located in the Black Sea basin, should be developed to address the eutrophication problem in the Black Sea. The objective of the Strategy should be to negotiate a progressive series of stepwise reductions of nutrient loads, until agreed Black Sea water quality objectives are met. Such a Basin Wide Strategy may also be required to ensure the reduction of inputs of other pollutants into the Black Sea, in particular oil.

30. Given that the Danube is the largest single source of nutrient inputs into the Black Sea, it is imperative that strategies for the reduction of nutrients be adopted for this river.

The Common Platform for the Development of National Policies and Actions under the Danube River Protection Convention (DRPC) (chapter 3.2.4) states:

The eutrophication by nutrients from land-based sources of pollution is one of the most serious environmental problems of the Black Sea, one of the key explanations for its environmental decline and the principal cause for the degradation of the Black Sea environment. The main causes of negative regional effects on the Black Sea ecosystems include:

- *Pollution by untreated municipal and industrial wastes,*
- *Pollution from agricultural activities,*
- *Reduction of wetlands and forested areas.*

In the framework of the DRPC implementation the following goals and objectives have to be achieved:

Strategic Goals:

- *to improve aquatic ecosystems and biodiversity*
- *to maintain and improve water resources quality and quantity (sustainable use)*
- *to prevent, reduce and control water pollution from point and diffuse sources, in particular where hazardous substances and nutrients are involved;*
- *to prevent and control transboundary impact and contribute to the Protection of the Black Sea from land-based pollution sources*

¹ Topping, G., H. Sarikaya and L.D. Mee (1998) Sources of pollution to the Black Sea. In: Mee, L.D. and G. Topping (Eds) (1999 *in press*) Black Sea Pollution Assessment. UN Publications, New York, 380, 280pp

Specific objectives for the main sectors:

- *to ensure biological and advanced waste water treatment in the municipal and industrial sector*
- *to promote the use of BAT and the adoption of BEP in all industries, particularly those involving hazardous substances*
- *to promote the adoption of BEP and sustainable land use in agriculture*

As a result of the severe economic downturn in the region following the political upheavals of the early 1990's, the near collapse of the industrial and agricultural sectors in the Danube/Black Sea basin countries has resulted in some modest short-term reductions in nitrogen and phosphorus inputs to the Black Sea from the Danube and probably other rivers. In recognition of this "window of opportunity" to catalyze improvements in the status of the Black Sea ecosystem, the Joint Danube-Black Sea Technical Working Group identified the following goal for the next seven years:

The long-term goal is for all Black Sea basin countries to take measures to reduce nutrient levels and other hazardous substances to such levels necessary to permit Black Sea ecosystems to recover to similar conditions as those observed in the 1960s.

As an intermediate goal, urgent control measures should be taken by all countries in the Black Sea basin, in order to avoid that discharges of nitrogen and phosphorus to the Black Sea exceed those levels observed in 1997. This will require countries to adopt and declare strategies that permit economic development whilst ensuring appropriate practices and measures to limit nutrient discharge, and to rehabilitate ecosystems which assimilate nitrogen and phosphorus. This target, monitored and reported annually, shall be reviewed in 2007 with a view to considering further measures that may be required for meeting the long-term objective.

The strategy put forth below integrates the technical, policy, legal, institutional and investment frameworks summarized in the preceding sections.

Addressing Danube/Black Sea Basin-wide Eutrophication through Reduction and Sequestering of Nutrient Releases:

The Joint Danube-Black Sea Technical Working Group identified four key measures which could be taken to reduce nutrient discharges to the Danube/Black Sea basin. These include:

1. Reform of agricultural policies to reduce non-point source run-off of fertilizers and manure (buffer zones, manure storage clamps, erosion control, organic agriculture, etc.);
2. Improved municipal and industrial wastewater treatment to capture nutrients, particularly using alternative technologies with low capital and O&M costs (e.g. constructed wetlands, advanced integrated ponding systems, etc.);
3. Rehabilitation of key basin ecosystems (e.g. wetland restoration) to enhance their capacities as nutrient 'sinks';
4. Changes in consumer practices (including use of phosphate free detergents), including legislation (where needed), enforcement and public awareness.

Annex 2

Preserving the Danube/Black Sea basin Environment: A brief history

The Black Sea was formed only seven or eight thousand years ago when changing sea level sent Mediterranean water through the Bosphorus valley into what was until then a large freshwater lake. Human populations emerged and flourished in the basin, with little apparent negative impacts on the Sea or the rivers that feed it. Though not very biologically diverse compared with open seas at similar latitudes, the Black Sea developed remarkable and unique ecosystems, particularly in its expansive northwestern shelf where the sea is relatively shallow. Today, the Danube/Black Sea basin encompasses 17 countries and supports a population of over 160 million people over an area of about ...square kilometers. Over the last 30-40 years, as a result of rapid and largely unsustainable development, industrialization and the 'green revolution', the Black Sea and many of the rivers that feed it have become severely degraded, with effects including:

- Loss of species diversity;
- Severe eutrophication over large areas (particularly in the NW shelf) due to excess inputs of nutrients;
- Declining water quality due to persistent inputs and levels of hydrocarbons and other chemicals from both marine and land-based sources;
- Landscape degradation due to unplanned coastal and watershed development;
- Introduction of exotic species (at least 26 in the Black Sea) with major impacts on the ecosystem and on commercial fisheries;
- Overfishing which together with the environmental factors led to a decrease in the diversity of Black Sea commercial species from 26 species to 6 in less than two decades;
- Increased frequency of outbreaks of waterborne diseases such as cholera and frequent beach closures due to poor coastal water quality.

Donor and National Activity:

Recognizing the declining status of the Danube/Black Sea basin environment, in recent years both the governments of the region and the international community have taken steps to remediate the degradation of the Danube/Black Sea basin and to prevent future impacts through a variety of reforms. Beginning in 1993, the Black Sea Environment Programme (BSEP) was created with both donor and national funding, including major inputs from the GEF and the European Union's TACIS and Phare programs. The BSEP focused on enabling activities, capacity building, and the preparation and approval of regional and national 'Strategic Action Plans' (SAP's). The BSEP focal areas included Emergency Response, Pollution Monitoring, Biodiversity, Integrated Coastal Zone Management, Fisheries, Database Management and Geographic Information System, Environmental Economics and Investments, NGO's, Information and Communication and Policy and Legislation.

Similarly, in 1991, GEF, the European Union and the countries of the Danube River basin created the Environmental Programme for the Danube River Basin (EPDRB), designed to support the Danube countries in their long term objective of improving the environmental management of the Danube river basin. EPDRB supported SAP and NAP preparation, monitoring, collection and assessment of data, emergency response systems, pre-investment studies, institutional strengthening, capacity building and reinforcement of NGO activities.

Concurrently, GEF and other donor-supported environmental protection activities have been underway in other Danube/Black Sea Basin rivers, including the Dnipro (GEF), Dniester (various), Don (World Bank) and Prut (Takis) Rivers, and the Sea of Azov (Dutch).

Legal Framework:

Both the Black Sea and the Danube, the largest river in the basin, have developed and ratified international conventions (Black Sea Convention, Danube River Protection Convention) whose objectives pertain to the prevention of pollution of the Danube/Black Sea basin. The Danube River Protection Convention came into force in October, 1998, the Black Sea Convention in February, 1994. A number of the basin countries are also parties to the UN Economic Commission for Europe's Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Most countries are also party to several other relevant conventions, including the Convention on Biological Diversity, Convention on Wetlands of International Importance (Ramsar Convention). At the national level, numerous policies, laws and regulations exist relating to protection of Danube/Black Sea basin resources, but exhibit a wide range of implementation, compliance and enforcement. In most countries, legislation to address some of the priority problems, especially transboundary ones, identified by the programs noted above is still in its infancy. In the Danube River Basin, most countries, especially those in the accession process to the European Union are actually revising their policy and legal frame for environmental and water protection to be coherent with EU water directives.

Policy Framework:

The BSEP was the first programme to develop a systematic approach to policy development through the application of a Transboundary Diagnostic Analysis and a Strategic Action Plan (SAP). The Black Sea SAP, contains 59 specific commitments on policy regarding measures to reduce pollution, improve living resources management, encourage human development in a manner which does not prejudice the environment, and take steps towards improving financing for environmental projects. In adopting this plan, the Black Sea governments have committed themselves to a process of profound reform in the manner in which environmental issues are addressed in the Black Sea and its basin. Preparation of National Action Plans to operationalize the SAP at the national level is also underway.

Concurrently, the Environmental Programme for the Danube River Basin adopted a Danube River SAP in 1994 (revised in 1999 as a Common Platform for National Policies and Actions under the DRPC) which provides direction and a framework for achieving the goals of regional integrated water management and riverine environmental management expressed in the Danube River Protection Convention. The most recent GEF intervention in the Danube sought to operationalize elements of the SAP and Convention through the preparation of a Pollution Reduction Programme (PRP) which was completed in July, 1999. Over \$5 billion in investments, primarily at the national level and targeting 'hot spots', were identified and project files prepared.

Preparation of a Strategic Action Programme and support to its implementation is also planned in the Dniro River Basin through UNDP-GEF and IDRC assistance.

Institutional Framework

Several emerging or operational institutions have key roles to play in the identification and implementation of activities aimed at the remediation and protection of the Danube/Black Sea basin waters and ecosystems. Key among these are the Commission on the Protection of the Black Sea Against Pollution and the Secretariat of the Black Sea Commission, and the International Commission for the Protection of the Danube River and its Permanent Secretariat, each with responsibility for coordinating implementation of the respective Conventions. The Danube Secretariat and the ICPDR Expert Groups (Monitoring, Laboratory, Information Management Expert Group, Emission Expert Group, Accidental Emergency Warning and Prevention Expert Group and Ad-hoc Expert Group for Implementation of EU Water Framework Directives and River Basin Management) are fully operational and financially sustainable whereas the Black Sea Secretariat has experienced repeated delays in overcoming political and bureaucratic challenges to its establishment. It is hoped that these will be overcome shortly (April, 2000) and the Black Sea Secretariat will come into existence in late 2000 or early 2001. In addition, donor-supported activities have resulted in the creation of non-permanent institutions such as the Black Sea PIU and Danube PCU responsible for coordination of the respective environment programmes.

Investment Framework:

Both the Black Sea and Danube Environment programmes have supported the identification and preparation of investments aimed at remediating and preventing environmental degradation in the Danube/Black Sea basin. Collectively, the 13 countries of the Danube River Basin invested approximately \$560 million in municipal and industrial wastewater treatment, agricultural water pollution reduction, wetlands protection and water resources management in 1997-98. An additional \$4.29 billion in water sector investments is planned for the next 2-5 years. For the Black Sea riparians, a total of nearly \$100 million in water sector investments are underway or near completion.

ANNEX 10 Relevance of the GPA for Land-Based Sources of Pollution in the frame of the DRPC

**STRENGTHENING THE IMPLEMENTATION OF NUTRIENT
REDUCTION MEASURES AND TRANSBOUNDARY
COOPERATION IN THE DANUBE RIVER BASIN**

**ENHANCING INTERNATIONAL COOPERATION AND
LEGAL PROVISIONS FOR REDUCTION OF
NUTRIENT INPUT IN THE DANUBE RIVER BASIN**

REPORT IN SUPPORT OF THE PROJECT BRIEF

AUGUST 2000



**United Nations Development Programme
Global Environment Facility**

Introduction

This study was prepared by a legal consultant to the United Nations Environment Programme / Regional Office for Europe (UNEP/ROE) in the framework of the PDF-B project “Strengthening the Implementation of Nutrient Reduction Measures and Transboundary Cooperation in the Danube River Basin” of the Global Environment Facility (GEF).

The main purpose of the study is to provide recommendations to UNEP on which legal steps are required in order to enhance the implementation of the Global Programme of Action (GPA)¹ in the Danube River basin, with particular focus on the issue of pollution by nutrients.

The paper includes:

- An introduction to the problem of eutrophication in the Danube River and in the Black Sea;
- Description of legal/policy response required or actually undertaken;
- Assessment of implementation of the GPA in the Danube River basin;
- Recommendation of proposed actions to be considered by Danube Basin Countries and stakeholders.

The paper was drawn up in consultation with key stakeholders, such as the Secretariat of the International Commission for the Protection of the Danube River (Secretariat of ICPDR), UNEP/ROE, and the UNEP/GPA Coordination Office. Scientific advice was provided by Professor Helmut Kroiss of the Technical University in Vienna in Austria.

Pollution by Nutrients in the Danube River Basin and in the Black Sea

The Danube and Black Sea Basins

On its way from the Black Forest to the Black Sea, the Danube crosses 11 countries, more than any other river in the world, representing a high diversity of cultural, economic and social characteristics. The Danube is the second largest river of Europe, its catchment area comprises areas in 17 countries and over 800.000 km², which are part of the Black Sea catchment area of an estimated 2.300.000 km². Therefore, the Danube provides for a large part of the input of water - and of pollution - from rivers to the Black Sea.

Eutrophication in the Black Sea

The last decades have seen a considerable increase in the input of nutrients (nitrogen and phosphorus) and into the Black Sea. As a result of eutrophication, excessive alga growth has been observed in areas of the Danube delta and of the Black Sea. The lack of oxygen in the water led to decrease in fish stocks and marine living resources. The peak of eutrophication was reached in the early 1990's. This situation led to the awareness that there is an urgent need for action in order to improve the ecological situation by controlling the release of nutrients into the aquatic environment.

¹ Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, adopted in Washington DC on 3 November 1995

Recent improvements

Since 1992, an improvement of the ecological situation has been observed in the Black Sea. Alga growth has decreased and stocks of certain fish species are slowly recovering. This improvement was mainly due to two factors. In the more upstream countries, efforts that started in the past decades in wastewater treatment and in implementing new agricultural policies are showing effect, resulting in stabilization and reduction of nutrient input. Nevertheless, further efforts will be necessary in agricultural policies as well as wastewater treatment in order to reduce the input of nutrients.

The other, more important factor was the economic transition of the Central and Eastern European Countries. Economic decline resulted in a significant reduction (e.g. estimates of about 15% reduction in total input of N and P to the Danube between 1988/89 and 1992) of pollution from nutrients, mainly due to decrease of agricultural and industrial activity. As economic recovery takes place, it will be a challenge to stabilize and further reduce input of nutrients to a sustainable level.

Main Sources of Nutrients

The main sources of nutrients entering the Black Sea from the Danube come from agriculture (>1/2), from communal discharges (>1/4), from industry and from background sources. Discharges can be from "point sources" (e.g. from communal wastewater discharge, agricultural point source) or from "diffuse sources", such as from agriculture/groundwater infiltration or erosion.

The scientific knowledge about the interrelations of hydrology, pollution and water quality of the Black Sea and Danube basins is constantly improving. The Transnational Monitoring Network (TNMN) and the resulting Danube Water Quality Model (DWQM) produced results, which can provide a sound basis for policy decisions. Nevertheless, many important factors still remain to be solved, e.g. with regard to an exact assessment of national shares of nutrient input into the Danube River.

Towards a Common Policy Response to Pollution by Nutrients and other Pollutants in the Danube River Basin

Background

The Danube basin comprises some of the most performing economies of the European Union, as well as countries with economies in transition, some of them just recovering from a conflict situation. Nevertheless, as demonstrated by the report ² prepared in the framework of this GEF PDF-B project, many DRPC countries are either implementing / approximating to EU legislation, others are planning to harmonize their legislation with the EU *acquis*. Two countries are already members of the European Union (Germany, Austria), some are harmonizing their legislation with a view of joining the EU in the near future (Czech Republic, Hungary, Slovenia) or later (Slovakia, Croatia, Romania and Bulgaria).

FR Yugoslavia and Bosnia Herzegovina find themselves in a special situation, but nevertheless, have expressed their interest of harmonizing their legislation to the EU law and

² "Existing and Planned policies and Legislation relating to Nutrient Control and Reduction", Draft Summary Report for Danube Regional Project, ICPDR-UNDP/GEF, June 2000 e.g., Table 14.5 "Planned Schedule for Approximation of National Legislation to EU Legislation"

policies. Moldova and Ukraine have also expressed the interest of taking into account the aspect of harmonization with EU policies in the development of national policies in the framework of cooperation with the EU in the field of environment protection.

Policy approach of relevant EU legislation

The current state of EU legislation is marked by one major event: the recent adoption of the “European Water Framework Directive”³ (WFD) of 18 July 2000. The Water Framework Directive will reform the EU water policy, setting out a new common approach to water management, as well as common objectives and principles, common definitions and basic measures. It is designed to prevent further deterioration and to protect and enhance the quality and quantity of aquatic ecosystems.

Key elements of the Directive relevant to the reduction of pollution by nutrients or other substances include:

- Protection of all surface waters, including maritime coastal waters, and groundwaters in their quality and quantity with a proper ecological dimension;
- Emissions and discharges to be controlled by a *combined approach* (see below);
- Integrated river basin management across administrative and political borders with coordinated programmes of measures, including the establishment of River Basin Districts and River Basin Management Plans.

The EU Water Framework Directive in its Article 10 stipulates a *combined approach* to be taken for the control of discharges from point and diffuse sources into surface waters. This combined approach includes:

- Emission controls based on Best Available Techniques (BAT);
- Relevant emission limit values;
- In the case of diffuse impacts the controls including Best Environmental Practices (BEP).

Control measures are set out more specifically in several EU Directives, to which the Water Framework Directive makes reference. These directives include, amongst others, the Directive concerning integrated pollution prevention and control (IPPC-Directive), the directive concerning urban waste water-treatment and the directive concerning the protection of waters against pollution caused by nitrates from agricultural sources (“nitrate directive”).

The following table gives an overview of the most relevant EU legal acts:

³ Directive of the European Parliament and of the Council establishing a framework for Community action in the field of water policy

Table 1:
Examples of relevant EU-legislation and underlying principles:

<p>European Parliament and Council Directive establishing a framework for Community action in the field of water policy (“European Water Framework Directive”, WFD)</p>	<ul style="list-style-type: none"> • Combined approach of water quality objective approach and emission limits value approach used to mutually reinforce each other. • Water quality standards • “Good surface water status” to be achieved within 15 years • Use of notions of “Best Available Techniques” and Best Environmental Practices for point and diffuse sources • River Basin Districts and River Basin Management Plans to be established.
<p>Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment.</p>	<ul style="list-style-type: none"> • Emission limitation for treatment and discharge of urban waste water and waste water from certain industrial sectors • Identification of “sensitive areas”, where there is a requirement of appropriate treatment of waste-water for the removal of nutrients
<p>Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources</p>	<ul style="list-style-type: none"> • Reduction and prevention of emission from nitrates from agricultural sources • Designation of “vulnerable zones”. • Establishment of codes of “good agricultural practice” and “action programmes”.
<p>Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control</p>	<ul style="list-style-type: none"> • Integrated prevention and control of pollution from industrial activities • Installation permit shall include emission limit value for relevant pollutants • Emission limit value shall be based on best available techniques (BAT). Additional measures to be taken if required by environmental quality standards

Targets and timeframes of WFD:

- **Prevent deterioration of surface and ground waters;**
- **Achieve good surface and groundwater status within 15 years of entry into force of WFD;**
- **Review of the environmental impact of human activity and Economic Analysis of water use within 4 years of entry into force of WFD;**
- **River Basin Management Plan completed by end of 2004, reviewed every six years.**

Integrated River Basin Management

One of the main innovations of the EU Water Framework Directive (WFD) is to create a single system of water management: the river basin management on the European level, following and complementing positive examples of initiatives taken forward by the States concerned for e.g. the Rhine or Danube basin. This policy is based on the recognition that the best model for a single system of water management is management by river basin – the natural geographical and hydrological unit – instead of according to administrative or political boundaries.

This development is also of particular relevance for the Danube basin. Therefore, several provisions of the WFD merit special consideration.

Establishment of River Basin Districts

The “River Basin District” is the main unit for management of river basins under the WFD. It is composed of the “area of land and sea, made up of one or more neighboring river basins together with their associated groundwaters and coastal waters” (Article 2 para. 15). The EU Member States shall identify river basins and assign them to river basin districts.

A river basin covering the territory of more than one EU Member State shall be assigned to an international River Basin District (Article 3 para. 3 of the WFD).

Conclusion: The Danube Basin will be assigned to an “International River Basin District” by EU and accession countries.

Paragraph 5 of Article 3 stipulates a principle of cooperation for River Basins Districts, which extend beyond the territory of the EU. In this case, the Member States concerned “shall endeavour to establish appropriate coordination with the relevant non-Member States, with the aim of achieving the objectives of this Directive throughout the River Basin District. For international River Basin Districts the Member States concerned shall together ensure this coordination and may, for this purpose, use existing structures stemming from international agreements.

According to Article 18 of the DRPC, the International Commission for the Protection of the Danube River (ICPDR) can, in addition to affairs explicitly entrusted to the International Commission, “deal with all other affairs the Commission is entrusted with by mandate from the Contracting Parties”.

Conclusion: ICPDR could perform coordination of International River Basin District with EU member and non-member countries, when entrusted by mandate from the DRPC Contracting Parties.

River Basin Management Plans

Article 16 of the WFD requires that for each River Basin District a River Basin Management Plan should be elaborated. In the case of an international River Basin District extending beyond the boundaries of the Community, Member States shall endeavour to produce a single River Basin Management Plan.

Where this is not possible, the plan shall at least cover the portion of the international River Basin District lying within the territory of the Member State concerned. The River Basin Management Plan shall cover various elements, which are listed in Annex VII of the WFD.

Conclusion: Danube Countries could consider establishing a joint International River Basin Management Plan for the Danube River basin.

Scope of application

As already stated in the preamble of the WFD, “an effective water policy must take account of the vulnerability of aquatic ecosystems located near the coast and estuaries or in gulfs or relatively closed seas, as their equilibrium is strongly influenced by the quality of inland waters flowing into them”. Consequently, according to Article 1 of the WFD, the “purpose of this Directive is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwaters”, thereby including “coastal waters” into the territorial scope of application of the WFD.

Furthermore, the definition of “surface water” in Article 2 paragraph 1 of the WFD also includes coastal waters. Paragraph 15 of Article 2 stipulates that “associated [...] coastal waters shall be included into the River Basin District. “Coastal waters” are defined by Article 2 paragraph 7 of the WFD as “surface water on the landward side of a line every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters”.

Conclusion: The quality of coastal waters of participating countries should be taken into account in the International River Basin Management Plan.

Environmental Objectives and Water Quality Status

According to Article 4 paragraph 1 subparagraph (a) (i) of the WFD, “Member States shall implement the necessary measures to prevent deterioration of the status of all bodies of surface water”. Subparagraph (a) (ii) stipulates that “Member States shall protect, enhance and restore all bodies of surface water [...] with the aim of achieving good surface water status at the latest 15 years after the date of entry into force of this Directive”.

Conclusion: The International River Basin Management Plan should contain targets and timeframes, including transitional provisions, for the reduction of the pollution by nutrients (and other pollutants).

Protected Areas

According to Article 6 of the WFD, “protected areas” shall be established in each River Basin District. Such protected areas shall include, in particular, “nutrient sensitive areas, including areas designated as Vulnerable Zones under the nitrate Directive and areas designated as Sensitive Areas under the urban waste-water Directive (Paragraph 1 - iv of Annex IV of the WFD).

According to Article 3 paragraph 2 of the nitrates Directive, all known areas of land in their territories which drain into nitrate polluted waters and which contribute to pollution shall be designated as “vulnerable zone”, requiring special action programmes.

The urban waste-water Directive requires that freshwater body, estuary or coastal water which are found to be eutrophic or which in the near future may become eutrophic shall be identified as “sensitive areas” (Annex II-A). Discharges from urban waste water treatment plants (of agglomerations of more than 10.000 persons) situated in the catchment area of a sensitive area, and which contribute to the pollution of such area, are subject to emission limits regarding concentration or for percentage of reduction of nutrients (Article 5, paragraph 5 of urban waste-water Directive).

Conclusion: Danube countries could consider establishing Vulnerable Zones and Sensitive Areas within the basin as Protected Areas under the International River Basin Management Plan.

Table: Some of main innovations of WFD vs. Danube River Protection Convention

	<i>WFD</i>	<i>DRPC</i>
<i>Scope of application</i>	<ul style="list-style-type: none"> Inland surface waters, including transitional waters and <i>coastal waters</i> Groundwater 	Hydrological river basin
<i>Quality standards and objectives</i>	“Good surface waters status” within 15 years (Article 4 paragraph 1 WFD)	To be developed under Article 7 paragraph 4 DRPC
<i>River Basin Management Plan</i>	Yes	No
<i>Protected Areas</i>	Yes	No

Implementation of the Global Programme of Action

Requirements of the Global Programme of Action (GPA)

The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) was adopted by 108 Governments and the European Commission in 1995. It is the response of the international community to the fact that a large part of the pollution of the world's oceans (estimated 80%) is caused by human activities on land. Therefore, marine protection is an issue of everybody, living in a coastal or landlocked country.

By adopting the GPA, States declared that the protection and management of the global water resources has to be based on a basin wide approach. This means that all countries lying within the catchment area of a hydrological basin of a water resource should cooperate to protect the water resource in question.

The GPA is aimed to be “*a source of conceptual and practical guidance to be drawn upon by national and/or regional authorities in devising and implementing sustained action to prevent, reduce, control and/or eliminate marine degradation from land based activities*”.

The GPA gives recommendations for action at the national level, and at the level of regional and international cooperation. Furthermore, the GPA provides guidance for “recommended approaches by source category”, including a chapter on nutrients, which are of particular relevance for this study.

The objectives of the GPA with regard to nutrients are to:

- identify marine areas where nutrient inputs are causing or are likely to cause pollution;
- reduce nutrient inputs into the areas identified;
- reduce the number of marine areas where eutrophication is evident,
- protect and restore areas of natural denitrification.

Action at the national level

Recommendations for Reduction of Pollution from Land Based Sources

On the national level, the GPA lists activities in the following fields, which are valid for reduction of all pollution from land-based activities, some of them being of particular relevance also for nutrient reduction:

- Identification and assessment of problems, such as identification of contaminants and of sources of degradation (e.g., point sources and diffuse sources of pollution), as well as identification of “areas of concern” (ecologically sensitive areas);
- Establishment of priorities for source categories and areas affected;
- Setting management objectives for priority problems, including goals, targets and timetables;
- Identification, evaluation and selection of strategies and measures, including e.g. implementation of best available techniques and best environmental practices, product substitution, waste treatment etc.

GPA Recommendations for Nutrient Reduction

With particular regard to the source category of nutrients, the GPA recommends different national action, policies and measures to be taken at the national levels. The GPA requires:

- the identification of areas where nutrient inputs are likely to cause pollution;
- the identification of point sources and diffuse sources of nutrient input;
- the adoption of appropriate cost-effective policy instruments, including regulatory measures, economic instruments and voluntary agreements, such as activities relates to sewage treatment, integration of best environmental practice (BEP), best available techniques (BAT), integrated pollution prevention and information campaigns;
- to strengthen capacity on the local level (urban development and agriculture);
- scientific research;
- to protect and restore potential natural sinks such as wetlands.

Implementation enhanced by DRPC

A thorough assessment of the nutrients problem and of the action required or undertaken at the national level is included in the report “Five Year National Nutrient Reduction Action Plan”⁴, which has been prepared in the context of the PDF-B phase of the present project. The following table gives an overview of the implementation of some of the key elements of the GPA at the national level regarding nutrients:

	Identification of point / diffuse sources of nutrient input	Nutrient Reduction Plan adopted	Completion of Appropriate Policy instruments	Product substitution of P-free detergents	Need of legislative changes identified
Germany	Yes	No	Partly	Yes	No
Austria	Yes	No	Partly	Yes	No
Czech Republic	Yes	No	Short term		Yes
Slovakia	Yes	No	Mid-term	Control planned	Yes
Hungary	Yes	No	Short term	No plan	Yes
Slovenia	Yes	No	Short term	No plan	Yes
Croatia	Yes	No	Mid-term	No plan	Yes
FR Yugoslavia	Yes	No	Long-term		Yes
Bosnia-Herzegovina	Yes	No	Long-term	No plan	Yes
Romania	Yes	No	Mid-term	In discussion	Yes
Bulgaria	Yes	No	Mid-term	No plan	Yes
Moldova	Yes	No	Long-term	No plan	Yes
Ukraine	Yes	No	Mid-term	No plan	Yes

It can be concluded that the implementation of the GPA is on the way, mainly driven by activities under the DRPC as well as the process of approximation of legislation to EU policies. For example, under the current GEF PDF-B project an exhaustive assessment of sources of nutrient pollution has been prepared, in order to provide the basis for the development of “national nutrient reduction plans”.

All of the Danube countries with two exceptions identified a need for legislative changes on the national level, in order to implement the planned policy reforms for nutrient reduction. The implementation of appropriate policy tools is just at the beginning.

⁴ “Five Year National Nutrient Reduction Action Plan”, draft summary report for the Danube Regional Project, ICPDR – UNDP/GEF, June 2000

A number of measures at the national level remain to be implemented. An effective implementation of a strategy, including identification of problem, establishment of objectives and implementation of activities in line with the guidance contained in the GPA, will be enhanced by the elaboration of national nutrient reduction plans.

Conclusion: Work on elaboration of National Nutrient Reduction Plans has been started under the umbrella of the ICPDR.

Action at the Regional Level

GPA Recommendations for Reduction of Pollution from Land Based Sources

The GPA recognizes that “regional and subregional cooperation and arrangements are crucial for successful action to protect the marine environment from land-based activities”. The objective should be to “strengthen and, where necessary, create new regional arrangements and joint actions to support effective action, strategies and programmes.

The GPA recommends the following activities:

- Participation in international regional and subregional marine and freshwater agreements or arrangements. Where necessary, existing agreements should be strengthened or new ones being negotiated ;
- Effective functioning of regional and subregional arrangements, including securing of funding and cooperation with multilateral financing agencies, adoption of programmes of action, information clearing house, inter-institutional cooperation, cooperation between secretariats and conventions ;
- Adequate secretarial support for regional and subregional agreements.

GPA Recommendations for Reduction of Pollution by Nutrients

Specifically for the issue of eutrophication, the GPA recommends:

- the establishment of common criteria for the identification of eutrophication problems;
- the identification of marine areas where nutrients are causing pollution;
- the identification of areas for priority actions;
- the estimation of uniform approaches to the calculation of anthropogenic nutrient input with the aim of improving estimation of these inputs;
- the development and implementation of programmes for reducing nutrient input, paying particular attention to the agricultural sector;
- to establish mechanisms for assessing the effectiveness of the measures taken; and
- to develop strategies for reducing eutrophication.

Assessment of Implementation

There are two regional conventions in force, which have direct relevance for the protection of the Black Sea:

The Convention on the protection of the Black Sea against pollution was adopted in April 1992 in Bucharest and came into force in 1994. It is not a basin-wide convention, but covers the six Black Sea riparian States.

It is supplemented by a Protocol on the Protection of the Black Sea Marine Environment against Pollution from Land Based Sources, which is an integral part of the Convention.

The assessment of the implementation of the GPA through the Black Sea Convention and the identification of legislative needs is subject of a detailed report prepared by Mr. I. Zrazhevski, consultant to UNEP under the framework of this PDF-B phase. One of the questions arising is whether an assessment of the Black Sea Protocol on land based sources would indicate that it requires amendment in order to enhance implementation of the recommendations of the GPA.

The Danube River Protection Convention (DRPC) was adopted in 1994 and entered into force in October 1998. Its scope covers 13 Danube River countries, most of which have already ratified the Convention. The DRPC is based on the basin-wide approach. As a river basin convention it is “land based” by nature; therefore, its provisions can be directly compared to the LBS Protocols of Regional Seas agreements, including the Black Sea Convention and the Barcelona Convention.

Several subsidiary bodies have been established under the DRPC, which address many of the recommendations of the GPA.

- Accident Emergency Prevention and Warning System Expert Group;
- Emission Expert Group;
- Monitoring Laboratory and Information Management Group;
- Strategic Expert Group; and
- Ad Hoc Expert Group for implementation of EU Water Framework Directive and River Basin Management.

In order to provide an overview of the legal and institutional framework and measures of implementation, a comparative analysis can be done of the above-mentioned regional instruments. The table below lists some of the recommendations of the GPA and the relevant provisions/implementation measures in the two LBS Protocols felt more relevant and the DRPC, as well as the new European system of the WFD.

GPA Recommendations	LBS Protocol 1996 Mediterranean Sea	LBS Protocol Black Sea	WFD	DRPC
	Not yet in force	In force	Entry into force expected 2000	In force
Basin Management Approach	Other States within hydrological basin invited to cooperate in implementation	<ul style="list-style-type: none"> “Coastal” convention. Black Sea Convention is open for accession by other States. Joint Ad Hoc Technical Working Group ICPDR- ICPBS⁵ 	River Basin Districts, including associated coastal waters, to be established	<ul style="list-style-type: none"> Implemented by Articles 1,2 and 3 of the Convention. Joint Ad Hoc Technical Working Group ICPDR-ICPBS
BAT/BEP	Annex IV Protocol	No	<ul style="list-style-type: none"> Article 10 WFD Related EU Directives 	Annex I DRPC
Secretarial Support	Yes	Yes	Yes	Yes
Cooperation in Monitoring	Article 8 of Mediterranean Protocol	Article 15 of Black Sea Protocol	Article 8 WFD	<ul style="list-style-type: none"> Article 9 Monitoring, laboratory and information management expert group. Transnational Monitoring Network (TNMN) and Danube Water Quality Model (DWQM)
Harmonization of emission limitation	Article 7: Common guidelines, standards and criteria to be developed	Article 6: Common guidelines, standards and criteria to be developed	<ul style="list-style-type: none"> Article 10 WFD “Combined approach” Article 11 controls for priority substances and priority hazardous substances Limitations of related EU Directives 	<ul style="list-style-type: none"> Article 7 DRPC: Emission limits and water quality objectives to be developed Emission expert group
Regional Strategic Action Plan adopted for nutrient reduction	Not yet	To be developed under present project	<ul style="list-style-type: none"> River Basin Management Plan to be produced (Article 13 WFD) Programmes of measures (Article 11 WFD) 	Joint Action Plan to be developed under proposed project
Information clearing house	Yes	Yes	Yes	Yes
Implementation of programmes with other international agencies	Yes	Yes	Yes	Yes

⁵ ICPBS: International Commission for the Protection of the Black Sea, “Istanbul Commission”

The Danube River basin - which forms an important hydrological “sub-basin” to the Black Sea basin – is almost entirely covered by the DRPC. The assessment of the implementation of the GPA in the Black Sea basin shows that the DRPC presently offers an appropriate legal framework for the implementation of the GPA on a regional level. The DRPC contains similar provisions, which are contained in the LBS Protocols examined, and which are sometimes more far-reaching than the LBS provisions, e.g., by implementing a basin wide approach for its sub-basin. Therefore, as far as the Danube River basin is concerned, it can be noted that presently the DRPC is supplementing the Black Sea Convention.

Furthermore, the adoption of a common policy approach in line with the EU legislation is providing a considerable impetus to harmonization of policies and to implementation of pollution reduction in the Danube River Basin.

On the side of practical implementation, considerable work remains to be done. The proposed Danube Regional Project proposes implementation measures to be undertaken, which will provide for a reduction in nutrient transport to the Black Sea of estimated 27% for Phosphorus and 14% of Nitrates.

The GPA requires the development of a regional strategy for reduction of pollutants including nutrients. Such action plan should contain the identification and assessment of the problem, the fixing of objectives (such as clear targets and timeframes), measures to achieve these objectives and a mechanism in order to review the effectiveness of the measures taken. Until presently, many activities have been undertaken, but no such regional action plan – which could serve as a common platform for implementation of nutrient reduction measures on the national level - was adopted.

Close co-operation with stakeholders, such as the International Commission for the Protection of the Black Sea (ICPBS), will be required in order to ensure full compatibility of this process with related work currently undertaken, such as the (possible) development of an amended Protocol on land-based sources to the Black Sea Convention. UNEP will continue to play a catalytic role in order to enhance this process.

Conclusions:

- **Most of the action recommended by the GPA is taken by DRB countries in the framework of participation in the DRPC, including its Commission and subsidiary bodies, and by implementing a common policy approach;**
- **The necessary secretarial support is provided by the Secretariat of the ICPDR;**
- **Common platform of action for implementation, such as a Joint Action Programme for the Danube River basin, should be developed and adopted in order to implement pollution reduction measures following the recommendations of GPA.**

Action at the international level

GPA Recommendations for LBS Pollution

Activities at the international level, which are recommended by the GPA, fall into the following categories:

- capacity building, including the mobilization of experience in support of national and regional action, as well as a clearing house mechanism;
- mobilization of financial resources, including the GEF;
- international institutional framework, with UNEP playing a catalytic role between the institutions concerned;
- additional areas of international cooperation, such as waste water treatment and management as well as Persistent Organic Pollutants

GPA Recommendations for Reduction of Pollution by Nutrients

Specifically for the issue of reduction of pollution by nutrients, the following activities are recommended at the international level:

- Participation in a clearing-house for providing information about BEP / BAT to reduce or eliminate causes of eutrophication;
- Strengthening of international programmes for capacity building for identification of areas where eutrophication is causing or is likely to cause pollution, Nutrient control and removal technique, application of BEP in aquaculture and agriculture;
- Technical cooperation for reduction of release of nutrients, including environmentally sound land-use techniques, planning and practices,
- Provision of forums for establishing criteria for determining the circumstances in which nutrients are likely to cause pollution,
- Maintaining existing international quality assurance and quality control procedures relevant to eutrophication.

GPA Strategic Action Plan on Sewage

In the period 2000 – 2001 a major mandated task of the UNEP/GPA Co-ordination Office is to forward and coordinate the implementation of the GPA Strategic Action Plan on Municipal Wastewater. A Global Conference Process is part of this action plan.

The main aim of the Strategic Action Plan is to initiate and facilitate a process, which leads to the development and implementation of national strategies on sewage. An innovative element of this strategy is the exploration of possibilities for public-private partnerships. There are a number of economic sectors, such as tourism, mariculture, and urban development, which can benefit from a healthier environment.

At present, pre-investment studies to identify suitable socio-economic opportunities are being carried out, with the support of the UNEP/GPA Coordination Office, in four regions: the East Asian Seas, the South Asian Seas, Eastern Africa, and the South-East Pacific. In addition, a number of case studies on the environmental, social, and economic benefits of addressing sewage are under preparation.

At a later stage, the UNEP/GPA Coordination Office, in partnership with governments and organizations such as the World Health Organisation, United Nations Centre for Human Settlements (Habitat), and the United Nations Development Programme, will be promoting development and implementation of national strategies on sewage.

Public Participation and Compliance

22 invited Experts of the ECE/UNEP network of Experts on Public Participation and Compliance drew up a “Guidance on Public Participation in Water Management and Framework for Compliance with Agreements on Transboundary Waters”⁶. These guidelines aim at promoting the full and effective implementation of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki 1992, “Water Convention”).

The Guidance on public participation in water management gives recommendations in the field of public participation in decision-making and recommends the development of a

⁶ Published by United Nations, New York and Geneva, 2000

communication strategy for each catchment area. Many of these recommendations are taken into account within the respective regional systems of the Danube and the Black Sea Conventions. UNEP could contribute to this aim by developing a Black Sea basin-wide communication strategy for public awareness, promoting the issue of the reduction of pollution of the Black Sea in the Danube basin and *vice versa*.

The Framework for Compliance recommends the establishment of a compliance review procedure in agreements on transboundary waters in order to facilitate compliance more effectively, as well as to introduce non-confrontational, non-judicial and consultative procedures to review compliance and resolve disputes. So far, no agreement on transboundary waters in the ECE region is currently following developments in global environmental agreements and providing a compliance review procedure.

Assessment of Implementation

A great part of this action is taken into account by the work under the DRPC as well as the Black Sea Convention. The proposed regional project will be a good example for international cooperation undertaken.

A crucial element is the cooperation between the two Commissions, which has led to the setting up – with the assistance of UNDP/GEF and UNEP - of a Joint Ad Hoc Technical Working Group in 1997. One outcome of this cooperation is the preparation of a draft Memorandum of Understanding between the two Commissions, which has not yet been signed.

Taking into account the number of activities, which are planned in relation to Danube and Black Sea Conventions and their close interrelation, further strengthening of this successful co-operation is crucial. UNEP is called upon to play a “catalytic role” in this process.

Furthermore, the synergies between the work of the UNEP GPA Co-ordination Office and the Danube / Black Sea Commissions should be further strengthened and exploited. Part of this cooperation could be the consideration of the future GPA Strategic Action Plan on Sewage, which could be appropriately undertaken in a Joint meeting. Furthermore, it is important that the GPA recommendations will be taken into account when implementing activities in the framework of the Danube and Black Sea Regional projects, e.g. by implementing joint pilot projects. Of particular interest will be to draw upon the experience of the GPA Coordination Office in enhancing public-private partnerships.

UNEP could contribute to the promotion of public awareness on the protection of the Black Sea and Danube by developing and implementing one basin-wide communication strategy, promoting the issue of protection of the Black Sea in the Danube basin and *vice versa*. The Framework for Compliance should be brought to the attention of the Danube and the Black Sea Countries.

Conclusions:

- **Cooperation between Danube and Black Sea Commissions should be continued and strengthened through the work of the Joint Ad Hoc Working Group and the signature and implementation of a MoU between the Black Sea / Danube Commissions;**
- **UNEP shall continue to play a catalytic role between the institutions concerned;**
- **GPA Strategic action plan on Sewage shall be considered by Danube and Black Sea countries in a joint meeting and integrated into implementation activities under ICPDR and ICPBS, e.g. by the joint implementation of pilot projects.**
- **UNEP should develop a common communication strategy for Danube and Black Sea basins;**
- **The Framework of Compliance with Agreements on Transboundary Waters should be brought to the attention of and considered by the Joint Ad Hoc Technical Working Group or a joint meeting.**

Summary of Conclusions:

- The Danube Basin will be assigned to an “International River Basin District” by EU and accession countries;
- ICPDR could perform coordination of International River Basin District with EU member and non-member countries;
- Parties of DRPC could consider establishing a joint International River Basin Management Plan;
- The coastal waters of the participating Danube River Basin countries would have to be taken into account in the International River Basin Management Plan;
- The International River Basin Management Plan should contain targets and timeframes, including transitional provisions, for the reduction of the pollution by nutrients (and other pollutants);
- Danube countries could consider establishing Vulnerable Zones and Sensitive Areas within the basin as Protected Areas under the International River Basin Management Plan;
- Work on elaboration of National Nutrient Reduction Plans has been started under the umbrella of the ICPDR;
- Most of the action recommended by the GPA is undertaken by DRB countries in the framework of participation in the DRPC, including its Commission and subsidiary bodies, and by implementing a common policy approach;
- The necessary secretarial support is provided by the Secretariat of the ICPDR
- There is a need of establishing a common platform of action for implementation, such as a Joint Action Programme for the Danube River basin;
- Cooperation between Danube and Black Sea Commissions should be continued and strengthened via the work of the Joint Ad Hoc Working Group;
- UNEP shall continue to play a catalytic role between the institutions concerned;
- The MoU between ICPDR and ICPDS should be signed and implemented;
- GPA Strategic action plan on Sewage shall be considered by Danube and Black Sea countries in a joint meeting and integrated into implementation activities under ICPDR and ICPBS, e.g. by the joint implementation of pilot projects;
- UNEP should develop a common communication strategy for Danube and Black Sea basins;
- The Framework of Compliance with Agreements on Transboundary Waters should be brought to the attention of and considered by the Joint Ad Hoc Technical Working Group or a joint meeting.

Recommendations

Parties to the DRPC may consider:

- to develop and implement a Joint Action Programme for the Danube River basin, which should serve as a common regional platform for implementation. The Joint Action Programme shall be elaborated with the participation of the ICPBS (or in consultation with the Joint Danube-Black Sea Technical Working Group), in order to achieve complementarity between the Joint Action Programme and the amended Protocol on LBS possibly to be developed under the Black Sea Convention. The Joint Action Programme should include clear objectives and timeframes for reduction of nutrient pollution.
- The Joint Action Programme should aim at establishing a joint International River Basin Management Plan, including the coastal waters of the participating Danube River Basin countries and establishing Vulnerable Zones and Sensitive Areas within the basin as Protected Areas under the International River Basin Management Plan. ICPDR should perform the coordination of the International River Basin District with EU member and non-member countries.
- The Cooperation between Danube and Black Sea Commissions should be continued and the MoU between ICPDR and ICPDS should be signed and implemented. UNEP shall continue to play a catalytic role between the institutions concerned.
- GPA Strategic Action Plan on Sewage shall be considered by Danube and Black Sea countries in a joint meeting and integrated into implementation activities under ICPDR and ICPBS, e.g. by the joint implementation of pilot projects. The Framework for Compliance with Agreements on Transboundary Waters of the ECE/UNEP Network of Experts on Public Participation and Compliance shall be considered by the ICPDR-ICPBS Joint Ad Hoc Technical Working Group or a joint meeting.
- UNEP/ROE should develop a common communication strategy for the Black Sea and the Danube.

Activities for consideration to be undertaken by UNEP

UNEP should inform the Danube and Black Sea Countries (or members of the Joint Danube-Black Sea Technical Working Group) on its activities and call for a meeting. The meeting should consider this report and the similar report for the Black Sea, comment on both of them and recommend UNEP/ROE the follow-up actions. As regards the development of a Joint Action Plan for Danube River basin Countries, the meeting should elaborate on policy issues and advise on the indicators assessing effectiveness of the Joint Action Plan.

ANNEX 11 Causes and Effects of Eutrophication in the Black Sea

DANUBE POLLUTION REDUCTION PROGRAMME

CAUSES AND EFFECTS OF EUTROPHICATION IN THE BLACK SEA

SUMMARY REPORT

JUNE 1999

**Programme Coordination Unit
UNDP/GEF Assistance**

prepared by

Joint Ad-hoc Technical Working Group ICPDR - ICPBS

Preface

The Black Sea is regarded as a regional sea that has been most severely damaged as the result of human activity. Based upon comprehensive studies by scientists, in 1996, Ministers of the Environment from Black Sea countries recognised, amongst other things, that *"The Black Sea ecosystems continues to be threatened by inputs of certain pollutants, notably nutrients. Nutrients enter the Black Sea from land based sources, and in particular through rivers The Danube River accounts for well over half of the nutrient input of the Black Sea. Eutrophication is a phenomenon which occurs over wide areas of the Black Sea and should be a concern to the countries of the Black Sea Basin."* Further more, the Ministers agreed that *"A Black Sea Basin Wide Strategy, negotiated wit all states located in the Black Sea Basin should be developed to address the eutrophication problem in the Black Sea. The objective of the Strategy should be to negotiate a progressive series of stepwise reductions of nutrient loads, until agreed Black Sea water quality objectives are met."*

In order to facilitate the development of such a strategy, it is necessary to have a clear common understanding of the nature of the problem, its causes and the options available for solving it. The purpose of this report is to present, in a concise but accessible manner, evidence linking the development of eutrophication in the Black Sea to the human influenced changes in discharges of dissolved compounds of nitrogen, phosphorus and silicon entering the sea from land based sources.

The present report was prepared taking into account the results of the Joint ad-hoc Technical Working Group established between the International Commission for the Protection of the Black Sea and the international Commission for the Protection of the Danube River. It is a product of the excellent cooperation, which exists between specialists from Black Seas coastal countries and those who represented the Danube Basin in this Group.

A first draft Summary Report has been prepared by Laurence D. Mee, on behalf of UNDP/GEF. This Report was discussed in the 3rd meeting of the Joint as-hoc Technical Working Group on December 10/11, 1998. It has been finalised on the basis of these initial discussions and on additional amendments agreed upon.

The present report is based on the five national reports on additional scientific literature, on reports of the Black Sea Environmental Programme (BSEP) and the Environmental Programme for the Danube River Basin (EPDRB), and on the professional experience of the representatives to the 'Joint as-hoc Group' and additional participant in its Meetings. The above mentioned five natinal reports were commissioned by the UNDP/GEF Danube River Pollution Reduction Programme, each with a title "Report on the Ecological Indicators of Pollution in the Black Sea". The responsibilities for the coordination of the national reports is as follows:

- (a) Bulgaria: Prof. B. Bojanovsky, Gaculty fo Biology, Sofia University;
- (b) Romania: Dr. A Cociasu, Romanian Marine Research Institute, Constanta;
- (c) Russian Federation: Ms. Liubov Stapanova, State Committee for Environmental Protection;
- (d) Turkey: Dr. Ösden Başturk, Institute for Marine Sciences at the Middle East Technical University (METU);
- (e) Ukraine: Dr. Oxana Tarasova, Ministry for Environmental protection and Nuclear Safety.

Overall coordination of the activity of the Joint ad-hoc Technical Working Group was assessed by Joachim Bendow, Project Manager of the Danube Pollution Reduction Programme and Laurence D. Mee from the Black Sea PIU. Chairman of the working sessions were Walter Rust from UNEP, Nairobi and Andrew Hudson from UNDP/GEF, New York. The report was edited by Michael Sokolnikov.

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Executive Summary

The Black Sea Strategic Action Plan, adopted at the Ministerial level in 1998, recognises the phenomenon of eutrophication as one of the principle causes of transboundary degradation of the Black Sea environment. Furthermore, it affirms the need for a coordination of actions across the entire Black Sea drainage basin in order to reduce eutrophication and restore key Black Sea ecosystems. The 'Danube River Protection Convention (DRPC)' is having a 'river basin approach'; it also stresses its responsibility for actions stemming from the River Danube Basin impacting on the Black Sea. Within the Environmental Programme for the Danube River Basin (EPDRB), the relevant Strategic Action Plan was adopted at Ministerial level in December 1994. This SAP makes also reference to the impacts from the River Danube Basin to the Black Sea. With the entry into force of the DRPC on October 22nd, 1998, the tasks and responsibilities of the EPDRB, including the Danube SAP, have been transferred from the former Task Force of the EPDRB to the decision making body charged to implement the DRPC, the ICPDR.

In response to the need to link all states impacting on the Black Sea and the states holding the Black Sea as 'a shoreline resource', a Joint ad-hoc Technical Working Group was established between the 'International Commission for the Protection of the Black Sea – ICPBS – i.e. the Istanbul Commission of the Bucharest Convention' and the 'International Commission for the Protection of the Danube River – ICPDR – i.e. the Vienna Commission of the Sofia Convention'. The 'Group' received its specific TOR, which did not only include eutrophication phenomena, but asked also for the clarifying of issues of hazardous wastes. This 'Group' examined the best available evidence for the problems and their causes and proposes remedial actions. Its findings are summarised in the present report.

Eutrophication is a phenomenon caused by the over-fertilisation of the sea by plant nutrients, usually compounds of nitrogen and phosphorus. The quality of water bodies affected by eutrophication gradually deteriorates and may result in the development of species with low nutritious value to larger animals including fish. It may also lead to severe oxygen depletion and the so-called "dead zones", where no animals can survive, and biological diversity is lost. It has a severe impact on the economy of human populations, amongst other things through fisheries and tourism loss. The Black Sea (i.e. the Black Sea proper plus the Sea of Azov) environment has been severely damaged by eutrophication since the 1970s. Evidence summarised in the present report shows how the structure of the ecosystem was damaged at every level, from plants to fish and mammals. Ukrainian colleagues estimate the losses of bottom animals between 1973 and 1990 as 60 million tons, among them 5 million tons of fish (i.e. 'on average 180.000 t per year'). To which extent this is due to the increased input of nutrients, and to which due to overfishing, is impossible to allocate now. The increased input of nutrients, with the subsequent changes along phototrophic growth, has had negative consequences throughout the Black Sea. It may also have contributed to the success of the comb-jelly *Mnemiopsis*, brought by accident to the Black Sea in the mid 1980s; it attained a biomass of some one billion tons in 1989, causing catastrophic damage to the ecosystem.

Results of extensive studies coordinated by the Black Sea Environmental Programme (BSEP) suggest that over 70% of nutrients entering the Black Sea are transported by major rivers, principally the Danube; however, the atmospheric input was not a part of the balance. A large share of the nutrients entering these rivers comes from Black Sea countries, which are having a shoreline. Because of the BSEP pollution source inventory, it has been possible to gather data on the inputs of dissolved nitrogen and phosphorus compounds to the Black Sea in 1995. However, the following data by Topping, Sarikaya and Mee do not reflect the inputs via the atmosphere. Some 14% of total nitrogen are from Bulgaria, 27% from Romania, 12% from Ukraine, 10% from the Russia Federation, less than 1% from Georgia, 6% from Turkey and about 30% from the non-coastal countries (Austria, Belarus, Bosnia and Herzegovina, Croatia, Czech Republic, Former Yugoslavia, Germany, Hungary, Moldova, Slovakia, Slovenia). In the case of phosphorus, the figures are

Bulgaria, 5%; Romania, 23%; Ukraine, 20%; Russia, 13%; Georgia 1%; Turkey 12% and 26%, for the remaining countries, a similar story to that of nitrogen. The importance of showing these numbers is to illustrate that nobody is “innocent”, not even the Georgians whose low percentage input reflects the current collapse in the coastal economy, probably a temporary feature.

Studies undertaken in the framework of the Environmental Programme for the Danube River Basin suggest the following: (a) About half of the nutrients discharged ‘internally in the Basin to the fine web of the river network’ are from agriculture; (b) somewhat more than one quarter from domestic sources; (c) an additional larger share is from industry; (c) the remainder is from ‘background sources’. The loads of nutrients entering the Black Sea from the Danube have fallen in recent years due to the collapse of the economies of many of the Danubian and former Soviet countries, the measures taken to reduce nutrient discharge in the upper Danube countries, and the implementation of a ban in polyphosphate detergents in some countries.

There is evidence of some recovery in Black Sea ecosystems, but the ecological status of the 1960s is for sure not yet reached. It is widely considered that nutrient discharges are – in line with the expected economic growth - likely to rise again, with consequent damage to the Black Sea, unless action is taken to implement nutrient discharge control measures as part of the economic development strategies.

Based on the reported positive signs (reduced input loads and improved ecological status in the Black Sea shelf), and also aware of the missing knowledge of the comparability of input loads (resolution both in time since the 1960s, and in space all over the Black Sea and the Sea of Azov), and aware that the load reductions are very likely linked with the decline of economic activity in the countries in transition, but that towards the future economic development is expected to take place in the overall Black Sea Basin, the ‘Working Group’ defined in its 2nd Meeting the possible strategies as follows:

- *The long-term goal for all States in the Black Sea Basin is to take measures to reduce the loads of nutrients and hazardous substances to such levels necessary to permit Black Sea ecosystems to recover to conditions similar to those observed in the 1960s.*
- *As an intermediate goal, urgent control measures should be taken by all States in the Black Sea Basin in order to avoid that the discharges of nutrients and hazardous substances into the Seas exceed those, which existed in 1997 ¹. The ‘Group’ recognised that these 1997 discharges are only incompletely known and that further work has to be undertaken to substantiate the size of the loads received by the Seas (Black Sea proper; Sea of Azov).*
- *The ‘Group’ concluded that the inputs of nutrients and hazardous substances into both receiving Seas have to be assessed in a comparable way, and that to this very end a common AQC system and a thorough discussion about the necessary monitoring, including the sampling procedures, has to be set up.*
- *The ‘Group’ also concluded that the ecological status of the Black Sea and the Sea of Azov has to be further assessed, and that the comparability of the data basis has to be further increased.*
- *Both the reported input loads as well as the assessed ecological status will have to be reported annually to both the ICPBS and the ICPDR.*

¹ Loads reported for 1997 to have been transported in River Danube were: orthophosphate, 16,000 tons (as P); total inorganic nitrogen, i.e. the sum of ammonia-N, nitrite-N and nitrate-N, 300,400 tons (as N) [A.Cociasu, 1998]. River scientists indicate that in order to ‘level the impact of river hydrology on the transport of pollutants out’, an averaging over e.g. a span of five years should be undertaken. This would yield for River Danube an ‘averaged load for 1995’ of 12,700 tons per year of orthophosphate-P and 456,000 tons of inorganic nitrogen per year. The corresponding value for 1997 can only be known as soon as the value for 1999 is known.

- *The States within the overall Black Sea Basin shall have to adopt strategies that will permit economic development, whilst ensuring appropriate practices and measures to limit the discharge of nutrients and hazardous substances, and to rehabilitate ecosystems which assimilate nutrients.*
- *Based on the annual reports and on the adopted strategies for the limitation of the discharge of nutrients and hazardous substances, a review shall be undertaken in 2007. It will focus on the further measures that may be required for meeting the long-term objective (reaching an ecological status similar to the conditions observed in the 1960s).*

The actions required to attain these goals need not be costly at this stage and may be achieved through a mechanism of basin-wide joint implementation including country commitments and external grants and loans. They should build on existing initiative where possible. Such actions fall within the following areas:

- Reform of agricultural policies.
- Improved wastewater treatment, where applicable also by alternative technologies.
- Rehabilitation of essential aquatic ecosystems.
- Changes in consumer practices (including use of phosphate-free detergents).
- Establishing of a legal frame.

Suggestions for implementing these actions are made in the report. It is recommended that follow-up activities should be at the policy development and practical project levels:

1. At the policy level. The TOR of the 'Joint *ad-hoc* Group' requires that the Group's Report will be made available to both the International Commission for the Protection of the Black Sea and the International Commission for the Protection of the Danube River, as well as GEF as donor. This Report will be an input to a Meeting between the Black Sea and the River Danube side, at the level of Heads of Delegations. The Heads of Delegations of both Commissions should in such a joint meeting, based on cooperation, consider endorsing the proposal to maintain nutrient levels at or below the loads recorded in 1997, subject to review in 2007. They should also approve a series of practical measures to achieve this goal including a total ban on polyphosphate detergents, clear targets for wetland restoration, an agreement on monitoring, and a mechanism for "joint implementation".
2. At the project level. Donors should establish mechanism(s) to support the agreed policy objectives by funding a series of demonstration projects to share the costs of measures to reduce nutrient discharge following the approach outlined in 10 (above). The approach could use GEF funding to cover the incremental costs of specific projects. The support of donors other than the GEF will be necessary in order to meet the agreed policy objectives. For their part, the Contracting Parties to the Bucharest and Sofia Conventions should ensure that a 'Memorandum of Understanding' is in place for implementing and monitoring the agreed policies. Furthermore, funds should be made available for the important task of raising the awareness of the general public and supporting local initiatives for reducing nutrient discharge or protecting key (aquatic) ecosystems.

1. Introduction to the Problem of Eutrophication

Simply defined¹, the term ***eutrophication*** describes an enrichment in the sea of plant nutrients because of human activity. This enrichment most commonly results in the excessive stimulation of phytoplankton² growth but may also trigger the growth of larger plants (macrophytes) on the sea floor in shallow areas. “Plant nutrients” mainly refers to inorganic compounds of nitrogen and phosphorus, essential for the growth of photosynthetic organisms. They also include dissolved silica, essential for the growth of diatoms, a class mostly consisting of free floating phytoplankton with silica skeletons (almost like tiny glass boxes), as well as micronutrients such as iron and manganese. Though the definition is simple, the phenomenon however, is a complex one because natural variations in the nutrient supply to the aquatic environment are very large.

Nutrient limitation occurs when the presence of one of these substances is insufficient for the continued growth of a particular community or species. Marine systems are generally considered to be nitrogen limited whereas freshwater plankton systems are generally phosphorus limited. This is because several species of freshwater phytoplankton are capable of “fixing” atmospheric nitrogen but, with minor exceptions, this is impeded in marine water. The nutrient requirements of individual species varies however, and a disturbance in the ratio of nitrogen, phosphorus, silica and perhaps iron, will result in changes in the composition of a particular plankton community. In many respects, all four nutrients may be considered as limiting. Lack of silica limits diatoms, for example, a phenomenon first observed in natural blooms off Cape Mendocino in the USA and since observed in the NW Black Sea as a consequence of the construction of inland dams including the Iron Gates dam. Where there are very large supplies of nutrients, light for photosynthesis may be the only mechanism limiting the scale of phytoplankton blooms.

For a better understanding of eutrophication, it is worthwhile to consider the typical ***succession*** of events during the eutrophication process. Firstly, it is important to understand that phytoplankton is not evenly distributed in the sea, neither in space nor time. In the similar manner to plants in temperate woods or meadows, species bloom and fade with changing seasons and are sometimes grazed by animals - only that in the sea, if they are not attached to the sea floor, plants are also at the mercy of tides and currents. The distribution of phytoplankton is patchy and individual species have developed their own particular physiology in order to have a comparative advantage over their competitors. This favours their development under certain optimal conditions. Some have particularly extraordinary adaptations including flagella, which permit them to seek better conditions of light or nutrients, or poisons against those animals that feed on them. It is important to recognise that this “patchiness” makes it difficult to establish baseline (typical) conditions. A large set of observations is necessary in space and time. Furthermore, the examination of spatial and temporal variability of phytoplankton requires laborious work of microscopic identification and counting by dedicated highly trained specialists.

When nutrients are added to the marine environment because of human activities, there is a general increase in the density of phytoplankton communities. At the same time, more subtle changes occur as the species composition adjusts to the new ratio of nitrogen, phosphorus and silica. High nutrients and low light (the plants tend to shade one another) favour smaller species with large amounts of surface chlorophyll. Phytoplankton is relatively short-lived and dies or is grazed by zooplankton and quickly falls to below the depth at which sufficient light can penetrate to promote photosynthesis (the euphotic zone). These cells, together with faecal material from zooplankton are

¹ GESAMP (1990) Review of potentially harmful substances. Nutrients.

IMO/FAO/UNESCO/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Pollution. Rep. Stud. GESAMP, 34, 40 pp. (participant authors: J. Portmann, R. Elmgren, I. Koike, L.D. Mee, M.A. Saad, J. Stirn and A. McIntyre). An alternative wider definition has been proposed by Nixon (Ophelia 41:199-219, 1995): An increase in the rate of supply of organic matter to an ecosystem.

² Phytoplankton are microscopic free-floating aquatic plants.

subjected to bacterial decay, a process that consumes oxygen. In extreme cases, processes of diffusion and mixing are insufficient to replace the oxygen and this becomes depleted to the degree that no animals can survive in the water. This becomes a so-called “dead zone”.

Eutrophication is widely considered a regional problem of global significance. *Hypoxic* or “*dead zones*” have been recognised in many estuaries and coastal waters. A case attracting much recent press attention has been the sea area adjacent to the Mississippi delta in the Gulf of Mexico. By 1997, 16,000 km² of the Gulf of Mexico’s benthic northern shelf had become hypoxic because of nutrient discharges from the Mississippi River, a phenomenon that severely damages the \$3 billion gulf fishing industry³. Much of the nutrient load is derived from the \$98 billion Mississippi basin farm economy - the relative monetary value of these industries giving a clue as to the difficulty for implementing costly nutrient reduction policies. It is equivocal however, to consider that the profits of one sector cannot be achieved without losses in another. High agricultural yields may be obtained without discharging huge amounts of nitrogen and phosphorus to rivers if suitable practices are adopted in response to appropriate incentives.

The problem of eutrophication is not simply limited to extreme events characterised by the formation of “dead zones”. The change in the composition of phytoplankton communities in the sea often affects the entire marine food chain. It may alter the composition of zooplankton, minute animals, which rely upon phytoplankton as food. Zooplankton include some fish larvae and these may be unable to feed on the tiny phytoplankton cells which are characteristic of eutrophication. A typical symptom of eutrophication is an increase in the abundance of jellyfish, which adapt more easily to the altered environmental conditions than other predators such as fish. It has also been associated with an increase in the frequency of blooms of toxic species, sometimes affecting human health. Eutrophication also has direct economic impacts: the aesthetic qualities of seawater are diminished and bathers see the green or brown eutrophic waters as “dirty” and unattractive. In some areas, phytoplankton species may bloom which produce foams in a similar manner to detergents. Beaches close to areas affected by “dead zones” may be strewn with dead animals.

³ Malakoff, D. (1998) Death by suffocation in the Gulf of Mexico. *Science* 281: 190-192.

2. Scientific Information on the Black Sea: Sources, Quality and Techniques of Comparative Study

Scientists have been gathering useful information on the state of the Black Sea ecosystem since the beginning of the present century. This information has, unfortunately, often been very fragmentary and somewhat anecdotal. This is not surprising as marine science was in its “exploratory” phase where a small number of academic specialists dedicated their lives to discovering and classifying the plants and animals in the marine biosphere. There were few co-operative or systematic quantitative studies of how the discovered communities functioned and varied in their composition with time and space. Some specialists however, did conduct “time series” of measurements, in which they studied particular communities or individual species over a relatively long time-span, sometimes representing their entire working lives. These data sets are invaluable jig-saw puzzle pieces, which help to contribute to the overall picture. The sampling methods used do not generally correspond with those employed by modern quantitative biologists but are consistent within each data set and, as trends, are fully comparable. Care must be taken not to over-interpret some of the observations by comparing individual data sets taken using very different methodologies, a particularly important matter when, for example comparing the diversity of zooplankton using different types of net or bottom fauna using different dredging techniques.

Some of the chemical data must be treated with great caution. Prior to the 1960's, methods for measuring phosphate and nitrate suffered from many systematic errors and the methods were rather unreliable, particularly in seawater where chemical interferences from other sea-salts had not been fully recognised. The introduction of simple methods by the groups of Riley (UK) and Grasshoff (Germany) led to a rapid improvement in data quality and comparability. Even so, recent intercomparison exercises conducted in the framework of the CoMSBlack, Danube, and similar programme revealed unacceptable errors of as much as 30% (after the removal of “outliers” - data which is obviously wrong) between analysts. Since the beginning of these exercises however, the quality of the data sets has considerably improved.

So how do we employ older data sets for chemical analyses? The work of validation relies on two principles. The first is internal consistency of the measurements - we have acquired considerable knowledge of the way nutrients vary with space and time and, unless explained by an obvious external source or physical phenomenon, a very “noisy” data set may be treated with suspicion. Secondly, we look for consistency in measurements at deep “reference stations” since the concentration of most nutrients varies very little in the deep sea and the values are rather predictable.

Having said this, great care must be taken not to compare data from cruises with very different densities of measurement points or between years where the studies did not pay regard to seasonal trends. Even the time of day in which observations were made is important in eutrophication studies as vast masses of photosynthetic algae “breathe in and out” as they photosynthesise and respire during the course of a day and oxygen may be “supersaturated¹” during the day and depleted at night. For this reason, comparative records of surface oxygen content are of dubious use unless all the observations were taken at the same time of day (rather unlikely during most oceanographic cruises). Measures of oxygen below the illuminated “euphotic zone” however, are somewhat more reliable as the daily changes due to plant activity are less strongly expressed.

¹ Supersaturation occurs when oxygen is introduced molecule by molecule by plants into water already physically saturated with air through mechanical mixing. Supersaturation of 130% is quite typical in productive coastal waters.

In conducting the present review, data that has not been validated or does not form part of a longer time series has been omitted. Under some circumstances, the information may be useful but for the purposes of the current review, it was decided to adhere to the criteria outlined above.

Some compromises have been made in analysing data. The data on river inputs of nutrients, for example, has often been gathered using an inadequate sampling intensity. The problem is that nutrient loads in rivers vary considerably with time and a “spate” of high discharge may last for just a few days. Such spates may transport large amounts of phosphorus, since this is often associated with sediment particles that are re-suspended more easily when flow rates are high. There is a higher statistical probability of underestimating loads than overestimating them when the sampling frequency is low. It has been suggested that at frequencies of sampling below 52 per year, the sampling error is generally more significant than that of random analytical measurements themselves. This is why river monitoring should be a continuous process at a small number of “key” points.

In the Black Sea, the current economic situation has resulted in the suspension of most programmes for systematic monitoring. The coasts of Russia, Georgia and Bulgaria, for example, have not been systematically monitored since the late 1980's. The monitoring programme in Romania has been maintained however, since the early 1960's and provides a record of the direct causes and effects of eutrophication at the discharge of the River Danube. In the case of Ukraine, there have been a series of research cruises, which though irregular, have occurred annually for several decades. Changes in the network of stations make some of this data difficult to interpret. In Turkish waters, there has never been a regular monitoring network but, since the early 1990s, Turkey has conducted excellent oceanographic research studies, often in co-operation with Ukrainian and US research institutions (with occasional participation of institutions from Bulgaria, Romania and Russia). These have paid considerable attention to data quality control and the application of modern technology, including remote sensing by satellite. Many of the co-operative oceanographic research studies were co-financed by NATO. From 1995-1997, a European Union Project, EROS-2000 (European River-Oceans Systems), worked together with research institutions from Bulgaria, Romania and Ukraine to examine the impact of the Danube River on the NW shelf of the Black Sea and published valuable information. Unfortunately, the study was discontinued owing to lack of EU funding.

Thanks to the earlier systematic studies in the former Soviet Union and Bulgaria, the continuous studies in Romania and the recent work co-ordinated from Turkey, it is possible to piece together evidence for cause and effects of eutrophication in the Black Sea. Regarding studies of the inputs to the Black Sea, the Danube Basin Environmental Programme has sponsored a number of research projects to bring together existing information and to improve the quality of monitoring programmes in the Danube. In the case of the Dnieper, Ukraine has regularly monitored the quality of its waters though the data has not been corroborated by independent quality checks. Direct (point source) inputs to the Black Sea have been studied using the WHO Rapid Assessment Method applied in each Black Sea country by the Black Sea Environmental Programme. There have been estimates of atmospheric inputs of nitrogen compounds by the World Meteorological Organisation (atmospheric phosphate inputs are usually negligible). If countries are to count on information necessary to make adequate management decisions, it will be necessary to maintain and hopefully improve the available monitoring systems.

3. Evidence of Long-term Changes in the Black Sea

We are fortunate that there is one set of measurements of indisputable quality, which allows us to examine the overall pattern of change in the Black Sea over the past seventy years. This is the measurement of water transparency using a device known as the Secchi disk. The Secchi disk is a weighted white disk of standard dimensions that is gradually lowered from the side of a ship by a piece of rope with depth markers. When observed from directly above, it disappears from sight at a depth proportional to the transparency of the water. Most of the changes in transparency in the open sea are due to fluctuations in the amount of phytoplankton present in the water. Almost all scientific expeditions to the Black Sea have routinely conducted these measurements and thousands of such data have been collected by scientists from the Marine Hydrophysical Institute in Sevastopol, Ukraine, covering a period from the 1920s to present¹. The results are illustrated in Figure 1. Though there were inter-annual variations in the mean Secchi Depth (SD) of up to 5 m, depths of over 20 metres (very transparent water) were recorded on several occasions prior to 1972, from when transparency gradually decreased to a minimum of only 6 m in 1991. This was the result of huge blooms of phytoplankton following a major ecological disturbance of the entire Black Sea ecosystem. The transparency has since gradually recovered to values similar to those recorded in the early 1980s.

The reason for some of these changes to occur will be discussed in subsequent sections, the important point to recognise is that changes have been recorded in the entire Black Sea though it will be shown that the most heavily impacted areas are clearly adjacent to the river inputs.

¹ Vladimirov, V.L., V.I. Mankovsky, M.V. Solov'ev and A.V. Mishonov (1997) Seasonal and long-term variability of the Black Sea optical parameters. In: *Sensitivity to Change: Black Sea, Baltic Sea and North Sea*, E. Özsoy and A. Mikaelyan (eds.), Kluwer Academic Publishers, Netherlands

4. The Black Sea Eutrophication Problem in Perspective

The Black Sea is also one of Europe's newest seas. It was formed a mere seven or eight thousand years ago when sea level rise caused Mediterranean water to break through the Bosphorus valley refilling a vast freshwater lake tens of metres below the prevailing sea level. The salty water sank to the bottom of the lake, filling it from below and forming a strong density gradient (known as a pycnocline) between the Mediterranean water on the bottom and the freshwater mixed with some seawater near the surface. The depth of this natural density barrier depended (and still depends) upon the supply of fresh water from rivers and rain, and the energy available from the wind and the sun for mixing it with the underlying seawater. The oxygen in the incoming water was quickly exhausted by the demands of bacteria associated with decaying biota and terrestrial organic material falling through the density gradient into the bottom water. Within a few hundred years, the Sea, below some 100 - 200 metres depth, became depleted of oxygen. The bacterial population switched to organisms capable of obtaining their oxygen by reducing dissolved sulphate to toxic hydrogen sulphide and the resulting water body became the largest volume of anoxic water on our planet.

For several thousand years therefore, only the surface waters, down to the "liquid bottom" pycnocline, have been capable of supporting higher life forms. Though not very biologically diverse compared with open seas at similar latitudes, the Black Sea developed remarkable and unique ecosystems, particularly in its expansive north-western shelf where the sea is relatively shallow. The seabed in this part of the Black Sea was well oxygenated since it is well above the pycnocline. This area, and the adjacent shallow Sea of Azov, also receives the inflow of Europe's second, third and fourth largest river basins, the Danube, the Dnieper and the Don. These rivers transport nutrients and sediments from an area at least five times that of the sea itself. The areas adjacent to the river discharges (including the entire Sea of Azov) were comparatively productive. On the North-western shelf, a particularly unique ecosystem developed, based on the "keystone" benthic (bottom living) red algae, *Phyllophora* sp., which formed a vast bed with a total area equivalent to that of Belgium and The Netherlands. The term "keystone" is not used lightly: like the keystone in the middle of a stone bridge, its removal causes the entire structure to collapse in a precipitous manner. This particular keystone was also a place of great beauty, vast underwater fields of red algae, home to a myriad of dependent animals, linked together in a complex web of life.

Despite its uniquely fragile natural physical and chemical characteristics, the Black Sea ecosystem appears to have been relatively stable. During the first half of the twentieth century, perhaps until three decades ago, there was little evidence of human impact on the Sea or on its flora and fauna. Some changes had occurred however, and these were precursors of much worse events to come. Sensitive monk seal populations, for example, began to decline from the late nineteenth century, driven from their breeding grounds by human activities. Nowadays the rarely sighted minuscule population of these seals seems certainly doomed. Indeed, there is no certainty that any of these animals remain in the Black Sea. Another early change was through the introduction of a number of exotic animal species, introduced by accident from the hulls, bilge or ballast tanks of ships, and which flourished to the detriment of the Black Sea's characteristic fauna. The voracious predatory sea snail *Rapana thomasiana*, for example, arrived from waters around Japan in the mid-1940s and devastated beds of the Black Sea genotype of the common oyster, *Ostrea edulis*. It is one of a list of some twenty-six species introduced through human activity (accidentally or intentionally) since the beginning of the century and which have profoundly altered the Black Sea ecosystem¹.

¹ Zaitsev, Yu., 1992. Recent changes in the trophic structure of the Black Sea. Fish. Oceanogr., 1(2): 180-189

Another gradual change was taking place on the coastlands of the Black Sea. Urban construction occurred in an unplanned and haphazard manner. The Black Sea was an increasingly popular tourist venue, particularly for the peoples of the former Soviet Union and the other Eastern and Central European COMECON countries. This, together with competing demands for space from shipping, industry and coastal settlements (mostly with inadequate waste disposal), placed increasing demands on coastal landscapes. The damming of many rivers brought hydrological changes, particularly through the decrease in sediment flux to the coast, a phenomenon that led to major problems of coastal erosion². This, in turn, was often ineffectively combated by the construction of a very large number of structures to protect beaches (groynes). These further degraded the landscape and exacerbated pollution problems. In the competition for coastal space, the natural environment was the seemingly inevitable loser. The human population has continuously encroached on the ecosystem that it is part of and upon which it depends.

From the late 1960s to the early 1990s, events occurred in the Black Sea that can objectively be considered as an environmental catastrophe³. The strongest single symptom of the catastrophe was the virtual elimination of the *Phyllophora* ecosystem of the Black Sea's north-western shelf in a matter of some ten years. The chain of events leading to the decline of this ecosystem started with an increase in nutrient flux down the major rivers, particularly in the late 1960's when fertiliser use increased markedly as a result of the "Green Revolution". However, there were several issues which coincided. Enabled by the "Green Revolution", primary agricultural produce was converted with an increasing bigger share into meat. This 'meat production' was also undertaken in large-scale industrialised production units, where it became more and more difficult to re-utilise animal manure on fields. At about the same time, urban settlements were increasingly sewered, but nutrients were not removed from sewage concurrently with the expansion of the sewer systems. Furthermore, polyphosphates were introduced into detergent formulations, thus increasing the loads of phosphorus in the loads transported. This increase in the long-distance transport of nutrients brought about a decrease in light penetration in the sea due to the increased intensity of phytoplankton blooms (eutrophication). Deprived of light, the red algae and other photosynthetic bottom dwelling (benthic) species quickly died. Their function was lost as a source of oxygen to the bottom waters of the shelf seas and as a habitat for a wide variety of organisms. The bottom waters of the north-western shelf became seasonally hypoxic (very low oxygen) and even anoxic (no measurable oxygen). Thousands of tons of benthic plants and animals were washed up on the shores of Romania and Ukraine and the seabed became a barren area with a very low biological diversity.

The loss of the north-western shelf ecosystem had an impact on the entire Black Sea. It also coincided with a period of expansion in the fisheries industry and the application of high technology fish-finding hydro-acoustics and more efficient, though unregulated and destructive, purse seining and bottom trawling gear. The consequence was a decrease in the diversity of commercially exploitable fish species from some 26 to 6, in less than two decades. As eutrophication advanced in the Black Sea, the smaller fish species such as anchovies and sprat were favoured since they depend upon the phytoplankton-driven pelagic ecosystem, rather than the benthic one. Furthermore, their predators had often been removed by overfishing or habitat loss. As a consequence, fishing effort switched to these lower value species. Annual catches of anchovy for example, rose from 225,000 tons in 1975 to some 450,000 tons a decade later⁴.

² Kos'yan, R.D., & O.T. Magoon (eds) (1993). Coastlines of the Black Sea. Proceedings of the 8th Symposium on Coastal and Ocean Management, Coastal Zone '93. Coastlines of the World, American Society of Civil Engineers, 573pp.

³ Mee, L.D. (1992) The Black Sea in crisis: The need for concerted international action. *Ambio* 21(4): 278-286.

⁴ MacLennan, D.N., T. Yasuda and L.D.Mee, 1997. Analysis of the Black Sea Fishery Fleet and landings. Black Sea Environmental Programme, Istanbul, 25pp

In the mid-1980s, another exotic species arrived in ship's ballast waters, the ctenophore *Mnemiopsis leidyi*, sometimes known as the comb jelly⁵. This species was brought from the eastern seaboard of America and, without predators, flourished in the eutrophic Black Sea environment where it consumes zooplankton including fish larvae. Perhaps the word "flourished" is an understatement. At its peak in 1989-90, it is claimed to have reached a total biomass of about one billion tons (1,000,000,000 tons wet weight) in the Black Sea, more than the world annual fish harvest! This massive population explosion had an enormous impact on the Black Sea's ecosystems and commercial fish stocks. The loss of zooplankton allowed huge populations of phytoplankton to develop in a series of blooms that reduced the mean Secchi depth (the maximum depth to which a white disk lowered into the sea from a ship remains visible) from the normal average of twenty metres, to only five metres. Anchovy catches plummeted in 1990 to only 60,000 tons.

The situation in the Black Sea was mirrored by another environmental stress on its coasts. The economic decline of the Black Sea coastal countries and the political upheaval of transition to a market economy led to a lack of maintenance of waste treatment facilities for domestic sewage and industrial waste. Of course, many cities had never had effective sewage treatment but the general decline was evidenced by an increased frequency of outbreaks of waterborne diseases such as cholera and frequent beach closures due to unsanitary conditions. In Ukraine, for example, 44% of bathing water samples taken in 1995, did not meet the national microbiological standards⁶. This environmental problem, coupled with the decline in standards of tourism infrastructure and limited spending power of people in the region, also led to a sharp decline in tourist numbers and in the local economies⁷.

The state of the environment in the Black Sea in the early 1990's gave little reason for optimism. The economic crisis did however give some respite for pollution. Farmers were often unable to apply the quantity of fertilisers used in the former centrally planned economies. Many large energy-inefficient and polluting industries were forced to close. By 1996 there was already some evidence of recovery of benthic ecosystems on the north-western shelf of the Black Sea, albeit small. Furthermore, *Mnemiopsis* populations started to decline and the anchovy fisheries recovered, almost to their mid-1980s level. Most local economists and ecologists agree however, the pressure on the environment will return as the economies recover, unless urgent measures are taken to limit the environmental impact of renewed growth. Furthermore, new environmental pressures are emerging as a result of the rapid increase in the use of the Black Sea as a maritime transport route, particularly for the shipment of oil en-route from the newly opened Caspian oil fields.

Recent data⁸ has shown that the current nutrient loading to the Black Sea is much lower than in the period of the seventies and eighties but appears to remain higher than in the 1960s. Data for N and P, observed by the Romanian Marine Research Institute⁹ on Black Sea shelf waters indicate that the phytoplankton growth in the Romanian shelf area seems to be limited by P; this 'observation area' is some 60 km east from Constanta. A cruise of the Turkish Research Vessel Bilim in March and April 1995¹⁰ showed along a transect in this area, and also along two additional transects vertical

⁵ GESAMP (IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection), 1997. Opportunistic settlers and the problem of the ctenophore *Mnemiopsis leidyi* invasion in the Black Sea. Rep.Stud.GESAMP, (58):84p.

⁶ BSEP (1997) Black Sea Transboundary Diagnostic Analysis, (Ed. L.D. Mee) United Nations Publications, New York. ISBN 92-1-126075-2, August 1997, 142pp.

⁷ BSEP (1996) Black Sea Sustainable Tourism Initiative (Background report), Istanbul, Turkey, 322pp.

⁸ see Annex I to the current report.

⁹ For Orthophosphate-P, data are available since 1963, for the sum of inorganic N (ammonium-N, nitrite-N and nitrate-N) since 1980, i.e. the N to P ratio can be observed since 1980.

¹⁰ See the Turkish National Report, coordinated by Dr. Ö. Bastürk.

to the Bulgarian coast, the same results. However, Turkish data ¹¹ show that the Black Sea is in its 'open deep waters' nitrogen limited. These observations are here reported, albeit - as indicated before - marine ecosystems are generally felt to be nitrogen limited. For the decision making process, however, the situation in the Black Sea (Black Sea shelf area; deep waters of the Black Sea) is important.

There is strong evidence of partial recovery of coastal ecosystems, though the recovery does only partially extend to benthic systems or to predatory fish. The remarkable recent decrease in some loads is a result of economic failure of agriculture and industry in coastal countries and to the success of nutrient reduction programmes, particularly phosphate removal, in the upper Danube countries. It has to be assumed that the economic failure in coastal countries is a temporary situation and that it represents a “window of opportunity” for recovery of marine ecosystems and for taking management actions to avoid a return to the previous situation of chronic eutrophication.

There is in general agreement that eutrophication is the most serious medium/long term problem to be overcome in the Black Sea. This problem is certainly not exclusive to the Black Sea. Nitrate reduction policies have had limited success in the countries of the European Union despite new legislation. It is difficult to implement these policies where there are strong divisions between sectors involved in competitive agricultural production and environmental protection and where the public itself is generally unaware of the long-term dangers of a “business as usual” approach.

¹¹ See again the Turkish National Report, coordinated by Dr. Ö. Bastürk.

5. Evidence for the Decline of Black Sea Ecosystems

Annex I to this report is a set of tables which summarise many of the conclusions of the national reports commissioned by the Danube and Black Sea programmes. Care has been taken to review each statement and to qualify it where necessary. The information is presented in sequence of trophic levels, starting with nutrient fluxes and nutrient concentrations in the Sea, and ending with fish. Only very limited information has been presented on fish populations as this was not the main focus of the national reports. Information has been limited to the phenomenon of eutrophication and its biological consequences. No attempt has been made at this stage to examine the causes or to assess the socio-economic impacts.

The information in the tables constitutes a remarkable quantitative account of the collapse of a major ecosystem, largely as a result of eutrophication. The reader will note that the system became destabilised in the early 1970s. The collapse of benthic ecosystems was catastrophic, occurring in the space of less than three years (Romania). The entire ecosystem appears to have switched from one relatively stable state to one of great instability but with a shortening of trophic chains (food chains), particularly favouring the so-called “dead end” species of gelatinous organism. “Dead end” refers to the fact that these organisms have few predators. The consequence is that the system produces more biomass but this has a low food value for fish which are consequently impoverished.

A summary of the switch in the species composition of the ecosystem is given by Zaitsev (1992) and included as Figure 16 for ease of reference. Prior to the onset of eutrophication, the Black Sea included two major interacting ecosystems; a benthic (bottom living) system with “keystone” species of macro-algae (such as *Phyllophora* and *Cystoseira*) and including benthic animals and fish, and a pelagic (upper water column) system supporting a food chain extending to predatory fish and mammals. Eutrophication has virtually excluded the benthic system and severely altered the pelagic one.

The reader will appreciate that the study of eutrophication in the Black Sea is an extremely complex one and that there are a number of gaps to be filled in our current understanding. The current decline in monitoring programmes is a particular cause for concern since the continuity of measurements is essential for determining the effectiveness of future nutrient limitation strategies.

6. Implications of the Study

- The impacts of eutrophication are not limited to the coastal margins. The entire Black Sea ecosystem has been altered by the combination of eutrophication and the intruding of opportunistic alien species.
- There has been some recovery of the Black Sea ecosystem in the past five years but this does not imply that the degradation taken place is now fully reversed. The system has not yet returned to a state similar to the 1960s. It is currently unlikely to do so as some species have disappeared and others have arrived from outside.
- The presence of large biomasses of gelatinous organisms in the Black Sea is a cause for the decline in the health of higher trophic levels, including fish. This presence is made possible by eutrophication.
- Shelf waters south of the outfall of River Danube, and down to the Bulgarian coast, appear to be phosphorus limited from the extremely low concentrations of phosphate in surface waters, see the former quotations. This is not the case for the Central SW Black Sea¹ where surface N/P is below the Redfield ratio².
- Any nutrient reduction possible should be undertaken. The question 'where to put the money first' seems legitimate. However, the full recovery of the Black Sea ecosystems is not merely a matter of reducing phosphate loads (though such reductions may be achieved at a relatively low cost and with a comparatively bigger speed). The ratio of phosphate and nitrate (and in some cases silicate) in the sea should be maintained as close as possible to the natural level (the Redfield ratio) and strategies are necessary for decreasing both nitrate and phosphate inputs to the Sea. There seems currently to be a large excess of total dissolved nitrogen in river inputs.
- Protection of the remaining beds of benthic algae (*Phyllophora*; *Cystoseira barbata*) is important to aid eventual recovery of the benthic ecosystem.
- Increased effort is needed for comprehensive monitoring of the Black Sea and its tributaries if improved Environmental Quality Objectives are to be developed in the future.

¹ For the SW Black Sea, mean phosphate concentrations are 0.12 μM P and mean nitrate is 0.28 μM N (Turkish report).

² The molar algal requirement for N:P is 7:1, which corresponds to a mass ratio (= 'weight ratio') of 15.5:1. It seems that marine scientists use molar ratios, whereas limnologists are used to mass ratios. It is important to be aware of the differences between 'molar ratio' and 'mass ratio'.

7. Sources of Nutrients to the Black Sea and Nutrient Control Programmes

The problem of eutrophication cannot be resolved without integrating the nutrient management strategies of all the States within the Black Sea basin. From a load allocation perspective, this is not an easy matter as the assimilation and conversion processes along the paths of flow are only incompletely known. The Group also recognises that in the case of the Danube Basin, the ICPDR is in charge of the load allocation.

As a result of the pollution source inventory conducted during the preparatory work for the Black Sea Strategic Action Plan, it has been possible to gather data on the inputs of dissolved nitrogen and phosphorus compounds to the Black Sea in 1995. However, the atmospheric input of nitrogen was not taken into account in this inventory. Based on this pollution source inventory and some additional data, [Topping, Sarikaya and Mee]¹ conclude the following:

For total nitrogen, 14% are from Bulgaria, 27% from Romania, 12% from Ukraine, 10% from the Russian Federation, less than 1% from Georgia, 6% from Turkey and about 30% from the non-coastal countries² (Austria, Belarus, Bosnia and Herzegovina, Croatia, Czech Republic, former Yugoslavia, Germany, Hungary, Moldova, Slovakia, Slovenia).

For phosphorus, the figures are Bulgaria, 5%; Romania, 23%; Ukraine, 20%; Russia, 13%; Georgia 1%; Turkey 12% and 26%, for the remaining countries, a similar story to that of nitrogen.

The importance of showing these numbers here is simply to illustrate that nobody is “innocent”, not even the Georgians whose low percentage input reflects the current collapse in the coastal economy, probably a temporary feature.

Romania plays a particularly important role in the discharge of nutrients to the Black Sea. Its entire territory drains into the Black Sea, mostly through the Danube. The industrial and agricultural practices adopted during the former political regime paid little regard to environmental protection, especially in the “green revolution”. Now that the economy of Romania is market-based, many subsidies on fertilisers have been removed and large animal production complexes are closing. The decrease in fertiliser use is beneficial to the environment but unless alternative and cost-effective agricultural practices are adopted, there will be enormous social problems of unemployed farm workers unable to compete with cheap food exports from places where cheaper production techniques are applied and/or fertilizer subsidies still exist. A similar situation prevails in neighbouring Moldova where large animal complexes have also closed but where smallholders now have excessive numbers of animals literally in their back gardens, in very unsanitary conditions. Human health is already declining in these places and shallow wells, the main local water supplies, are polluted. A complete solution to these problems would require a change in consumption patterns themselves - and how can countries with rampant over-consumption in the west demand changes of their poorer neighbours in the east?

Though the biggest single contributor of nutrients to the Black Sea seems to be Romania it contributes less than one third of the total waterborne load. All the States in the Black Sea basin share the responsibility to reduce nutrient loads to the Sea. The Danube river basin has its own management regime, which includes the Danube River Protection Convention (which has entered into force on October 22nd, 1998) and the ‘International Commission for the Protection of the Danube River

¹ Topping, G., H. Sarikaya and L.D. Mee (1998) Sources of pollution to the Black Sea. In: Mee, L.D. and G. Topping (Eds) (*in press*) Black Sea Pollution Assessment. UN Publications, New York, 280pp

² The loads of nutrients discharged into the ‘fine drainage web’ of the river network in a regional drainage area and the ones reaching the receiving Seas will always differ. For the Danube Basin, it will be one of the tasks of the ICPDR to come up with good estimates for the reasons of these differences.

(ICPDR)' charged to implement it, plus a Strategic Action Plan³ developed under the EPDRB, the implementation of which with the DRPC's entry into force is now under the responsibility of the ICPDR. The current 'GEF River Danube Pollution Reduction Programme (GEF-RDPRP)' will help to define new strategies for reducing pollution, including nutrients, in the entire Danube Basin. Similarly, in the Dnieper River (shared by Ukraine, Belarus and Russia), a GEF-supported programme is developing a new Action Plan. Parallel projects have been developed for the Prut river (Taxis funding), the lower Don river (World Bank funding), the Sea of Azov (primarily Dutch government funding) and the Dniester river (various donors).

³ EPDRB (1994) Strategic Action Plan for the Danube River Basin, 1995-2005, Environmental Programme for the Danube River Basin, Vienna, 109pp.

8. Policy Perspectives for Controlling Eutrophication

It is not possible at this stage, and with the limited historical data available on nutrient inputs, to set clear ultimate targets for nutrient reduction. The data set tells us about the historical state of the environment but eutrophication does not follow a linear cause-effect relationship. The collapse of ecosystems seems to have occurred rather abruptly as the system “flipped” from one state to another. However, the partial recovery of parts of the Black Sea ecosystem is encouraging.

The Black Sea Strategic Action Plans takes a pragmatic approach to the issue of pollution control which follows the “paradigm of iterative management”¹. The basic approach is rather simple. Firstly, there has to be a recognition that the integrity of marine and coastal ecosystems and/or human health is threatened by pollution. The complete removal of the threat would be desirable but is often impracticable in the short/medium term for social and economic reasons and an interim strategy is necessary for pollution control. It also requires that there are measurable indicators of ecosystem health. The coastal states (or those of the entire basin in the case of nutrients) as the cooperating partners involved then agree on a short term target for reduction. In the first iteration, the reduction is agreed on the basis of what can reasonably be achieved within a given time frame. The agreement is made on the basis of common but differentiated responsibilities, in this case each partner finds the most economically convenient approach for reaching the agreed target. It is understood from the outset that the first reduction is modest and somewhat empirical. The partners involved also agree on a programme of research and monitoring to refine the estimates of optimal reductions so that - at the end of the first period - new targets may be set with lower uncertainty regarding the outcome. The iterations should continue until all partners agree that the environment is adequately protected. At the same time, public understanding of the issues will also gradually improve, as will the public's demands for tighter criteria for protection and, hopefully, their willingness to pay. This is an open-ended process with a moving target, driven by continuity of observation and reasoning and the full involvement of all stakeholders. Such an approach avoids creating a stark division between “the public” and “the polluters” and seeks a consensus that addresses pollution at its root causes.

This general approach was applied by the “Group” in the following manner:

- by recognising and thus proposing to both Commissions concerned that the ecological status to be aimed at should be similar to the one of the 1960s but that it is not practicable to achieve this in a short time frame;
- by considering that in order to start with, an agreement is needed on the limits of the inputs of nutrients (and in fact also hazardous substances) into the Black Sea (and the Sea of Azov) and on the ecological status related with these inputs;
- to propose to both Commissions to limit the discharges to the Black Sea to the (only partially known) 1997 level, in order to learn to know how the Black Sea ecosystem(s) respond in regard to the already observed improvements.

The purpose of this approach is that there has to be agreement on improving the ‘knowledge base’ for optimal reductions such that at the end of this period, new targets can be set with a better certainty regarding the social and economic implications of the decisions to be taken.

¹ See, for example, Costanza, R., F. Andrade, P. Antunes, M. van den Belt, D. Boersma, D. F. Boesch, F. Catarino, S. Hanna, K. Limburg, B. Low, M. Molitor, J.G.Pereira, S.Rayner, R.Santos, J.Wilson and M. Young (1998). Principles for Sustainable Governance of the Oceans. *Science* 281:198-199

In order to arrive at the goal to further maintain and hopefully improve the ecological status of the Black Sea, the following principles for nutrient management measures and strategies will be necessary:

- Nutrients have to be 'kept on land' where they are needed for phototrophic productivity, and
- they have to be kept away from any waterborne transport.

The latter aim is to limit the phototrophic productivity in the receiving waters to adequate conditions, including the receiving area of the overall Black Sea.

The public understanding of the basic issues involved will hopefully increase in the overall Black Sea Basin over time, as hopefully will the willingness of this public to pay for actions required. In order to arrive there, all 'inlanders' will have to be made aware of what has happened with the ecological status of the overall Black Sea over time, and what – after the signs of improvement since 1992 – has to be avoided towards the future. The public should also know that 'exact values for the permitted discharges to the Black Sea' for the needed good ecological status are not yet known, and that in order to arrive there, solid observations, good scientific reasoning and a full co-operation are needed.

Based on the reported positive signs (reduced input loads and improved ecological status in the Black Sea shelf), and also aware of the missing knowledge of the comparability of input loads (resolution both in time since the 1960s, and in space all over the Black Sea and the Sea of Azov), and aware that the load reductions are very likely linked with the decline of economic activity in the countries in transition, but that towards the future economic development is expected to take place in the overall Black Sea Basin, the 'Working Group' defined in its 2nd Meeting the possible strategies as follows:

- *The long-term goal for all States in the Black Sea Basin is to take measures to reduce the loads of anthropogenically applied nutrients and hazardous substances to such levels necessary to permit Black Sea ecosystems to recover to conditions similar to those observed in the 1960s.*
- *As an intermediate goal, urgent control measures should be taken by all States in the Black Sea Basin in order to avoid that the discharges of nutrients and hazardous substances into the Seas exceed those that existed in 1997². The 'Group' recognised that these 1997 discharges are only incompletely known and that further work has to be undertaken to substantiate the size of the loads received by the Seas (Black Sea proper; Sea of Azov).*
- *The 'Group' concluded that the inputs of nutrients and hazardous substances into both receiving Seas have to be assessed in a comparable way, and that to this very end a common AQC (Analytical Quality Control) system and a thorough discussion about the necessary monitoring, including the sampling procedures, has to be set up.*
- *The 'Group' also concluded that the ecological status of the Black Sea and the Sea of Azov has to be further assessed, and that the comparability of the data basis has to be further increased.*

² Loads reported for 1997 to have been transported in River Danube were: orthophosphate, 16,000 tons (as P); total inorganic nitrogen, i.e. the sum of ammonia-N, nitrite-N and nitrate-N, 300,400 tons (as N) [A.Cociasu, 1998]. River scientists indicate that in order to 'level the impact of river hydrology on the transport of pollutants out', an averaging over e.g. a span of five years should be undertaken. This would yield for River Danube an 'averaged load for 1995' of 12,700 tons per year of orthophosphate-P and 456,000 tons of inorganic nitrogen per year. The corresponding value for 1997 can only be known as soon as the value for 1999 is known.

- *Both the reported input loads as well as the assessed ecological status will have to be reported annually to both the ICPBS and the ICPDR.*
- *The States within the overall Black Sea Basin shall have to adopt strategies that will permit economic development, whilst ensuring appropriate practices and measures to limit the discharge of nutrients and hazardous substances, and to rehabilitate ecosystems which assimilate nutrients.*
- *Based on the annual reports and on the adopted strategies for the limitation of the discharge of nutrients and hazardous substances, a review shall be undertaken in 2007. It will focus on the further measures that may be required for meeting the long-term objective (reaching an ecological status similar to the conditions observed in the 1960s).*

It is clear that placing such a “cap” on nutrient discharges would be a bold step towards restoration of the Black Sea ecosystem. It would give the Black Sea ecosystem a chance to recover and would offer economic benefits for the coastal countries in terms of improved fisheries and tourism. It would also offer global and regional benefits, measured in terms of biological diversity. By contributing to this process, the non-coastal areas within the overall Black Sea’s hydrographic catchment – including those within the River Danube Basin – would also contribute to these non-tangible global benefits.

9. The Danger of Doing Nothing

Holding nutrient inputs at their 1997 levels does not imply “doing nothing”. There is an urgent need to develop agriculture and industry in Black Sea and Danube Basin countries as the present economic and food supply situation is unsustainable. These sectors should be developed in a manner which will afford greater protection to the environment and decreased economic loss from wastage. However, such development will require the commitment and engagement of all concerned and the support of international donors. As will be discussed in a later section, many of the necessary national policies and regulations are already in place but require activation.

Clearly, if nothing is done and the economies will start again to be active by a strong 'principle of materials flow-through', nutrient loads reaching the Black Sea and the Sea of Azov will soon begin to rise again. The weakened ecosystems would degrade again and phenomena such as “dead zones” would return. This could eventually lead again to a loss of biological diversity. It would also inflict economic damage on the nascent tourist industry and affect fisheries in an unpredictable manner.

10. Practical Short-term Measures

How can low-cost practical measures be developed for implementing the agreed goals? In a developing or transition economy, there are many opportunities for implementing nutrient reduction policies without huge capital costs. This is because many of the contaminating industries and practices are already highly inefficient and in need of modernisation as part of a suite of measures for economic reform. The removal of subsidies for fertilisers for example, provides an incentive to reduce wastage and exploit animal manure currently discharged into rivers. In some cases however, new technologies fall short of nutrient removal because they address problems of short-term national interest. Many new municipal wastewater treatment plants (WWTPs) are being planned for example by oxydizing the biodegradable carbon in sewage, but these generally lack provisions for nutrient removal and, despite solving important domestic problems of human health, further exacerbate nutrient discharges. Such WWTPs are a good example of domestic baselines; the cost of adding a nutrient reduction stage would be the incremental cost to address regional and global environmental problems¹. Similarly, a wetlands rehabilitation project, of immense value for biodiversity conservation, may have true additional incremental benefits in the maintenance or enhancement of a capacity for nutrient removal. This “ecosystem service” is rarely taken into account when planning biodiversity projects: the cost of wetlands protection and restoration is an incremental one and maybe a meaningful investment.

The “Group” has discussed some of the low-cost measures that could be taken to prevent increases in nutrient discharge to the Black Sea. Some of these measures will have to be set in the context of a new or revised legal frame, but the “Group” did not discuss this issue in any detail. The recommendations for measures fall into four general categories:

1. ***Reform of agricultural policies.*** The use of market fertiliser has strongly declined in many Danube Basin and NIS² countries due to the current economic crisis. Agricultural production has slumped to unprecedented levels. The sector is currently being restructured in many countries in order to improve its productivity in several cases via assistance from the World Bank. If a return to large increases in nutrient run-off is to be avoided, it is important to include relatively simple policy provisions in the restructuring process. These include such things as leaving strips of unploughed land ('buffer strips') near streams, rivers and lakes; provision of storage clamps for overwinter storage of manure; erosion control through practical demonstration projects, and incentives for “biofarming³”. Regulations concerning buffer zones for streams and rivers are already in place in some countries (eg. Ukraine), but enforcement is still rather poor. Another area requiring attention is freshwater fish farming: extensive (low feeding) aquaculture should be encouraged rather than intensive rearing which has very large nutrient discharges. Intensive farms should be subjected to discharge permits and levies as an incentive for proper treatment of waste. Effective levies should also be imposed on intensive animal rearing facilities that do not treat or recycle their waste.
2. ***Improved waste-water treatment, where applicable through the use of alternative technologies.*** As mentioned earlier, conventional primary and secondary domestic wastewater treatment does not prevent large nutrient discharges. Tertiary treatment

¹ In practice, the matter is more complex. Even if funding can be raised to cover the capital cost of technological removal of phosphorus and nitrogen, the operation and maintenance cost may be virtually unaffordable for many countries in transition or in development. Funds from the GEF might theoretically cover the capital costs but not the operations and maintenance. These issues of sustainability must be carefully considered when prioritizing GEF interventions.

² The term NIS, Newly Independent States, refers to the countries of the former USSR.

³ The term “organic farming” is commonly employed in some countries. In the UK, for example, standards for this practice are set by the Soil Association.

(including nutrient removal) implies high operation and maintenance charges which may be unaffordable under current economic conditions. For small communities, an example of low-cost alternative technology is the use of reed-bed techniques for sewage treatment following screening. This is now also employed for small towns in western countries. This technique has not been successfully applied for larger towns or cities, and it cannot be recommended without adequate feasibility studies. One option that should be properly evaluated for towns in Russia, Georgia and Turkey, is the use of deep discharge diffusers. They can carry wastewater to depths well below the pycnocline (the density gradient at about 100m depth in the Black Sea). With careful design, diffusers can be effective in keeping the nutrients away from the phototrophic zone. With industrial wastewater, nutrient removal should also be a statutory requirement.

3. ***Rehabilitation of key basin (aquatic) ecosystems.*** The creation of protected areas, particularly in the case of wetlands, encourages the natural assimilation of plant nutrients. The reflooding of wetlands results in nutrient removal in two stages - a fast initial removal as aquatic plants grow and then a slower continuous removal as phosphorus is bound into sediments and nitrogen returned to the atmosphere by denitrification. What is presently only partially known is the long-term effectiveness of wetlands for nutrient removal (respectively the 'backholding' of nutrients). The protected or reflooded wetlands serve as biodiversity reserves and productive areas for fisheries. It was also felt that the areas needed for such ecosystem rehabilitation should not only be along the main rivers, but in the overall drainage web. The creation of terrestrial protected areas is also very important as it allows buffer zones to enhance carbon and nitrogen removal. An urgent priority is to afford protection to the remaining areas of marine macro-algae such as the *Cystoseira* beds in Russia or the *Phyllophora* beds in Ukraine in order to seed recovery of the Black Sea's ecosystems. These beds are currently under threat as a result of development of the oil industry (Russia), tourism development (all areas) and trawling (all areas).
4. ***Changes in consumer practices (including use of phosphate-free detergents).*** The prohibition of polyphosphate-based detergents leads to a major reduction in phosphate discharge to aquatic systems. These detergents seem to be already banned in most Danubian countries and the ban should be extended to all Black Sea countries as soon as possible (such a ban should be part of an agreement for cooperation). Public awareness of the eutrophication issue should be raised and clear information provided on modifying the consumer practices that lead to higher nutrient discharges. Awareness should also be raised of the need for protected areas and the consequence of their loss to developers.

11. Follow-up

The work of consolidating the information on eutrophication in the Black Sea, including the Sea of Azov, is still incomplete. There are many gaps to be filled in, and research to be continued. This report integrates a consistent record of change from which the impact of the phenomenon of eutrophication of the Black Sea and the Sea of Azov can be clearly highlighted and practical measures developed for controlling it. There is a broad consensus between specialists from Black Sea and Danubian countries regarding the validity of the observations and deductions.

There are two follow-up actions necessary at this point:

1. At the policy level. The TOR of the 'Joint *ad-hoc* Group' requires that the Group's Report will be made available to both the International Commission for the Protection of the Black Sea and the International Commission for the Protection of the Danube River, as well as GEF as donor. This Report will be an input to a Meeting between the Black Sea and the River Danube side, at the level of Heads of Delegations. The Heads of Delegations of both Commissions should in such a joint meeting, based on cooperation, consider endorsing the proposal to maintain nutrient levels at or below the loads recorded in 1997, subject to review in 2007. They should also approve a series of practical measures to achieve this goal including a total ban on polyphosphate detergents, clear targets for wetland restoration, an agreement on monitoring, and a mechanism for "joint implementation".
2. At the project level. Donors should establish mechanism(s) to support the agreed policy objectives by funding a series of demonstration projects to share the costs of measures to reduce nutrient discharge following the approach outlined in 10 (above). The approach could use GEF funding to cover the incremental costs of specific projects. The support of donors other than the GEF will be necessary in order to meet the agreed policy objectives. For their part, the Contracting Parties to the Bucharest and Sofia Conventions should ensure that a 'Memorandum of Understanding' is in place for implementing and monitoring the agreed policies. Furthermore, funds should be made available for the important task of raising the awareness of the general public and supporting local initiatives for reducing nutrient discharge or protecting key (aquatic) ecosystems.

Annexes

Annex I

Summary of Data Sets Showing Evidence for Eutrophication and Its Effects

Location	Observation period	Change observed	Fig. Ref.	Report/ orig. Ref	Comments
Nutrients					
Estimated values of outflow	1988/92	Estimated values calculated on the basis of the Bucharest Declaration monitoring data. Loads into surface water re-calculated from Danube country reports, with modelled retention. See note regarding assumptions: Annual emissions into surface water (1988/89) 990kt N; 130kt P in 10 out of 13 Danubian States: (1992) 820kt N; 105kt P Flow into Black Sea: (1988/89) 447kt N; 46kt P (1992) 345kt N; 25kt P		EPDRB (1997), Nutrient Balances for Danube Countries - Project EU/AR/102A/91, Final Report	These are estimated values which make assumptions regarding total/inorganic ratios. Quoted errors are typically +/-20%. Data demonstrates effectiveness of river system in decreasing loads to the sea.
Danube outflow, measured in the Sulina channel	1959-1960 and 1980-97	The values presented are yearly ones and thus do not reflect the existing hydrological variations. Inorganic Phosphate load increased ¹ from 12 kt P/yr (1959/60) to a maximum of 30.7 kt P/yr in 1991. Inorganic nitrogen increased from 140 kt N/yr (1959/60) to a maximum of 813 kt N/yr in 1989. Silicate decreased from 790 kt Si/yr (1959/60) to 154 kt Si/yr (1990).		[Rom., Table 1]	These data are calculated from concentration in one branch of the delta times total river flow. This is an estimate of load for the whole river. See footnote on accuracy and source of data.
Danube outflow, as above	1980-97	All mass fluxes presented here are gliding averages over 5 years, with the 'middle year' being representative for the point in time. This 'gliding averaging' is levelling out yearly fluctuations. Increase in inorganic phosphate between 1980-89 from 12.1 kt/yr to 27.8 kt/yr, then decrease to 12.7 kt/yr for 1995. Gradual decrease in total nitrogen discharge from 730 kt N/yr in 1990 to 456 kt N/yr in 1995. Decrease of silicate from 417 kt Si/yr for 1982 down to a range of 234 - 265 kt Si/yr for the years between 1991 to 1995. Mass N/P ratios varied from 50-70 in 1988-92, rising to over 100 in 1993-94 and gradually falling to current values of about 40 Mass Si/P about 40 from 1988-94, then steadily rising to over 110 in 1997 Doubling of nitrate to 1.9 mg/L 65% decrease in inorganic phosphate to 0.27 mg/L Increase of total nitrogen from 31.5kt/yr in 1952-56, to 62.5kt/yr in 1977-81 Irregular trend in phosphorus showing no net increase.	Fig.2	[Rom]	These data are computed from values using very consistent sampling and measurement methodologies. They represent the most up-to-date set of data on the discharge of the Danube (though they are taken from a single site).
Danube (Vilkovo) Kerch Straits (from Azov Sea)	1994 - 96 1952-81		Table 1	[Ukr.] [Rus]	This is a small data set, changes do not represent a statistically valid trend Systematic data sets were kept until 1981 and for rivers until 1986. The input from the Kerch straits was usually about 10% that of the Danube Information from one of the best data sets in the Black Sea region. Full accounts of seasonal variations are found in the Romanian report. Note that onshore P levels were heavily
NW. Shelf (Romanian Sector)	1959-1997 for P and Si; 1980-97 for N	Onshore: Pre 1970 surface PO ₄ values below 0.5 µM then spectacular increase in period from 1971 to 1991 with values from 4-9 µM. Current levels have since declined to about 1µM. Almost no decline in total inorganic nitrogen over period from 1980. Silicates have declined to about 30% of 1960s levels.	Fig. 3 (based on Figs 4 and 5b of	[Rom]	

¹ This change (phosphates) is not statistically significant with this limited data set. Note that the 1959-60 data of Amazov has been questioned by the 'Group' in regard to its 'statistical meaning', as the method of arriving at the loads and as the sampling and analytical procedures involved are not adequately known.

Location	Observation period	Change observed	Fig. Ref.	Report/ orig. Ref	Comments
		N/P ratios have increased from 2-3 (1982-88) to over 15 (1997) Offshore: Pre 1970 surface PO ₄ values below 0.5 µM then spectacular increase in period from 1971 to 1991 with values of up to 2.6 µM. Current levels have since declined to below 0.4µM. Gradual decline in total inorganic nitrogen over period from 1980, currently reaching about 5µM. N/P ratios have decreased from values over 100 (1982-88) to below 50 (1997)	[Rom]		influenced by a fertilizer factory now closed. Offshore changes mirror those of the Danube.
NW Shelf (Ukrainian Sector)	1950-1997	Very similar pattern observed to that of the study in the Romanian sector	Table 2	[Ukr.]	No sampling locations provided - clarification requested from authors of report.
W Shelf (Bulgarian sector, Sozopol station), neritic zone	1987-1996	Sharp decline in phosphate since 1990 (except for single high value in 1996) No clear trend for Nitrate or ammonia		[Bulg]	The frequency of sampling for obtaining this data set is unclear as are the relative errors and the units employed. The similarity with patterns observed in other countries is striking however.
Sea of Azov, Taganrog Bay	1985-89, 1990-95	Inorganic nitrogen halved between the two periods due to reduction in economic production. Total phosphorus and silicates remain approximately the same (nitrates + ammonium averaged 335 µg/L in 1985-89; total phosphorus, 57 µg/L).		[Rus]	No information is given on the sampling network and measurement frequency. The data is included as a contrast to the NW Shelf.
Hypoxia					
Open Black Sea	1970-1998	Suboxic zone enlarging towards the surface by about 0.3-0.4 density units (some 10 metres)		[Tur]	Data from various cruises by US and Black Sea scientists
NW Shelf	1950s - 1995	Hypoxic bottom waters often present on NW Shelf in summer after 1960 and covered up to 15,000 km2 from 7-8 to 35-40m depth in 1980s. They have recently receded to 1960s levels.		[Bastürk] Zaitsev, 1992; EROS-2000 cruise data, 1996]	More research needed on historical data sets to document this phenomenon accurately.
Phytoplankton and chlorophyll					
NW Shelf near Constanta	1983-1997	Chlorophyll - the range of variation for offshore and inshore stations has generally exceeded 50 µg Chl _a /L (some very large values), lower since 1994 with a high in 1997.	Table 3	[Rom]	Unfortunately there are no pre-1983 reference figures. Also median values need to be computed.
Western Black Sea (rim current and central gyre)	1986-1997	Chlorophyll - Large fluctuations but increasing concentrations to 1992, particularly in the rim current. Decrease in both areas after 1994 (slightly higher concentrations in 1996). This is evidence of eutrophication as a basin-wide phenomenon	Figs 4 & 5	[Tur] Yilmaz	Important study based upon the results of ocean-ographic cruises and satellite observations

Location	Observation period	Change observed	Fig. Ref.	Report/ orig. Ref	Comments
NW Shelf near Constanta	1962-1994	As eutrophication has progressed, blooms of microplankton and nanoplankton have become increasingly important. Species of Cyanobacteria (blue-green algae) and coccolithophorads which were rare before 1970 have become frequent or even dominant.	Table 4	[Rom]	The table illustrates the change in species dominance, the Romanian data set is extremely extensive.
Bulgarian Black Sea region (Cape Galata)	1961-97	Huge increase (about 40x) in phytoplankton biomass between period 1961-63 and 1983-90 then 30% decrease to present.	Fig. 6	[Bulg]	This data is based on over 30 years of systematic research. The sampling frequency may mean that some blooms were unsampled.
Bulgarian Black Sea region (Varna Bay)	1954-95	Until 1971, by far the dominant species belonged to the bacillariophyta (diatoms). From 1972 to 1989 dinophyta often dominated as eutrophication advanced. Some recovery of diatoms was noted from 1990 - 93 (the flora is more diverse than previously however) The transition from a stable diatom dominated system to an unstable one was a remarkably sharp one.	Fig. 7	[Bulg] Petrova-Karadjova	An extraordinary time series of seasonal measurements has been made which illustrates the apparent association between eutrophication and changed species composition.
Bulgarian Black Sea region (Varna Bay)	1981-96	Incidence of unusually intense blooms seems to have diminished since 1992. The diversity has also increased (some of the blooms in the mid-1980s were virtually monospecific)	Fig 8	[Bulg]	Author of the report (Moncheva) considers it too early to assert that the system has significantly recovered.
Ukrainian Black Sea region (NW Shelf)	1950-95	Overall decrease in species diversity as a result of eutrophication. Diatoms have decreased in diversity, dinoflagellates have increased (similar observation to Bulgarian colleagues)	Table 5	[Ukr]	Work based upon extensive data set covering over 40 years
Novorossiisk Bay (Russia)	1930s-40s, 1980s-90s	Change from diatom dominated blooms to increasing incidence of dinoflagellate blooms		[Rus]	Report does not include sufficient information to assess the representativity of the data set
Marine macrophytes					
NW Shelf	1960s-80s	Zernov's phyllophora field occupied 11,800 . sq. km in 60s with total biomass of these alga 9 million t. By the end of 70s, the phyllophora biomass was 1.4 million t, but by the end of 80s it did not exceed 0.3 million t and occupied only 500 sq. km. No trace of the field was found in 1998 cruises by Ukrainian scientists.		[Ukr]	Data based upon extensive field observations but requires further updating and revision.
NW Shelf (Romanian and Ukrainian sectors)	1971-79	Disappearance of the "keystone species" <i>Cytoseira barbata</i> (150m wide belt). 5,400 t (fresh weight), 1971; 755t, 1973; 123t, 1979. Similar reports in Ukrainian sector. Cytoseira was replaced with opportunistic species of short life cycle.		[Rom] [Ukr]	Supports notion of sudden collapse of the ecosystem in the early 1970s.

Location	Observation period	Change observed	Fig. Ref.	Report/ orig. Ref	Comments
Zooplankton					
NW Shelf (Romanian sector)	1970 -86	Increase in copepods between decade of the 70s and the 80s. The summer biomass increased by six times. These are food species for <i>inter-alia</i> , sprats, the production of which also increased.	Table 6	[Rom]	This illustrates how the NW shelf ecosystem started to shift from a system dominated by benthic production to a pelagic one as eutrophication advanced.
NW Shelf (Romanian sector)	1980-91	Development of huge blooms, especially in the summer of <i>Noctiluca scintillans</i> , a gelatinous zooplankton which is not considered to contribute to the trophic chain (ie. act as food for larger species). The species has contributed up to 99.8% of the summer biomass.	Tables 7 & 8	[Rom]	As eutrophication advanced further the “dead end” gelatinous organisms were increasingly favoured.
NW Shelf (Romanian sector)	1983-94	Change in seasonality and the decline of zooplankton communities. The arrival of the gelatinous ctenophore, <i>Mnemiopsis</i> seems to have led to the collapse of summer blooms of “fodder zooplankton” (those species which, unlike <i>Noctiluca</i> , can contribute to the marine food chain). This has severe implications for fish populations. Some recovery was noted in 1996-97.	Fig 9	[Rom]	This illustrates how eutrophication can eventually impoverish the food chain.
Bulgarian Black Sea coast	1967-95	Summer biomass of non-gelatinous “fodder” species declined to about 20% of late 1960s values. Noctiluca densities doubled in the same period.	Fig. 10	[Bulg]	Observations in the Bulgarian sector are very similar to those in Romania.
Ukrainian NW Shelf	1950-95	Similar situation to that described for Romanian sector. The “fodder species” in 1992-95 were the lowest since observations first began, the zooplankton communities had become dominated by Noctiluca.	Table 9	[Ukr]	The longest continuous record available highlights the clear pattern shown in other study areas.
Novorossiisk Bay (Russia)	1950-90	Copepods declined from constituting 44% of the biomass in the 50s-60s, to 8.8% at the beginning of the 90s. A sharp four fold increase in the amount of Noctiluca was reported between the 70s and 80s.		[Rus]	The report is sketchy on details but it is clear that profound changes occurred in the eastern Black Sea at the same time as those in the west.
Overall offshore Black Sea	1955-96	Analysis of time series by Turkish scientists together with their own data from recent cruises, illustrates decline of fodder species in the NW Shelf region of the Black Sea, particularly since the late 1980s when Mnemiopsis emerged. This region was the richest in fodder zooplankton in the 1960s but from the 1970s the NE region was equally important. The Turkish data gives evidence of some recovery during the 1990s in the W and SE region. In 1976, 11 of 13 common species of Black Sea copepod were present in Sevastopol Bay; by the 1990 only 6 species remained and only one was present in the summer months.	Fig. 11	[Tur]	This is a useful compilation of offshore data which illustrates the disturbance of the entire Black Sea ecosystem and the reduced availability of fodder for higher trophic levels.

Location	Observation period	Change observed	Fig. Ref.	Report/orig. Ref	Comments
Gelatinous predators (other than Noctiluca)					
Overall Black Sea	1949 - 1990	In the Black Sea the average biomass of the jellyfish <i>Aurelia aurita</i> increased from 670 th.t in 1949-1962 [28] up to 222 ml.t in 1976-1981 [11] and up to 300 - 500 ml.t by the end of 80s. The opportunistic invader <i>Mnemiopsis</i> , arrived in the mid-1980s and developed quickly, by 1989 attaining a total biomass of some one billion tons (wet weight), or 2 kg/m ² ! The eutrophic conditions of the Black Sea favoured the development of this species.	Fig 12	[Ukr] [Tur]	Jellyfish and other gelatinous species are often characteristic of eutrophic ecosystems. The invasion of <i>Mnemiopsis</i> is probably the most devastating case of accidental introduction this century.
Offshore Black Sea	1991-97	<i>Mnemiopsis</i> is still present in large quantities in both E and W parts of the Black Sea. 1997 cruise data reports biomasses of some 600 g/m ² in the E and 300g/m ² in the W. Similar biomasses of the jellyfish <i>Aurelia</i> were also recorded	Fig. 13	[Tur]	These data are for individual cruises and should not be interpreted as annual or seasonal averages. Nevertheless they provide extremely important evidence of the continuation of the <i>Mnemiopsis</i> infestation.
Bulgarian Black Sea region	1997	The ctenophore ² <i>Beroe ovata</i> , which can predate on <i>Mnemiopsis</i> , was first identified in the Black Sea in October 1997. Bulgarian scientists are concerned that this will herald a new invasion.		[Bulg]	The arrival of <i>Beroe</i> has unpredictable consequences. It may act as a control to <i>Mnemiopsis</i> but it may also pose an even greater threat to the existing ecosystem.
Zoobenthos					
NW Shelf (Romanian sector)	1965-1982	Changes in sandy sublittoral : 14 species of polychaete in 1965, 2 in 1982 17 species of amphipod in 1965, 2 in 1982 density of species in 1965 = 100,000 individuals/m ² , 4,000 -60,000 in 1982		[Rom]	These figures are consequences of the changes from benthic dominant ecosystems to pelagic ones as a consequence of eutrophication
NW Shelf (Romanian sector)	pre 1980s-1993	Changes in rocky bottoms : 28 crustacean species before 1980 at 3m depth, 14 in 1993		[Rom]	Report not very strong on benthic studies. Most significant changes noted here.
NW Shelf (Romanian sector)	1977-1980	Catastrophic collapse of communities in muddy bottom habitat: 15 species of crustacean in 1977, 2 in 1980 20 species of mollusc in 1977, 4 in 1980 Biomass reduced proportionally: 30 (1977), 10 (1978), 1 (1980)		[Rom]	Massive loss of species in a three year period
NW Shelf (Romanian sector)	1994-1997	Apparent recovery of species diversity in prodeltaic sector: 1994, 14 species; 1995, 23 species, 1996, 25 species; 1997, 30 species		[Rom]	Gradual recovery confirms the value of nutrient reduction.

² A ctenophore is a tube-like gelatinous organism, sometimes known as a comb-jelly. This organism is a predator of zooplankton including copepods, fish-larvae etc. Both *Mnemiopsis* and *Beroe* are ctenophores, neither of which are native species of the Black Sea. *Mnemiopsis* is believed to have been transported to the Black Sea in the ballast water of a ship, presumably from the eastern seaboard of America.

Location	Observation period	Change observed	Fig. Ref.	Report/ orig. Ref	Comments
NW Shelf (Ukrainian sector)	1973-1990	Mortalities due to hypoxia were estimated as 100-200 t/km ² , including 10% young and adult fishes. Between 1973 and 1990 losses were estimated as 60 million t bottom animals including 5 million.t of fish.	Table 10	[Ukr]	These estimates, coupled with the areas given in the table give a sense of the magnitude of loss of the benthic ecosystem
Coastal area near Novorossiysk, Russia	1960s-1980s	In living <i>Cystoseira</i> beds ³ , there is a relative stability in zoobenthos, especially as compared with the NW shelf.		[Rus]	The importance of keystone species is highlighted with this example.
Fish⁴					
Anchovy populations in the Black Sea	1968-1997	Anchovy stocks and fisheries increased rapidly from the late 1960s to 1988, attaining over 500,000 tons annual catch. With the arrival of <i>Mnemiopsis</i> , the catch plunged to less than 100,000 tons in one year. Since then it has gradually recovered and is currently over 400,000 tons. The recovery is entirely on the S side of the Black Sea (mostly the coast of Turkey) and there is evidence that spawning grounds have switched from the N to the S. Most fish stocks in the NW Black Sea are still depleted. Following the mid-1970s, benthic fish populations (eg. turbot) collapsed and pelagic fish populations (small pelagic fish such as anchovy and sprat) started to increase. This may have resulted from habitat loss as the benthic algal beds were lost. The commercial fisheries diversity declined from some 25 fished species to about five in twenty years (60s to 80s).	Figs. 14 & 15	[Tur]	Figures show catch statistics and larval distribution. The larval distribution studies conducted from Turkey have been very extensive, enabling a clear picture of the recent developments.
Western Black Sea	1965-97				There are two reasons for the collapse of benthic species: eutrophication and overexploitation. Scientific evidence points to eutrophication as the most significant factor.

Information contained in the Annexes I to III is - not for all quotations, but for a large share - based on the reports undertaken for the National Studies furnished by the teams of the shoreline Riparian States (Bulgaria; Romania; Russian Federation; Turkey; Ukraine), see also Annex V.

³ The coast of Russia has intact beds of *Cystoseira*. These have been reduced in size, possibly through oil pollution, but are living remnants of the earlier Black Sea coastal benthic ecosystem.

⁴ The analysis of fish populations has not been attempted in most of the country reports. The reader is referred to the studies of Prodanov et al. (1996) and McLennan et al (1997) for further information.

Annex II

The Supporting Tables 1 to 10

Table 1 **Content of Nutrients in the Danube Water, in micrograms of N or P/l, as indicated, for the station Vylkovo, at Kilia arm, 1994-1996 (from the Ukrainian National Report)**

Compound	1994	1995	1996
N inorganic			
Average	890	1960	1920
Max	1500	2400	2800
Min	260	130	120
P inorganic			
Average	430	190	270
Max	1000	580	90
Min	180	70	100

Table2 **The changes of content of major nutrients(% of measured in the 50-60s.) in the north-western shelf of the Black Sea (from the Ukrainian National Report, original data by Garkavaia G.P., 1998)**

Compounds	1950-1960	1950-1960	1977-1988	1989-1991	1994-1997
	µg per l	%	%	%	%
NH ₄	25,0	100	1780	262	133
NO ₂	2,5	100	216	196	126
NO ₃	10,0	100	424	454	587
N _{organic}	230,0	100	192	237	517
PO ₄	13,5	100	214	248	118
P _{organic}	16,0	100	159	166	77
SiO ₃	1262,0	100	106	73	48

Table 3 **Chlorophyll-a concentrations along the Romanian marine area, in µg/l, and where the highest concentrations are reported for the part just in front of the (now abolished) fertiliser plant discharging phosphates to Sea. (From the Romanian National Report). The control area on the shelf (10 to 30 miles off the coast reported values between 0.04 - 1 µg/l).**

Year	Range of Variation	
	Minimum	Maximum
1983	0.031	85.32
1984	0.1	49.68
1985	0-1.09	62.50
1986	0.12	59.34
1987	0.09	86.91
1990	0.06	35
1991	0.01	96.80
1992	0.13	25.62-292.44
1993	0.06	36.48- 44.64-406.90-427
1994	0.14	3.66
1995	0.18	46.86
1996	0.08	31.58
1997	0.16	58.12

Table 4 Maximum density (in millions of cells/l) produced by dominant species during 1980-1994 (from the Romanian National Report).

Years	62-65	75-77	80	81	82	83	84	85	86	87	90	91	92	93	94
Species															
Skeletonema costatum	0.01 - 82.6	0.01 - 97	40		87.6	3.68	1074016	41.2	50.4	16.5	21.9	0.45	15.0	52.1	53
Cerataulina bergonii				0.80		0.95		0.10	0.56	7.09	11.1	2.73	9.38	9.46	2.13
Detonula confervacea										33.7					
Chaetoceros socialis										53.6				4.13	
Chaetoceros similis					1.38					0.25				0.57	
Cyclotella Caspia	0.032 - 12	0.009 - 9			1.63		0.25	1.29	2.40	0.53	0.65				
Prorocentrum cordatum	1 - 4	10 - 100		421	47.8	6.89	13.5		30.9	164	3.27	115	204		
Heterocapsa triquetra		1.85- 40.5	65.2		3.12		5.35	0.30	7.73					29.5	3.49
Apedinella spinifera		0.014	1.7			21.5						0.40		21.3	2.52
Mantoniella squamata													5.97	1.36	12.5

Table 5 Changes of Phytoplankton Diversity (total number of species) in the north-western shelf of the Black Sea before and after large scale eutrophication (from the Ukrainian National Report; data by Zaitsev, Yu.p. and B.G. Alexandrov, 1998)

Type of Phytoplankton	1954-1960 before eutrophication	1973-1994 after eutrophication
Bacillariophyta	180	116
Pyrrophyta	76	104
Chlorophyta	62	52
Cyanophyta	24	30
Chrysophyta	17	20
Euglenophyta	12	2
Xanthophyta	1	2
Total	372	326

Table 6 Mean values of the densities (D=individuals per m³) and biomass (B=mg per m³) of the pelagic copepods in the Romanian waters of the Black Sea during 1970-1979 and 1980-1986 (from the Romanian National Report, data by PORUMB, 1989).

Period	Winter		Spring		Summer		Autumn		Annual mean	
	D	B	D	B	D	B	D	B	D	B
1970-1979	2502	10.37	1340	7.10	6075	19.90	4742	5.38	4337	14.37
1980-1986	463	14.58	2131	21.67	8267	127.47	9840	81.41	7184	61.59

Table 7 Seasonal mean densities (D = individuals per m^3) and biomasses (B = mg per m^3) of *Noctiluca scintillans* in Romanian continental shelf waters (from the Romanian National Report)

Period	Winter		Spring		Summer		Autumn	
	D	B	D	B	D	B	D	B
1980-1986	16296	1300.86	17086	1367.33	62439	5022.43	40232	3258.77

Table 8 The dominance (share in %) of *Noctiluca scintillans* in the total quantities of summer zooplankton in the Constantza area (from the Romanian National Report)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total density	91.5	94.7	95.6	41.0	91.5	92.3	91.5	97.9	97.5	99.2
Total biomass	95.8	96.7	99.1	34.3	98.3	98.5	98.5	99.9	99.3	99.8

Table 9 Abundance (D = individuals per m^3) and biomass of zooplankton (B = g per m^3) in the period 1950 - 1995 in the north-western part of the Black Sea (from the Ukrainian National Report; data by Zaitsev Yu.P., and B.G. Alexandrov, 1998)

Years	Noctiluca		Copepoda		Cladocera		Total	
	N	B	N	B	N	B	N	B
1950-60	2806	0.16	9897	0.08	1511	0.03	16606	0.37
1961-70	2930	0.17	7177	0.02	727	0.02	19662	0.25
1971-80	43772	2.53	11955	0.06	2657	0.03	63254	2.71
1981-90	60996	4.33	8999	1.09	2670	0.41	111104	6.59
1992-95	14276	0.37	741	0.06	898	0.56	23636	0.93

Table 10 The change over time of the area where hypoxic conditions and bottom animal deaths were observed during the years 1973-1990 (from the Ukrainian National Report; data by Yu.P. Zaitsev, 1992)

Year	Area, th.sq.km	Year	Area, th.sq.km	Year	Area, th.sq.km
1973	3.5	1979	15.0	1985	5.0
1974	12.0	1980	30.0	1986	8.0
1975	10.0	1981	17.0	1987	9.0
1976	3.0	1982	12.0	1988	12.0
1977	11.0	1983	35.0	1989	20.0
1978	30.0	1984	10.0	1990	40.0

(It should be noted that the improvements with the eutrophication process in the Black Sea started after 1990!)

Annex III

The Supporting Figures 1 to 16

Annex IV

The Terms of Reference of the Ad Hoc Joint Technical Working Group

Terms of Reference

Ad Hoc Joint Technical Working Group established between Bucharest¹ and Sofia² Conventions on issues in the Transboundary Waters in the Wider Black Sea Basin

1. Scope of the Working Group

The wide mandate of this 'Joint Technical Working Group' between countries in the Black Sea Basin is to reinforce the cooperation of the States of the Bucharest and Sofia Conventions in relation to taking practical actions to protect the transboundary waters in the wider Black Sea Basin.

2. Objective of the Working Group

To create a common base of understanding and agreement on the changes over time of the Black Sea ecosystem and the reasons for these changes, and to propose practical goals and objectives for remedial actions to address them.

3. Primary Activities of the Working Group

The following tasks are to be achieved by screening existing informations:

- a. Assessment of the nutrient loads to the Black Sea from all sources in the Black Sea Basin, and their impacts on the Black Sea ecosystem;
- b. Assessment of the nutrient loads to the Black Sea from the Danube River Basin, and their impacts on the Black Sea ecosystem, with emphasis on the Black Sea shelf;
- c. Analysis of other types/sources of pollution to the Black Sea, and their impacts on the Black Sea ecosystem, with emphasis on the input from the Danube river;
- d. Assembling and assessing the available information on the likely response of the Black Sea ecosystem to specified reduction in nutrient loads; and
- e. Recommendation of a joint mechanism to evaluate progress over time and to report to both Commissions.

The assessment of the nutrient loads to the Black Sea will include:

- analysis of available water quality data (changes over time of the Black Sea and its ecosystems, including the marine system (including the shelf area) and coastal systems (including the Danube Delta; point and nonpoint discharges to surface waters, with emphasis on the input to the Black Sea;
- analysis of available water quantity data (as a means of determining nutrient loads).

¹ Convention on the Protection of the Black Sea Against Pollution

² Convention on Cooperation for the Protection and Sustainable Use of the Danube River

4. Determination of possible strategies

For the nutrient loads and analysis of other types/sources of pollution, as noted in step (3) above, strategies and approaches for implementation of pollutant reductions must be determined. This will comprise:

- a. Definition of common pollutant reduction goals (particularly nutrients) in the Black Sea Basin;
- b. Assessment of whether or not the implementation plans of Strategic Action Programmes (SAPs) undertaken in the Black Sea Basin are sufficient to achieve the common pollutant reduction goals identified in step(a) above; and
- c. Proposal of recommendations for improvements or amendments to the implementation plans of the SAPs undertaken in the Black Sea Basin to facilitate achievements of the common pollutant reduction goals.

5. Definition of the Working Group and its Reporting Obligations

This 'Joint Technical Working Group' will be constituted upon agreement of both the Black Sea and River Danube Protection Commissions. The opinions expressed in the Group activities are informal and will serve to provide guidance for later decision-making at the level of Heads of Delegations in a proposed Black Sea - River Danube Joint Meeting. The results of the Working Group activities will be taken into consideration in developing the River Danube Pollution Reduction Programme. Every representative in the Working Group has one position in regard to the issues being addressed (i.e., States that participate in both the Danube River and the Black Sea Commissions can only have one position). The findings of the Working Group are not for public release, and upon completion of its work, the Working Group is to report its findings to the Black Sea and River Danube Protection Commissions, and the Sponsoring donors.

6. Composition of the Working Group

The composition of the ten-person Working Group is as follows:

- For all the Danube States - comprising the chairman of the MLIM (Monitoring, Laboratory and Information Management), the chairman of the EMIS (Emission) Expert Groups, and representative of the Interim Secretariat (to be supplanted by the Permanent Secretariat) with expertise in technical and scientific issues;
- For the downstream Danube States - comprising representatives from Bulgaria, Romania and Ukraine (who are also contracting parties to the Black Sea Convention), to be selected on the basis of their technical and scientific merits by the national heads of delegations of the two Commissions;
- For all the other Black Sea States - comprising three representatives with technical and scientific expertise, to be selected by the respective Black Sea Commissioners;
- The representative of UNEP will serve as Chairman of this Technical Working Group.

The Working Group may consult other groups and individuals as it deems necessary to carry out its tasks.

7. Time Frame of the Working Group

- The Group will begin its work immediately after its recognition by both Commissions, to take place as soon as possible, and no later than 30 January 1998;
- To facilitate completion of its work in time for the proposed joint Black Sea - River Danube Meeting at the level of Heads of Delegations, the Group will meet at least every three months;
- In order to ensure sufficient lead time for discussions in the administrative systems of all involved parties, the Technical Working Group must finalize its work no later than the end of October 1998;
- The finding of the Working Group will provide background material and guidance for the proposed Black Sea - River Danube Meeting at the level of Head of Delegations, anticipated for January/February 1999;
- The Working Group will organize its work in such a manner as to also produce technical inputs for the preparation of new GEF projects for the region, for submission to the November 1998 meeting of the GEF Council.

GEF Black Sea Environmental Programme	List of participants	Environmental Programme for the Danube River Basin
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Annex V

The Composition of the 'Group' in Its Three Meetings

The TOR specifies in its para (6) the composition of the ‘Group’. Based on this para (6) and additional participation in the three Meetings, the following representatives and additional participants took part in these Meetings:

1st Meeting, Baden/Austria, March 26, 1998

Representatives.

Chairman: Dr. W. Rast, UNEP; MLIM Expert Group: Mr. L. N. Popescu; EMIS Expert Group: Mr. B. Mehlhorn; ICPDR Secretariat: Dr. H. Fleckseder; Bulgaria: Dr. B. Boyanovsky; Georgia: Not present; Romania: Dr. A. Cociasu; Russian Federation: Mrs. L. Stepanova; Turkey: Dr. S. Beşiktepe; Ukraine: Dr. O. Tarasova.

Additional participants.

Dr. A. Hudson, UNDP/GEF; Dr. L. Mee, Programme Manager, Black Sea Env. Programme; Dr. R. Mihnea, Black Sea Env. Programme; Mr. J. Bendow, Manager, UNDP/GEF River Danube Pollution Reduction Programme; Mr. A. Garner, UNDP/GEF River Danube Pollution Reduction Programme.

2nd Meeting, Istanbul/Turkey, August 31st / September 1st, 1998

Representatives.

Chairman: Dr. W. Rast, UNEP; MLIM Expert Group: Mr. L. N. Popescu; EMIS Expert Group: Mr. B. Mehlhorn; ICPDR Secretariat: Dr. H. Fleckseder; Bulgaria: Dr. B. Boyanovsky; Georgia: Not present; Romania: Dr. A. Cociasu; Russian Federation: Mrs. L. Stepanova; Turkey: Dr. Ö. Baştürk; Ukraine: Dr. O. Tarasova.

Additional participants.

Dr. A. Hudson, UNDP/GEF; Dr. R. Mihnea, Manager, Black Sea Env. Programme; Mr. J. Bendow, Manager, UNDP/GEF River Danube Pollution Reduction Programme; Dr. L. Mee, consultant to UNDP/GEF.

3rd Meeting, Baden/Austria, December 10 / 11, 1998

Representatives.

Chairman: Dr. A. Hudson, UNDP/GEF; MLIM Expert Group: Mr. L. N. Popescu; EMIS Expert Group: Mr. F. Überwimmer (as substitute for Mr. Mehlhorn); ICPDR Secretariat: Dr. H. Fleckseder; Bulgaria: Dr. B. Boyanovsky; Georgia: Not present; Romania: Dr. A. Cociasu; Russian Federation: Mrs. L. Stepanova; Turkey: Dr. Ö. Baştürk; Ukraine: Dr. O. Tarasova.

Additional participants.

Dr. A. Hudson, UNDP/GEF; Dr. R. Mihnea, Programme Manager, Black Sea Env. Programme; Mr. J. Bendow, Manager, UNDP/GEF River Danube Pollution Reduction Programme; Dr. L. Mee, consultant to UNDP/GEF; Mr. T. Botterweg, Manager for Phare and Team Leader, Danube PCU; Dr. I. Natchkov, Manager for Phare in the Danube PCU.

All the National Studies hold the same title, i.e. 'Report on the Ecological Indicators of Pollution in the Black Sea'. All these reports have been undertaken in the frame of the Danube River Pollution Reduction Programme and the Black Sea Environmental Programme, and they have been financially assisted by UNDP/GEF.

Bulgarian National Study.

The report holds a total of 104 pages containing print.

The report has been compiled and the work has been coordinated by Dr. B. Boyanovsky, Prof., Faculty of Biology, Sofia University.

The study team consisted of B. Boyanovsky, G. Hiebaum, A. Konsulov; M. Mollov and V. Vassiliev, with contributions by K. Dencheva, L. Kamburska, Tz. Konsulova, V. Kujumdjiev and S. Moncheva.

Romanian National Study.

The report holds a total of 59 pages containing print.

The report has been compiled and the work has been coordinated by Dr. A. Cociasu, Researcher at the Romanian Marine Research Institute, Constanta.

The study team consisted of colleagues of A. Cociasu from the Romanian Marine Research Institute and has not been expressly mentioned in this report.

National Study, Russian Federation.

The report holds a total of 30 pages containing print.

The report has been compiled and the work has been coordinated by Dr. A. A. Shekhvotsov, Director General of the State Center for Environmental Programmes. He had been appointed to this position by the State Committee on Environmental Protection.

The members of the study team have not been expressly mentioned in the report.

Turkish National Study.

The report holds a total of 112 pages containing print.

The report has been compiled and the work has been coordinated by the team of Turkish Scientists from the Middle East Technical University (METU), Institute for Marine Sciences, at Erdemli.

The study team consisted of Ö. Baştürk, S. Tuğrul, A. Yilmaz, A. E. Kideys and Z. Uysal..

Ukrainian National Study.

The report holds a total of 49 pages containing print.

The report has been compiled and coordinated by the Institute of Biology of the Southern Seas, Odessa Branch.

The study team consisted of B.G. Alexandrov, V.A. Briantsev, G.P. Garkavaya, G.G. Minicheva, D.A. Nesterova, I.G. Orlova, L.O. Sebakh, O.G. Tarasova and Yu.P. Zaitsev. Most of these scientists work at the Institute of Biology of the Southern Seas, Odessa Branch.

Annex VI

**The Final Minutes of the 1st Meeting of the “Group”,
March 26, 1998, Baden/NÖ, Austria**

1st Meeting of the *Ad hoc* Joint Technical Working Group established between the International Commission for the Protection of the Black Sea (Bucharest Convention) and

the International Commission for the Protection of the Danube River (Sofia Convention), which took place at Baden/Lower Austria, March 26, 1998

1. The participants present encompassed (without titles and written as close as possible to the spelling in English) the members of the *Ad-hoc* Group, Mr. W. Rast (UNEP; Chairman), Mr. S. Beshiktepe (Turkey), Mr. B. Boyanovsky (Bulgaria), Mrs. A. Cociasu (Romania), Mr. H. Fleckseder (Interim Secretariat, ICPDR), Mr. B. Mehlhorn (EMIS Expert Group, ICPDR), Mr. L. Popescu (MLIM Expert Group, ICPDR), Mrs. L. Stepanova (Russian Federation) and Mrs. O. Tarasova (Ukraine). Georgia was not represented. In addition to the members of the *Ad hoc* - Group, Mr. J. Bendow (GEF Representative in the Danube PCU), Mr. A. Garner (GEF Technical Adviser in the Danube PCU), Mr. L. Mee (Team Leader, Black Sea PCU) and Mr. R. Mihnea (Black Sea PCU) also participated in the Meeting. A handwritten list of participants was circulated in the Baden Meeting. For this very reason, these draft minutes do not contain a list of participants.

2. The Terms of Reference discussed December 8/9, 1997, at Mamaia, which form the base for the work of this *Ad-hoc* Group (later only called '*Group*'), were handed out again; they are attached. The Agenda to agree upon was to follow these TOR and to screen what actual work has to be undertaken. At the end of the Meeting at Baden, additional two meetings were scheduled (August 17/18 at Istanbul; October 2/3, place to be decided), and it was understood that in order to arrive at a draft report by early December 1998, at least one additional meeting by mid-November 1998 will be required.

The Chairman highlighted the objective of the work of the *Group* by repeating it and making it understood by every participant. It reads:

To create a common base of understanding and agreement on the changes over time of the Black Sea ecosystem and the reasons for these changes, and to propose practical goals and objectives for remedial actions to address them.

The Chairman also stated that the individuals participating in this *Group* are scientific and technical experts and that the primary goal of their work is to fulfil the aims of the TOR as good as possible.

3. Discussion to the Agenda:

One main issue initiated by Mrs. Tarasova, Mr. Bendow and Mr. Fleckseder was whether the Sea of Asov and its catchment area is / are part of the 'system' to be considered in this work or whether not. The *Group* was aware of the fact that the 'Convention for the Protection of the Black Sea against Pollution' is a shoreline convention, whereas the 'Convention on Co-operation for the Protection and Sustainable Use of the Danube River' is structured by the catchment area of River Danube. Both Programmes, the 'Black Sea Environmental Programme' as well as the 'Environmental Programme for the Protection of the Danube River' are - at least from their conceptual point of view - related to the hydrographic catchments. Based on the 'catchment approach' common with UNEP work, the *Group* concluded that the Sea of Asov and its catchment area are within the system to be studied.

Additional comments by Mr. Mee to the Agenda were as follows:

- There is an exciting point in time - both Conventions will be implemented at the latest starting by the end of 1998. The DRPC will then have entered into force, the ICPBS will hold its Secretariat.

- Thus, the political reality is speeding up. The two International Commissions charged to fulfil the respective Conventions should not fail to talk to one another.
- In order to support the contact between these two International Commissions, GEF would like to entertain a new implementation phase on nutrient reduction (for nutrient reduction, an incremental cost funding could take place). For this very reason, concrete proposals of this study should go into the next meeting of the GEF Council in January 1999. The remark by Mr. Duda, Leader of the GEF Secretariat on International Waters to both Mr. Mee and Mr. Mihnea was that if the report is not ready by January 1999, the GEF money will go to other projects, and not to the Black Sea and River Danube
- Mr. Mee also reported that at present, the GEF Secretariat would like to bring around 30 - 35 Mio. US\$ each for incremental cost funding to both sides, the Danube and the Black Sea side. This money should go preferably into projects in agriculture and for wastewater treatment. In addition, some of the bilaterally available money will be used to do some international GEF work in both the Danube and the Black Sea.
- The World Bank will also make ~ 500 Mio US\$ available as bank loans for ~ 10 projects in the Black Sea countries over the next 3 years, and something similar may happen in the Danube countries too.

Mr. Bendow reported about the GEF RDPRP (River Danube Pollution Reduction Programme) and the fact that this was started finally by end-of-November 1997 with the Inception Workshop at Krems, and that this holds a duration of at least 18 months. From his point of view and as contained in the report of the Krems November 1997 Inception Workshop, the work output of this *Group* is part of the GEF RDPRP, and this work output must fit into the time frame of the GEF RDPRP. For this very reason, the deadline reported by Mr. Mee to be January 1999 is from his point of view *not* binding, since the RDPRP can only be finalised in mid-1999. However, single projects coming out of the national planning processes can be taken into account. Within the GEF RDPRP, the 'Danube Water Quality Model (DWQM)' is under development. This model is also relating to the work of the *Group*, providing information to support the analysis.

The position of the *Group's* Chairman was that in order not to endanger any GEF support, the time frame reported on by Mr. Mee (that the report of this *Group* should be ready for the next meeting of the GEF Council in January 1999) should be followed.

In retrospect, however, it has to be noted that the output of the *Group* is not only to serve the GEF Council (this is only slightly contained in its TOR, see the last part of para (5)), but the more essential reporting by the *Group* contained in the TOR is to both International Commissions for their decision making at their respective political levels - be it domestic or also in the Commissions' Meetings.

4. The discussion then centred around the assessment of nutrients reaching the Black Sea from all sources and also from the Danube, and the impact of these inputs on the Black Sea ecosystem(s), including also the Black Sea shelf.

In order to make existing published information available, Mr. Fleckseder distributed copies of the two papers 'Long-Term Ecological Changes in Romanian Coastal Waters of the Black Sea' (A.Cociasu, L.Dorogan, Ch.Humborg and L.Popa, 1996) and 'Effect of Danube River Dam on Black Sea Biogeochemistry and Ecosystem Structure' (Ch.Humborg, V.Ittekkott, A.Cociasu and B.v.Bodungen, 1997), and the PhD-Thesis by Ch.Humborg ('Untersuchungen zum Verbleib der Nährstofffrachten der Donau'. *Ber.Inst.Meereskunde, Kiel*, **264**, 1995). The Black Sea PCU made a pre-publication paper available entitled 'Land-based Sources of Contaminants to the Black Sea' (authors: G.Topping, L.Mee and H.Sarikaya).

Mr. Mee presented the contents of the last paper mentioned, of which he is co-author and which is of importance for the work of the *Group*. The authors based their estimate on the data available as of end-of-1997, and where when has to take into account that a common system of quality assurance is not yet in overall use. Further, the inputs of totN and totP (TN and TP as used in the enclosed figure) were structured as follows: All 'shoreline' countries of the Black Sea (Bulgaria; Romania; Ukraine; Russian Federation; Georgia; Turkey), which are also Contracting Parties to the 'Convention for the Protection of the Black Sea', plus another column indicated as 'other countries'. The allocation is according to 'countries' (i.e. national entities), and not according to catchment areas or direct inputs. The biggest share for 'other countries' is for all the non-Black-Sea-shore-riparians of the Danube, and only a minor share can be allocated to Bjelorussia.

The values presented assume for the Danube the following: Based on work undertaken in the 'Applied Research Programme (ARP) of the Environmental Programme for the Danube River Basin (EPDRB), the Project EU/AR/102A/91 ('Nutrient Balances for Danube Countries') contains on p. 54 a comparison between the output of the regional materials budgeting principle underlying this report, and the data obtained as an input into the Black Sea from the Project EU/AR/203/91 (and in which Delft Hydraulics participated). From p. 54 of Project EU/AR/102A/91, the following has to be quoted in this context: *'On the basis of data available, the TN and TP loads reaching the Black Sea can be estimated as 447 and 46 kt/a in 1988/89, and 345 and 25 kt/a in 1992 (Delft Hydraulics, 1997). These immission based loads are about 45 and 35% of the TN and TP emissions estimates (Section 3.1) clearly demonstrating the significant role of "self-purification", retention and losses in the river system (settling, denitrification,).'* The passage quoted, however, seems not to have been intended for quantifying purposes, but only for indicative ones.

The percentages mentioned 'compare' in fact the average input of totN and totP into the internal drainage network of the hydrographic catchment of River Danube due to the amount of work undertaken (i.e. **not** in the **overall** Danube catchment) on the one hand with the immission loads assessed by simple means according to the principles of sampling and analysing in the respective years (1998/89 and 1992) on the other hand. This also means that all the 'noise' (errors etc.) contained on both sides of the methods enter such comparison.

Mr. Mee indicated that the authors of the study cited ('Land-based sources of contaminants to the Black Sea') had, based on their interpretation of the Report of Project EU/AR/102A/91 that 42% of the inputs of tot N and 24% of the inputs of totP into the 'internal Danube water web' reach the Black Sea. (The preceding estimates (in Arial Narrow) show that the value for totP seems to be 'correct', whereas the value for totN seems to be only ~ 35%). With the values in this study, the authors further assumed that the same 'reduction' is applicable to the national indirect inputs by Bulgaria, Romania and Ukraine to the a 'total sum' can be arrived at for these three countries, and that the remainder of the immission load reaching the Black Sea has to be attributed to the more upstream Danube countries, see the enclosed figure (and in a similar way also for the

N.B. Going beyond the mere reporting of this meeting at Baden, it has to be indicated that the work input to Project EU/AR/102A/91 was not possible for Bosnia-Herzegovina, Croatia and the Federal Republic of Yugoslavia for funding reasons. This also means that it was impossible to include the emissions of ~ 14.8 Mio. people (~18% of the overall population) and ~ 163.000 km² (~ 21% of the drainage area). If one assumes that these are 'on average' of the same size as with all the other Danubian Riparians, the loads of totN and totP were in 198/89 ~1.240 kt/a and ~ 161 kt/a, and in 1992 ~ 1.030 kt/a and ~ 133 kt/a. When these estimates for 'overall emissions into the internal drainage web of River Danube' are compared with the previously cited immission loads, these 'on average' can only explain in 1988/89 ~ 36% of the totN and ~ 29% of totP, and in 1992 ~ 34% of totN and 19% of totP.

Dnjepr catchment area, reflecting the situation of Bjelorrussia). The validity of this approach will have to be discussed in the next meeting of the *Group*.

An additional presentation on nutrient inputs and also the 'status in nutrients' in the Romanian shelf of the Black Sea was given by Mrs. Cociasu. She highlighted that for daily samples taken at Sulina 5km upstream from entering of the Sulina branch into the the Black Sea, silica and PO₄-P are analysed since 1980 and Σ inorganic N species since 1988, and that modern analytical methods (see the paper handed out, of which Mrs. Cociasu is the 1st author) are in use. She showed graphs which - when these Sulina data are extrapolated for the overall Danube - indicate a steady decline over time, e.g. for Σ inorganic N species from ~ 1.000 kt/a in 1988 to ~ 400 kt/a in 1996. She also indicated that the flow in River Danube in front of the three branches also declined in the same period. Some historical data exist, but they are limited, their reliability is unknown and thus their interpretation as yearly immission loads should not be undertaken. The data Mrs. Cociasu showed for the Romanian shelf indicate that since 1992/93 a slight improvement in the occurrence of algal blooms has taken place, and a phosphorus limitation in the Romanian shelf exists.

Mr. Beshiktepe, an expert on the link between satellite imagery and the overall monitoring of the situation of the Black Sea, presented 1997 images from algal blooms in the Black Sea. The unfortunate situation is that (1) the Sea of Azov is holding a 'more or less permanent' algal bloom of 50 mg/l or more during the warmer season (spring till fall), whereas (2) the Black Sea is having such high concentrations at higher frequency in areas of the Black Sea shelf area, stretching from the Romanian to the Bulgarian part. There are, however, also some algal blooms in limited areas at lower concentrations along the Turkish coast.

The discussion centred around the following issues: (a) The atmospheric input of totN into the Black Sea; the estimate given was 1/3 of the land-based discharges. (b) The question of the importance of silica: Mrs. Cociasu and Mr. Mihnea, supported by Mr. Boyanovsky, mentioned that from their point of view the idea expressed by Mr. Humborg is correct and that silica seems to play a role in the shift of organisms which are blooming, whereas Mr. Mee was of the opinion that the impact of the relative change of silica is of lesser importance. (c) Any other polluting input from land-based sources of importance into the Black Sea; here the main issue mentioned was mineral oil via River Danube. (d) It was agreed that existing information, assembled by the Turkish Black Sea Center at Middle East Technical University, Institute of Marine Sciences, at Erdemli/IGEL, Turkey via Nato funded Workshops and undertakings, will be made available as soon as this is in a form to be agreed on by the authors to be published.

5. The assembling and assessing of the available information on the likely response of the Black Sea ecosystem to specified reductions in nutrient loads was only indirectly accessible by reasoning. Mr. Mee remarked that the response of ecosystems to stresses and their recovery is never a linear relationship. Ecosystems can have over a long period in time only minor changes, due to their resilience, but as soon as a certain level of stress is surpassed over a too long period, they collapse. In addition, and because of the shifts in time, the likelihood that ecosystems reach the starting level is quite slim. The Black Sea seems to have been in good shape still in the late 1960s and early 1970s. Starting from then, the conditions in the shelf declined and got worst between 1990 and 1992. As already mentioned, since then a slight improvement (decrease in the frequency and intensity of algal blooms; improvement in oxic conditions, in order to name a few) has taken place. The decrease of the input of N and P as reported by Mrs. Cociasu has been comparatively bigger. Thus the only way to meaningfully advance in formulating a policy for the protection of the Black Sea will be the need to reformulate it in intervals. It will be possible to come up with a suggestion for the 1st period in sight, but the quantification in absolute terms (load reduction values) is not very safe.

The discussion afterwards centred (1) around the fulfilment of the requirement of load reductions in absolute terms and (2) around the P - limitation. The Bulgarian and Romanian participants were of the view that a further reduction of the input of - especially dissolved, but also easily bound total - P into the Black Sea is beyond doubt of benefit for the frequency and intensity of algal blooms, whereas Mr. Mee held up his position that due to internal cycling of P, a reduction of totN is equally needed. Mr. Fleckseder indicated, in order to bridge to the issue of 'strategies', that a reduction of P is on the time scale more easily obtainable, whereas due to the large pools of N in groundwater aquifers, it will take decades until a longer-lasting reduction will be achieved; this, however, does not mean that in regard to nitrogen no strategies should be developed.

6. In regard to strategies, the *Group* took note of the information received that by the summer of 1998, 6 NAPs for Black Sea countries should be available, and that within the GEF RDPRP, National Reviews are in progress and will also be available by summer of 1998. Based on these and some other work, it should be possible to come up with proposals for strategies.
7. Allocation of work to be accomplished until the next meeting of the *Group*, see para (2):
Mr. Bendow focused the attention and discussion to the point that the main objective is not necessarily to reduce the nutrients discharged to the Black Sea, but to reestablish the resilience of the ecosystems of the Black Sea. In order to arrive there, he raised the question of suitable indicators to observe the development of ecosystems over time, to record such changes, and also to analyse possibilities to safeguard or reestablish the resilience of the ecosystems. Surprisingly, there were no precise indicators available to demonstrate the change over time of ecosystems in various parts of the Black Sea. The following discussion centered around the identification of suitable parameters available as data, in order to arrive at a clear link between the input of nutrients (or other pollution) and the change over time of Black Sea ecosystems. The 'state of the Black Sea ecosystem over time' (e.g. 1960 - 1985/90 - 1997/98) was to be examined considering the following:
 - ❶ the secchi-depth;
 - ❷ chlorophyll-a (phytoplankton biomass);
 - ❸ N/P/Si (total / available);
 - ❹ macroalgae (phyllophera) - areal extent;
 - ❺ oxygen concentration at shelf (spatial and temporal extent);
 - ❻ phytoplankton (# of species, density);
 - ❼ zooplankton (biomass, composition);
 - ❽ micro-zoobenthos (biomass, composition); and finally
 - ❾ 'Other pollutants'.

The participants from the Black Sea countries agreed on this proposal; however, they requested additional financial support (10.000 US\$ per country) to elaborate on the ecological indicators. Mr. Bendow agreed to provide for financial support, but he requested precise ToRs (including the indicating of available information, and the data and expertise necessary to elaborate an assessment in change of the Black Sea ecosystems). The participants from the Black Sea countries have been asked to submit their respective proposals as soon as possible to the Black Sea PCU's Coordinator, in order to liaise with the Danube GEF Programme.

In the discussion, Mr. Beshiktepe held up the view that with the Nato funded work, most of the information available has been put together, and that one has thus for the type of work the *Group* has to deal with only wait until the reports of the Nato Workshops are agreed upon by scientific panels and by the authors. This should be the case by late June or early July at the latest, and that from this point of view the next meeting of the *Group* should take place in mid-August 1998.

Pollution Input into the Black Sea: There is work available by the Black Sea PCU; it will - for review by the members of the *Group* - be made available either by the BSPCU or Mr. Mee by early May 1998.

The members of the *Group* are asked to critically screen the material to both points (pollution input as well as the ecological state of the Black Sea) mentioned; they were told to receive this material before the next meeting (August 17/18, 1998, at Istanbul), for further discussion in this upcoming meeting.

These draft Minutes have been conceived by H.Fleckseder, IS/ICPDR. The delay in time relative to the Meeting is due to a having been moved from one part in VIC to another, to the Easter Week, as well as to other obligations of the rapporteur, and the fact that this was 'counter-read' by others.

Initially the draft had been finalised at Vienna on May 11, 1998

The final status has been indicated at Vienna on September 3, 1998

Annex VII

**The Draft Minutes of the 3rd Meeting of the ‘Group’,
December 10/11, 1998, Baden/NÖ, Austria**

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**Draft Minutes of the 3rd Meeting,
Joint Ad-hoc Technical Working Group,
established between the ICPBS and the ICPDR.**

Meeting dates: December 10 / 11, 1998.

Meeting venue: Schloßhotel Weikersdorf, Baden, Lower Austria

The participants in this 3rd meeting were the **representatives to the Group** and **additional participants**.

The **representatives to the Group** (or as their substitute in this meeting) were

Mr. A. Hudson (AH; UNDP-GEF, as Chairman, replacing the former Chairman, W. Rast, UNEP);

Mr. B. Boyanovsky (BB; BG);

Mrs. A. Cociasu (AC; RO);

Mrs. L. Stepanova (LS; RUS Fed.);

Mr. Ö. Baştürk (ÖB; TR);

Mrs. O. Tarasova (OT; UA);

Mr. F. Überwimmer (FÜ; substituting B. Mehlhorn, EMIS EG of ICPDR);

Mr. L.N. Popescu (LNP; MLIM EG of ICPDR; only participating December 11);

Mr. H. Fleckseder (HF; Permanent Secretariat, ICPDR).

Additional participants encompassed:

Mr. J. Bendow (JB; Project Manager, GEF River Danube Pollution Reduction Programme);

Mr. R. Mihnea (RM; Programme Manager, Black Sea PCU);

Mr. L. Mee (LM; former Manager of the Black Sea PCU and consultant to UNDP/GEF; December 10 and December 11 till ~ 1 1/2 hours before the end of the meeting);

Mr. T. Botterweg (TB; Programme Coordinator, Danube PCU) and I. Natchkov (IN; Phare / Tacis Programme Manager, Danube PCU), both only on December 11, 1998.

1. The opening of the Meeting and the introduction to the 'Draft Summary Report' by L. Mee.

Mr. A. Hudson opened the Meeting on December 10, 1999, at 9h30. He welcomed the participants present. He hinted at - as no agenda had been prepared by the Chairman of the two preceding meetings - that the 'Group' should screen the reports which had (with the exception of Ukraine) been presented already at Istanbul and which are now finalised. The Group should also go through the draft summary report by LM (which was stated to be based on the contributions from the Black Sea shoreline riparian States). It should also discuss and come to an agreement as far as possible relating to measures to be taken to limit the discharges into the Black Sea, as agreed upon in the preceding 2nd meeting at Istanbul.

The draft minutes of the Istanbul Meeting, agreed upon there to be available at the end of the 1st full week in October 1998, were not available. The draft summary report by LM was neither available before this 3rd Meeting, but printed out in this Meeting at Baden. Already during the print-out and the following copying, LM informed the 'Group' about the contents of this draft summary report, which he had entitled "Eutrophication in the Black Sea: Establishing the causes and effects." This initial draft summary report is annexed to these draft minutes (Annex 1). LM told the 'Group' also that the 'Black Sea side' will 'have to produce something productive for the net GEF Meeting in May if GEF funding for investment should be further available'.

As this draft summary report is late and as it merits careful reading, it is understood that no decision on its contents can be taken in this Meeting. However, in order to fulfil his commitments, LM stated to be in need of amendments, in written at the latest in front of Christmas 1998, such that he can finalise this draft summary report by the end of the year 1998.

LM communicated also the following report to the Danube PCU: 'An input-output study on nutrient loads in the Danube River Basin'. 68 p. plus ~ 30 pages Annex. This report has been written by V.J.P. van't Riet, and supervised by drs P.H.L. Bujis (from 'International Center for Water Studies B.V.') and ir R.H. Aalderink (Landbouwniversiteit Wageningen, Department of Env. Sciences, Aquatic Ecology and Water Quality Management Group).

The main remarks by LM to the contents of the draft summary report were:

- In going through the national contributions, the main question arriving was: Are the data made available really reliable? Where are the sampling stations located, and for which time span are monitored data available?
- If one group of researchers stuck to specific methods over a specified time period, it seems meaningful to assume that this data set can be compared in itself (but not automatically with data monitored by other researchers).
- The methodological problems seem to be bigger with biological data than with chemical data.
- The load assessment (and the 'comparing' of reported loads and where the way in which these loads were assessed is not known) must be an issue of specific concern. Loads for soluble parameters can be assessed with much less sampling effort than loads of parameters, which are transported, sediment-bound.

LM repeated how the eutrophication problem of the Black Sea evolved over time:

- The phytoplankton outcompeted the macrophytes, due to its ability to grow.
- With an increase in nutrients available - and which is documented by measurements in the Sea only in later phases, when the eutrophication process was already relatively advanced - the growth and decay was such that (over time) not only the macrophytes were outcompeted, but also they died off to a large extent. Conditions with low oxygen concentrations (or even free of oxygen) evolved also ('hypoxia').
- This led to an ecological status where there was very low biological diversity with both phytoplankton and zooplankton, and based on this also with very low diversity of fishlife.
- In the 1980s, alien "jellyfish" intruded, found very good growth conditions, and no species utilising them.
- The good news is that benthic algal beds (*cystoseira barbata*) are still present along the coast of the Russian Federation, in other places in patches. Small patches of *phyllophora*-fields also exist. If the conditions improve, these patches can be the stock from which conditions similar to the pre-1960 conditions can develop over time.

- There is a recovery in fisheries (e.g. anchovis).
(In the discussion to this, the colleagues from the Black Sea shoreline states indicated that due to the zooplankton, the sprats and the anchovis, bonitos have intruded this year from the Sea of Marmara into the Black Sea. The survival of bonitos in the Black Sea will also depend on the respecting of their reproductive cycles).
- The big 'eutrophication problem' of the Black Sea is, according to LM, the dominance in the food chain of gelatinous organisms ("jellyfish"). These jellyfish - originally alien to the Black Sea- are a 'dead end' in the foodchain, i.e. they cannot serve as food for higher carnivores leading to diversity in fishlife. There is the only hope that with a further decline in phytoplankton growth, the predominance of jellyfish will fade out.
- Presently, the Black Sea is on the way of improving, but it has not yet reached the situation of the 1960s.
- According to LM, the main problem and the driving force for the planktonic growth is the extreme surplus of nitrate. This, however, is in contradiction with the P-limitation in the shelf area, to be discussed later.
- Decisions taken in the last Meeting (i.e. the 2nd meeting of the Group at Istanbul, and where no draft minutes of this meeting were made available) are in the opinion of LM meaningful.
- LM stressed in the discussion to the report the use of 'inexpensive means' of removing nutrients from wastewater, and BB supported him. For both these colleagues, the technology describing the term 'inexpensive' is constructed wetlands. HF contributed in the discussion to this point that the actual and long-lasting removal of nutrients via constructed wetlands can primarily only be due to the harvesting of plants; if this is not done properly, the treatment will ultimately fail. HF cited a study undertaken at the relatively large and shallow 'Lake Neusiedl'. This study revealed that the harvesting of reed, such that the rhizoma are not destroyed and that the harvest is actually taken away at the end of the growth period, is such expensive that the application of this method was there discarded. RM reported about similar experience gained in the Romanian Delta of River Danube, and OT claimed the same to have been arrived at in Ukraine. HF concluded that such 'inexpensive technology' must have its limits in plant size.

2. Discussion to the 'Draft Summary Report'

Asking for proposed amendments:

As the 'Draft Summary Report' written by LM was not known before, no full discussion was possible in this Meeting. The agreement to respond to this draft not later than around Christmas 1998 has already been highlighted.

Remarks to individual aspects of the draft summary report:

There was some time to go through the report in reading, and afterwards, some amendments were proposed. LM took note of them. One important aspect is with the nutrient data from Romania: They are given in phosphates and silicates, but their actual dimension (not shown in the tables) is phosphate-P and silicate-Si, and nitrogen is correctly shown as the 'nitrogen species' or 'sum of inorganic nitrogen'.

Such proposed changes related to the text of the draft report, to the summarising table, but also to the tables and figures annexed.

Under debate: The limiting 'chemical species' for phytoplankton growth:

HF distributed a paper called 'Sweden's nitrogen debate' (Water Quality International (WQI), September / October 1998, the 'popular' news media by IAWQ) (Annex 2). In this paper, reference is made to an ongoing debate in Sweden whether nitrogen is actually limiting for the eutrophication process in the Baltic – as claimed for long – or whether at a systems level, this is actually falling to phosphorus. In this debate in Sweden, the final conclusion is not yet reached. The interesting point, however, is that nitrogen fixers (i.e. blue-green algae) are occurring in certain parts of the Baltic, thus indicating that not nitrogen, but phosphorus is limiting.

The question by HF to the representatives of the shoreline States in the Joint Ad-hoc Group was whether such blue-green algae occur, and there was a positive reply. The quantification of this positive reply was split: LM claimed that these covered not more than 2% of the phytoplankton occurring, whereas others felt that this value is higher.

AC indicated again - as she had done in both preceding Meetings of the 'Group' - that the phytoplankton growth in the Romanian shelf is limited by phosphorus. ÖB agreed also that the data obtained in the cruise of R/V Bilim in March and April 1995 allow the same statement for the northwestern shelf area. This is the area in the Black Sea with the most intensive phytoplankton growth, with the biggest spread. The currents then transport the phytoplankton into the direction of the Bosphorus.

HF indicated – as he had already done in the previous Meetings of the 'Group' – that in regard to actually achieving load reductions within a short span of time, reducing phosphates and phosphorus is potentially much more easy and less costly than a quick 'curbing' of nitrogen. HF therefore suggested discussing how the limitation of phosphorus can be achieved by legal and technical means. The 'curbing' of nitrogen should be also undertaken from the beginning where possible (e.g. by forbidding liquid discharges from large animal raising units, and thus curbing the discharge of both nitrogen and phosphorus). With urban wastewater, the removal of nitrogen is much more costly than the removal of phosphorus. In the Danube Basin, a large fraction of nitrogen is from diffuse sources. From the point of view of HF, the 'curbing' of nitrogen has primarily to be discussed at a strategic level, and maybe even not only at the scale of the hydrographic catchment area of the Black Sea, but on a worldwide scale. LM responded that seas are nitrogen limited, and that therefore - in line with the 'Redfield ratio of 7 to 1 (for N to P) - nitrogen has also to be strongly limited from the start.

The view within the representatives to the 'Group' was that the limiting of phosphorus must have an impact, and that therefore some of the stress of the GEF incremental cost funding should be with the curbing of phosphorus. This was i.a. stated by ÖB.

What load of nutrients in River Danube could be a 'basis' for a comparison?

Reference is made in the Romanian national report, in which data by ALMAZOV are cited for the years 1959 and 1960. The full-length paper by ALMAZOV was not available; OT stated that this paper is written in Russian, and that she would send a copy to LM. The aim of this sending is to gain better knowledge about how ALMAZOV arrived at the loads he presented. HF indicated again that aside from the question of how many data sets were used by ALMAZOV care should be given to the fact that the yearly loads vary also from hydrologic year to hydrologic year. An 'average load estimate' should be based on at least data from 5 years.

3. Where would the representatives of the States participating put GEF funding for incremental cost?

Possible 'fields of action' for improving the ecological status of the Black Sea options highlighted were:

- The A reform of agricultural practices (influenced by the legal frame and the type of policy)
- Use of wastewater treatment (including alternative methods)
- Rehabilitation of key basin ecosystems
- Changing of consumer practices (including the use of poly-P-free detergents)
- Definition of the legal frame (including also the use of chemicals and import regulations).

Answers received

Suggestions by BB for Bulgaria:

- Monitoring and control should be strengthened, incl. the import ban on poly-P-containing detergents.
- The nutrients should as much as possible be kept in / on the soil. This also relates to the appropriate use of animal manure, to 'biofarming', to the necessary fighting against soil erosion, to the setting-up of riverine buffer zones and to decrease intensive fish farming. Sludge from WWT (= wastewater treatment) should as much as possible be used agriculturally.
- Wastewater treatment should be used, and for reasons of investment and where possible, this should encompass low-cost removal of N and P. In order to better utilise N and P, municipal and industrial wastewater should be treated in a combined way.
- Measures in the Black Sea should also be considered, i.a. the creation of artificial reefs, including the increased harvest of mussels, and fishing practices in such a way that the carnivorous fish stock can grow.

Suggestions by AC, supported by LNP and RM, for Romania:

- The loads via River Danube have decreased, and the application of fertilisers on agricultural land is now for some time very low. A reform of the Act governing agriculture still has to pass legislature.
- WWTP have to be improved and to be built inland, along the Romanian coast, mainly improvement is necessary, as there is no discharge of untreated wastewater into the Sea. The main question here is in regard to the investment and how this can be converted into a 'continuous series of payments'. Industry is - where possible - treated in a combined way.
- Romania would like to utilise river-related ecosystems to minimise the nutrient transport.
- Romania is holding a law demanding the use of poly-P-free detergents.

Suggestions by LS for the Russian Federation:

- Agriculture is vital in RUS, but the input of mineral fertiliser has been drastically been reduced. There is only small-scale raising of animals.
- Both with the Sea of Azov as well as the Black Sea untreated or not sufficiently treated wastewater is discharged, and thus the stress must be with wastewater treatment. This relates to both municipalities and industries. Along the coast of the Black Sea, there are also outfalls under the pycnocline, with only mechanically treated wastewater. Around Novorossisk, there is also some oil pollution, due to the handling of oil. Methods of wastewater treatment should be reliable, and the investment should last as long as possible.

- Wetland areas are along the Kuban, and also along the Don. If this works, RUS would like to utilise the potential.
- Detergents are imported, i.a. by Procter and Gamble.

Suggestions by ÖB for Turkey:

- Agriculture is also important in TR, but even more important is the fighting of soil erosion. Farming in the Black Sea catchment of TR is on small lots - e.g. some animal raising, some garden-like agriculture, and also the growing of tea.
- There are only a few large cities along the Turkish Black Sea coast, with the possibility like in RUS to discharge below the pycnocline. The population is otherwise living in very scattered settlements. It is relatively easy to force industry to do something, but it is tremendously more difficult to convince municipalities.
- Wetlands play in TR - due to the character of the landscape - a minor role.
- ÖB is not familiar with the legislation in TR covering poly-P in detergents.

Suggestions by OT for Ukraine:

- In agriculture in UA, like in other States, the application of market fertilisers declined, and there is no longer any type of industrialised animal raising. Nevertheless, there should be a further stress with improving nutrient discharge from agriculture, assuming that it will hopefully recover over time.
- There is a huge demand for treatment of untreated or improvement of not adequately treated wastewater, be it from municipalities or industries (e.g. mining, with acid mine drainage and where mines are also no longer in operation; metallurgical enterprises; etc.). The Seas impacted are both the Black Sea proper and the Sea of Azov. River Dnjepr, dammed from upstream from Kiev and with large man-made lakes, is strongly eutrophied.
- There are many wetland areas in Ukraine, and UA would like to utilise the potential.
- OT is not familiar with the legislation in UA covering poly-P in detergents.

During the presentation of these answers, HF highlighted that the EU is running a research programme dealing with the assessment of buffer areas ('European river margins project'). This joint research indicates that a potential for the reduction of nitrogen in groundwater exists primarily in the 'transition zones' from groundwater to river water. He also indicated that this 'denitrification potential' is only having a larger impact if as much river length as possible is utilised in this way.

HF also indicated that certain interests in chemical industry favour the use of poly-P in detergents, by claiming that by precipitation, phosphates will be removed from wastewater anyhow. By proposing this, there is an economic gain involved in both selling poly-P as well as additional precipitants.

The need to establish (or to improve) a "transboundary assessment of indicators of the Black Sea"

To this item, mainly RM contributed.

- A Monitoring Programme for the Black Sea was fixed both in the Convention and the Declaration.
- Control stations have been proposed in 1994, a long list of parameters to be determined exists also. The suggestion is to start with nutrients and with bathing water quality.
- However, no station has been implemented. The stations are foreseen to be erected up to 10 ÷ 15 nautical miles from the shore, located at transboundary positions.

Discussion to this:

OT reported that UA would be undertaking for a period of two years a detection of oil pollution by remote sensing. LNP and ÖB asked both to remind the politicians that the jointly agreed upon monitoring programmes (e.g. the proposed monitoring programme for the Black Sea by the shoreline riparians; TNMN in the Danube Basin) and the 'support structures' (e.g. the Expert Groups under the ICPDR) should be funded, and where things are missing, this should actually be implemented. Otherwise the work developed will collapse. HF asked whether GEF funding is possible for monitoring stations. The reply by AH and LM was that this task is a 'national baseline contribution'.

Legal and Political Issues

TB asked for the function of the existing Conventions and the Commissions charged to implement them. ÖB, JB and HF stressed that any 'true acting' is only at the respective national level, and the function of the Commissions is to have an 'umbrella' via the 'principle of cooperation'. JB hinted at that an outcome could be e.g. ① a 'Memorandum of understanding between both the ICPBS and the ICPDR', and that this memorandum should contain principles, whereas in step ②, the measures to implement these principles should be clarified. OT stressed also the need for harmonisation and cooperation between both Commissions.

LM indicated that he wanted to have a Ministerial Meeting among the Black Sea shoreline riparians. This should i.a. deal with the banning of poly-P in detergents and an agreement on certain areas of land to be utilised for aquatic ecosystems, including a joint implementation principle.

JB suggested: Based on the reports (Minutes of the Meetings; the report drafted by L.Mee, after its revision by the 'Group') a restricted group of persons (e.g. JB; RM; HF; LM) should be charged to come up with a paper of 2 ÷ 3 pages and propose it to the 'Group'. This paper should contain the essential elements to be communicated.

Vienna, February 2nd, 1999

Hellmut Fleckseder

Annex VIII

Draft Memorandum of Understanding

DRAFT

Memorandum of Understanding between

the International Commission for the Protection of the Black Sea (ICPBS) and the International Commission for the Protection of the Danube River (ICPDR) on common Strategic Goals

- The 'International Commission for the Protection of the Black Sea (ICPBS)' holds the power to implement the 'Convention on the Protection of the Black Sea against Pollution'. This Convention is a 'shoreline convention', i.e. it itself holds no power over the inland activities of the States within the hydrographic drainage area discharging to the overall Black Sea (Black Sea proper; Sea of Azov).
- The 'International Commission for the Protection of the Danube River (ICPDR)' holds the power to implement the 'Convention on Cooperation for the Protection and Sustainable Use of the Danube River'. This Convention is a 'hydrographic basin convention', i.e. it itself holds power over the transboundary impact via the drainage network of the River Danube Basin (valid only for Contracting Parties to this Convention).
- This Memorandum of Understanding becomes effective as soon as it has been agreed upon in the respective Meetings of both Commissions mentioned and an exchange of letters has taken place. It loses its effectiveness as soon as one of both the International Commissions mentioned notifies the other.
- This Memorandum of Understanding constitutes by no means a legal document for the joint implementation of issues of importance for the protection of the Black Sea against pollution by its Transboundary Waters in its wider basin.

Representatives of the ICPBS and the ICPDR with the assistance of UNDP/GEF and UNEP set up on December 8 and 9, 1997, a Joint *Ad-hoc* Technical Working Group ('the Group') in a Meeting at Constanta, Romania. The following elements of this Memorandum of Understanding correspond with the results of 'the Group':

- The term 'overall Black Sea' encompasses the Black Sea proper and the Sea of Azov as water bodies receiving inputs via inland waters. Both the Black Sea proper and the Sea of Azov are in regard to their ecology and their response to discharged pollution completely different water bodies.
- The term 'Black Sea ecosystems' refers to ecosystems in both these Seas.
- The term 'wider Black Sea Basin' refers to the basin determined by the hydrographic boundary of all inland waters discharging to the overall Black Sea and the surface area of the overall Black Sea. For the sake of convenience and until decided otherwise between both Commissions the outer border of this basin is looked upon to be the Strait of Bosphorus.
- The results of studies on the 'Ecological Indicators of Pollution in the Black Sea', carried out in the frame of the activities of the Joint *Ad-hoc* Working Group, have given evidence of recovery in Black Sea ecosystems. However, the ecological status of the 1960s – which is deemed to be the goal to aim for – is not yet reached.

- There is in general agreement that the status of Black Sea ecosystems is largely affected by nutrients discharged within the wider Black Sea Basin, and to a large extent by the riverine input into the overall Black Sea. Information of a possible role of other sources of pollution and their impact on Black Sea ecosystems was not yet available.
- The size of the pollution loads reaching the overall Black Sea (resolution both in time and in space for the Black Sea proper and the Sea of Azov) are either not known, or information is missing on the comparability of the data available.
- 'The Group' was aware of the decline of the economic activities in the countries in transition, the possible impact of them on the discharge of pollution, and the reversal of such a trend in case of future economic development (concerning in particular agricultural and industrial activities).
- The data available to 'the Group' to undertake its assessment ended at best with values for the year 1997.

In order to safeguard the Black Sea from a further deterioration of the status of its ecosystems the Contracting Parties to the 'Convention on the Protection of the Black Sea against Pollution' and the Contracting Parties to the 'Convention on Cooperation for the Protection and Sustainable Use of the Danube River' individually and in mutual contact with all States within the wider Black Sea Basin strive to achieve the following strategic goals:

- *The long-term goal for all States in the wider Black Sea Basin is to take measures to reduce the loads of nutrients and hazardous substances discharged to such levels necessary to permit Black Sea ecosystems to recover to conditions similar to those observed in the 1960s.*
- *As an intermediate goal, urgent control measures should be taken by all States in the wider Black Sea Basin in order to avoid that the discharges of nutrients and hazardous substances into the Seas exceed those that existed in 1997. (These 1997 discharges are only incompletely known.)*
- *The inputs of nutrients and hazardous substances into both receiving Seas (Black Sea proper and Sea of Azov) have to be assessed in a comparable way. To this very end a common AQC system and a thorough discussion about the necessary monitoring approach, including the sampling procedures, has to be set up and agreed upon between the ICPBS and the ICPDR.*
- *The ecological status of the Black Sea and the Sea of Azov has to be further assessed, and the comparability of the data basis has to be further increased.*
- *Both the reported input loads as well as the assessed ecological status will have to be reported annually to both the ICPBS and the ICPDR.*
- *The States within the wider Black Sea Basin shall have to adopt strategies that will permit economic development, whilst ensuring appropriate practices and measures to limit the discharge of nutrients and hazardous substances, and to rehabilitate ecosystems which assimilate nutrients.*
- *Based on the annual reports and on the adopted strategies for the limitation of the discharge of nutrients and hazardous substances, a review shall be undertaken in 2007. It will have to focus on the further measures that may be required for meeting the long-term objective.*

This Memorandum of Understanding becomes effective by an exchange of letters between the ICPBS and the ICPDR in which each of them mutually agrees on the contents of this Draft Memorandum of Understanding. As soon as this is reached, a final version (with the omission of the word 'Draft') will be circulated between both the ICPBS and the ICPDR.

ANNEX 12 Evaluation of the UNDP/GEF Pollution Reduction Programme

Annex 12.1 Terminal Evaluation

Annex 12.2 Terminal Report

United Nations Development Program - Global Environment Facility
United Nations Office for Project Services

Developing the Danube River Basin Pollution Reduction Program
RER/96/G31

Terminal Evaluation

An der schönen blauen Donau.
(On the Beautiful Blue Danube.)

Introduction.
Andantino.

Waltz.

JOHANN STRAUSS. Op. 314.

Piano.

The musical score is presented in three systems. The first system shows the introduction in Andantino, marked 'Piano' and 'pp'. The second system shows the beginning of the waltz, marked 'mf' and 'f'. The third system continues the waltz. The score includes various musical notations such as notes, rests, and dynamic markings.

Stanislaw MANIKOWSKI

Esther PARK

Friedrich SCHWAIGER

François Van HOOF

JUNE 1999

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The consultation mission gratefully acknowledges Mr. R. Aertgeerts, from the UNOPS, Mr. A. Hudson, from the UNDP/GEF, and Ms. T. Akhtar from RBEC-UNDP for their comments during the briefing sessions before and after our time in the field. The Project Manager, Mr. J. Bendow, and his team provided the mission with all of the necessary documentation, information, and technical support. They were always available to discuss the Project and the issues relative to its evaluation. Finally, we are greatly indebted to Mr. I. Schuets-Mueller, the Chief of UNOPS/ENVP, and Mr. W. Stalzer, the President of ICPDR, for the time they devoted to discussing regional implications of national pollution reduction policies and the role of international cooperation in regional programmes.

ABBREVIATIONS AND ACRONYMS

BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
DANIS	Danube Information System
DANUBIS	ICPDR Information System
DEF	Danube Environmental Forum
DEFF	Danube Environmental Financing Facility
DPRP	Danube Pollution Reduction Program
DRPC	Danube River Protection Convention
DWQM	Danube Water Quality Model
EC	European Commission
EMIS	Emission Expert Group
ENVP	Division for Environmental Programmes
EPDRB	Environmental Program for the Danube River Basin
EU	European Union
FGG	Finanzierungs Garantie Gesellschaft
GEF	Global Environment Facility
Hot Spot	A local land or water area, which is subject to excessive pollution, and which requires specific actions to prevent or reduce degradation caused by pollutants
ICPBS	International Commission for Protection of the Black Sea
ICPDR	International Commission for the Protection of the Danube River
IFI	International Financing Institution
ISEP	International Society for Environmental Protection
KfW	Kreditanstalt für Wiederaufbau
N	Nitrogen
NGO	Non Governmental Organization
P	Phosphorus
PAG	Project Appraisal Group
PCU	Danube Program Co-ordination Unit
Phare	Poland, Hungary: Aid for Reconstruction and Economy; Program of assistance for economic restructuring in the countries of central and Eastern Europe
PIF	Project Implementation Facility
PMTF	Project Management Task Force
PPC	Project Preparation Committee
PRP	Pollution Reduction Program
RBEC	Regional Bureau for Europe and CIS
REC	Regional Environmental Center for Central and Eastern Europe
SAP	Strategic Action Plan
TA	Transboundary Analysis
TACIS	Technical Assistance to the Commonwealth of Independent States
TDA	Transboundary Diagnostic Analysis
TF	Task Force
TOPP	Target Oriented Program Planning
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNOPS	United Nations Office for Project Services
WWF	World Wide Fund for Nature

SUMMARY

The “Developing the Danube River Basin Pollution Reduction Programme” project RER/96/G31 represents the Global Environment Facility (GEF)’s contribution to the second phase of an Environmental Programme for the Danube River Basin (EPDRB), created in 1992. The project was a continuation of two previous GEF projects that assisted the EPDRB. All three projects helped the EPDRB to prepare a Strategic Action Plan (SAP), and develop a Danube Water Quality Model (DWQM). They helped, as well, in creating public awareness, and contributed to several other areas, including knowledge base building, information exchange and transboundary water pollution understanding. Beyond these actions, they also showed preoccupation with Black Sea marine ecosystem degradation.

There were eleven countries (Bosnia-Herzegovina, Bulgaria, Croatia, The Czech Republic, Hungary, Moldova, Romania, Slovenia, Ukraine, and the Federal Yugoslav Republic) that benefited directly from the present project activities while two others (Austria and Germany) collaborated closely. The International Commission for the Protection of Danube River (ICPDR) was a regional partner of the project. The project came in at a cost of \$3.9 million with its activities implemented between December 1996 and June 1999. (Four minor activities will continue until December 1999).

The project’s overall long-term objective was to stimulate sustainable, institutional and financial arrangements for effective environmental management of the Danube River Basin. The immediate goal was to prepare for funding pollution prevention and reduction activities required to both restore the Danube River basin and protect the Black Sea environment. This immediate goal was composed of four objectives:

1. Complete the knowledge base for priority pollution loads and priority environmental issues in the Danube River basin;
2. Review policy for protection (especially nature protection) of the Danube basin and Black Sea;
3. Increase public awareness and participation;
4. Develop financing for the pollution reduction programme under the Danube Strategic Action Plan.

The project fits into regional and national plans of the Danube River basin countries, into the GEF priorities, and the United Nations Development Programme (UNDP) areas of concentration. The Project Document clearly designs beneficiaries, contains implementation plan, and corresponding financial provision. Under the project dynamic leadership, and strong support of the backstopping agencies: the UNDP/GEF and the United Nations Office for Project Services (UNOPS), the project successfully implemented and realized all activities, and delivered all outputs. The data needed to the output production were collected and provided by national teams. The project prepared framework and methodology for data collection. The methods were discussed in more than 35 meetings and workshops.

There was, however, great differences among the countries of the region in levels of their economical, technological and knowledge skills. Because of that, the data national teams provides were not all of the same quality and precision.

The project successfully completed the knowledge base for priority-settings. It updated national reviews of Danube pollution, and prepared a list of 421 priority pollution reduction projects. It improved the DWQM model and used it to simulate the nitrogen and phosphorus pollution of the Danube with and without the projects. However, since the data used in description of the regional priorities and in modeling were of unequal quality, the regional results have to be taken with precaution. To overcome the data inaccuracies and approximations, the project developed a database that will in the future allow for more accurate diagnoses of pollution sources as well as more efficient cost evaluation.

The reviews by national teams that contributed to formulation of the regional Danube basin and Black Sea protection policies, and updating the SAP did not yet produced a global political or strategic approach to a regional pollution reduction. The updated SAP gives to the policy and strategies too narrow a meaning.

The project successfully planned and organized the public awareness programme of pollution reduction activities. However, the project's tight schedule and the NGO's ineffectiveness in promoting the programme, hampered the public awareness campaign. The impact of this campaign is yet unknown.

On the basis of the national reports, the project developed a portfolio of 421 priority pollution reduction investments. For each investment the project proposed a baseline and the incremental costs. For some of these investments, the costs were estimated according to the best available information.

The project proposed to ICPDR the establishment of a Project Appraisal Group (PAG) that would advise the ICPDR, the country, and the donors about conformity of the project with ICPDR standards. It also proposed the creation of a Project Implementation Facility (PIF) that would support the ICPDR in regional investment programme, assist member countries in project preparation, and monitor the results. The ICPDR endorsed the project results, in particular, the updated SAP, the PAG, and the PIF. By the end of this year, the ICPDR will present the proposals of SAP, PAG, and PIF to the ministries of the member countries for approval.

All project activities were deeply imbedded in the GEF priorities, however, To fully satisfy the GEF requirements, some outputs need to be improved; the SAP will require further developments. Nonetheless, the project fully justifies the GEF support.

The project's achievements were highly praised by the ICPDR. Especially appreciated were the following participation methods the project employed: participating planning, logical approach, and consultative and iterative planning process of the SAP revision. The project management paid close attention to strengthening cooperation among various sectors – the government decision makers, the administrative delegates, and the private-sector representatives.

The project final results will likely remain sustainable. In particular, the principal objective will probably be pursued well after the end of the project. Moreover, the method used to gather data as well as the regional standardization of the collection procedure contributed to growth in national capacity and reinforcement of regional cooperation.

To increase the impact of the current project, the mission recommends:

- 1.1 To the project management and the UNDP/GEF** to finance a critical review of the project's documentation. It is recommended they should also finance an evaluation of each country's progress in water pollution reduction, including public participation and policy issues as they were outlined in the previous Project Documents. This review should be organized and completed before the next phase of financing. This critical review should be professionally edited, published, and widely distributed.
- 1.2 To the project management**, to edit the existent technical materials according to the UNDP standards. The project should pay close attention to rhetoric (clarity, organization, consistent and critical arguments) and to the internal coherence of the documents
- 1.3 To the project management**, to include, in the final report, an exhaustive evaluation of all achievements and difficulties.
- 1.4 To ICPDR**, to collect and disseminate information produced by the project and the national teams; organize training, demonstrations, and transfer knowledge and technologies to the countries; this would include the DWQM, standardized data collection methods and analytical procedures. Continue to edit and distribute the Danube Watch, and to update regularly the DANUBIS web site.

To implement regional assistance for future water pollution reduction plans in the Danube River basin, and in addition to the activities and objectives specified in the past GEF projects, the mission recommends to the **UNDP/GEF** to include into the project programme the following issues:

Supply management:

- 2.1 The regional organizations and the regional assistance projects should develop consistent criteria for evaluating and monitoring water development investments. These criteria should take into account all direct and indirect costs, as well as the potential risks and impacts.

Municipal and industrial programmes:

- 2.2 The efforts to control pollution should be both site-specific and consistent with water basin requirements.

Agricultural practices:

- 2.3 The regional projects should support tests and dissemination of sound agricultural practices, and support national awareness campaigns.

Safety of abandoned industry and mine wastes:

- 2.4 The regional project should investigate the pollution from abandoned industry and mine wastes, and help countries to find funding to ensure the environmental safety of this waste.

Toxic and persistent contaminants:

- 2.5 The regional project should promote a sense of cooperation among the affected countries to research the best control measures and control policy.

Atmospheric pollution:

- 2.6 The regional project should collaborate with the other regional organizations involved in monitoring and reduction of air pollution. It should support national efforts toward atmospheric pollution.

Regional policy instruments:

- 2.7 A mandate should be given to regional project to support the regional and international organizations evaluating and applying regional policy tools. This support could cover such areas as evaluating future projects priorities (according to GEF standards), establishing baseline and incremental costs, or investing in a country that is complying with regional standards.

Integrate technical, economic, political, and social dimensions:

- 2.8 A holistic approach needs to be adopted to get to the bottom of the problem. The regional projects should consider a long list of activities: data collection and dissemination, training and demonstrations, research, norms and legislation standardization, and public participation promotion. These elements need to be looked at in the context of supply and demand of each country's water and macroeconomic policy.

Country's contribution to regional efforts:

- 2.9 The regional project should prepare periodically a ledger of regional expenses and gains and inform the countries about advantages of adhering to a specific cooperative programme. This balance will help to mobilize national efforts for a particular programme, and decide on the amount a country may contribute to the regional effort.

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INTRODUCTION

Project evaluation aims to assess its relevance, performance, and success (Annex I). In principle, every significant UNDP-sponsored project is subject to evaluation. The evaluation of the important UNDP/GEF project “Developing the Danube River Basin Pollution Reduction Programme (RER/96/G31) took place between June 8th and June 21st, 1999 (Annex II). Four consultants contributed to the evaluation. They were:

- Team leader, Stanislaw Manikowski;
- Public awareness specialist, Ester Park;
- Financial specialist, Friedrich Schwaiger; and
- Transboundary pollution assessment specialist, François Van Hoof.

During the evaluation process, the mission met with several stakeholders (Annex III). It encountered the UNOPS and GEF officers who provided technical backstopping and administrative support for the project, the ICPDR officials, the beneficiary country representatives, and the project team. The mission visited Vienna project management headquarters, and offices of major technical contributors in Frankfurt, Munich, Delft and Budapest. Briefing and debriefing of the mission took place in UN offices in New York.

The evaluation referred to the procedures described in the Terms of Reference provided by the UNOPS (Annex I), and the guidelines for project evaluation by the UNDP Central Evaluation Office. The present report describes findings, conclusions, and recommendations of the mission. The report is organized so as to reflect UNOPS’ concerns in regard to the Terms of Reference.

1 PROJECT DESIGN

The design of the present project RER/96/G31 (the Project) follows guidelines of the Global Environment Facility (GEF) sponsored projects. It represents the GEF's contribution to phase two of an Environmental Programme for the Danube River Basin (EPDRB)¹, created in 1992. The Project was a continuation of two previous GEF projects (RER/91/G/31 and RER/95/G45) that assisted the EPDRB in building a framework for a long-term solution of pollution problem in the Danube River.

During the first phase of the framework building, between 1992 and 1996, both the EPDRB and the GEF assistance projects concentrated their efforts on such priorities as:

- Building regional cooperation for water management;
- Evaluating and defining environmental problems;
- Establishing a basin-wide water quality monitoring strategy; and
- Establishing a warning system for accidental pollution.

The first-phase GEF assistance projects contributed to:

- Strengthening of national and regional institutions;
- Increasing awareness that agriculture be integrated into environmental policies;
- Addressing human health issues related to cross-border (transboundary) pollution;
- Improving the knowledge base and exchange of information;
- Promoting investment;
- Supporting public participation;
- Developing the Danube Water Quality Model (DWQM); and
- Drafting the Strategic Action Plan (SAP).

The Project Document of September 1997, stated the objectives of the present project (Project Document [15], 11 and 12):

The overall long-term goal of the new GEF project is to stimulate sustainable, institutional and financial arrangements for effective environmental management of the Danube River basin, in accordance with the International Strategy of GEF Operational Strategy and the International Water Operational Programme No 8.

The immediate goal of the Project was (ibid., 12): "... to prepare for funding pollution prevention and reduction activities required to both restore Danube River basin and to protect the Black Sea environment." Four intermediate objectives should help to achieve this goal:

1. Complete the knowledge base for priority pollution loads and priority environmental issues in the Danube River basin;
2. Review policy for protection (especially nature protection) of the Danube basin and Black Sea;
3. Increase public awareness and participation; and
4. Develop financing of the pollution reduction programme under the Danube Strategic Action Plan.

¹ The EPDRB aimed at establishing an operational basis for the integrated management of Danube River Basin environment.

The Project's objectives were approved by senior officials of eleven Danube River basin countries (Bosnia-Herzegovina, Bulgaria, Croatia, The Czech Republic, Hungary, Moldova, Romania, Slovakia, Slovenia, Ukraine, and The Federal Yugoslav Republic) who, in July 1996, attended the EPDRB Task Force and International Commission meeting in Vienna.

The United Nations Development Programme and the GEF (UNDP/GEF) contributed \$3.9 million to the Project. The Danube basin countries provided national personnel, salaries and appropriate allowances, offices, and training facilities.

The United Nations Office for Project Services (UNOPS) was designated as the Executing Agency.

The Project was to be implemented over a period of 16 months, beginning August 1997.

The Project fits well into the GEF priorities (the eight International Water Operational Programme and important transboundary concerns), and UNDP area of concentration (environmental problems and natural resources management). The Project Document clearly set out the problems that needed to be solved, and it correctly outlined the Project execution strategy. The intended regional and national users were properly identified. Capacity building within the countries was part of the Project design. The Project Document contained a clearly laid out logical framework, stated the outputs in verifiable terms, and included a work plan.

In summary, the Project Document analysis shows that the Project fits into regional and national plans, and into the GEF and UNDP areas of concentration. The objectives, outputs and activities are clear. The Project Document contains an implementation plan and specifies adequate financial provisions. The beneficiaries are correctly identified.

2 PROJECT IMPLEMENTATION

The present section assesses the Project's general implementation, its management, monitoring, and backstopping, all with regard to the quality and timeliness of activities and outputs. The section contains, as well, an evaluation of how adequately management arrangements were made. Finally, some light will be shed on what environmental changes were brought on by the Project. The elements discussed in this section constitute the rationale for the GEF support, particularly in the areas of regional cooperation, policy development, and public participation.

2.1 General Implementation

The Project was scheduled to start its activities in August 1997. However, since the document was signed in September 1997 and the personnel recruited in autumn 1997, the Project's implementation was delayed until December of the same year. Most of the Project's 29 activities ended in May and early June, 1999 (Figure 1). The Project was operational for 19 months instead of the 16 originally scheduled by the Project Document. It completed almost all intended activities and delivered all important outputs. Four activities are yet to be completed:

- The community-based projects will last until September;
- The Danube Internet network will be established by December;
- The ministerial conference to revise and probably adopt the Strategic Action Plan (SAP) is scheduled for the end of this year; and
- The fund-raising conference will take place by the end of 1999 or the beginning of 2000.

The allocated budget covered adequately all Project expenses.

The Project management efficiently and dynamically mobilized the region's 13 countries (11 signatory countries plus Austria and Germany). This task was arduous since the countries are at the beginning of their environmental cooperation. Moreover, language barriers, economic differences, and open hostilities in one part of the region sometimes hampered collaboration. Nevertheless, the skill and persistence of the Project team did mobilize the countries toward closer and more effective collaboration.

Figure 1. Implementation of project activities

Activities	1997					1998												1999											
	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	D				
Objective 1																													
1.1.1 Update 11 National Review																													
1.1.2 Prepare Bosnia-Herzegovina, FRY National Reviews																													
1.1.3 Define National Baselines																													
1.2.1 Prioritise Hot-spots																													
1.2.2 Extend Danube Water Quality Model																													
1.2.3 Asses Priority wetlands/floodplains																													
1.2.4 Prepare social analysis of Danube pollution																													
1.2.5 Prepare draft Transboundary Diagnostic Analysis																													
1.2.6 Hold technical conference on transboundary pollution																													
Objective 2																													
2.1.1 Prepare review of Strategic Action Plan																													
2.1.2 Hold Danube/black Sea Basin technical consultations																													
2.1.3 Hold Danube/black Sea Basin policy consultations																													
2.1.4 Prepare pollution reduction programmes																													
2.1.5 Integrate pollution reduction strategy into SAP																													
Objective 3																													
3.1.1 Launch public-awareness programme																													
3.1.2 Hold stakeholder discussions on transboundary pollution																													
3.1.3 Distribute 3 editions of ‘Danube Watch’																													
3.1.4 Support the Danube NGO Forum and national NGO meetings																													
3.1.5 Provide grants for community-based pollution reduction projects																													
3.2.1 Establish Danube internet network																													
3.2.2 Update and disseminate DANIS																													
Objective 4																													
4.1.1 Develop financing strategies for pollution reduction programmes																													
4.1.2 Prepare project documents for hot-spots																													
4.1.3 Prepare project documents for wetlands and floodplains projects																													
4.2.1 Assess feasibility of Danube Environmental Fund																													
4.2.2 Prepare legal basis, procedures, etc. for Danube fund(s)																													
4.3.1 Integrate project portfolio into SAP review																													
4.3.2 Adopt revised SAP at Ministerial Conference																													
4.3.3 Hold donor pledging conference/facilitate meeting																													

The ICPDR (International Commission for the Protection of the Danube River), was the Project's regional counterpart. The Project closely collaborated with the ICPDR: all the Project staff, national collaborators, and national experts regularly participated in the ICPDR meetings.

Overall, the Project was very well implemented on a regional level and in the countries themselves. While experience from the previous regional projects helps, it is still quite a challenge to successfully complete a Project of such a dimension in so short time. It all requires good managerial skill from the staff as well as unwavering support from the Executing Agency.

2.2 Management, Monitoring, and Backstopping

The Project management was located in the UNDP Vienna Office and benefited from the Vienna Office administrative support. According to the management, the Office support was helpful because it freed up the Project from the every-day administrative work and allowed staff to focus on technical issues. The monitoring of the Project's progress and the additional administrative support was in the hands of the UNOPS. The UNDP/GEF Office in New York took care of technical back-stopping. *All administrative supports, monitoring, and technical back-stopping were judged by the Project management as not only sufficient but very helpful in implementing Project activities.*

2.3 Changes in the Project's Environment

The Project activities spanned a period of less than two years. This is a relatively short time for detecting any noticeable changes of attitude on a national or regional scale. However, that period coincided with emerging of a strong, general, political and ethical trend in the region, and a collective set of goals: improvement of the environment, pollution reduction and Danube basin and Black Sea protection. The Project itself helped to reinforce this trend, by organizing more than 35 meetings and workshops, and making the regional and transboundary issues of Danube protection more specific and easier to visualize. Thanks to the Project, the most important river polluters were identified [3] and the river's pollution become something more than just an impersonal and vague problem.

The Project has benefited from this impetus as well. According to comments of country representatives the mission met (see Annex II for a list), the national collaborators were enthusiastic about the Project and devoted themselves to realizing their assigned tasks. The results were considered "essential" by the countries' representatives.

In conclusion, the Project worked in a climate favorable to realization of its assignments. The presence of the Project contributed even further to the creation, among the Danube basin countries, of positive attitudes towards pollution reduction. The Project implementation fully justifies the GEF support.

3 PROJECT IMPACT

This section reviews the Project's achievements measured against its goals, outputs, and activities. It will be arranged according to the following outline: (1) Complete priority-setting; (2) Review policy for nature protection of the Danube Basin and Black Sea; (3) increase public awareness and participation; (4) Develop financing for a pollution reduction programme within the Danube Strategic Action Plan.

3.1 Complete the Knowledge Base for the Priority-Settings

The Project Document allocated 42% of the Project's budget toward the completion of the knowledge base for priority-settings.

To complete the knowledge base for the priority-settings, the Project should have updated national reviews, and analyzed the national action plans. This should have been achieved by using a common format. The national reviews should be completed with the transboundary diagnostic analysis.

3.1.1 Update National Reviews and Analyze National Actions Plans Using a Common Format

In 11 of the 13 Danube basin countries (all but Austria and Germany), the Project, effectively using national expertise, organized and updated national reviews². The national reviews teams received from the Project a thorough training in data collection and reporting. As a result, the reviews were based on common sampling methodology and common reporting procedures. Despite of this, the data included in the national reviews were of unequal quality, due to the differences in laboratory capacity and national staff training among member countries³.

The updated reviews focused on priority pollutants and on sectors that contributed to Danube pollution. The reviews have helped the pollution impact analysis, and the cost analysis of pollution reduction projects.

3.1.2 Transboundary Diagnostic Analysis

The Project improved on an existing Danube Water Quality Model (DWQM), and used it to forecast the nitrogen and phosphorus pollution of the Danube⁴. The Project also financed a study of wetlands and floodplain areas of the river⁵. The results of national updated reviews, the model, and the studies were used for transboundary analysis. As in the national reviews, the transboundary analysis, which represents for the moment the best global image of pollution in the Danube basin, also suffered the burden of an uneven quality of data. It should be mentioned, however, that this shortage could not have been corrected within the short life of the Project⁶.

The updated national reviews, the analysis of national plans and the transboundary SWQM are outstanding and lasting achievements of the project. To fully exploit the potential created by the Project, the member countries should well appropriate the model and agree on a timetable for input data improvement. To facilitate assimilation by those who have benefited from the Project's achievements, the reports describing the DWQM, transboundary analysis [4 and 20] and other main Project's reports [1, 3 to 8, 16, and 17] dealing with the transboundary problems should be edited in such a way that the users can easily see the progress from the data collecting to the fully developed transboundary diagnostic.

² Annex V, 1.1.1; VI, 1.1.1, and 1.1.2; VII, 6.1.

³ Annex VII, 6.1.

⁴ Annex V, 1.2.2; VI, 1.2.1, 1.2.2., and 1.2.3, page 3; and VIII, 6.2.

⁵ Annex V, 1.2.3; VI, 1.2.3, and 1.2.5, page 3; and VIII, 6.3.

⁶ Annex VII, 6.2, and 6.3.

3.2 Review Policy for Protection of the Danube Basin and the Black Sea

The policy review received 5% of the Project's budget. As in previous activities, the policy review was organized entirely by national experts, in consultation with national authorities. The Project's regional experts collated that information and integrated it into the main document, the updated Strategic Action Plan (SAP)⁷.

It should be noted that the national environment policy has some specific mandates. It is concerned with achieving the most cost-effective pollution reduction; an equitable distribution of the pollution reduction burden; and an acceptable and just distribution of charges for pollution emission. It attempts to enforce the policy at the lowest cost. It takes into account the ethical, moral, and traditional issues. The national strategy (the actual implementing of the policy) describes the standards set down and the incentives employed to achieve the policy. The regional policy is distinct from the national one. The regional policy is a sum of sovereign national policies that specifically concern the region. A regional organization or a regional project may reinforce the will of the countries for adherence to a given regional treaty.

The analysis of the policy description contained in the SAP, as well as in the meeting records and technical documents produced by the Project [1 and 16], shows that the country delegates are still at the initial stages of defining regional policies with respect to the Danube basin and the Black Sea protection⁸.

It is important to analyze exhaustively the pollution reduction approaches when embarking upon the regional pollution reduction project. Analyzing national and regional policies, national policy instruments, and possible international pressures could best indicate to project management and to donors how to allocate regional resources, and how to help countries stick to their regional agreements.

3.3 Increase Public Awareness and Participation

According to the Project Document [16, page 24], "Wide public participation in the Project is an essential requirement for development of sustainable policies in Danube Basin." Through the activities and outputs developed under the objective "increase public awareness and participation", the Project would have to increase the importance of pollution reduction in the public's mind. It would also have to reinforce public participation in designing of regional and national policies and to improve coordination and exchange of information.

The Project invested about 23% of its budget to make this all possible.

3.3.1 Raise the Public Awareness of Pollution Reduction Activities

Early on, the Project saw that through training, workshops, discussions and consultations, it will set up ways for the public to be involved, and it will raise public awareness. The public involvement activities were held with the participation of technicians, national government administrators, public, and NGOs. The NGOs⁹, and one of their regional bodies, the Danube Environmental Forum (DEF), become the Project's principal proponents in raising public awareness. The Project efforts were well planned, well organized and worked well with the Project Document programme. However, the tight schedule and the NGO's¹⁰ ineffectiveness in promoting the Project, hampered public awareness campaigns.

The Project was also responsible for financing five community-based project grants that totaled \$200,000. At this point, it is yet to measure the impact the investment had on the awareness of Danube basin citizens.

⁷ Annex V, 2.1.1 to 2.1.5; VI. 2.1.1. to 2.1.5.

⁸ Annex VI, pages 5 to 11.

⁹ Annex V, 3.1.1 to 3.1.5; VI, 3.1.1 to 3.1.5; and VIII.

¹⁰ Annex V, 3.2.1 and 3.2.2; VI 3.2.1 and 3.2.2, page 14; and VIII.

3.3.2 Improve Coordination and Information Exchange

The Project financed three editions of a periodical called Danube Watch, devoted to Danube pollution issues, and it plans to finance two more editions. The Project also developed and improved an information web site, called DANIS (transformed into DANUBIS).

In a final analysis of section 3.3 we can observe that the weakness of DEF was a major obstacle in efficient implementation of the public awareness programme. While weak, NGOs for now are convenient partners for many UNDP projects, even though, they may not, in the context of Central European traditions, be the best intermediaries for a project and a group of citizens. These countries' traditional institutions such as the church, older universities, mainstream media, and high-profile individuals may be better at influencing public opinion. The NGOs are still new on the scene, and their position may be looked upon in the public eye with some trepidation. In consequence, replacing the NGOs with another structure may give better results in public awareness raising.

A well targeted public awareness campaign is vital for any environmental programme. It helps decision makers appraise the breadth and strength of public attitudes. It may provide information that otherwise would be unavailable and also can generate a dialog for the project. Open debate is the first step to improving mutual understanding, promoting compromise, enhancing credibility, and making better final decisions.

Increase in public awareness should be carefully monitored through the appropriate tools. Such monitoring can demonstrate the changes in public opinion over environmental matters more objectively than the progress reports. It may also help the Project evaluate how well the message is being transmitted and then adjust its own working programme, thus making it more efficient.

To sum up, the Project planned and launched a systematic and well organized set of activities aiming at raising public awareness and public participation in designing environmental projects. The ultimate results of these activities are not yet known in detail. Since raising public awareness has long been the GEF project's goal, efforts in this area should be carefully evaluated before further investment takes places.

3.4 Develop the Financing of the Pollution Reduction Programme Within the Danube Strategic Action Plan

The Project should have developed under this objective a portfolio of Danube Basin projects and proposed a mechanism that could provide sustainable financial support for Danube Basin pollution reduction. It should also finalize and come to an agreement on how to go about adopting a revised Strategic Action Plan.

3.4.1 Portfolio of Danube Basin Projects

The present Project developed a portfolio of 421 projects worth \$5.5 billion, including documentation for priority hotspots and wetland projects for investment consideration. The projects' costs were estimated according to the best available information, and the degree of priority for the project was duly documented¹¹. However, since the countries' inputs differ in quality and precision, and the ongoing national research is adding new information, the portfolio should therefore be periodically updated. The Project has prepared a database that will easily integrate the updated information [9].

National experts and consultants gathered all the information needed to the portfolio preparation, and later, along with interested industries and public, agreed on the portfolio project's priorities. The projects were then reviewed on a governmental level before being put on a regional priority list. The portfolio results from a national effort and represents what is probably an exhaustive list of Danube pollution priorities.

¹¹ Annex V, 4.1.1 to 4.1.3; VI, 4.1.1 to 4.1.3; and IX

The portfolio deals, however, with only half of all pollutants in the area. The other half originate from the so called “non point” pollution sources, such as agriculture or storm water that periodically flushes in from cities and villages¹². The Project is aware of these pollutants but did not (and could not, given its workload) develop a strategy that takes into account these factors.

3.4.2 Mechanism for Sustainable Financial Support

The Project Document favored establishing a fund that would support priority investments for the whole Danube Basin or Black Sea. The Project Document [15, pages 23, 29, and 33] required a feasibility study for such a fund and demanded that the Project direction prepare structures and rules for this type of regional financing.

As a result of a feasibility study [9] and preliminary discussions with regional partners, the Project put forward two proposals to ICPDR: (1) establishment of a Project Appraisal Group (PAG) that would assess the projects and, if they conformed to the ICPDR standard, recommend them to donors; and (2) creation of a Project Implementation Facility (PIF) that would support the ICPDR in several areas including regional investments programmes that would assist member countries in both project preparation, and results monitoring. The estimate cost of PIF for 3 to 4 years was US\$ 2.3 million.

The ICPDR endorsed the PAG and PIF proposals and expects that PIF may be financed by UNDP/GEF.

Although the Project’s proposal of establishing PAG and creating PIF is in line with the Project Document requirements and the ICPDR programme, it should be noted that it is not known as to what extent donors and the financing institutions will use the PAG and PIF facilities in selecting projects for financing. On the other hand, it cannot be taken for granted that the governments will address their financing requests through the ICPDR. Without the donor’s support of PAG and PIF and the governmental recognition of them, both facilities may remain simply an administrative entity.

3.4.3 Adopting a Revised SAP

The revised SAP and the list of priority projects were discussed at a regional workshop in May, 1999 and presented in the ICPDR Steering Group in June. It will be proposed for adoption in a conference of the involved technical ministries, scheduled for either the end of this year or the beginning of next¹³.

The portfolio of the Danube basin pollution reduction investments, the proposal of implementation of PAG and PIF, the SAP revision process are the Project’s outstanding achievements.

3.5 Project Effectiveness in Realizing Its Objectives

The Project was effective in identifying national pollution sources and in preparing proposals for pollution reduction¹⁴. It appropriately implicated the national expertise and the national administration in all steps of the Project objectives realization. The results of these efforts, achieved in such a tight schedule, requires, nevertheless, further improvements. The accuracy of the DWQM should be increased¹⁵. National policies, as well as strategies for national policy implementation and regional approaches to pollution reduction need yet to be described and analyzed¹⁶. The effectiveness of the public awareness campaigns is impossible to assess at this

¹² Annex VI, 1.2.2.

¹³ Annex V, 4.3.2 and 4.3.3; and VI, 4.3.2 and 4.3.3.

¹⁴ Annex VII, 6.9.

¹⁵ Annex VII, 6.2 and 6.3.

¹⁶ Annex VI, 2.

point, since the campaigns' impact has not yet been evaluated¹⁷. The written documents produced by the Project that transmit the results would have better served the interested users if they unequivocally stated their objectives and working hypothesis. It would also have been helpful if within these documents the conclusions were clearly stated and supported by evidence.

3.5.1 Project's Actions and Results in Light of Existing GEF Guidelines

The Project's actions were in line with GEF priorities. The pollution reduction projects portfolio is definitely the most outstanding achievement and it represents a great step forward in identification of pollution reduction activities¹⁸. Another great success of the Project is the fact that high levels of government have endorsed the SAP¹⁹. The use of the DWQM and all efforts at attaining reliable data production may provide an excellent tool to transboundary pollution monitoring. Finally, the Project's efforts to assume financing for priority pollution reduction investments²⁰ is one more example of successful GEF programme activity. Still, the SAP will require further improvements, especially in the baseline calculation²¹. (The GEF considers the well-defined baselines as a key element of the SAP.) Realizing these improvements is in fact independent of the project since it requires better data inputs from the countries. The GEF requires, as well, that the SAP contains an examination of national economic development plans and sector economic policies. This will better define feasible environmental plans. The sections of the SAP dealing with these issues are not yet completed.

3.6 Sustainability of the Programme

The Project's main results point to a continued sustainability.

The Project's results benefit the national ministries responsible for Danube pollution, the national industries and the Danube basin countries' people. It bodes well that these countries feel a strong motivation to clean up their environment and that the pressure for a clean environment is growing. The Project results, especially the register of hot-spots and priority pollution reduction projects, should make for a lasting contribution to Danube pollution reduction.

On a regional level, sustainability of the Project's results and, to a larger extend, the Danube River Protection Programme, was boosted recently after the signing of the DRPC Convention by 12 Danube Basin countries (all except Yugoslavia) and its ratification by 11 (all except Ukraine and Yugoslavia).

¹⁷ Annex VI, 3.

¹⁸ Annex VI, 1.1 and 1.2; and VII.

¹⁹ Annex VI, 4.2; and IX.

²⁰ Annex VI, 4.1 and 4.2; and VII.

²¹ For the standards description see WWW site gefweb.org/public/opstrat/ch4.htm, pages 6 to 8.

4 GENERAL IMPACT OF THE PROJECT

This section will look at the Project's general impact on the countries involved and on the international organizations. This evaluation is based on eight criteria: (1) Awareness of the Project's outputs by the participating countries; (2) Degree of ownership and commitment felt by the participating countries towards the Project; (3) The extent to which policy and strategies of the countries are affected; (4) Technical and managerial cooperation among the countries; (5) Cooperation within agencies and ministries of each country; (6) Cooperation among international organizations; (7) Cooperation among the different sectors, specifically the non-governmental and private sectors; (8) The Project's long term sustainability.

4.1 Awareness Among Participating Countries of the Project's Outputs

The Project systematically built up an awareness campaign of its activities and outputs. The national workshops received attention in the media; the Project has trained national teams and working groups of citizens and institutions concerned with identifying pollution problems. Three issues of the periodical "Danube Watch" were devoted to information on Project activities and their outputs. Two additional issues will cover the SAP and the projects included in Pollution Reduction Programme (PRP) [4]. All of the Project's results can be seen by going to the DANUBIS web site.

The Project's achievements were highly praised by the ICPDR Steering Group meeting in June 1999. Especially appreciated and recognized were the various methods used: participatory planning, logical approach, and consultative and iterative planning process.

The Project's high profile and its usefulness served the UNDP/GEF well. In June 1999, the ICPDR Steering Group expressed its appreciation and gratitude for UNDP/GEF's support, conceptual guidance, and coordination in fulfilling the Danube pollution reduction programme.

Finally, encouraged by such a constructive collaboration, the Steering Group invited GEF to build a partnership to help implement the PRP.

It should be noted, however, that there was no independent assessment on how the Project was perceived nor was there a study to gauge awareness of the Project's output among the citizens in Danube region countries.

4.2 Degree of Ownership and Commitment of the Project Among Participating Countries

The countries participated in all the Project's efforts that had been scheduled in the Project Document. All the information the Project needed to design regional programmes was collected by national teams, lead by ministry-designed experts. The Project team itself provided the national teams with data collection methodologies and funds for implementation. It may be presumed that, the data collected, the working methodology, and regional cooperation are all lasting legacies of the Project owned now by the countries' Ministries of Environment or Water. On a regional level, the Project had been working in close collaboration and frequently consulting with ICPDR. The ICPDR appreciated the outputs from the Project and is seriously looking at their implementation.

The fact that both the countries' technical ministries and the ICPDR own the Project should not raise any concerns. Nevertheless, the endorsement by other ministries and governments of the Project proposals, especially those concerning pollution reduction investments, pollution limitations, and wetland restoration cannot be seen as a fait accompli. Judging by the documents available in the Project files, this endorsement is yet to be a reality. The respective governments will most likely endorse the proposals once they have added their own studies. Several elements will probably need to be completed before the pollution reduction investment are made: a more detailed financial analysis, alternative considerations, impact studies, and some type of public opinion study. In the government's eyes, the Project proposals included in the PRP may be perceived, not as final products ready to be financed, but as reliable indicators of important pollution problems.

4.3 Impact on National Policies and Strategies

The documents produced by the Project devote too small a space to political and strategic considerations. Since policy is very important in designing sustainable and publicly acceptable projects, a wide and detailed approach for policy issues clarification needs to be developed in the future.

The Project's positive impact on country policies probably results from having the pollution issues better documented than in any other previous analyses. Showing the Danube pollution in all its severity provides solid arguments for the environmental lobby.

4.4 Technical and Managerial Cooperation Among Countries

There was good technical cooperation among countries, particularly reinforced through joint efforts in identifying pollution problems. Cooperation among countries is necessary for the purpose of reducing transboundary pollution; the donor's funding being subject to regional scrutiny. Managerial cooperation also stood out as it increased the skills of the various national experts. Much was garnered, as well, in the area of project development, and institutional and private donor relations.

4.5 Interagency and Inter Ministerial Cooperation

The Project-financed workshops were attended by representatives of various ministries and national agencies. However, it is not currently known as to what extent this participation will be responsible in furthering cooperation.

4.6 Cooperation among International Organizations

The Project cooperated closely and successfully with the key international organizations involved in the regional Danube River pollution reduction programme: Phare, GEF, Danube Task Force (became PTF), and ICPBS. The cooperation bore positive results through joint meetings and mutual (and alternative) financing of meetings and activities.

4.7 Cooperation Among all Sectors, Including Non-Governmental and Private Sectors

The Project management paid close attention to strengthening cooperation among the various sectors: the government decision makers, the governmental administrative delegates, and the private sector representatives. For this purpose the Project organized numerous meetings and workshops attended by them. However, no study has been done on the collaboration's impact on pollution reduction practices among Danube basin countries.

4.8 Long-Term Sustainability of the Project Impact

The Project's activities and outputs affected many institutions and organizations. Their long-term effects will vary depending on the lasting impressions and continued interests of the recipients. It is too early to assess the sustainability of the Project, however, the available information, namely the meetings with the countries' delegates, gives us a sense there has been an increase in the awareness of pollution reduction necessity in the Danube.

5 CONCLUSIONS

The conclusions will be grouped under four headings: general conclusions stemming from an overall evaluation of the Project; conclusions related to the Project design; conclusions related to assessment of the Project's general implementation in terms of human and financial resources; and finally, a review of the Project's results measured against its initial objectives and actions.

5.1 General Conclusions

The Project was designed as a UNDP/GEF contribution for reducing pollution in the Danube River Basin and for eventually lessening pollution in the Black Sea. The Project's specific mandate was to have a strong effect on transboundary pollution. It was, therefore, part of the ICPDR (a regional organization mandated to co-ordinate the national programmes in Danube pollution reduction) effort. All Danube basin countries were involved in the Project's activities. The immediate goal, as described in the Project Document, was to: "prepare for funding pollution prevention and reduction activities required to both restore the Danube River basin and to protect the Black Sea." To reach this goal, the Project had to put together a list of the main sources of pollution, review countries' Danube basin protection policies, increase public awareness and participation, and develop financing for pollution reduction programmes.

Overall achievement. The Project identified 421 of the most important pollution reduction investments and ranked them according to the amount of pollution that each respective investment could reduce. Collectively, these projects encompass all of the main sources of pollution in the basin. The Project evaluated their costs according to the best available knowledge and prepared the project documents. The Project management should be praised for this achievement that directly and successfully addressed the principal goal of the Project.

Sustainability. The pollution reduction projects were brought to fore by the efforts of several groups of participants. National experts, administrative agents, national industry representatives, NGOs and members of the private sector all contributed to execute the Project. In each country, national teams prepared lists of pollution sources, evaluated their importance, and incorporated them into their national environmental plans. As a result, the Project's effort will likely be continued well after its end. Moreover, the method used to gather data, as well as the regional standardization of the collection procedure, contributed to a growth of national capacity in environmental management and reinforcement of regional cooperation.

Data quality improvement. The pollution reduction projects were identified over a very short period of time, encompassing 11 countries with varying economic levels and environmental standards. Consequently, the collected data contain numerous inaccuracies and approximations. To overcome these limitations, the Project developed a database to allow for more accurate diagnoses of pollution sources, as well as more precise cost evaluation.

Limitations. These vital achievements, completed in less than one year (excluding training and final data elaboration), was done at the expense of other Project's goals. As a result, the global image of Danube basin pollution strategy is strongly biased towards point pollutants. The diffuse sources that contribute to more than half of all pollution are not in the Project's priority list.

ICPDR, UNDP, and DEF concerns. The ICPDR, a regional organization that voices the need for transboundary pollution reduction in the Danube River basin, was the principal beneficiary of the Project. Many of the Project's activities coincided with the technical objectives of the ICPDR. The most important was the improvement of the outdated SAP, originally prepared in 1994. The UNDP/GEF was interested in the formulation of pollution reduction activities, so as to sort out national and regional (transboundary) costs and benefits. The endorsement of the SAP at high levels of government was equally important for the UNDP/GEF.

The Project drafted a new version of the SAP. The road to improvement of the SAP involved a series of consultations with the national teams and discussions in the technical meetings of the ICPDR. The new SAP was finally adopted at a recent ICPDR meeting in June, 1999. The next step is for the ICPDR to present the SAP to the concerned ministries at the meeting of the Danube basin member countries at the end of this year.

The Project Document insisted that the Project management develop financing for a pollution reduction programme. The realization of this objective was an arduous task, since the Project management is not an ideal intermediary for national and international financing institutions, nor for donors. The Project, however, developed an original financing proposal. It was accepted by the ICPDR and will probably be accepted in the future when the ministries of the member countries meet.

Technology transfer. The Project has satisfied an important UNDP requirement concerning technology transfer and training of national agents. The Project management adequately adopted a standard for the training of national personnel who collect and analyze pollution data. All subsequent steps regarding the treatment of information and the elaboration of result were discussed in international and national workshops. The timeliness of this realization as it relates to national activities attests to the effectiveness of the expertise and the transfer of responsibility from the Project to the national teams.

Link with the past two GEF projects. Before the implementation of the Project, there were two other GEF projects that aimed over six years to improve water pollution in the Danube basin and assist the ICPDR. They helped to prepare the first SAP, as well as develop the DWQM model, gather a list of hot spots, finance public awareness campaigns, edit the Danube Watch, and distribute small grants for pollution reduction programmes. Yet, the documentation of the present Project make no references to past achievements. It is unclear as to what extent the present Project made use of them and what lessons it learned from the past projects.

5.2 Relevance of the Project Design

The Project was a continuation of two previous GEF projects that assisted EPDRB in searching for a long-term solution to the pollution problem in the Danube basin. All three projects concentrated their efforts on building regional cooperation, evaluating and identifying pollution problems, establishing and developing basin-wide pollution monitoring, supporting public participation and developing SAP.

The Project Document adequately covered the most important regional pollution reduction issues, namely:

Completing the knowledge base for priority pollution loads and priority environmental issues in the Danube River basin;

- Reviewing policy for protection (especially natural habitat protection) of the Danube Basin and Black Sea;
- Increasing public awareness and participation;
- Developing the financing for a pollution reduction programme under the Danube Strategic Action Plan.

All these issues are relevant to the GEF priorities, and UNDP area of concentration.

All initial objectives were achieved. Some of them, however, still require more action. The next step in the regional cooperation, therefore, should be to assure the full realization of those partially attained objectives, and attainment of new goals that will emerge. These goals are outlined in more detail under Section 6: Recommendations.

5.3 Human and Financial Resources Use and Backstopping

In practice, the Project completed all its intended activities. This was realized thanks to efficiency and dynamism of the Project management, and strong motivation of the national teams. The UNDO Vienna Office administration support, the administrative backstopping from the UNOPS, and the technical support from the GEF all contributed to the Project's success. The Project funding adequately covered all activities.

Though the Project realized all its activities, the quality of the results was unequal. The next section will review those results.

5.4 Project Results

The Project's main objective was to stimulate sustainable, institutional and financial arrangements for effective management of the Danube River basin, in accordance with the International Water Strategy of GEF Operational Strategy and the International Water Operational Programme No 8.

The immediate goal of the Project was to prepare for funding pollution prevention and reduction activities required to both restore the Danube River basin and to protect the Black Sea environment.

This goal was composed of four objectives:

- Complete the knowledge base for priority pollution loads and priority environmental issues in the Danube River basin;
- Review policy for protection (especially nature protection) of the Danube basin and Black Sea;
- Increase public awareness and participation;
- Develop the financing of the pollution reduction programme under the Danube Strategic Action Plan.

In this section we will review the degree of achievement of each of the four specific objectives. Then, we will assess how well the Project contributed to the immediate goal, and finally, look at the long-term goal of the Project.

Complete the Knowledge Base for Priority Pollution Loads and Priority Environmental Issues in the Danube River Basin

The Project completed the knowledge base for priority pollution loads and priority environmental issues by updating the national reviews. The updated reviews provide the best available set of data needed for both pollution impact and cost analysis of pollution reduction projects. The Project improved the DWQM and produced transboundary analysis, evaluated wetland and floodplain restoration, and analyzed the social impact of pollution. The national reviews differ in quality due to the differences among the countries in data collection standards and laboratory facilities. They focused strongly on pollutant concentration. Pollutant load was seldom mentioned.

On the downside, their analysis and conclusions carry the burden of insufficient data on which they had been build. Globally, however, the updated national reviews, and the very specific and detailed national action plans that resulted from this activity are outstanding and will remain lasting achievements of the Project.

Review Policy for Protection (Especially Nature Protection) of the Danube Basin and Black Sea

The proceedings from the ICPDR and ICPBS meetings and the analyses of the Project's reports show that the country's delegates are at the initial stages of defining the environmental policy concept. The 1999 updated SAP describes in details the point pollution reduction projects and evaluates theirs costs. It does not describe and analyze adequately the national policies and strategies.

Increase Public Awareness and Participation

The Project has planned and realized a systematic and well-organized set of activities that aimed at raising public awareness and eliciting participation when designing environmental projects. Since raising public awareness has long been the GEF Danube basin projects' goal, efforts in this area should be carefully evaluated before any new public awareness activities are launched. Since they are so strongly tied to the NGOs, and in particular to the DEF, the awareness programme needs these institutions to stay cohesive.

Develop the Financing of the Pollution Reduction Programme Under the Danube Strategic Action Plan

Development of the pollution reduction programme and its financing proposals was completed by:

- A portfolio of 421 projects evaluated at \$5.5 billion ranked according to investment cost effectiveness;
- Proposal of funding for regional activities;
- Revision of the Strategic Action Plan so as to include the newly identified projects.

The entire responsibility for realizing objectives was in the hands of national experts and was based on national consultations. Unfortunately, that means, the results reflect national preoccupations and priorities. Even the data quality weaknesses have important political and technical significance. They force one to realize where improvements need to be made and will hopefully motivate the countries to attain similar technical standards.

The immediate goal: prepare for funding pollution prevention and reduction activities

The Project prepared, as it was requested by the Project Document, a list of prioritized pollution reduction projects for co-financing by national and international sources.

The Project proposed to the ICPDR the establishment of a PAG to appraise newly submitted projects, and the creation of a PIF to support the regional investment programmes. The ICPDR endorsed the PAG and PIF proposals.

Overall Long-Term Goal: Stimulate Sustainable, Institutional, and Financial Arrangements for Effective Environmental Management of the Danube River Basin

The Project activities helped to stimulate sustainable, institutional and financial arrangements. The Project implicated fully the national ministry-designed experts, and trained them in data collection, environmental assessment, and regional cooperation. These specialists probably will remain important agents, voicing the idea of regional co-operation among national administrations. On the regional level, the Project has been working in close collaboration with the ICPDR, who become a custodian of all three past UNDP/GEF projects. The role of the ICPDR will be reinforced as well by the expected national project support through PAG and PIF. Both the national administrations and the regional ICPDR will be significantly strengthened as a result of the Project activities.

6 RECOMMENDATIONS

Now that project is complete, further actions need to be taken to sustain the Project's results in the region. These actions, along the lines of GEF goals, will concentrate on two areas: actions to be taken to increase the impact of the Project results, and suggestions for future regional efforts to reduce pollution in the Danube River basin.

6.1 Actions to be Taken to Increase the Impact of the Current Project

All three UNDP/GEF projects that helped develop pollution reduction in the Danube have left a very important legacy on the countries of the region, the ICPDR and the GEF. There is now abundant technical documentation, increased national capacities, and strengthened regional cooperation, as a result of these undertakings. The value of this legacy, once the Project ceases its activities, is less certain. Soon, the technical reports, which have been widely distributed, will no longer be available. The trained national personnel will probably be assigned to other tasks. The institutions involved in the Project's programme will implement other projects. It is therefore important to reflect on and learn from the Project's achievements, and widely distribute conclusions based on this reflection. This Project should be given a special consideration upon its completion because the regional cooperation in the Danube basin is more advanced than other GEF-sponsored river basin collaborations. More importantly, there is a strong expectation from the Danube basin countries and the regionally-based ICPDR, that the GEF assistance will continue. The evaluation mission supports these expectations.

The mission recommends to the Project and UNDP/GEF

- 1.1 In order to increase the Project's impact, the Project management and UNDP/GEF finance a critical review of the Project's achievements. They may also finance an evaluation of each country's progress in water pollution reduction, including public participation and policy issues as they were outlined in the previous Project Documents. Such a review should be organized and terminated before the Project's next phase of financing. The critical review should be professionally edited, published, and widely distributed.

The Project plans to publish two editions of the Danube Watch and to post the Project findings in the DANUBIS web site. The mission supports these initiatives and recommends to the Project to

- 1.2 Edit the existing technical materials according to the UNDP standards; pay close attention to rhetoric (clarity, organization, consistent and critical argumentation), and to the internal coherence of the documents.

Finally, the Project itself did not yet evaluated its achievements with respect to the Project Document requirements. This evaluation would have dealt with the GEF guidelines, UNOPS management services, the ICPDR support, regional cooperation, national collaboration, and the countries' expectations. Such an evaluation may be valuable for the Project's successors because it offers up the Project's results. The mission recommends to the Project

- 1.3 Include, in the final report, an exhaustive and critical evaluation of its achievements and difficulties.

The ICPDR is the regional organization that will benefit directly from the Project outputs. Therefore, the ICPDR should take steps necessary to safeguard the produced documents, databases, and models. The ICPDR should also take all steps needed to assure transfer of outputs and technologies from the Project to the beneficiary countries. The ICPDR should also ensure the necessary arrangements for regularly updating the database, running the models, and actualizing the financial and technical parameters of the priority projects. To this effect, the ICPDR should

- 1.4 Collect and disseminate information produced by the Project and national teams; organize training and demonstrations; transfer to countries the Project's knowledge and technologies including DWQM; standardize data collection methods and analytical procedures; continue to edit and distribute the Danube Watch; and update regularly the DANUBIS web site.

6.2 Implementation of the Future Regional Assistance to Water Pollution Reduction in the Danube River Basin

The Project Document has covered a vast spectrum of activities, however, they did not bring out all important issues for regional water pollution reduction. The mission recommends that, in addition to the actions outlined in the Project Document, a future Danube project pay attention to the following issues:

Supply management: The easily foreseeable rapid economic growth of the region will increase demand for water. This increasing demand may create both national and transboundary environmental problems, which, in turn, will affect regional assistance.

- 2.1 The regional organization and the regional assistance projects should develop consistent criteria for evaluating and monitoring water development investments. These criteria should take into account all direct and indirect costs, potential risks, and impacts.

Municipal and industrial programmess: The demographic forecasts suggest that the countries' respective populations will remain stagnant. However, an increase in living standard will stimulate municipal growth. Industrial development will increase the use of water and thus raising risks of increased water pollution. The regional projects, in collaboration with national authorities, should determine the most effective methods of constructing wastewater and stormwater facilities for towns and industry, and stimulate efforts to reduce industrial pollution through ecologically sound technologies.

- 2.2 Efforts to control pollution should be monitored for both their site specificity and adherence to water basin requirements.

Agricultural practices: Agricultural practices are a major source of a very difficult to control diffuse pollution. Preventing this type of pollution requires the mass application of sound agricultural practices.

- 2.3 The regional projects should help countries to identify, test and disseminate sound agricultural practices, and support national awareness campaigns.

Safety of abandoned industry and mine wastes: The waste which accumulated during the past industrial development periods and was abandoned after the closing of obsolete industry, is another source of diffuse pollution.

- 2.4 The regional project should investigate this problem and help countries to find funding in order to ensure the environmental safety of this waste.

Toxic persistent contaminants: Toxic wastes should be strictly controlled throughout their entire chemical life – from their release into the environment to their safe decomposition.

- 2.5 The regional project should promote coordination among the affected countries to research the best control measures and an appropriate control policy.

Atmospheric pollution: Water quality is indirectly influenced by atmospheric pollutants such as sulfur dioxide and nitrogen oxide. Atmospheric pollutants are essentially transboundary.

- 2.6 The regional project can collaborate with other regional organizations involved in the monitoring and control of air pollution. It should support national efforts towards reducing atmospheric pollution.

Additionally, the following three aspects of regional cooperation should be included in a planned regional project.

Project as a regional policy instrument: Regional cooperation is always voluntary. The countries should feel economically or ethically motivated to adhere to regional treaties and standards. The regional projects, in collaboration with the regional organizations, may selectively invest their resources according to regional interest.

- 2.7 The mandate of the regional project may be to support regional and international organizations that are attempting to apply the regional policy tools. This support may cover areas such as evaluation national projects priorities from the regional point of view (according to GEF standards), establishing of baseline and incremental costs, and investment help for a country complying with the regional standard.

Integrate technical, economic, political, and social dimensions: The regional projects have a unique opportunity to integrate all three of these dimensions. The projects can gather technical data from several countries, collate them, make statistics, prepare comparisons and spread information over the region. Most traditional regional projects are satisfied to simply deal with a regional version of a current national technical problem. More complex data gathering and more sophisticated analytical processing are required for successfully completing environmental projects. Environmental degradation is a visible and measurable consequence of human behavior. An investment that improves one environmental sector may have ramifications in several aspects of human life. It may well become a welcome political issue but could also be seen as a new unwanted expense for the citizens. The regional projects may help countries to comply to the regional decisions and have them consider the technical, economic, political, and social ramifications.

- 2.8 The regional projects should adopt a holistic approach and take in a list of their activities: data collection and dissemination, training and demonstrations, research, norms and legislation standardization, and public participation and promotion. All of these would be seen in the broad sense of supply and demand for water, and of a country's macroeconomic policy.

Finally, a country may expect that its contribution to a regional effort will be in proportion to its benefit. The regional projects and regional organizations should manage their resources in such a way that the global regional effort under their management has greater value than the sum of national efforts, and that the all participating countries benefit from the cooperation. Therefore it is recommended that

- 2.9 The regional project prepare periodically a balance of regional expenses and gains, and informs the countries about advantages of adhering to a specific cooperation programme. This balance will help the project and its regional counterpart to mobilize national efforts for a particular programme, and to decide on the amount a country may be willing to contribute to the regional effort.

7 LESSONS LEARNED

The Project experience offers constructive lessons for the UNDP in areas such as human development, capacity building, and an improved understanding of transboundary pollution.

Human development. The sustainability of environmental projects depends on how much the public has learned about the environmental impact, and how much the attitude of beneficiaries towards environment has changed. Increasing the public's knowledge is a relatively easy task compared to changing the attitudes of beneficiaries. Increasing knowledge or raising public awareness can be achieved through training sessions, documents distribution or media implication. Changing attitudes, on the other hand, is very hard. The rate of message adoption and behavioral change depend on the intrinsic value of the message, on the transmission medium, on the past experience of the subjects, and on their expectations. A systematic evaluation of the message adoption rate should be included in the environmental projects. This evaluation may help in selecting the best tools and media to transmit the message.

Capacity building. Capacity increase among the project beneficiaries depends strongly on their personal involvement in the project and on how attractive the project's activities appear to them. One may expect a strong personal involvement in an activity that, for example, helps a person solve a similar problem in the future. For example, the Project trained hundreds of national technicians in data collection and report preparation. They have brought the acquired skills to the national levels. Virtually all information was collected nationally within the national services, using local human resources. These individuals probably still contribute to increased professionalism on the national environmental arena. It would be interesting to the UNDP and GEF to evaluate the impact of these agents on national and regional environmental activities.

Understanding transboundary pollution. Completing the Project's activities advanced the national concerns about the basin-wide water pollution reduction problem. The increase in transboundary pollution understanding will become a lasting record since the Project transformed an abstract concept of a transboundary pollution into a neat package of identified problems. The identified polluting agents have a clear and measurable consequence of pollution. The Project strengthened, as well, personal collaboration among the high-ranking officials of the various ministries. It is, therefore, possible to put a human face on an anonymous governmental decision. Putting a recognizable features onto the vague problem of transboundary water pollution, the Project made this issue more comprehensive than any before in the history of such regional collaboration.

ANNEX I

TERMS OF REFERENCE

Objective and Scope of the Evaluation Mission

1. Purpose

This is a final evaluation of the project: it will consider the impact, effectiveness and efficiency of the project. Consider contribution of project towards capacity development, long-term sustainability and direction for the future.

2. Scope

The evaluation is an activity in the project cycle which attempts to determine as systematically and objectively as possible the relevance, efficiency, effectiveness, impact and sustainability of the project. The evaluation will assess the achievements of the project against its objectives, including re-examination of the relevance of the objectives and the project design. It will also identify factors that have facilitated or impeded the achievement of the objectives. While a thorough review of the past is in itself very important, the in-depth evaluation is expected to lead to detailed recommendations and lessons learned for the future.

In particular the evaluation will address the following issues considering the participation of all countries covered by the project:

2.1 Project Design

- a. Review and assess the appropriateness of the project's concept and design to the overall situation in the Danube River Basin (DRB)
- b. Apprise the project's current effectiveness in realizing the four objectives, and the extent to which they contribute to the overall development objective as announced in the project document
- c. Apprise the project's actions and outcomes in the light of the pertaining GEF guidelines
- d. Assess sustainability of the programme

2.2 Project Implementation

The mission will review:

- a. Assess the general implementation and management of the project in terms of quality and timeliness of inputs and activities, with particular reference to financial and human resources management
- b. Evaluate the adequacy of management arrangements as well as monitoring and backstopping support given to the project by all parties concerned
- c. Evaluate changes in the environment in which the project operates and which constituted the rationale for GEF support, particularly in the areas of: regional cooperation, policy development, and public participation.

2.3 Project Impact

The mission shall review the achievements of the project against the announced objectives, outputs and activities as detailed in the project document and summarized below:

- I. Complete the knowledge base for priority-settings
 - i. Update national reviews and analyze national actions plans using a common format
 - ii. Complete the transboundary diagnostic analysis
- II. Review policy for protection of the Danube Basin and the Black Sea
 - iii. Promote pollution prevention and reduction policy review
- III. Increase public awareness and participation
 - iv. Raise public awareness about pollution reduction activities
 - v. Improve coordination and information exchange
- IV. Develop the financing of the pollution reduction programme within the Danube Strategic Action Plan
 - i. Develop portfolio of Danube basin projects
 - ii. Mechanisms to provide sustainable financial support for the Danube River Basin
 - iii. Finalize and agree on the process for adopting a revised SAP

In addition, the evaluation will consider the general impact of the project in terms of the following criteria:

- awareness of the participating countries about the project's outputs;
- level of ownership and commitment of the participating countries towards the project;
- impacts on the policy and strategies of the countries;
- technical and managerial cooperation among the participating countries;
- interagency/interministerial cooperation in each country;
- cooperation among sectors, including the non-government and private sectors;
- sustainability of project impact.

3. Method

The evaluation will be composed of two activities: studying documents and interviews of individuals who are either involved in the project, or who have or might be expected to have impacted by the project.

Although the mission should feel free to discuss with the authorities concerned all matters relevant to its assignment, it is not authorized to make any commitment on behalf of UNOPS, UNDP or GEF.

4. Conclusions and Recommendations

Based on the above the mission shall:

- a. Write up its conclusions of the visit
- b. Address the relevance of the project design in view of the current situation of the Danube countries and the priorities within the donor community, particularly UNDP, the World Bank, and GEF
- c. Assess the general project implementation in terms of use of human and financial resources, and backstopping services provided
- d. Review in detail the project results against announced project objectives and actions
- e. Advice on the suitability of further actions in the region upon completion of the current project within the overall objective of GEF.

ANNEX II**MISSION CALENDAR****June 1999**

- 7 New York. Meeting with Mr. R. Aertgeerts, UNOPS and Mr. A. Hudson UNDP/GEF
- 9 Vienna, meeting with the UNDP/GEF Project Management.
- 10 Vienna, meetings with the Project Management and documentary study.
- 11 Vienna, meetings with the Project Management and documentary study.
- 12 Vienna, participation in ICPDR meeting.
- 13 Vienna, mission internal meetings.
- 14 Vienna, meetings with the Project Management, FGG, mission internal meeting, documentary study.
- 15 Vienna, meetings with the Project Management, EU Phare, and documentary study; Budapest, meeting in REC.
- 16 Vienna, meetings with the Project Management, ICPDR, WWF, EU Phare, and documentary study.
- 17 Vienna, meetings with the Project Management and documentary study; Frankfurt, meeting in KfW; Munich, meeting in DEF.
- 18 Vienna, meetings with the Project Management and documentary study; Delft, meeting in Delft Hydraulics.
- 21 New York, meeting in UNOPS and UNDP/GEF.

ANNEX III

LIST OF PERSONS MET

AERTGEERTS, Roger	Senior Project Manager, Division for Environmental Projects, UNOPS, New York
AKHTAR, Tehmina	GEF Regional Coordinator, RBEC – UNDP, New York
BEDRICH, Milan	Povodi Moravy, Brno
BENDOW, Joachim	Project Manager UNDP/GEF RER/96/G31, Vienna
BOSNJAKOVIC, Branko	Regional Adviser on Environment, Economic Commission for Europe, Geneva
BOTTERWEG, Teun	Team Leader Danube Programme Coordination Unit, European Commission Phare, and Tacis Environmental Actions, Vienna
FABIANOVA, Marcela	UNDP/ GEF RER/96/G31, Vienna
FLECKSEDER, Hellmut	Technical and Scientific Director, ICPDR, Vienna
GARNER, Andy	Environmental Engineer UNDP/ GEF RER/96/G31, Vienna
GILS van, Jos	Modeling Expert, Delft Hydraulics, Delft
HANTSCH-LINHART, Wilhelm	Infrastructure Financing Specialist, FGG Vienna
HUDSON, Andrew	International Waters Principal Technical Adviser, UNDP/GEF, New York
JAKSIC, Borislav	Water Management Institute, Banja-Luka
KITTINGER, Wilhelm	Former President, ICPDR, Vienna
LATIF, Mohammad, A.	USAID, Washington
LOTTMANN, Jürgen, H.	Chief of the Environment and Public Health Division, KfW, Frankfurt
LUKSIC, Mojca	State Water Directorate, Zagreb
MARA, Liliana	Ministry of Water, Forest and Environmental Protection, Bucharest
MARGRAF, Christine	DEF, Munich
MATUSKA, Milan	Ministry of Environment, Bratislava
NATCHKOV, Ilya	Deputy Team Leader, Team Leader Danube Programme Coordination Unit, European Commission Phare, and Tacis Environmental Actions, Vienna
PINGULI, Entela	REC, Budapest
POPESCU, Liviu	ICIM Research and Engineering Institute of Environment, Bucharest
SCHUETZ-MUELLER, Ingolf	Chief, Division for Environmental Projects, UNOPS, New York
SCHULZE-VORNHAGEN, Dieter	Senior Project Manager, Promotional Banks, KfW, Frankfurt
STALZER, Wolfgang	President, ICPDR, Vienna
THOMPSON, Stuart	Office of High Representative Bosnia and Herzegovina, Sarajevo
WANNIGER, Reinhard	Financial Consultant, Vienna
WARMUTH, Heike	UNDP/ GEF RER/96/G31, Vienna
WELLER, Phil	Director, WWF – Danube – Carpathian Programme, Vienna

ANNEX IV

LIST OF DOCUMENTS REVIEWED

- 1 Analysis of Financing Mechanisms. PCU and Wanninger, R. 1999. No page numbering.
- 2 Convention on cooperation for the Protection of sustainable use of the Danube River (Danube River Protection Convention). Uated. 43 p.
- 3 Danube Regional NGO Consultation Workshop Report. REC, 1998. 28 pp. and 5 volumes of specific presentations.
- 4 Danube River Basin Pollution Reduction Programme Report. PCU, 1999. 57 p. and 15 annexes.
- 5 Danube Water Quality Model Simulations in support to the Transboundary Analysis. PCU, 1999. 54 p.
- 6 Eutrophication of the Black Sea: causes and effects. ICPBS and ICPDR, 1999. 70 p.
- 7 Evaluation of Wetland and Floodplain Areas in the Danube River Basin. PCU and WWF, 1999. 84 p.
- 8 Final Report. RER/91/G31 and RER/95/G45. Undated. 66 p.
- 9 Financing Pollution Reduction Measures in the Danube River Basin. PCU and KfW, 1999. 68 p. and 7 annexes.
- 10 Framework for Development of an Information Network for the ISPDR. PCU, 1998. 105 p.
- 11 GEF/UNDP Project Implementation Inception Workshop. PCU, 1997. 30 p. and 7 annexes.
- 12 Guidelines for Target Oriented Program Planning Workshop. PCU, undated. 91 p. and 23 flipcharts.
- 13 Local Grants for the Danube Pollution Prevention Program. REC, 1998. 16 p.
- 14 National Review Reports. (1999). Vol. 1,2, 3,and 4.
- 15 PMTF meetings 1,2 and 3 (1998 to 1999)
- 16 Project Document. RER/96/G31. 1997. 50 p.
- 17 Socio-Economic Analysis. PCU and R. Wanninger, 1999. No page numbering
- 18 Strategic Action Plan for the Danube River Basin 1995-2005. EPDRB, 1994. 109 p.
- 19 Strategic Action Plan for the Danube River Basin 1995-2005. Revision 1999. PCU, 1999. 130 p. and 4 annexes.
- 20 Terms of Reference for Programme Management Task Force (PMTF). ICPDR, 1998. 7 p.
- 21 Transboundary Analysis. Final Report. PCU, 1999. 218 p.

ANNEX V

ACTIVITIES

Objective 1: Complete the knowledge base for priority setting

Sub-objective 1.1: Update National Reviews and analyze National Action Plans, using a common format

1.1.1 Update National Reviews focusing on priority pollutants/sectors agreed in SAP

The UNDP/GEF staff, assisted by three international experts and eleven teams of national experts (45 national experts in total), prepared, from December 1997 to January 1998, guidelines for national reviews including the electronic formats for substance emissions and other water quality data required by the DWQM. Between February and November 1998, the national teams, in consultations with the NGOs and the public, prepared the national reports according to the provided guidelines. These reports were validated between September 1998 and January 1999, and became available to the DWQM. In 1999, the project team, together with the national and international experts, used the information available to prepare, for each country, an analysis of water pollution socio-economic effects, and a description of financial mechanisms for pollution reduction projects.

Two of the countries situated in the Danube River Basin (Austria and Germany) were not eligible for the project funding. Consequently, the project provided the countries with guidelines and formats, but not with financial support for the data collection. Up till now, these countries sent to the project the water quality data essential to development of the DWQM; however, they provided the project only with a part of information needed for their respective national reviews.

1.1.2 Prepare National Reviews for Bosnia-Herzegovina, the Federal Republic of Yugoslavia and Croatia

Bosnia-Herzegovina, Federal Yugoslav Republic, and Croatia were included in the national review studies during the same time as the other countries (see activity 1.1.1), and they provided all the data as scheduled, before the end of January 1999.

1.1.3 Definition of national baselines contribution through analysis of national policies, projects, investments, etc. defined in National-Action Plans

The project staff, assisted by a consultant and by EMIS, prepared in December 1997 and January 1998, a format for the national baselines. Then, in each country, the national teams in consultations with public and NGOs, prepared the national baselines. Between November 1998 and April 1999, the national baselines were introduced into the DWQM.

Sub-objective 1.2: Complete the Transboundary Diagnostic Analysis (TDA)

1.2.1 Prioritization of ‘Hot spots’

The hot spots screening methodology that enables their prioritization for N and P pollution reduction projects proposals was completed by the project staff in January 1998. Between February and November 1998, in each country, the list of hot spots was completed and they were prioritized according to the prepared screening methodology. Between November 1998 and January 1999, the project team, assisted by one consultant and by ICPDR Steering Group, incorporated the prioritized hot spots into a Transboundary Analysis Report.

1.2.2 Develop extended Danube Water Quality Model for priority pollutants

From September 1998 to May 1999, the project team, assisted by a consultant, validated the DWQM results. Simultaneously, the project improved and developed further the DWQM by increasing its analysis capability.

1.2.3 Asses the priority sites for wetland/floodplain restoration for pollution reduction and ecological rehabilitation

Between February 1998 and February 1999, the project team, assisted by a consultant, reviewed wetlands and floodplains in the Danube River Basin, and assessed their ecological functions; especially their nutrient removal capacity. The results were described in a basin-wide overview. Simultaneously, the project prepared an intervention program of wetland and floodplains restoration for inclusion in the Transboundary Diagnostic Analysis and drafted a management schemes outline (with baseline and total costs of management). A detailed development of wetland and floodplain management, initially included in the project document, appeared to be not feasible within the given budget.

1.2.4 Social analysis of pollution in the Danube River Basin and Black Sea

Between November 1998 and January 1999, the project team assisted by a consultant, completed a generalized format of reporting information on social impact of water pollution. In the meantime, the international consultant assisted by the project staff, and on a base of information provided by the national consultants, prepared a basin-wide overview of the national reports. Between January and April 1999, the results were incorporated into the overview of the Transboundary Diagnostic Analysis.

1.2.5 Integrate updated National Reviews and DWQM results with initial Transboundary Analysis (TA) to produce a draft basin-wide environmental status and strategy for tackling priority transboundary issues

The first draft of the transboundary analysis was completed in January 1999, the second in February 1999.

1.2.6 Hold Technical conference on transboundary pollution

In November 1998, the project management selected location, proposed dates, and organized logistic arrangements for a conference on transboundary issues. The program of the conference was developed in December 1998, and the conference itself was held in January 1999. The conclusions and proceedings of the conference were circulated among the Danube basin countries five weeks later. The definitive version of transboundary analysis was available in May 1999.

Objective 2: Review Policy for Protection of the Danube Basin and Black Sea

Sub-objective 2.1: Promote a Pollution Prevention and Reduction Policy Review

2.1.1 Prepare a timetable and a process for implementing and, if needed, updating the Danube SAP with an aim of aggregating quantified targets for pollution prevention and reduction

The project has, so far, within the frame of PMTF meetings, and in collaboration with the International Commission, organized three consultative meetings (in November 1997, October 1998, and in May 1999) with Danube countries to discuss updating the Danube Strategic Action Plan. The participants of the meeting agreed upon approaches to updating the SAP. Working groups, consisting of experts from the Danube Basin Countries, were organized to develop SAP progress indicators, prioritize work on hot-spots and wetlands, achieve policy consensus concerning TDA and GEF pollution reduction targets and ecological rehabilitation. The SAP update was also discussed in national NGO workshops and in national planning workshops.

2.1.2 Hold joint technical discussions with Danube and Black Sea countries to agree load/concentrations and sources of priority pollutants and wetland/floodplains of overall (Black Sea) basin-wide significance

2.1.3 Hold policy discussions with Danube and Black Sea countries to agree necessary pollution reduction strategies for the Black Sea Basin, consistent with GRF Operational Strategy

The project held one technical workshop on December 1998 to discuss: loads, concentration and sources of priority pollutants impacting the Danube and the Black Sea; and the rehabilitation and management of wetlands and floodplains of basin-wide significance. It held also three meetings in March, August and December 1998 to discuss technical strategies and policy basis for reducing the impact of priority pollutants within Black Sea basin.

2.1.4 Prepare pollution prevention and reduction programs for priority pollutants, especially nutrients

In December 1997 and January 1998, the project management developed a general framework for prevention and reduction programs for priority pollutants. The national teams prepared pollution programs and, between January 1998 and June 1999, held consultations with both the economic sector and non-governmental organizations involved. The program was completed in June 1999.

2.1.5 Integrate pollution prevention and reduction strategy into the SAP revision process

Between February and June 1999, the project team incorporated the results of the initial pollution prevention and reduction programs into the drafting process for the revised SAP.

Objective 3: Increase public awareness and participation

Sub-objective 3.1: Raise public awareness about pollution reduction activities

3.1.1 Launch public awareness program based on updated National Reviews and TDA – produce and disseminate a general brochure

In February and March 1998, the project prepared materials for a basin wide workshop to train national facilitators from the government and NGOs, and published guidelines for conducting national workshops. Eleven workshops for national NGOs and eleven national planning workshops were held between May and November 1998.

3.1.2 Hold consultations with local Stakeholders about priorities for transboundary pollution reduction

During the eleven national planning workshops held between May and November 1998, the project organized: (1) review of national transboundary pollution problems, (2) overview of national baselines, and (3) overview of wetlands and floodplains. Then, in January 1999, the project organized a technical conference on transboundary pollution. The conference reviewed the results of the transboundary diagnostic analysis. The project held as well, between May and November 1998, sub-regional and national consultations (planning workshops) and discussions about common strategic approaches to pollution reduction and ecological rehabilitation in the river basin and coastal Black Sea areas. To gain some feedback on the emerging pollution reduction programs, the project organized in May 1999 a pollution reduction program workshop.

3.1.3 Distribute three editions of “Danube Watch”

In March, June and September 1998, the project prepared, edited, and published three issues of the “Danube Watch”. The fourth issue (not included in the original work program) will be edited and published in July 1999. Finally, the project will edit an easy-to-read volume of Danube Watch reporting the key points of the SAP and PRP. This fifth edition is scheduled for September 1999.

3.1.4 Support the Danube Environmental Forum and national NGO meetings

The project held two meetings of the Danube Environmental Forum (in November 1998 and in March 1999) to discuss and agree the response of environmental groups to the on-going review of the SAP. From May to September 1998, the project has organized national NGO meetings to discuss strategies for influencing the government, business, and the public on the issues relevant to the Strategic Action Plan review. Finally between May and October 1998, the project, jointly with the Danube Environmental Forum, organized in Bulgaria, Romania, and Ukraine the national workshops aiming at reinforcement of cooperation between the NGOs from these three Danube and Black Sea countries.

3.1.5 Provide small grants for community-based pollution reduction and awareness projects

Between March and May 1998, the project established the mechanisms of awarding small decentralized grants in each Danube country. The grant program was elaborated and publicized widely between May and June 1998. The implementation of grants started in September 1998. The total budget of US\$200,000 was allocated. The small grant program will probably be completed in September 1999.

Sub-objective 3.2: Improve coordination and information exchange

3.2.1 Establish Danube internet network

Between January and March 1998, the project assessed the existing information system in Danube region. After that assessment, the project convened, still in March 1999, a Danube information system workshop that reviewed the existing information and created ad hoc working group that developed tools for information Internet network. The members of the workshop, jointly with the project management and the ICPDR, decided to establish the Danube Internet network as a part of the larger ICPDR information system. The government of Austria provided additional US\$280,000 for development of that information network. The development of network itself will take one year, between December 1998 and December 1999. Actually (June 1999), the project installed the appropriate hardware and software for the network (supported by additional funding by the Austrian Agricultural Ministry by US\$50,000). It is foreseen that the final product of this activity will be delivered as scheduled, in December 1999.

3.2.2 Update and disseminate DANIS

Following the recommendation of the workshop held in March 1998 (activity 3.2.1) and by joint decision of the project management and the IPCDR, the obsolete DANIS information network was incorporated into modern and widely used ICPDR information network DANUBIS

Objective 4: Develop the financing of the pollution reduction program within the Danube SAP

Sub-objective 4.1: Develop portfolio of Danube basin projects

4.1.1 Develop financing strategies for the pollution reduction program within the SAP, in accordance with the Basin-wide strategy

The project prepared formats for financing strategy for pollution reduction as early as in December 1997 and January 1998. The national teams confirmed their readiness to contribute to development of financing strategies and started to prepare the national strategies between February and November 1998. Overall basin-wide financing strategies were reviewed in a workshop held in February 1999. They were finally incorporated in the revised SAP in June 1999.

4.1.2 Prepare project documents for priority hot-spots projects for investment consideration

The model structures of project documents for pollution reduction in Danube countries were prepared by the project management, assisted by a consultant, in December 1998 and January 1999. The elaborated national projects were incorporated progressively into a computerized project file and, in May 1999, all developed projects (according the model) were reviewed in a Pollution Reduction Program Workshop.

4.1.3 Prepare the outline descriptions of wetland, floodplain and demonstration projects for potential donor grant support

The model structures for project document were proposed between February and June 1998. Between June and November 1998, the country teams prepared individual projects with assistance of an international consultant. The implementation strategies were identified and developed between October 1998 and April 1999.

Sub-objective 4.2: Mechanisms to provide sustainable financial support for the Danube River Basin

4.2.1 Feasibility of establishing a Danube Environmental Fund, including the exploration of the economic instruments needed

Between April 1998 and April 1999 the project team, ICPDR, and a consultant conducted a feasibility study of options for establishing an international Danube Environmental Fund. The feasibility of this fund was discussed in a workshop in February 1999. From September 1998 to February 1999, the international community was consulted on provision of funds for the Danube Environmental Fund.

4.2.2 Prepare structures, rules etc. for a Regional Fund, or other mechanism as agreed

The rules and structures of the regional funds were elaborated by the project between April 1998 and January 1999 as a part of the feasibility study (activity 4.2.1).

*Sub-objective 4.3: Finalize and agree on the process for adopting a refined SAP*4.3.1 Integrated portfolio of investment and capacity-building projects, and regional financing mechanisms, into SAP

Between February and May 1999, the project organized discussions of results of financing strategies and project pipelines for pollution reduction programs. These strategies were discussed with groups responsible for the updating SAP. As a result, between February and May 1999, the project, the ICPDR, and the drafting group have prepared an updated version of the SAP.

4.3.2 Adopt updated Danube SAP at the ministerial conference

The updated versions of SAP and PRP were discussed at a regional workshop in May 1999 and then presented to the IPCDR Steering Group in June 1999. The ministerial conference that will discuss and eventually adopt the Danube SAP will be organized by ICPDR in November 1999 or early in 2000.

4.3.3 Donor Pledging conference (or PC meeting) for priority investment projects

The project documents, including proposed financing packages for pollution reduction projects, were finalized by June 1999. These documents were consulted with donors during the regular PMTF meeting, during individual consultations, and during presentation of country or regional documents to the PMTF. Subsequent meetings with donors are scheduled for November 1999. Two special editions of a journal 'Danube Watch' will discuss the pollution reduction program and review the SAP.

Cooperation between UNDP and The European Commission

The Project assisted the UNOPS and EC in updating an agreement between the UNDP and the European Commission. The updated agreement was presented to the Danube Task Force for review in 1998. The agreement was approved in 1998.

Danube Task Force

The project organized one meeting of the former Task Force (TF), two meetings of the new Program Management Task Force (PMTF), and provided financial support to the recipient countries for attendance. The project participated in discussions concerning the transfer of responsibility for implementation of the SAP from the PMTF to the new TF established under the DRPC.

ANNEX VI

OUTPUTS

Objective 1: Complete the knowledge base for priority setting (Output description is based on Van Hoof findings – Annex VII)

Sub-objective 1.1: Update National Reviews and analyse National Action Plans, using a common format

1.1.1 Eleven updated National Reviews and an extended and improved Danube Water Quality Model for analysis of transboundary pollution loads and export to the Danube delta and Black Sea

1.1.2 Two National Reviews and an extended and improved Danube Water Quality Model for analysis of transboundary pollution loads and export to the Danube delta and Black Sea

The project has received national reviews from nine countries (except Austria and Germany). The reviews were updated and put in a common format. Each of them contained pollution emission data required for the transboundary analysis and the water quality model simulations. However, the quality of data and the reports produced by the countries was unequal. The most salient inadequacies are:

Slovenia

Frequency of the immission measurements on surface waters is very low (four per year) and mostly performed at low river flows which does not allow reliable calculations of loads of priority pollutants.

Czech Republic

Immission measurement frequency is only twelve per year; load calculations are not given.

Slovakia

Missing information on sampling frequencies; no details on calculation of loads

Only immission concentrations for the priority parameters requested are given. Organochlorine pesticides and triazine herbicides residues are reported without mentioning concentrations.

Hungary

No observation.

Bulgaria

Data available are limited to priority parameters. Low sampling frequency (once per month).

No load calculation description. The report is written in very general terms.

Romania

Methods used for load calculation are not described.

Moldova

Different water quality problems mentioned, but not described systematically. No systematic information on parameters measured and sampling frequencies; no indication on load calculation. Information reported in a non structured way.

Ukraine

Lack of systematic information on sampling frequencies and analyzed parameters. Only immission concentrations are reported. No information about loads.

Croatia

Sampling frequencies are not mentioned. Loads have been calculated by scientifically unsound method.

Bosnia-Herzegovina

Only a very limited set of water quality data is available. Hot spots were not prioritized.

Federal Yugoslav Republic

Lack of reliable time series of immission values after 1992.

1.1.3 Calculation of the national bselines for pollution reduction from priority substances (especially phosphorus) impacting the Danube River and Black Sea

Pollution Reduction Program Report (PRP), page 48, provides national baselines and incremental costs for the proposed projects. The division of total costs into baseline and incremental were calculated in a simple and schematic manner that is satisfying at this stage of PRP reporting. The baselines should be, however, recalculated once an identified donor will consider the project for implementation.

Sub-objective 1.2: Complete the Transboundary Diagnostic Analysis (TDA)

1.2.1 Prioritised list of hot-spots relevant to the pollution reduction program in the Danube River Bassin

The list of prioritized hot spots is incorporated into a report “Transboundary Analysis,” June 1999.

1.2.2 Substantially validated Danube Water Quality Model capable of quantifying transboundary pollution loads in the Danube River Basin and export to the Black Sea, ready for discussion and approval as a management tool by all Danubian countries

The output is described in a document “Danube Water Quality Model simulations in support of the Transboundary Analysis and the Pollution Reduction Programme”, dated June 12, 1999. The model (DWQM) simulates the flow of pollutants through the Danube River basin. The Model may simulate pollution by such substances as BOD, COD, N, P, or oils. It aimed at evaluation of transboundary pollution and calculation of various pollution reduction scenarios.

However, now, due to the limited water pollution quality data available, the model may be used in preference to simulate the N and P pollution according to two scenarios (high or low pollution). The results should be interpreted with caution.

The first simulations by the DWQM indicate the most important sources of N and P pollution, demonstrate that diffuse pollution is the most important contributor to N and P pollution in the Danube basin and that the impact of wetlands on N and P reduction is limited.

1.2.3 Basin-wide overview of the wetlands and floodplain network and a program of baseline and incremental management interventions which will contribute to transboundary pollution reduction and nature conservation.

The draft report ‘Evaluation of Wetlands and Floodplain Areas in the Danube River Basin’ (February 1999) evaluated indirectly (e.g. by the number of days a landstrip has been flooded) the effect of wetlands on N and P removal. The report made clear that:

- Nutrient reduction by wetlands is only a side effect of wetland rehabilitation and should not be considered as an alternative for waste water treatment;
- Involvement of beneficiaries in this activity is a prerequisite for success for wetland restoration.

1.2.4 Basin-wide overview of Danube water pollution on people is prepared and integrated into the Transboundary Diagnostic Analysis

A document that covers this subject is very general and does not handle the hygienic risks adequately.

1.2.5 Draft final version of the Transboundary Diagnostic Analysis for wide international review, including by IC Emissions Expert Group

Transboundary analysis is based on national reviews that contained many inconsistencies. The report describes the results but not mention any conclusions neither in relation to the Danube River basin nor to the Black Sea.

1.2.6 Conference proceedings and the final version of the Transboundary Diagnostic Analysis

The conference was held in January 1999; the results of discussions were incorporated in the definitive version of the transboundary analysis in May 1999.

Overall output of Objective 1:

The outputs from the first sub-objective represent the best available knowledge on Danube River basin pollution. All together, the information provided a first input to the basin pollution model. It helped the countries and the project to identify the important sources of pollution, and to prepare proposals for pollution reduction projects.

The overview of national reports shows, however, that they differ strongly in quality. All reports focus on pollutant concentrations (quantity of pollutant in a given volume of water), whereas pollutant loads (quantity released from the pollution point) - important tools for policy evaluation - are seldom mentioned.

A major problem affecting successful implementation of the objective was lack of sufficient and reliable imission water quality data needed for the transboundary analysis and for the validation of the Danube Water Quality Model. This shortage could not have been overcome within the duration of the project.

In general, the reports produced represent a high quality despite of the burden of insufficient data. Report on the Danube Water Quality Model demonstrate elegant approach to solve this basic problem. The model as well as other outputs represent a good achievement of the immediate objectives of the project, and will contribute to the development of the region.

Objective 2: Review policy for protection of the Danube Basin and Black Sea (Findings of S. Manikowski)

2.1.1 An agreed timetable and approach for updating part or all Danube SAP is prepared. In particular the project has designed an approach to updating the pollution reduction targets for priority substances and sectors, required to ensure protection the Danube River Basin and the Black Sea

A common timetable and approach for updated the Danube SAP was elaborated and agreed upon durind a Facilitator Training Workshop in March 19, 1998. The workshop's approach was based on the Target Oriented Program Planning methodology which aimed at reinforcing country-driven initiatives, and ensuring that government, administration, NGOs, scientific institutions, and cooperating agencies are all involved in the planning process.

2.1.2 An agreement is reached on the priority pollutants and sectors affecting the Black Sea Basin, and a strategy is developed to overcome current environmental problems

The agreement on priority pollutants and sectors was reached and the list of the priority pollutant incorporated into the revised Strategic Action Plan (SAP). This agreement was based on the National Reviews, which described and analyzed the socio-economic impact, water quality, water engineering, and financial mechanisms. At the regional level, these data were synthesized and used to prepare a comparative socio-economic analysis, develop a financing mechanisms, and complete an investment portfolio.

2.1.3 First steps are taken toward a technical and policy agreement. These agreements cover the strategy pollution reduction and ecological rehabilitation in the Danube/Dniester/Dnieper/Don river basins and along the Black Sea coastal zones

The workshop and meetings initiated by the project created both a basis for national and regional policies; and strategies for pollution reduction, and ecological rehabilitation of both basins.

2.1.4 Draft national Pollution Reduction Programs for all Danube countries

The drafts of the national pollution reduction programs and the draft of the Danube River Basin Pollution Reduction Program (PRP) were prepared and finalized in June 1999. The final PRP draft was amended on the basis of comments and validating arguments of the decision-makers from the member countries. The PRP corresponds to the priorities defined separately by each nation. It focuses on point source pollution. The PRP is the basis for developing investment portfolio in support of the SAP.

2.1.5 Introduction into the SAP the policy directions concerning pollution prevention and reduction

The SAP was finalized in June 1999, and it contains the policy considerations perceived by member country representatives.

Overall output of Objective 2

According to the Project Document, the activities conducted and the products achieved in the frame of objective 2 should

- Contribute to an agreement on policy directions for pollution prevention and reduction in the Danube River and Black Sea basin;
- Lead to an updating of the Danube SAP;
- Identify in each Danube country a range of pollution reduction targets.

The present section will evaluate activities and their outputs. It will describe how they contributed to achieving each of these aforementioned three goals.

A. Agreement on policy directions for pollution prevention and reduction in the Danube River and Black Sea basins.

The studies and investigations undertaken in activities 2.1.2, and 2.1.3 designed a picture of a progressive poisoning of the Black Sea ecosystems due to pollutants produced by surrounding countries. The studies clearly indicated the countries responsible and warned them about the economic and social consequences of polluting civilization. The studies indicated the current weaknesses in the monitoring of pollution. The information provided helped to bring the issue of reducing Black Sea pollution to politicians, political organizations, economic agents, research institutions, NGOs, and citizens attention.

The project, jointly with ICPBS and ICPDR, attempted to formulate both policy and strategy for reduction and prevention of pollution. The policy is discussed in the “Summary Report of the joint ICPBS and ICPDR of Ad-hoc Technical Working Group” dated May 1990. On page 12, under the section “Policy Perspectives for Controlling Eutrophication”, the report makes reference to an “iterative management” that has been taken by the Black Sea Strategic Action Plan as an approach to reducing pollution.

The iterative management approach is as follows: When complete removal of pollutants is desirable but unattainable in the foreseeable future, the progress in pollution reduction may be achieved by an iterative process. In the first step of this process, each partner agrees to reduce pollution by some reasonable amount during a given time frame. Once this is attained, the partners set the next reduction target. The iteration continues until all partners agree that pollution emission has been reduced to a satisfactory level. The iterative steps in pollution reduction are accompanied by research programs, pollution measurements, and public awareness building.

It seems that both Commissions tacitly agreed on this approach. According to the cited Summary Report (page 11), the group proposed to both Commissions that pollution reduction should aim at restoration in the Black Sea of an ecological state similar to that of the 1960s. This well corresponded to the “satisfactory level” attended at the end of the iterative management method. Furthermore, (keeping in mind the iterative steps) the group believed that (still on page 11) “in order to start, an agreement is needed on Black Sea nutrient input limits and on the state of the ecology regarding these inputs.” Then, in the next paragraph, the document proposes to both Commissions to maintain temporarily the discharges at 1997 level in order to see the Black Sea ecosystems response.

The Commission’s proposal needs yet to be endorsed by the States and translated into specific commitments by the countries concerning the first step of the iteration process: the limitation of pollutants, and then, the programmes accompanying these limitations. The countries should take initiative in determining the policy directives and policy implementation instruments for pollution reduction since, as it was rightly stressed by three participants of a third meeting Group, and cited in the Draft Minutes of the third meeting (page 5) “any true acting is only at the respective national level, and the function of the Commissions is to have an ‘umbrella’ via the ‘participation of cooperation’.”

The Group has also attempted to develop some strategies. In the second meeting of the joint ICPBS and ICPDR Ad-hoc Technical Working Group, the Group defined “possible strategies” for reducing pollution as follows (Summary Report, page 12):

- The long-term goal for all States in the Black Sea Basin is to take measures to reduce the loads of anthropogenically applied nutrients and hazardous substances to such levels necessary to permit Black Sea ecosystems to recover to conditions similar to those observed in the 1960s.
- As an intermediate goal, urgent control measures should be taken by all States in the Black Sea Basin in order to avoid that the discharges of nutrients and hazardous substances into the Seas exceeded those that existed in 1997. The ‘Group’ recognized that these 1997 discharges are only incompletely known and that further work has to be undertaken to substantiate the size of the loads received by the Seas (Black Sea proper; Sea of Azov).
- The ‘Group’ concluded that the inputs of nutrients and hazardous substances into both receiving Seas have to be assessed in a comparable way, and that to this very end a common AQC (Analytical Quality Control) system and a thorough discussion about the necessary monitoring, including the sampling procedures, has to be set up.
- The ‘Group’ also concluded that the ecological status of the Black Sea and the Sea of Azov has to be further assessed, and that the comparability of the data basis has to be further increased.
- Both the reported input loads as well as the assessed ecological status will have to be reported annually to both the ICPBS and the ISPDR.
- The States within the overall Black Sea shall have to adopt strategies that will permit economic development, whilst ensuring appropriate practices and measures to limit the discharge of nutrients and hazardous substances, and to rehabilitate ecosystems which assimilate nutrients.
- Based on the annual reports and on the adopted strategies for the limitation of the discharge of nutrients and hazardous substances, a review shall be undertaken in 2007. It will focus on the further measures that may be required for meeting the long-term objective (reaching an ecological status similar to the conditions observed in the 1960s).

The Group’s definition of the strategy may be considered as a preliminary identification of problems related to the pollution reduction policy implementation. The elaboration of national and regional strategies is yet to come.

In conclusion, the activities 2.1.2, 2.1.3 and their outputs yielded several positive results. They helped in understanding the Black Sea eutrophication problem, provided evidences for the decline of coastal ecosystems, raised the problem of nutrient sources to the Black Sea and warned about the danger of doing nothing. They are the first steps in designing a specific common approach on policies, strategies, and technical measures to pollution reduction and ecological rehabilitation in the Danube/Dniestr/Dnieper/Don river basins and from Black Sea coastal zones.

B. Updating the Strategic Action Plan

The Danube River Basin Environmental Declaration of 1994 required that the SAP prepared in 1994 be evaluated and updated by 1997. The activities 2.1.1, 2.1.2, and 2.1.5 and their outputs aimed at this outcome. The final SAP, the SAP-1999, is one of the outputs.

The SAP-1999 is a document of 150 pages that summarizes the most important pollution reduction measures both current and future for the Danube. For over a year and a half, the project its member countries have mobilized representatives of technical ministries concerned, NGOs, and, through the consultations on the national level, the private sector. The project provided several inputs, such as overall guidance, organization, financial support and technical expertise. The national level contributors collected data, prepared documentation, and formulated proposals for the revision of the SAP. As a result, the SAP 1999 reflects an understanding of how pollution reduction is approached by DRPC member countries. The SAP-1999 is accompanied by a Danube River Pollution Reduction Program (PRP) containing description of priority targets for pollution reduction identified in each Danube country. The draft SAP-1999 was discussed at a workshop in May 1999, adopted in June 1999, and will be presented for approval to the technical ministries of the member countries by the end of this year.

Both the SAP-1994 and SAP-1999 stem from the decisions taken by the Environmental Program for the Danube River Basin (EPDRB) created in Sofia in 1991. The content of the SAP should indicate to the countries how the EPDRB program formulated in a document called Danube River Protection Convention (DRPC) will be implemented. The SAP should serve as an important tool for policymakers (SAP dated 1994, page i) and provide direction and framework for regional cooperation among countries in the Danube River basin (Ibid., page iv). The SAP should indicate the regional policies and strategies for water pollution reduction and environment protection (SAP-1999, page v).

Since the SAP-1999 is continuation of the SAP-1994, and both documents concern the program formulated in the DRPC, an evaluation of the SAP-1999 requires a brief presentation on both the DRPC and the first SAP.

Danube River Protection Convention (DRPC)

According to DRPC or Convention, the cooperation among the Danube River basin countries in river pollution reduction may take on several forms including consultations, joint actions and exchanges of information (Article 4 of the Convention). This cooperation should consist of the following (Ibid., Articles 5 to 17):

- Prevention, control and reduction of transboundary impact;
- Specific measures for water resources protection;
- Limitations on emission objectives and criteria for water quality;
- Emission inventories, action programs and progress reviews;
- Monitoring programs;
- Obligatory reporting;
- Consultations;
- Information exchange;
- Informing the public;
- Research and development;
- Communication, warning and alarm system, emergency plans;
- Mutual assistance.

The Convention covers a broad area of pollution reduction, without necessarily involving the EPDRB into policy and strategy efforts. In fact, the word policy or strategy does not appear in the Convention.

Strategic Action Plan of 1994 (SAP-94)

The first Strategic Action Plan (SAP-94) was drafted by a special group mandated by a task force that had been established by the EPDRB. The draft was completed in October 1994. In December 1994, the Environment or Water Ministries of the Danube countries and a Member of the European Commission responsible for the Environment, endorsed the SAP-94.

The SAP-94 has four goals (page 13):

- (1) Improvement of aquatic ecosystems and biodiversity in the Danube River basin and reduction of pollution loads entering the Black Sea;
- (2) Maintaining and improving the quantity and quality of water in the Danube River basin;
- (3) Controlling the damage from accidental spills; and
- (4) Development of regional cooperation in water management.

The SAP clusters the sources of pollution and water quality problems into 'Sectors'. The SAP identifies four sectors (page 9 and 10):

- (1) cities;
- (2) rural towns and villages;
- (3) industry, energy production and transport; and
- (4) agriculture.

The agents that need to change their behavior so as to ease the pollution problems are called 'Actors'. The SAP considers actors to be (page 10):

- (1) public authorities;
- (2) public and private enterprises; and
- (3) general public and NGOs.

The policies that should help countries achieve the goals consists of (page 16):

- (1) Integrated water management;
- (2) Environmentally sound sector policies;
- (3) Lowering the of risks of accidents; and
- (4) Investments.

The SAP-94 identifies 59 wetlands to restore and 179 hot spots for action. It also describes the Danube River basin environment and its important pollution problems and priorities.

The SAP contains some inconsistencies. We will discuss those relevant to the evaluated SAP 1999.

First, the formulation of the SAP-94 goals differs depending on which area of the document you read.

The goals listed on the page 13 have been quoted previously in this section. On the page 71, the first two goals were stated as follows: (1) "Maintain and improve the availability and quality of waters in the Danube River basin;" (2) "Reduce the negative impact of activities in the Danube River basin on the riverine ecosystem and the Black Sea." In the executive summary, page v, the first goal from the page 71 become the second, and the second become the first.

Furthermore, the sectors cited earlier from the pages 9 and 10, are classified differently in page 15: (1) Phased expansion of sewerage and municipal waste water treatment; (2) Reduction of discharges from industry; (3) Reduction of emissions from agriculture; (4) Conservation, restoration and management of the wetland and floodplain areas of the tributaries and main stream of the Danube River basin.

Finally, the meaning of so called "Actors" is not defined. On page 10, the SAP-94 describes the role for two of them in pollution reduction: the public authorities and the general public. Nowhere does it state the role for public and private enterprises. The definition of regional cooperation (page 9) is circular: "Regional cooperation

means the full participation in and utilization of regional mechanisms and structures for international cooperation, consultation and coordination.” Table 1.3 that identifies links between actors and actions to water management problems (page 12), proposes some questionable links. For example, the public authorities should ensure adequate tariffs to cities but not to rural towns and villages, nor to industry, agriculture, and livestock. The public and private enterprises should safely dispose the hazardous waste from rural towns and villages but not from cities, industry, or agriculture. Finally, the general public and NGOs are in charge of managing the livestock manure. On pages 16 to 18, the SAP lists the short term and medium term targets, and on pages 18 to 23, it describes in general and qualitative terms, short- and medium-term actions. However it is virtually impossible to put target on these actions.

In conclusion, it can be stated that, (1) the SAP really needed to be improved and updated; (2) nevertheless, it covers a gamut of actions included in the Convention.

Strategic Action Plan of 1999

The SAP 1999 identifies one “core problem” namely the “ecologically unsustainable development and inadequate water resources management in the Danube River basin”. From this core problem stems one objective: “Achievement of sustainable development in the Danube River basin,” which in turn is composed of three sub-objectives:

- 1) Improvement of the wastewater and solid waste management. This objective concerns municipalities. Its realization will deliver the following outputs:
 - Extended and upgraded public sewer system by the year 2005, operated in 90% of municipalities with population over 5000;
 - Appropriate wastewater treatment, by the year 2005, assured in 70% of settlements with population over 5000;
 - Proper solid waste management by 2010, applied in 90% of localities with population over 50 000.
- 2) Introduction of best available techniques, best environmental practice, and abatement of water pollution. This objective concerns industry and mining; it will be achieved through four outputs:
 - Clean technologies and the abatement of water pollution, introduced by the year 2010;
 - Pre-treatment facilities of industrial waste-water, implemented by the year 2010;
 - Adequate management of all enterprises, ensured by the year 2005;
 - Hazardous substances treated and disposed of in proper landfills by 2010.
- 3) Implementation of good agricultural practices and mechanisms for sustainable land management. This objective will be achieved through five outputs:
 - Integrated approach for land and water management in all countries by 2010;
 - Adequate use of pesticides and fertilizers; by the year 2010, the number of certified organic farms be increased by 20%, and in other farms the P and N consumption stabilized at 1998 level;
 - Waste water discharged by animal farms properly treated. By the year 2005, 50% of animal farms with over 500 livestock units equipped with the wastewater treatment plants, and by 2010, 75% farms be equipped;
 - An accelerated run-off and erosion prevention plan. By 2010, the length of hedgerows, forest belts and wind breaks increased by 25%, and 2000 km of regulated rivers be restored;
 - Wetlands and floodplains adequately protected and restored. By the year 2005, 110 000 ha, and by 2010, 140 000 ha of wetlands restored.

The SAP 1999 lists 328 hot spots of high and medium priority for consideration by the pollution reduction program.

The SAP 1999 contains a list of nine plans and programs suitable to regional cooperation (page 128). However there is no indication on a specific role these plans would play in pollution reduction or on their link with national plans. It is not clear if national and regional policies as well as institutions are sufficient to support and successfully implement the SAP 1999.

The SAP contains two important sections: 4: Regional Policies and Strategies (pages 45 to 66), and 5: Sector Strategies (pages 67 to 112).

Section 4: Regional Policies and Strategies analyzes regional problems (the core problem, its direct causes, roots, and direct and ultimate effects), identifies causes of water pollution (hot spots, diffuse sources of pollution, and Significant Impact Areas), describes the pollution effects (transboundary and effects on the Black Sea ecosystems), and finally, analyzes the objectives and targets for pollution reduction and sustainable water management. Thus, the section content develops the arguments supporting investment in pollution reduction projects (proposed in the SAP and outlined in detail in the RPR) than rather the regional policy and strategies.

Section 5: Sectorial strategies. The section contains, for all three sectors (municipal, industry and mining, and land use – agriculture), a situation analysis (sector importance, current assets as know-how, legislation, financial resources, public awareness, transboundary effects); a problem analysis (sector core problems, causes and effects of environmental problems); and sector objectives (their description, expected results, important assumptions and impact indicators).

There is no doubt that both sections reflect well the results of national investigation and that they both (summarized) have their place in the SAP. However, the SAP, a document of such political importance, should detail and discuss policy considerations and strategy issues in details. The need for policy and strategic considerations may be justified as follows:

The environmental policy and macro economy's concerns are as follows:

- Finding the best way to achieve an efficient and cost-effective pollution reduction. (This means the point where marginal pollution abatement cost and marginal damages are equal);
- Finding the ways to assure equitability in distribution of the burden for pollution reduction (the relatively well-off people may be charged more than the less fortunate);
- Finding the ways to assure an acceptable distribution of pollution emission charges;
- Knowing how to assure the policy is enforced at the lowest cost;
- Finally, that it take into consideration ethical issues, moral considerations, and national traditions.

It's important for the project to know to what extent implementation of its objectives helps or hinders national policy; and, on the other hand, to evaluate the policy influence on the project's pertinence, impact, and duration. It would be the most useful for the project, its implementing agencies, financing institutions, and donors to know the government environmental policy and to check it against the project costs, objectives, assumptions and indicators.

The national policy may be evaluated as well for its coherence at the central, sector and local levels and, on a regional scale, for its coherence among the countries. In particular, it would be useful to evaluate periodically how it compares to the regional and country policies and the proposed project's objectives so as to assure that the project's activities and objectives aim for the same goal as the policies coming from the government or region.

Strategy (or policy implementation instruments)

The governmental strategy for the implementation of an environmental policy is based on two basic instruments: environmental standards and incentives.

An environment standard is the mandated level of performance that is enforced by the law. The best available technology (BAT) which DRCP recommends (DRCP, Annex I part I) is a standard. The maximum released level

of a given pollutant is also a standard. The standards have drawbacks. To be just, the standards cannot be identical for all industries and often the standards do nothing to stimulate, improve or innovate.

The incentives remunerate agents in proportion to their compliance with the law. Taxes, subsidies and transferable discharge permits are the most common incentives. The incentives stimulate the polluter's invention and contribute to technology progress, but they are difficult to apply if the pollution discharge measurements are inadequate.

As in the case of the policy, it is important for the project designers to be aware of the government instrument used to realize the environmental policy. The project's viability and its economic importance depend strongly on the policy implementation strategy.

Regional policy

Finally, the success of a regional pollution reduction project depends on member countries' policies and regional agreements. Regional policy is of equal weight to sovereign national policies. However, international agreements are (usually) voluntary. In consequence, it is reasonable to suppose that a country will not sign a new agreement or honor an old one if the agreement will make it worse off. Knowledge of national policies can help negotiators of environmental agreements to strike the required equilibrium. More important, the regional project which is familiar with national environment policies and regional issues, can invest its resources among countries in such a way that the investment will encourage all countries to take part in a regional agreement. With a wide set of investments, the regional project may well assist a country to resist the temptation to free ride on the pollution control efforts of others.

C. Pollution Reduction Targets: Danube River Basin Pollution Reduction Program (PRP)

The Danube River Basin Pollution Reduction Program (PRP) supports the SAP 1999. It lists the projects for pollution reduction that has been agreed upon by the Danube basin countries during a series of meetings and workshops. The main source of information on projects, priorities and costs are found in the National Reviews. The RPR contains a detailed technical summary of priority projects to be executed in the Danube River basin. It describes 513 identified hot spots, and formulates 421 projects. For each of the 421 projects, the document specifies expected load reduction for BOD, COD, N, and P, baseline costs, incremental costs, and total investment cost.

The total investment is estimated at \$US 5 522 million, of which US\$ 3 289 million represent the baseline costs and US\$ 2 034 million the incremental costs (PRP, Annex 6, page 32). The investment should reduce the load of pollutant as follows:

Type of emission	Estimates of emission in thousand tons per year (SAP 199, page 52)	Expected emission reduction (PRP, Annex 6, page 30)	Improvement in %
BOD	324	421	?
COD	851	623	73..2
N	884 – 944	100	8.8 – 9.4
P	103 – 119	20	19 – 17

The projects were evaluated only in financial terms according to the current (1997) value of local currencies. There is no economic evaluation of the projects. There are great differences in financial cost effectiveness of the projects among countries and among sectors.

According to the PRP, the separation of total costs into basic and incremental is provisional and should be updated.

For five of the eleven countries involved, the total investment in pollution reduction, according to the PRP, represents a budgetary burden equivalent to more than 6% of Gross National Product in 1997 of the Danube River basin area of the country. For Bosnia-Herzegovina, it represents as much as 16% (PRP, Annex 11, page 1).

The PRP discusses little the economic and political consequences of the program on the beneficiary countries. It remarks, however, that the pollution reduction may result in two kind of economic consequences (page 39):

- Inflation of construction prices due to the short-term rise in demand for construction services;
- Restoration of wetlands may require the forfeiting of arable land.

Objective 3 : Increase public awareness and participation

(Based on the contribution of Esther Park, Annex VIII)

Sub-Objective 3.1: Raise Public Awareness about pollution reduction activities

3.1.1 Materials and events to publicise the need for pollution prevention and reduction and ecological rehabilitation in the Danube River Basin

3.1.2 Input to the development of the technical basis and policy for pollution reduction in the Danube River Basin and Black Sea is available.

The project did not produce materials or hold events to raise public awareness as outlined in the project document. Instead, the project felt that the objective 3 would be better served by holding a regional training workshop called “Target Oriented Program Planning” (TOPP), in which one NGO representative and one government representative from each country were trained in public participation methodology.

These representatives then became facilitators in the National NGO Workshops convened by the Regional Environmental Center for Central and Eastern Europe (REC), where national priorities were discussed and identified. These priorities were consequently introduced in the National SAP Planning Workshops where the results from the National Reviews (and the National NGO Workshops) were brought together to result in the revised SAP and the Pollution Reduction Program.

Further, the results of the National NGO Workshops were brought to a Regional NGO Consultation Meeting, in which NGO representatives from all 13 countries came together to discuss regional priorities and to re-establish or revitalize the Danube Environmental Forum (DEF).

In general, the DEF has been weak and unable to participate effectively in implementation of this project. Instead, the REC has taken responsibility for the National NGO meetings. For similar reasons, the DEF was unable to hold a joint workshop with the Black Sea Basin NGO Forum. Cooperation with the Black Sea project has been slow as a whole. So far there has been only a joint technical working group with the Black Sea.

3.1.3 Wide awareness of pollution reduction issues in the Danube River Basin and in international community

The “Danube Watch” has been published in three issues, with two more special editions forthcoming. Four thousand copies of each issue were being disseminated, and now the edition increased to 8000 copies. In the future, the Danube Watch will be published on the DANUBIS site, and its condensed version inserted into another existing environmental publication (in Austria).

After PHARE funding stops in October 1999, sustainability of the Danube Watch will be in the hands of a new publisher. There is the possibility of inserting advertisements into the journal by which it might be self-sustaining.

3.1.4 Stronger role for environmental NGOs in the Danube River Basin and practical cooperation with similar groups in the rest of the Black Sea region

The project was effective in the arena of public participation. Considering the scope of the project, most of the major NGOs in each country were brought into the SAP planning and revising.

The project greatly relied on the DEF for its sustainability in this component. However, the DEF is weak and unable to take on this burden. In the future, the ICPDR is willing to support public participation, but does not necessarily identify DEF as the agency through which it should happen.

It should be noted that the past failures of the DEF have alienated some NGOs from participating, most noticeably those in Hungary. As a group, a number of Hungarian NGOs refused to participate in the National NGO meeting and sent a letter of protest stating that they would not have anything to do with the DEF. Currently, the DEF is in the rather precarious position of not being legally registered as an entity. As with many NGOs, the organization has little know-how with regard to legality, financial viability, and general management. However, they have made good progress in information sharing. The members have created an e-mail network.

3.1.5 A series of community-based projects which will contribute to pollution reduction in the Danube River Basin and Black Sea

The small grants program destined to finance community-based projects was carried out by the REC. The project management developed guidelines for the grant attribution and publicized the program. Because of a delay in actually disseminating the grants, the impact and results of the program have not yet been revealed.

Sub-objective 3.2: Improve coordination and information exchange

3.2.1 Strong communication links among Danube experts, decision-makers and NGOs, and cost-effective means of publishing information about the Danube River Basin

3.2.2 An improved and extended DANIS information system accessible to the general public

The PCU began work on a web site DANIS (the Danube Information System) and found that it would be more effective in the big picture to incorporate DANIS into the system being created by the ICPDR, "DANUBIS." To date, the web site is not yet functional, but is expected to be fully operational by the fall of 1999. In the meantime, PHARE has published a Danube home page connected to that of REC, from which all activity will be forwarded to DANUBIS once it is functional. This home page is being hosted by the REC web site and has the appropriate links to maps, legislation, donors, and other relevant information. A counter was put into the system, from which it can be assumed that up to 1000 people have visited the site.

Overall output from the objective 3:

Although the project achieved its objectives concerning increase of public awareness and participation, the project design hampered the intentions and the goal of the public participation component of the project. While NGOs were effectively drawn into the decision-making process, the government side was less prepared for cooperation on this level. Nevertheless, overall, the project did what it needed to in order to fulfill the objectives. The full impact of many of these efforts has yet to be seen, as timing is a factor. And still, as in the case of any development project, this is just one step in the process.

The past weakness of the DEF and its current unresolved status is a critical factor for the future sustainability of public participation and cooperation in the Danube region. If the legal status of the organization is not adequately established from the beginning, its capacity to attract funding will be greatly diminished. Currently, the representatives of the DEF are unaware as to how and effectively establish the organization.

Objective 4: Develop the financing of the pollution reduction program within the Danube SAP
(Prepared on the basis of findings of Friderich Schwaiger)

Sub-objective 4.1: Develop portfolio of Danube basin projects

4.1.1 Financing strategies for pollution reduction developed for the particular circumstances of each Danube Country

The report “Analysis of Financing Mechanisms “ issued in March 1999 gives a general financing strategy recommendation for all countries. For the project financing, the study recommends to use at first the national resources (mainly water revenues and public funds), and then, when the national funding is no more available, the international financing. The study recommends promotion of private sector participation. Implementation of these recommendations requires significant improvement in revenue collection for water and waste water services.

4.1.2 A portfolio of investment-related pollution reduction projects for co-financing

4.1.3 A portfolio of wetlands and capacity-building projects for co-financing (grant) consideration

The “Danube River Basin Pollution Reduction Programme Report” of June 1999 contains a portfolio of 421 projects, including 246 hot-spots and 298 693 hectares of wetlands. The projects were identified, and their cost estimated by national experts. The PCU checked the information for plausibility. Total investment cost equals US\$5.5 billion. The total is distributed as follows: municipal projects – US\$3.5 billion; wetlands – US\$1.1 billion; others –US\$0.9 billion The baseline cost are of US\$ 3.5 billion, the incremental cost, US\$ 2.0 billion

According to the GEF regulations, only the transboundary project incremental costs are eligible for financing. Regarding the waste water treatment plants, the incremental costs represent the tertiary treatment. Regarding the wetland and floodplain projects, incremental is the cost of restoration.

The projects were ranked according to investment cost needed per unit of removed BOD, COD, P and N. Although the data should be systematically updated, according to the project management, the ranking of the top series projects should not be affected, as experience shows a good positive correlation between project size and priority ranking.

Sub-objective 4.2: Mechanisms to provide sustainable financial support for the Danube River Basin

4.2.1 An agreed feasibility study for establishing a fund

4.2.2 Agreed mechanism to set up long-term financing mechanisms for pollution reduction projects in the Danube River basin

A specialized agency (KfW) that conducted the study for creation of a Danube Environmental Fund have concluded that such a fund would not be feasible. The study, described in April 1999 in a report ‘Financing Pollution Reduction Measures in the Danube River Basin: Present Situation and Suggestions for new Instruments’, arguments thoroughly and convincingly against the fund. The arguments are supported by examples of difficulties experienced by other similar funds. The main arguments are:

- The wealthier countries have not interest in a compensation mechanism (wealthy countries contribute to the fund, less well off countries receive from fund);
- International taxes and pollution charges as source of finance is not accepted by all countries;

- The amount of available donor and IFI money would not increase by such fund - why to carry administration cost for such fund;
- EU extends sizeable concessional money to potential accession countries but not to a fund;
- PMTF can take over a possible brokerage function of the fund and assistance in project preparation.

As an alternative, the agency proposed a fund that will provide assistance for project identification, grants for investment projects, and packaging of projects for financing. This alternative was rejected by ICPDR Steering Committee.

As a result of the rejection, the KfW recommended establishment of a Project Appraisal Group (PAG) that would apprise the projects and, if they were conform to the ICPDR standard, recommend them to donors. Simultaneously with PAG, the KfW recommended creation of a Project Implementation Facility (PIF) that would support the ICPDR in regional investment programs, assist member countries in project preparation, and monitor the results. The cost of PIF for a 3 to 4 years would be of US\$2.3 million. The ICPDR endorsed the PAG and PIF proposals, and expects that the PIF may be finance by UNDP/GEF.

4.2.3 Updated revision of the SAP

The project has revised the Strategic Action Plan and enriched it with inputs from national reviews, workshops and international expert studies. The SAP follows the target-oriented project planning method. However it is overloaded with information and contains repetitions. In consequence, the document should be streamlined, restricted to essentials, well structured and made easy to read.

4.2.4 High level endorsement for the policy objectives and pollution reduction targets of the SAP

Endorsement of the final version of the revised SAP by the Ministers of the Danube countries is expected to take place at the Ministerial conference in Romania, scheduled for the end of 1999 or beginning of 2000.

4.2.5 Agreed co-financing for pollution projects

A donor pledging conference or a PPC meeting has not been held yet. However, according to the project management, the regular meetings of the PMTF (two to three times a year), usually combined with the Steering Committee in presence of major donors representatives, actually substitute such a meeting.

Overall output from objective 4

The successful completion of all outputs within the objective four allowed the project to

- Present a portfolio of 421 projects evaluated at US\$5.5 billion;
- Rank them according to investment cost effectiveness;
- Propose funding for regional activities; and
- Revise the Strategic Action Plan so as to include the newly identified projects.

The whole load of objective realization was in the hands national experts and based on national consultations. In consequence, the results genuinely reflect the national preoccupations and priorities. Even the output's weaknesses due to the difference in the quality of data available in the countries have important political and technical significance. They identify the domains to improve and motivate the countries to attain the same technical standards in project elaboration

ANNEX VII

PROJECT NUMBER: RER/96/G31 /A/1G/31

PROJECT TITLE: DEVELOPING THE DANUBE RIVER BASIN POLLUTION REDUCTION PROGRAMME

Author: FRANCOIS VAN HOOF

Title of Report: EVALUATION REPORT ON THE COMPLETION OF THE KNOWLEDGE BASE FOR PRIORITY SETTING

Duration of Contract: 12 – 18 JUNE 1999 (7 days)

Contract Number: 99-15094

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1. EXECUTIVE SUMMARY

This evaluation mission had to find out whether the objectives related to the knowledge basis for priority setting had been realised .

The major tasks mentioned in the project document have been carried out within the time schedule originally proposed

This resulted in documents being available at the time of the mission on the following topics :

- updated national reviews
- transnational diagnostic analysis (TDA)
- development of a Danube Water Quality Model (DWQM)
- assessment of the priority sites for wetland and floodplain restoration
- social analysis of pollution in the Danube River Basin

Some of these reports were available in draft form only

This project has been very relevant to the Danube river basin countries and The Black Sea and was well in line with UNDP and GEF priorities.

It has been focusing on nitrogen and phosphorus pollution mainly . Although the project has been managed efficiently and produced several high quality reports , some parts (mainly TDA and DWQM) had to deal with insufficient data for emission and imission of N and P .This created uncertainties which have compromised the results obtained in TDA . In the DWQM work , these shortcomings were overcome these with success .

Apart from the technical aspects , increased cooperation between the countries in the Danube region is without doubt a very positive output of this project .

In order to enable sustainability after the ending of this project , the International Commission for Protection of the Danube River (ICPDR) should be supported by international financial sources to enable the implementation of different parts of this project .

2. ACKNOWLEDGEMENTS

Special thanks are herewith extended to:

Mr. R. Aertgeerts , portfolio manager , Mr. J. Bendow , project manager and Mr.A. Garner , environmental specialist , for introducing us to the project and providing all the necessary information .

The colleagues of the evaluation team : Esther Park , Fritz Schwaiger and Stanislaw Manikowski , team leader , for their collegial attitude and stimulating discussions .

3. INTRODUCTION

3.1 PROJECT BACKGROUND

After the end of the first phase of the Danube River Basin Environmental Programme (1992 - 1996) , which concentrated on building regional cooperation for water management , evaluating and defining problems , implementing a basin wide water quality monitoring strategy and establishing a warning system for accidental pollution , the need was felt for an extension which would cover the following items :

- pollution reduction programmes for substances causing eutrophication in the Danube river and the Black Sea
- ecological rehabilitation programmes for priority wetlands
- development of a revised strategic action plan including linkages with the Black Sea
- increasing public awareness
- strengthening capacities of NGO's
- preparing project documents for priority pollution reduction
- improvement of international cooperation

The project should have started August 15 1997 with a duration of 16 months . In practice it started December 15 1997 and will end July 1999 .

3.2 EVALUATION MISSION

UNOPS contracted the final evaluation of the project to a team of individual consultants.

They carried out a field mission from June 12 to June 20 1999.

The team consisted of :

Stanislaw Manikowski , environmental Policy specialist , Team Leader

Francois Van Hoof Environmental Assessment Specialist

Esther Park Institutional Development/ Public Awareness Specialist

Fritz Schwaiger Environmental Finance Specialist

In accordance with the TOR each team member prepared separate mission report . These reports were brought together in one integrated report by the team leader .

4. OBJECTIVES

According to the TOR the main objectives of the evaluation mission should consider the impact , effectiveness and efficiency of the project . In particular the evaluation had to address the following issues :

Project design

Project implementation

Project impact (completion of the knowledge base for priority setting , review the policy for protection of the Danube Basin and the Black Sea , increase public awareness and participation , develop the financing of the pollution reduction programme within the Danube Strategic Action Plan)

5. SOURCES OF INFORMATION

This evaluation report is based on information and documents received during the evaluation mission in Vienna and other locations (cfr. Itineraries of the team members).

The following documents have been consulted :

- Updated national reviews of all Danube River Basin Countries except Germany and Austria
- Transboundary Analysis (draft report , March 1 1999)
- Danube Water Quality Model Simulations (June 12 1999)
- Social analysis of pollution in the Danube River Basin (final version 1999)
- Evaluation of wetlands and floodplain areas in the Danube river Basin (draft report , February 1999)
- Pollution Reduction Programme Report (June 1999)
- Environmental Programme for the Danube River Basin : Annual Report 1996

6. REPORT OF FINDINGS

6.1 NATIONAL REVIEWS

All national reviews , updated in a common format , were available (except for Austria and Germany).

All reports contain lists of hot spots in the municipal , industrial and agricultural sectors . Only the report for Bosnia Herzegovina does not mention prioritisation due to lack in experience in this field.

In most cases , the hot spots are categorised according their urgency (high , intermediate , low) .

Each report was evaluated with respect to the data needed for the transboundary analysis and water quality model simulations .

A short overview of the findings for each of the countries is given below .

SLOVENIA

- apart from the priority substances (N,P,COD and BOD) , the report brings data on some pesticides (a.o. atrazine and its metabolites desethylatrazine and desisopropylatrazine) and mentions that fifty percent of the ground waters are unfit for human consumption as a consequence of diffuse pollution (nitrates and pesticides)
- the frequency of the immission measurements on surface waters is very low (four per year) , mostly performed at low river flows . This approach doesnot allow reliable calculations of loads of priority pollutants .

CZECH REPUBLIC

- in addition to the priority substances to be monitored , attention has been given to some organic and inorganic micropollutants , especially mercury and PCB's which have caused some problems .
- the measuring frequency for immission measurements is twelve per year . The approach for load calculations is not given .
- 3000 - 4000 abandoned waste sites (industrial and municipal) are mentioned as potential threats to water quality

SLOVAKIA

- information on sampling frequencies is completely missing
- no details are given at all on the calculation of loads
- information is only given in terms of immission concentrations for the priority parameters requested , in addition organochlorine pesticides and triazine herbicides have been found , without mentioning concentrations

HUNGARY

- ° in addition to the priority parameters requested , a wide set of parameters is measured additionally
- ° sampling frequencies used for immission measurement are once a month , once per two weeks or weekly depending on locations and parameters
- ° the laboratories performing the analysis follow strict quality assurance schemes
- ° the data obtained are being statistically treated
- ° in addition to the priority parameters , sufficient data for reliable load calculation are available for phenols , anionic detergents and oil .

BULGARIA

- ° data available are limited to priority parameters
- ° sampling frequency once per month
- ° calculation of loads is not described
- ° the report is written in very general terms

ROMANIA

- ° data on priority parameters available
- ° loads have been calculated over the period 1988 - 1996 for priority parameters
- ° methods used for load calculation are not described

MOLDOVA

- ° the report mentions different problems related to water quality but fails to describe them systematically
- ° there is no systematic information on parameters measured nor on sampling frequencies
- ° information on priority parameters and a few parameters is being reported in a non structured way
- ° no indications on load calculations could be found

UKRAINE

- ° the report shows a lack of systematic information on sampling frequencies and parameters analysed
- ° as far as immissions are concerned , only concentrations are reported , loads are not mentioned at all

CROATIA

- ° results on priority parameters are available for the Danube and the Sava and Drava rivers , results for some organic and inorganic micropollutants have been produced
- ° the sampling frequencies are not mentioned
- ° loads have been calculated by multiplying the yearly average concentrations with the yearly average discharges : this approach is scientifically unsound and does not allow to produce reliable load figures . as such it renders evaluation of transboundary effects impossible .

BOSNIA HERZEGOVINA

- ° due to the war in which the country was involved for several years , only a very limited set of water quality data is available as well in terms of parameters analysed as samplings performed .
- ° due to this situation , the calculation of loads as well as the evaluation of transboundary effects is rendered very difficult

In addition to the chapters on water quality gives important information on the recent evolutions in Bosnia Herzegovina :

- ° unaccounted for water percentages ranging between 30 to 70 %
- ° of the waters used , only 15 % is purified in waste water treatment plants
- ° 30 -40 % of the drinking water doesnot meet the quality criteria
- ° hot spot prioritisation was not carried out due to lack of experience in this field , nevertheless a list with municipal , industrial and agricultural hot spots is included in the report
- ° future policies will stress reconstruction of sewerage collection and waste water treatment plants

FORMER REPUBLIC OF YUGOSLAVIA

- ° the report stresses that Yugoslavia receives confluent of the Danube river which drain 360.000 km² (45 % of the Danube River basin) and also attracts the attention to the difficult relations with its neighbour countries and international exclusion

In relation to water quality it mentions the following points of attention :

- ° emission data collected after 1992 are limited and unreliable
- ° there is a lack of reliable time series of immission values
- ° unsufficient laboratory equipment
- ° the laboratories perform only first line quality control , participation in interlaboratory tests (third line control) is non existant

The overview of all national reports learns that they differ strongly in quality . Excellent reports have been produced by e.g. Hungary . On the other hand , the reports of Moldova and Ukraine provide little usefull information .

In general and as far as water quality data are concerned , all reports strongly focus on concentrations . Pollutant loads on the other hand are seldom mentioned , although they are important tools for policy evaluation .

6.2 TRANBOUNDARY ANALYSIS

The document which was available to the evaluation mission is the March 1 , 1999 draft report .

The authors of the document realised that the data available in many of the national reviews were insufficient for carrying out their task . Due to the fact that the 1996 report of the TNMN was not available at the time this topic was engaged , it was decided to use the data in the national reviews for this purpose in spite of many inconsistencies .

The documents correctly mentions that the recommended procedure for calculating loads should be based on monthly average discharges and concentrations corrected for monthly average discharge . This approach can be defended in cases where data are scarce . The report does not give indications whether this approach has been used consistently .

A source of important errors lies in the calculations of BOD loads based on immission results : these values are in most cases very low and as such subject to important analytical errors . Using these figures for load calculation , will lead to unreliable load figures .

The draft report does not mention any conclusions (they will be added later) nor in relation to the Danube River nor to the Black Sea , although the introduction describes the relation between both in detail .

6.3 THE DANUBE WATER QUALITY MODEL

The report entitled “ Danube Water Quality Model simulations in support of the Transboundary Analysis and the Pollution Reduction Programme “, dated June 12 1999 was available to the evaluation team .

This report meets the requirements formulated in the project document , taking into account the limited water quality data sets available . As a consequence of this limitation , no modelling could be applied regarding to BOD , COD and oil .

The DWQM was built on generic software used for many years by Delft Hydraulics , which was adapted to The Danube basin and to which were added elements from the AEWS model (Project Code 95-0412 : Development of a Danube Basin Alarmmodel in support of the Accident Emergency Warning System) .

The development of the DWQM aimed in a first phase on nutrients pollution (N,P) with a double aim :

- ° evaluation of transboundary pollution
- ° implementation of pollution reduction programmes

In addition the effects of wetlands in terms of nutrient removal had to be addressed as well .

As well as the transboundary analysis , the application of the model came across the lack of consistent and reliable data . Due to the uncertainties in emission values for nitrogen , two emission scenarios (high and low) were considered .

The uncertainties for P , due to a.o. stratification in the river , were taken into account by multiplying the figures with a factor two . Taking into account these hypotheses , simulations have been carried out in support to the Transboundary Diagnostic Analysis and the Pollution Reduction Programme .

Given the prerequisites mentioned above , the results obtained have to be interpreted with caution . Nevertheless, the first results give indication on the most important sources of N and P pollution : they demonstrate a.o. that diffuse pollution is the most important contributor to N and P pollution in the Danube basin and that the impact of wetlands on N and P reduction is limited .

The report lacks clear conclusions and recommendations for future work .

6.4 WETLANDS AND FLOODPLAINS

The draft report “ Evaluation of Wetlands and Floodplain Areas in the Danube River Basin “ (February 1999) and its annex was available to the evaluators .

This document meets the criteria put forward in the project document including the discussion of the potential of wetlands for nutrient removal . The effect of wetlands on N and P removal , has been evaluated indirectly (e.g. by the number of days a landstrip has been flooded) .

During the discussion of the report with the authors , it was made clear that nutrient reduction by wetlands is only a side effect of wetland rehabilitation and should not be considered as an alternative for waste water treatment or policies aiming at reducing nutrient input from diffuse sources . This point of view is confirmed by the limited impact predicted by the DWQM model for nutrient removal by wetlands .

Apart from the activities themselves the sub-contractor carrying out this work , made it clear that involvement of local people in this activity is a prerequisite for success . Keeping this in mind , financial support has been given to local people for improvement of tourism infrastructure (WWF funds) .

6.5 SOCIAL ANALYSIS OF POLLUTION IN THE DANUBE RIVER BASIN

A report on the above mentioned subject written by Reinhard Wanninger (dated March 1999) was available to the evaluators . It covers the topics mentioned in the project document .

The information given in chapter 4 (Population potentially affected by unsanitary conditions in the Danube River Basin) is very general and does not cover hygienic risks adequately . However this topic was very poorly described in the project document (point 57 , page 18 : “ There is no indication of the extent to which transboundary pollution may contribute to the incidence of these diseases . The project document should have mentioned several outbreaks of waterborne gastro intestinal diseases which have occurred in several Danube countries (e.g. Romania) and which are very relevant in this context .

6.6 CALCULATION OF NATIONAL BASELINES FOR POLLUTION REDUCTION

All details for cost analysis , including baseline and incremental costs can be found in the Pollution Reduction Programme Report (section 7.2.4) .

6.7 PROJECT CONCEPT AND DESIGN

The concept and design of the project were appropriate at the time when the project was approved and fit in different UNDP areas of concentration : environmental problems , national resources management , management development and technical cooperation between the countries in the Danube River Basin .

The first UNDP project tied up very well with the EU PHARE project (1992 - 1996) . For the second phase , cooperation between both programmes is less evident .

The project document clearly states the problems which the project intended to solve . Political risks especially linked to the situation in Croatia , Bosnia Herzegovina and the Former Republic of Yugoslavia were recognised .

The framework of the project document clearly stated the objectives and outputs . The phasing of the project activities is realistic given sufficient input (water quality data) is available . However , this was not the case .

The project document strongly stresses the effects of wetlands and floodplains in terms of nutrient reduction , while nutrient reduction in this context should be considered as a beneficial side effect .

The project's actions and outcomes are in line with GEF guidelines related to quality of transboundary waters , habitat degradation , excessive exploitation of resources and the GEF role as a catalyst for eco-system based approach , assisting groups of countries to understand the environmental concerns of their international waters and implementation measures addressing transboundary concerns . The focus of the project on control of land based sources of pollution and prevention of degradation of critical habitats agree with GEF's focuses .

6.8 PROJECT IMPLEMENTATION

A work plan was developed from the beginning . The project took off several months after the start date mentioned in the project document .

All activities mentioned in the project document have been implemented . Some of them (e.g. the transboundary analysis) were implemented in a less effective way due to lack of water quality data .

The involvement of national staff occurred mainly through the input of local consultants (e.g. the drafting of national reviews and the study related to wetlands and floodplains) .

At least two countries (Bosnia Herzegovina and the Former Republic of Yugoslavia) were in a war situation or were emerging from it , as a consequence their capacity to supply inputs to the project was very limited .

The administrative management of the project was excellent , without cost overruns hindering implementation .

A major problem affecting successful implementation was the lack of sufficient and reliable imission water quality data which were needed for the transboundary analysis and for the validation of the Danube Water Quality Model .

This shortage could not be overcome within the duration of the project .

6.9 PROJECT RESULTS

The results obtained are relevant in the current context and the programme was efficiently managed .

The project produced all the reports required (some of them in draft form at the time of the evaluation mission) . Most of the reports produced have a high quality , nevertheless some reports carry the burden of the insufficient amount of data on which they had to build (transboundary analysis) , others demonstrate elegant approaches to solve this basic problem (Report on the Danube Water Quality Model)

Overall there was a good achievement of the immediate objectives of the project , which can make a contribution to the development of the region .

Effectiveness and efficiency could have been improved by describing the information needs more precisely before the start of the project .

Sustainability can be secured by transferring the results of the project to the International Commission for the Protection of the Danube River .

7. CONCLUSIONS

1. All updated national reviews have been produced . The reports on Bosnia Herzegovina and the Former Republic of Yugoslavia report only a limited number of water quality data due to their particular political situation .
2. All national reviews contain lists of municipal , industrial and agricultural hot spots made up by a common methodology , information on national policies with focus on N and P reduction .
3. Based on these data , national baselines are available in the pollution reduction programme report .
4. A mathematical model (DWQM) has been developed which should be used in the evaluation of transboundary pollution and implementation of the pollution reduction programme . Although the model as such is very valuable , its application is greatly hindered by a lack of sufficient and reliable emission and imission data .
5. The lack of reliable imission data and the low frequency of measurements render the calculation of loads necessary for transboundary analysis (TDA) very difficult . It was impossible to generate the data necessary for TDA and application of the DWQM within the project duration .
6. The assessment of the priority for wetlands and flood plain restoration has been carried out in a very satisfactory way .
7. One of the most obvious achievements of this project is the fact that countries in the Danube region have learned to cooperate in spite of enormous differences in their economic and political situations .

8. RECOMMENDATIONS

With regard to the future planning of similar projects , it should be kept in mind that sufficient , reliable water quality data should be available for vital parts of the project . If not , monitoring experiments should be carried out which can supply these data .

Knowledge transfer from this project to the ICPDR should occur in order to use the information generated for water quality management by the commission and further development of those elements in the project which could not be fully implemented by lack of data .

In order to use and further develop the information produced in this project , international funding should be made available to the ICPDR . This is considered the only way to secure sustainability of the project impact and results .

During the last years , the load of some priority pollutant , especially P , from the Danube towards the Black Sea has decreased . At the same time a reversal of trends in algal blooms and its negative consequences has been observed in the Black Sea . As far as the input of P is concerned , the poor economic situation in many Danube countries has certainly contributed in this trend .

It should be strongly advised that under a future improvement of economic activities , stringent policies are implemented which limit the input of nutrients in the Black Sea to at least present day levels .

In order to evaluate the input of pollutants in the Black Sea , a common methodology covering adequately the inputs in the Black Sea should be developed . This should be accompanied by the introduction of quality assurance schemes in the laboratories performing the analytical and sampling activities .

9. LESSONS LEARNED

A major positive lesson is certainly that through this project countries in the Danube River Basin have learnt to cooperate better in management of the Danube waters .

Another positive element is the input of local consultants and NGO's in different parts of the project (e.g. updating national reviews , wetlands and floodplain study).

A negative lesson to be kept in mind is the lack of communication between different important actors (GEF - UNDP , EU PHARE and the World Bank) . The refusal of the World Bank to fund transboundary projects is experienced as negative for effective cooperation among Danube countries .

In the same context , the change in PHARE rules (from multicountry to single country approach) and the take over of former PHARE projects by TACIS did not improve effectiveness nor efficiency .

Another lesson is that before engaging in pollution loads and mathematical modelling sufficient and reliable imission data should be available before the start of these activities . Generating these data in an ongoing project is impossible .

10. ANNEXES

ITINERARY AND SITE VISITS

Sunday , June 13 : Travel from Brussels to Vienna . Arrival in Vienna 15.00 . Meeting with Stanislaw Manikowski , team leader , Esther Park and Roger Aertgeerts , UNOPS portfolio manager : introductory discussion on the tasks of the mission .

Monday , June 14 : Meeting with Joachim Bendow , Programme Manager , Stanislaw Manikowski , team leader , Andy Garner , Esther Park and Roger Aertgeerts , UNOPS portfolio manager , Fritz Schwaiger at the Vienna international Center. Discussion on the methodology to be followed during evaluation .

Afternoon : Discussion of the points to be addressed and where the information can be found . This meeting was attended was attended by the same persons as the morning session , except Mr. Schwaiger .

Evening : evaluation of the national reports of several countries

Tuesday , June 15 : Meeting with Mr. Teun Botterweg , EU/PHARE Programme and Mr. F.Schwaiger, Vienna International Centre on the activities of the PHARE and TACIS in the Danube region

Further evaluation of the national reports of several countries

Afternoon : Meeting with Mr. Andy Garner , environment specialist and Mr. F.Schwaiger on different aspects of the project , Vienna International Centre

Evening : evaluation of the national reports of several countries

Wednesday , June 16 : Meeting with Mr. Helmuth Fleckseder , Technical and Scientific Director of the ICPDR and Mr. F.Schwaiger, Vienna International Centre on the strategies of nitrogen and phosphate reduction .

Evaluation of the national report on the Republic of Yugoslavia

Afternoon : Meeting with Mr. Phil Weller WWF Danube - Carpathian Programme Director on different aspects of wetlands and floodplains at the WWF office Ottakringer Strasse 114 - 116, Vienna .

Meeting with Mr.Wolfgang Stalzer , Director at the Ministerium of Landwirtschaft and President of the ICPRD on the activities of the ICPRD with Stanislaw Manikowski , team leader , Esther Park and Fritz Schwaiger .

Thursday , June 17 : Meeting with Mr. Stanislaw Manikowski , team leader on the preliminary conclusions of the mission at the Vienna International Centre .

Flight from Vienna to Brussels , arrival in Brussels 21.30

Friday , June, 18 : Travel from Hove to Delft . Meeting with Mr. J. van Gils at Delft Hydraulics .

Return to Hove

Saturday , June 19 : Report writing

Sunday , June 20 : Report writing

ANNEX VIII

Esther PARK

3. Public awareness, public participation, information exchange

3.1 Project Design

The public awareness component of the project was designed to increase public participation and awareness not only in the individual countries, but also on a regional level. Central and Eastern European countries (including NIS countries) in transition were the main targets, assuming that Austria and Germany already had effective third sector development. The rationale for this output is that it will lead to sustainable policies in the Danube Basin.

This aspect of the project had a threefold objective, which was only partially effective due to an inattention to structural considerations, which will be expounded on in section 3.4. The project's effectiveness with regard to public awareness was limited because the "public" was not well defined. It was not clear to whom exactly the awareness campaign should reach. If the target group was non-governmental organizations (NGOs) and governments, then the project was mostly effective. If the target group was the wider public, then the effectiveness of the project is a bit more ambiguous. It is difficult to measure the impact of the project on the wider public without doing a large-scale study. Additionally, the final outcome of the small grants that were given to awareness raising projects is still pending.

The project was more effective in the arena of public participation. NGOs were effectively brought into the process of SAP planning/revising and their input noted. Considering the scope of the project, most major NGOs in each country were brought into the decision-making process. Perhaps the biggest drawback was that of the Danube Environmental Forum (DEF). The project overestimated the potential effectiveness of this organization and its force within the objective was minimal.

Overall, this component contributed well to the development objective, but the most constraining factor on all the elements was timing. From a structural point of view, transitioning governments are dealing with various pushes and pulls, and thus are not always able to be in the ideological position that the project already assumes. For this reason, it would be difficult to implement public participation in countries that were not ready for it. Additionally, the strict time frame of the project caused many components, which could and should have contributed to one another, to overlap.

The project greatly relies on the DEF for its sustainability in this component. At this point, the DEF is weak and unable to take on this burden. The ICPDR is willing to support public participation, but does not necessarily identify DEF as the agency through which it should happen.

Cooperation with the Black Sea NGOs has been somewhat unrealistic. The NGOs in the Danube River Basin must have some history of cooperation among themselves before attempting cooperative efforts with the Black Sea NGO Forum.

3.2 Project Implementation

The project was implemented by the PCU in an excellent fashion with regard to timeliness. Though the design of the project itself was constrained by time, the PCU made the best effort that it could to allow the different components and stakeholders to interact. The PCU also considered the expansion and contraction of various objectives as they deemed relevant to prevailing circumstances.

The bulk of this component of the project was contracted out to the Regional Environmental Center for Central and Eastern Europe (REC), which was in an excellent position to provide this kind of specialized support for the PCU. The REC is a long-standing organization dedicated to the support of environmental NGOs and administers grant programs from governments and other international donors. While headquartered in Szentendre, Hungary, the REC has local offices in every country in which they work. These local offices have formed good relationships with the governments and the NGO communities, respectively; and they know the specific needs of each country. Thus, the REC was an ideal candidate for the work of the project. Because they are established as an organization, there was little reinventing of the wheel and the implementation of the Small Grants Program was relatively smooth. Timeliness of this program was an issue because of the lack of effective communication between the REC and the PCU.

Given the time limits of the project, the REC was probably the best option as subcontractor. However, as a trade-off, the PCU was two steps removed from the NGOs. There was little direct interaction between the two, which may have reflected poorly on the CPCs' level of cooperation with the NGOs.

The "Danube Watch" was also subcontracted out to an independent editor and publisher. Three copies of the Watch were published, but along the way it became clear that the editor was unreliable and the PCU lost control of the content of the publication. At this point in time, the editing and publishing of the Watch has changed hands. Phare has been actively involved in the process and was instrumental in finding a new editor/publisher.

The PCU began work on the Danube Information System (DANIS) and found that it would be more effective in the big picture to incorporate DANIS into the system being created by the ICPDR, "DANUBIS." This project is being co-funded by a combination of Phare, Austrian Trust Fund, and the Austrian Ministry of Agriculture and Industry. To date, the web site is not yet functional, but is expected to be fully operational by the fall of 1999. In the meantime, Phare has published a Danube home page connected to that of REC, from which all activity will be forwarded to DANUBIS once it is functional.

3.3 Project Impact

The PCU did not produce materials or hold events to raise public awareness as outlined in the project document. Instead, the PCU felt that they would be better served by holding a regional training workshop called "Target Oriented Program Planning" (TOPP), in which one NGO representative and one government representative from each country were trained in public participation philosophy and methodology.

These representatives then became facilitators in the National NGO Workshops, arranged and facilitated by the REC, where national priorities were discussed and identified. These priorities were consequently introduced in the National SAP Planning Workshops where the results from the National Reviews (technical) and the National NGO Workshops were brought together to result in a revised SAP and the Pollution Reduction Program.

Further, the results of the National NGO Workshops were brought to a Regional NGO Consultation Meeting, in which NGO representatives from all 13 countries came together to discuss regional priorities and to re-establish or revitalize the DEF. The DEF has been weak and unable to participate effectively in the implementation of this project. Instead, the REC has taken the responsibility for the National NGO meetings. For similar reasons, the DEF was unable to hold a joint workshop with the Black Sea Basin NGO Forum. Cooperation with the Black Sea project has been slow as a whole. So far there has been only a joint technical working group with the Black Sea.

It should be noted that the past failures of the DEF have alienated some NGOs from participating, most noticeably those in Hungary. As a group, a number of Hungarian NGOs refused to participate in the National NGO meeting and sent a letter of protest stating that they would not have anything to do with the DEF. Currently, the DEF is in the rather precarious position of not being legally registered as an entity. As with many NGOs, the organization has little know-how with regard to legality, financial viability, and general management. However, they have made good progress in information sharing. The members have created an email network, which acts essentially as a list serve, and so far there has been good participation.

The Small Grants Program was carried out by the REC, working together with the PCU to develop guidelines and publicize the program. Because of a delay in actually disseminating the grants, the impact and results of the program have not yet been revealed.

The “Danube Watch” has been published in three issues, with two more special editions forthcoming. Four thousand issues were being disseminated, and now it has increased to 8000. Future plans have it being published on the DANUBIS site, as well as a condensed version inserted into another existing environmental publication (in Austria). Unfortunately, the former editor at some point stopped following the developments of the Danube program. After Phare funding stops in October 1999, sustainability of the publication will be in the hands of the new publisher. There is the possibility of inserting advertisements into the journal by which it might be self-sustaining.

The establishment of the Danube program home page has been facilitated by Phare, as mentioned above. This home page is being hosted by the REC web site and has the appropriate links to maps, legislation, donors, and other relevant information. A counter was put into the system, from which it can be assumed that up to 1000 people have visited the site.

Instead of updating DANIS as the project document outlined, the PCU felt it would be better to create a new system with a wider scope, and thus created a working group to create “DANUBIS” in March 1998. Existing components of DANIS, as well as the program home page, will be integrated into the new system.

3.4 Theory (Project Design revisited)

When considering the design of a project, it is important to analyze how it affects societal structure as well as how the project is designed internally. First, looking at societal structure, the decision making process is the focal point. Individual actors bring their own self-interest and ideologies to the table and make decisions based on those interests. Each of these actions comes together to create a collective action, the output from which affects the environment in some way. When the environment is altered, the individual’s perception of reality changes. And so the cycle continues. Between each of these stages, there is an imperfect flow of information and communication. Disjunctures among individuals’ worldviews can create greater disparity in the outcome of the collective action (if there be any outcome at all), and thus will maintain or intensify the differences among worldviews. If the point is to alter the outcome, the set of notions with which each person comes to the decision-making table must also be altered. Simply introducing a new set of actors will not necessarily bring about the desired outcome.

With regard to the design of a project, factors such as principal-agent problems must be addressed. A hierarchy arises such that the donors and the project staff form one relationship, and the project staff and the sub-contractors form another. Increasing levels of hierarchy widens the opportunity for miscommunication and information gaps. Thus any organization has it within its best interest to minimize its hierarchical levels. Additionally, the number of decision points through which any action must go through is directly related to the cohesiveness and efficiency of that action. The decision to sub-contract usually comes out of the necessity to have specialized services as well as a low level of uncertainty. Also, special effort must be made to assure that processes are linked to goals.

3.5 Conclusions and Recommendations

Overall, the project did what it needed to in order to fulfill the objectives of the project. The full impact of many of these efforts has yet to be seen, as timing is a factor. And still, as in the case of any development project, this is just one step in the process.

In all, the project design hampered the intentions and the goal of the public participation component of the project. While NGOs were effectively drawn into the decision-making process, the government side was less prepared for cooperation on this level. Because many of the countries in the Danube river basin are still in a transitional phase from an authoritarian to democratic rule, government authorities have yet to fully understand

the importance of accountability to the public. With this disparity in social framework, the collective action will also suffer either from a lack of action at all or some of the participants dropping out of the process.

The decision to contract out a large part of the public participation component was probably the best decision to make, though there were trade-offs involved. The project had to its advantage that the REC was a large and well-established organization with a history in many of the countries in the Danube river basin. However, this also necessitated that the contact with NGOs had to go through the REC's bureaucratic structure in addition to that of the project, which at times conflicted. Also, the fact that the REC did not work in all the countries in the basin contributed to a somewhat patchwork approach to NGO involvement as a whole. The nature of subcontracting similarly caused somewhat of a rift between process and goals. The result was that the process was adequately executed, though somewhat in isolation from the other processes in the project. This disconnectedness may also contribute to an undesirable collective action in the implementation stage of the SAP or Pollution Reduction Program.

The past weakness of the DEF and its current unresolved status is a critical factor for the future sustainability of public participation and cooperation in the Danube region. NGOs in Hungary have already collectively decided not to participate in the DEF. If the legal status of the organization is not adequately established from the beginning, its capacity to attract funding will be greatly diminished. Currently, the representatives of the DEF are unaware as to how to most effectively establish the organization.

In light of the above, recommendations are as follows:

1. Support should be given to the Commission to find or implement third sector awareness programs on the governmental level, especially for developing countries. EU requirements for free press have been instrumental in ascension countries thus far, but training programs are still needed. There has to be some kind of history of intra-sectoral cooperation before real changes in decision-making can take place.
2. The Commission should support the DEF through management skills in legality and financial liability, and work consistently to facilitate communication between the DEF and government officials.
3. Should the DEF fail to establish itself, personnel support should be given to the Commission to maintain a network among NGOs regionally until another means of regional cooperation should become apparent.
4. The Commission should update and maintain the DANUBIS system until it can be sustainably given to the work of the DEF or a like organization.

3.6 Mission Timeline

Saturday, June 12:	arrival in Vienna
Sunday, June 13:	meeting with team leader
Monday, June 14:	briefing with project leader, Joachim Bendow project delineation, Joachim Bendow, Andy Garner
Tuesday, June 15:	meeting with Entela Pinguli, REC in Budapest
Wednesday, June 16:	meeting with Teun Botterweg, Phare meeting with Wolfgang Stalzer, ICPDR
Thursday, June 17:	meeting with Christine Margraf, DEF rep in Munich
Friday, June 18:	depart from Munich

ANNEX IX

PROJECT NUMBER: RER/96/G31/A/1G/31

PROJECT TITLE: DEVELOPING THE DANUBE RIVER BASIN POLLUTION
REDUCTION PROGRAMME

Author: FRIEDRICH SCHWAIGER

Title of Report: EVALUATION REPORT ON OBJECTIVE 4
– DEVELOP THE FINANCING OF THE POLLUTION REDUCTION
PROGRAMME WITHIN THE DANUBE STRATEGIC ACTION PLAN

Duration of Contract: 12th – 22nd June 1999 (9 Working days)

Contract Number: CFS-99-1720

Project: RER/97/RG1

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ANNEX Schedule of Meetings

1. Executive Summary

This is the end of project evaluation report, covering objective 4 of the project, the financing of the pollution reduction programme.

A team of four experts carried out a mission to the Project Co-ordination Unit at Vienna. The financial expert was there from 14th to 18th June 1999 with the exception of a visit to KfW Frankfurt, who did the feasibility study for the proposed Danube Environmental Fund.

Some sections of the project document were designed rather optimistically. It practically assumed that an environmental fund will be feasible and that implementation of investment projects could start quickly. In some cases it is very specific and did not cover “what to do if ... not”. However, the project management applied a very practical approach and so compensated above fact.

The project was implemented within the extended time frame (agreed at the beginning of the project) with the exception of getting the revised SAP endorsed by the Ministerial conference.

The project work was well organised and strictly managed.

The project management applied the logical framework method (ZOPP) and involved to a high extent national experts, which is found good.

Some 400 hot spot projects have been identified with a total investment portfolio of USD 5.5 billion, the majority of projects being municipal waste water projects.

Costs have been split into baseline cost and incremental cost, according to GEF funding criteria. No reliable operation and maintenance cost could be obtained, so the ranking of projects was done on the basis of investment cost effectiveness.

Existing financing strategies in each country have been studied and general financing strategies were presented.

KfW did the feasibility study on the establishment of a Danube Environmental Fund and came to a negative conclusion. The result is found correct. The proposed alternative of establishing a grant facility fund was turned down by the ICPDR, as it would require a modification of the International Convention.

It is now proposed to install under the directive of the ICPDR a PIF (Project Implementation Facility) and a PAG (Project Appraisal Group). The PIF will support ICPDR with regard to investment programs and all regional activities, project preparation and identification. The PAG is a group of national experts who approve investment projects confirming by their seal to a potential donor that a) the project is of quality as defined by ICPDR and b) that it is a priority project.

A comprehensive SAP has been prepared which is not any more a revision but practically a new document. Some more editing is recommended to shorten it and make it easier to read. The document is scheduled to be approved at the Ministerial conference in Romania on 11th November 1999.

The project management does not consider a special donor pledging conference necessary since practically all interested donors are represented in the PMTF which meets 2 to 3 times annually anyway.

Revenues from water supply waste water services is a primary source of finance of waste water projects. A project should be executed aiming at improving the revenue collection efficiency.

Financing of investment projects will be done on a bilateral basis. There are good prospects for substantial WB/GEF funds for financing primarily incremental cost. Addition financing by UNDP/GEF to ICPDR, their bodies and activities is essential for maintaining the integrative element and financing of regional projects. The cost for running the PIF are about USD 2.5 million for a period of 3 to 4 years.

The Multi Country Programme of the EU ends by October 2000. Future assistance will be given only at the country level and primarily to EU accession countries. This also stresses the need to extend further GEF support to ICPDR.

2. Introduction

2.1 Project Background

A first phase of the Danube Programme was carried out from 1992-96, concentrating on building regional co-operation in the water sector in the Danube river basin. The main output of this phase was the Strategic Action Plan (SAP) 1994.

A Phase II project was designed and named “Developing the Danube River Basin Pollution Reduction Programme” – being the project subject to this evaluation.

The main purpose of this project is to prepare prioritised pollution reduction projects for co-financing by national and international sources within the strategic policy framework for the Danube river basin and Black Sea.

The project comprises of the following objectives:

- Objective 1: Complete the knowledge base for priority-setting
- Objective 2: Review policy for protection (especially nature protection) of the Danube River Basin and the Black Sea
- Objective 3: Increase public awareness and participation
- Objective 4: Develop the financing of the pollution reduction programme within the Danube Strategic Action Plan (SAP)

2.2 Evaluation Mission

UNOPS contracted the end of project evaluation of referenced project to a team of individual consultants. Every team member worked on particular objective. The team consisted of:

Dr. Stanislaw Manikowski	Team Leader, Policy and Institutional Expert
Dr. Francois Van Hoof	Technical Specialist
Esther Park	Specialist on Public Awareness
Fritz Schwaiger	Financial Specialist

The team carried out a field mission to Vienna with individual trips to Budapest, Frankfurt and Delft in calendar week 24/99. The Financial Specialist stayed in Vienna from 14th to 18th June 1999 with the exception of a one day mission to KfW Frankfurt on 17th June 1999.

In accordance with the TOR the team members prepared individual mission reports covering their tasks and discussed their findings with the Team Leader who prepares an integral final report.

Consequently this financial report should be read in conjunction with the other reports.

3. Acknowledgements

Special thanks is herewith extended to:

- all PCU-GEF Project Team headed by the Project Manager Mr. Joachim Bendow at the UNDP office in the VIC (Vienna International Centre) for all administrative and logistic support extended to the evaluation team
- the KfW (Kreditanstalt für Wiederaufbau) for the lively discussions in their offices and sparing sufficient time.
- Mr. Rainhard Wanninger, Financial Consultant to the PCU
- the Team Leader and all other members of the evaluation team for the fruitful discussions during project evaluation.

4. Objectives

This is the final evaluation of the project and should consider the impact, effectiveness and efficiency of the project and its chances for sustainability. The scope of the evaluation shall cover the:

- Project design
- Project implementation
- Project impact

5. Sources of Information

This evaluation report is based on information and documents received during the evaluation mission to Vienna. A schedule of meetings held and documents received is attached in Annex 1.

6. Report of Findings

6.1 Project Design

6.1.1 The Scope of Works as per the Project Document

Objective 4 consists of four sub-objectives and each sub-objective consists of several activities and tasks. They are briefly summarised below.

Sub-objective 4.1: Development of project portfolio and financing strategies

Activity 1: Develop financing strategies.

National and international financing strategies should be developed for each country for the two different types of projects (i.e. capacity building / demonstration projects and investment projects) by:

- a) preparing a model structure for each Danube country
- b) preparing national financing strategies including confirmation of national contributions
- c) holding a workshop to review basin-wide financing strategy.

Activity 2: Portfolio of hot-spot projects

Brief project documents should be prepared for priority hot-spot projects. Cost estimates should distinguish between incremental cost and base line cost. O&M cost should be considered carefully. This to be achieved by:

- a) preparing a model structure for project documents
- b) preparing project documents for individual projects
- c) agreement on implementation strategies for each project

Activity 3: Prepare wetland, floodplain and demonstration projects

This types of projects would not create any revenue stream and should therefore be grant financed. Cost estimates should distinguish between incremental cost and base line cost. O&M cost should be considered carefully. To be achieved by:

- a) making a model structure for project documents
- b) preparing project documents for individual projects
- c) the agreement on implementation strategies for each project

Sub-objective 4.2: Mechanisms to provide sustainable financing (Danube Environmental Fund)Activity 1: Feasibility study on establishing an environmental fund

In order to promote and finance transboundary pollution projects, the establishment of an international (or a series of national) Danube Environmental Funds (Trust Fund) should be studied. This should be achieved by:

- a) preparation of a feasibility study of options to establish an international fund and possibly merge with the upcoming Transnational Danube Recovery Fund
- b) Hold a workshop to agree on the approach
- c) Hold consultations with the international community

Activity 2: Prepare structures, rules and mechanisms for the environmental fund

The legal basis, organisational structure, rules of procedure, financing sources etc should be prepared for the fund by:

- a) preparation of basic documents for establishing the fund
- b) completion of administrative procedures to establish legal basis
- c) setting-up the required organisations to manage the fund

Sub-objective 4.3: Finalise, agree and adopt a revised SAPActivity 1: Integrate portfolio of investment and capacity building projects and the financing mechanisms into the SAP

The existing SAP shall be refined and augmented with the elements described above, leading to a single document. This shall be achieved by:

- a) discussion of the results of the financing strategies and proposed projects with the group responsible for updating the SAP.
- b) Preparation of an updated version of the SAP.

Activity 2: Adopt updated SAP at Ministerial Conference

The original SAP, being adopted by the member countries through the Minister Conference in 1994 states that it will be updated after 3 years. A Ministerial Conference should therefore be organised covering the following:

- a) organisation of a consultation meeting with the Country Programme Co-ordinators and representatives of the International Commission
- b) provide support to logistic organisation of the conference
- c) prepare wide spread publication of the SAP including the Ministerial declaration

Activity 3: Preparation of a donor pledging conference (or PPC meeting)

Careful preparation and intensive consultations with bilateral and multilateral donors and IFIs should be done to ensure a successful conference.

- a) Finalisation of project documents
- b) Hold a series of consultations with potential financiers
- c) Hold a donor pledging conference
- d) Publicise widely the achievements and settled financing

6.1.2 Comments on the Project DesignGeneral

Generally the project document is well prepared, well structured, easy to understand and to read.

The project was designed at the end of Phase I. It is set up in a way to ensure a smooth change from Phase I to Phase II and a rapid progress in the next step in the project cycle, leading finally towards actual project implementation and investments.

The project document reflects much optimism. It is commonly agreed that national as well international financing contributions should be combined. It seems that the establishment of a Danube Environmental Fund (trust fund) has actually been decided.

Due to this “clear vision” where the project will go to, not much room has been given to thoughts about alternatives if things do not develop as programmed.

It is understood that project documents need to be formulated in an optimistic way and with objectives set rather high, in order to achieve all the project settings. Criticism mentioned above needs to be seen in this respect.

Sub-objective 4.1

specifies the development of financing strategies / financing models for each Danube country and the confirmation of expected national contributions. Due to the economic problems these countries are facing at the moment, it is very unlikely that any commitments can be achieved for these projects.

Sub-objective 4.2

comprises the preparation of a feasibility study on a Danube Environmental Fund and the associated legal requirements and rules and structures for operating such fund. It actually recommends to merge with the upcoming Danube Recovery Fund lead by Germany and does not deal with the possibility of a negative result of the study.

The feasibility turned out to be negative. The project team (and their consultant) could have stopped working on this issue then. Nevertheless, they continued looking for alternative solutions.

Sub-objective 4.3

is again specified with much optimism but generally considered correct.

6.2 Project Implementation

6.2.1 Time Schedule

The project was originally set up for a period of 16 months. This is unrealistically short.

When the project team (manager) started to work and made its work planning, a project period of 24 months was agreed. This is still considered very short.

The project has been executed within the specified 24 months. All outputs have been produced as specified with the exception of the conference for high level endorsement of the revised SAP and the donor pledging conference.

Endorsement of the revised SAP is scheduled for the conference of Ministers in Romania on 11th November 1999.

A special donor pledging conference has not be organised since donors meet anyway regularly in the PMTF (Project Management Task Force). So the Project Manager does not expect any benefit from organising a special conference.

6.2.2 Project Management

The project was well managed and strictly controlled. High priority was put on keeping the time schedule.

The contacts already established in Phase I of the project helped to quickly have efficient communication with the Country Co-ordinators and Experts. Workshops and clear guidelines how to collect and present data and information substantially contributed to the efficient information flow. All 13 Danube countries submitted the National Review Reports, without exception.

Concern has been raised that the strict time keeping and the time pressure may have affected the quality of input data, work and output. Regarding objective 4 this can not be confirmed. According to the project team and their Financial Consultant, the quality of the input data would not have improved significantly if more time was available.

KfW (Kreditanstalt fuer Wiederaufbau) of Frankfurt was commissioned to carry out the feasibility study for the establishment of a Danube Environmental Fund. KfW is the state owned bank in Germany in charge of export financing and bilateral and multilateral economic co-operation. This fact and the fact that Germany is the most potential Danube river riparian country may have made KfW the consultant of choice for doing the study. KfW usually does not provide consulting services but accepted this request since it was channelled through the German Ministry of Co-operation. The output of the study is satisfying. It has to be seen in the future whether or not such an involvement of a bank will additionally benefit project work (e.g. selling of projects to IFIs easier).

6.2.3 Project Approach

The project was organised and executed such that the involvement of national experts was given priority to the execution of the works by international experts. They were only used to co-ordinate the national experts and summarise the results. This approach is considered correct.

Generally the logical framework method of (ZOPP) target oriented project planning was applied. National experts were trained in this method which helped considerably to create a uniform structure of all inputs and reports. Nevertheless, also this approach has its limits of application and should not be reflected in reports to an extent which makes them difficult to read (see revised SAP report).

6.3 Project Impact

Sub-objective 4.1: Development of project portfolio and financing strategies

Financing strategies

The report “Analysis of Financing Mechanisms “ issued in March 1999 deals with the requested model for a financing strategy of pollution reduction projects. In a summarised form the essence of this report is contained also in the revised SAP report.

The report describes well the existing financing mechanisms and environmental funds in each of the Danube countries. It outlines the big differences of national financing capacity and in parallel the decreasing efficiency of water / waste water revenue collection systems in each country with a clear falling gradient following the Danube river in flow direction.

The study does not present individual model structures for financing strategies for each country (as per ToR) but gives a general recommendation for all countries. In short this is

- a) to improve and to use to a maximum the national resources (mainly water revenues and public funds) and
- b) only then to use international financing
- c) to promote private sector participation.

This requires that the revenue collection systems for water and waste water services are significantly improved in most countries in order to change the situation that the governments / municipalities have to raise the financing.

The approach is considered correct and absolutely essential for the financing of such projects.

A confirmation of expected national contributions to the projects – as specified in the ToR – has not been received.

Financing mechanisms were discussed at each of the National Planning Workshops. Preliminary results of the study were presented in the Transboundary Analysis workshop in Baden in January 1999 and finally in the workshop on Development of a Financing Facility in Baden in February 1999.

Portfolio of hot spot and wetland & floodplain projects

The “Danube River Basin Pollution Reduction Programme Report” of June 1999 contains a portfolio of 421 projects. In total 513 hot spots were identified with 246 of them being actually based on existing improvement projects. A summary of the key figures is contained also in the revised SAP.

The grand sums are:

Total investment cost	USD 5.5 billion
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Thereof

municipal projects	USD 3.5 billion
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wetlands	USD 1.1 billion
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others	USD 0.9 billion
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Thereof

baseline cost	USD 3.5 billion
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incremental cost	USD 2.0 billion
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The projects were identified and cost estimates provided by national experts. They were trained in a workshop on how to collect and verify the information and a model structure of a project document (data sheet) was handed over to them.

The PCU team managed to get from all Danube countries – without exception – information in return and managed to compile country reviews. The quality of work certainly varies from country to country.

The PCU team checked the so collected information for plausibility. A source of error is seen in the conversion of cost estimates from local currency to USD. Generally the official exchange rates were applied.

The careful assessment of operation & maintenance cost is specified in the ToR but no reliable information could be obtained.

As per GEF funding regulations, water projects need to have a transboundary effect and only this element is eligible for GEF funding. It is generally accepted that the annual nutrition load (nitrogen and phosphorus) is the main cause of eutrophication of the Black Sea. The river Danube is one of the main contributors. The general approach was that measures aiming at P and N removal are incremental cost and all other cost are baseline cost.

Regarding waste water treatment plants the incremental cost represent the tertiary treatment. The removal of carbon and other elements are considered as baseline cost. Regarding wetland and floodplain projects, the provision of land is considered as baseline cost and the cost for restoration as incremental cost.

The cost effectiveness method was used as a parameter for ranking of projects. Due to the vague O&M cost information, a ranking of projects was done according to investment cost needed per unit of removed BOD, COD, P and N.

The method using the present value approach was presented in the Pollution Reduction Programme in Hernstein in May 1999 to the country experts and it was agreed that the project data need to be completed and updated to be able to apply such method.

Concern has been raised about the quality of data, also in relation to the short project period. PCU staff explained that the quality of financial data (cost estimates) would not have improved with and extension of time. Data are based mainly on cost estimates on projects of former years and an improvement of the data quality could only be obtained if individual (feasibility) studies are carried out for each project.

The PCU staff confirms that the identified projects include all major hot spots. Some medium size projects may still be missing and smaller projects are not included. However, the data bank established needs to be regularly updated and projects be included step by step. The ranking of the top series of projects should not be affected as experience shows a good positive correlation between project size and priority ranking.

Regarding the argument of possible deficiencies in cost data and the incompleteness of projects, the big gap between projects identified with associated investment cost and the realistic investments to take place in the next years has to be seen. In addition each project will be checked again before investments actually take place.

The ToR also specify the need to agree on implementation strategies for each of the pollution reduction programme rather vague. If this term refers to eligibility of GEF funding and the ranking of projects by cost effectiveness than this task has been covered.

The ToR further require the definition of revenues achieved by the projects. Most of the projects are waste water treatment projects which do not generate any revenues. Only in exceptional cases they have an effect of reduction of alternative treatment cost.

Sub-objective 4.2: Mechanisms to provide sustainable financing (Danube Environmental Fund)

Feasibility study on establishing a Danube Environmental Fund

PMU contracted this task to KfW who published their work in the report: “Financing Pollution Reduction Measures in the Danube River Basin: Present Situation and Suggestions for new Instruments” in April 1999. After careful analysis they came to the conclusion that such fund is not feasible due to the following:

- The wealthier countries have not interest in a compensation mechanism (wealthy countries contribute to the fund, less well off countries receive from fund,
- International taxes and pollution charges as source of finance is not accepted by all countries
- The amount of available donor and IFI money would not increase by such fund; why to carry administration cost for such fund?
- EU extends sizeable concessional money to potential accession countries but not to a fund
- PMTF can take over a possible brokerage function of the fund and assistance in project preparation.

Very similar was the outcome of a study from a different consultant regarding a Black Sea Environmental Fund.

KfW then investigated into alternative solutions and recommended a Danube Environmental Facility Fund (DEFF). This fund would not be an intermediary for IFIs but would concentrate on providing grant money for:

- Technical assistance for project identification
- Grants for investment projects (which can not be financed by loans)
- Packaging of projects for financing by IFIs.

KfW provided details who such fund should function and be administered. The DEFF was supposed to be placed under the ICPDR. However, this would require an addendum to the International Convention to set the legal basis. In view of the difficulties and the time needed to implement and ratify such addendum, the idea to establish an DEFF was dropped in the June 1999 Steering Committee Meeting of the ICPDR.

The KfW study then recommended the establishment of a Project Appraisal Group (PAG) and a Project Implementation Facility (PIF), both of them under the ICPDR.

The PAG would be an expert group for project appraisal. By this, less attractive projects could be sold better to donors. Secondly the PAG would approve and authorise projects from individual countries, confirming that the project is up to the standard defined by the ICPDR and an ICPDR priority project. The President of the ICPDR thinks that the PAG facility will be necessary for a some period of time, until national experts have gained experience in this work.

The role of the PIF would be

- To support the work of ICPDR regarding regional investment programs
- Assist member countries in project preparation (acceptable for IFIs and GEF)
- Monitoring of results

ICPDR has welcomed this idea and hopes that the required financial support is provided by UNDP/GEF. An exit strategy could be that finally PPC takes over this role or the PMTF is charged with additional competencies, similar to the METAP model.

The cost of the FIP for a 3 to 4 year period are USD 2.5 million.

Preparation of structures, rules etc. for the Environmental Fund

The project document was set up with the assumption that the fund will be certainly established. It also mentions, that the proposed fund should be merged with the upcoming transnational Danube Recovery Fund, lead by Germany. Such fund has not materialised.

As outlined above, the feasibility of the Danube Environmental Fund was negative and so there is no need to prepare structures and rules for the fund. Nevertheless, KfW has outlined such structures and rules for the proposed DEFF.

Sub-objective 4.3: Finalise, agree and adopt a revised SAP

Preparation of a revised SAP

The ToR specify the revision of the original SAP by refining the existing content and integrating the portfolio of projects and the regional financing mechanisms.

The PMU prepared practically a new SAP. The main reason for it was, that the SAP should be a strategic paper containing policy and strategy issues and no actions and projects. They were put into the “Pollution Reduction Programme” report. These major changes are not very much appreciated by country experts who were strongly involved in the preparation of the first SAP.

The revised SAP is a comprehensive and substantial document with inputs from the national reviews, the results from the workshops and from international experts. The document has recently been sent out for the final review by the national experts.

The document strictly follows the target oriented project planning method which is principally appreciated. But, the document is overloaded with information and contains repetitions. The report should be streamlined, restricted to the essential information, well structured and made easy to read.

The previous SAP document was considered the “bible” for the ICPDR. As long as the International Convention was not signed and ratified, it was the only document binding ICPDR together. The revised SAP should be finalised with the same expectations.

Ministerial endorsement of the revised SAP

The PMU does not expect major changes and comments to come back from the national experts on the SAP, so the endorsement of the final version of the revised SAP by the Ministers of the Danube countries is expected to take place at the Ministerial conference in Romania, scheduled for 11th November 1999.

Donor pledging conference

A donor pledging conference or a PPC meeting has not been held yet.

The project management informs that the regular meetings of the PMTF (2 to 3 times a year) which are usually combined with the Steering Committee meetings actually substitute such a meeting. At these meetings all major IFIs and donors are present and a special donor conference would not attract additional financiers.

7. General Remarks

7.1 Activities of Other Organisations in the Sector and Region

EU Phare and Tacis

This project co-operated well with EU Phare in Phase I. Phare and also Tacis complemented the Phase II programme of UNDP/GEF covering the early warning model, financing pilot projects, some of the working groups and activities of ICPDR, the PMTF etc.

The fact that some countries fall under Phare and others under Tacis makes administration for their Project Manager rather difficult. It also does not support the crucial aspect of integrating all countries into the programme.

The project operates under the Multi Country Programme which was terminated by the EU. Approximately ECU 5 million are still available under the ongoing project and have to be earmarked until October 1999. The project will end by October 2000.

It is planned that Phare and Tacis will then continue their assistance in this sector and region at the country level. Special technical assistance and financial support (ISPA funds etc.) is expected to be given to the EU accession candidate countries which have to improve the environmental situation before becoming EU member country.

This aspect obviously does not contribute to the integrative aspect of all Danube countries.

Private Sector Participation

In view of the budgetary constraints of the down stream Danube river countries, private sector participation may play an important role in achieving the set goals. French water companies are already established in the region.

The Austrian company FGG – Finanzierungsgarantiesgesellschaft is an organisation of the Ministry of Finance extending guarantees to Austrian companies for foreign investments. FGG has recently established in Budapest with an Hungarian state bank the joint venture company Duna Development Ltd. This organisation identifies and formulates projects in the environment and energy sectors and promotes them to private industries.

KfW is in the process of establishing credit lines through local banks among others also in the Danube river countries. They aim at projects in the range of DM 5 to 10 million by financing up to 2/3 of the total project cost.

7.2 Remarks on the General impact

The project has been working mainly with national experts which is good. These experts are the people who are already convinced about the need for investments in improving the environment. The dissemination of this understanding still needs to go on in horizontal and vertical direction in the governments and administrations, but this needs time.

The involvement of the private sector was not part of this project, but should be promoted.

Project implementation will mainly be going on at the country level. Donors and IFIs will negotiate on a bilateral basis. There are expectations that WB/GEF could make available a USD 70 million WB/GEF grant portfolio for investment projects for the Danube and Black Sea region. These funds could cover incremental cost and WB will offer (might tie) complementary loan financing for meeting the base line investment cost.

In addition to above, the integrative element of the ICPDR is very important. Further assistance should be extended by UNDP/GEF to the ICPDR and its activities. Some of the projects do not qualify for loan financing and have regional character, so need to be promoted through ICPDR. Continued UNDP/GEF assistance in parallel to incremental financing of WB/GEF is essential.

ICPDR needs continued financial assistance to ensure sustainability of the integrative role of ICPDR.

8 Conclusions

- 1) All substantial elements of the project have been completed within the (modified) project period.
- 2) All outputs in form of reports and workshops have been delivered.
- 3) A portfolio of some 400 projects (hot spot and wetland) has been prepared.
- 4) A priority ranking of the projects has been done on the basis of investment cost effectiveness as no reliable operation & maintenance cost could be gathered. Cross checking of the data is advised but can be done on a project to project case when picked up by a potential financier.
- 5) Projects still need to be hooked on to national / international financiers.
- 6) The establishment of a “big” Danube Environmental Fund is not feasible.
- 7) The alternatively proposed Danube Environmental Financing Facility (a grant fund facility) can not be realised as well.
- 8) The revised SAP is actually a new report and not only a revision. Some more editing would improve easy reading and quality of the document.
- 9) Ministerial endorsement of the revised SAP is expected to be obtained on 11th November 1999.
- 10) The primary source of finance for this type of investment projects is revenues collected from water and waste water services plus other national financing plus international grants. Only then international loans should be used.
- 11) The project management does not consider a special donor pledging conference necessary since practically all interested donors are represented in the PMTF which meets regularly.
- 12) Financing of investment projects will (and should) be done on a country level. GEF funds for financing incremental cost (here nutrition removal) is needed for the proposed projects but should not be tied to international loan financing.
- 13) Private sector participation could play an important role and should be promoted.
- 14) EU accession countries are faced with the requirement of the EU, to improve their environmental situation. Significant financial assistance from the EU is expected towards these countries. It can be expected that this is the main driving force for investments in the environmental sector in these countries.
- 15) The main driving force for the other (non EU accession) countries is a) the will to improve the environmental situation, b) to reduce pollution load to the Black Sea. Both incentives are weaker than the EU accession arguments. An increase of the existing disparity in the environmental situation between the Danube countries can be expected.
- 16) The ICPDR is an integrative element. It needs to be given the power and financial capacity to maintain its role in particular in view of above prospects.
- 17) Any future non-national (regional) activities / projects must be placed under the umbrella of the ICPDR.
- 18) ICPDR’s activities should be on the policy and strategy level. However, regional activities which are of no significant interest to individual countries need to be taken up by ICPDR. Special bodies under ICPDR like PIF, PAG etc. should be charged with these activities.

9 Recommendations

- 1) Further editing of the revised SAP to make it a smart policy and a strategy document.
- 2) Get Ministerial endorsement for the SAP
- 3) Co-ordination of all future regional activities by the ICPDR.
- 4) Any future body established (PCU, PIU, PIF, GAP etc.) on a regional level must be under the directive of ICPDR.
- 5) Continued UNDP/GEF support to the ICPDR, their activities and bodies is needed in order to maintain the integrative element and to implement regional projects which are of low priority to individual countries.
- 6) ICPDR should operate on the policy and strategy level and get involved in activities only for regional aspects which would not be taken up by individual Danube countries.
- 7) Project implementation and investment financing will go on at the country level. Each country will negotiate its own terms. ICPDR should assist the national experts in preparing bankable projects.
- 8) An essential financial source for financing waste water projects is the revenues from water sales. A project should be formulated covering each individual country to improve revenue collection efficiency with the following scope of work:
 - a) analysis of the current revenue collection system (technical legal and practical aspects)
 - b) define the socially acceptable tariffs
 - c) calculate the revenue potential country wide
 - d) defines the necessary legal modifications to improve the situation
 - e) define the necessary technical and administrative modifications to improve the situation
 - f) formulate the investment package (water meters, computer systems etc)
 - g) formulate training requirements of water company staff
 - h) define an project with budget for public awareness building
 - i) make realistic projections for increased income from water sales
- 9) GEF financing of incremental cost is needed but should not be tied to international loan financing.
- 10) Private sector participation should be included in future activities.

ANNEX 1

RER/96/G31/A/1G/31

DEVELOPING THE DANUBE RIVER BASIN POLLUTION REDUCTION PROGRAMME

FINANCIAL ANALYST

SCHEDULE OF MEETINGS

Date/ Time	Location / Participants	Subject / Documents received
Mo. 14.06.99 08:30	<u>Arrival in Vienna</u>	
Mo. 14.06.99 09:00 – 11:00	<u>VIC</u> Mr. Joachim Bendow, Project Manager Mr. Roger Aertgeerts, UNOPS Mr. Stanislaw Manikowski, Team Leader Mr. Francois van Hoof, Technical Specialist Ms. Ester Park, Public Awareness Specialist Mr. Fritz Schwaiger, Financial Specialist	Introduction to the team members and to the project by the Project Manager <u>Documents received:</u> List of documents. All documents (output) produced by the project.
Mo. 14.06.99 11:00 – 13:00	<u>VIC</u> Mr. Roger Aertgeerts, UNOPS Mr. Stanislaw Manikowski Mr. Francois van Hoof Ms. Ester Park Mr. Fritz Schwaiger	Introduction by the Team Leader to proposed approach and discussion of individual tasks. <u>Documents received:</u> Checklist for drafting the evaluation report.
Mo. 14.06.99 13:30 – 15:00	<u>FGG-Finanzierungs Garantie Gesellschaft</u> Dr. Wilhelm Hantsch-Linhart, Infrastructure Financing Specialist Mr. Fritz Schwaiger	Introduction to their approach to stimulate private sector investments in Hungary and other CEECs by establishing a Project Development Company in the recipient country. <u>Documents received:</u> FGG Brochure Description of Duna Development Ltd.
Tu. 15.06.99 09:00 – 10:30	<u>EU Phare</u> Mr. Teun Botterweg, Team Leader Mr. Francois van Hoof Mr. Fritz Schwaiger	The Phare Environmental Programme for the Danube river. <u>Documents received:</u> 1996 Annual Report Danube Strategic Action Plan Implementation Programme 1996-99
Tu. 15.06.99 10:30 – 11:30	<u>VIC</u> Mr. Stanislaw Manikowski Mr. Francois van Hoof Mr. Fritz Schwaiger	Internal; Relevant Documents
Tu. 15.06.99 13:30 – 15:00	<u>VIC</u> Mr. Andy Garner, PCU, Environmental Engineer Mr. Francois van Hoof Mr. Fritz Schwaiger	Organisations involved in the Programme
Tu. 15.06.99 15:00 – 16:30	<u>VIC</u> Mr. Joachim Bendow, PCU Project Manager Mr. Fritz Schwaiger	Time schedule, comments on outputs, and organisations involved in the Programme
Tu. 15.06.99 16:30 – 17:30	<u>VIC</u> Mr. Stanislaw Manikowski Mr. Fritz Schwaiger	Social elements in the project
We. 16.06.99 09:00	<u>VIC</u> Mr. Stanislaw Manikowski	<u>Documents received:</u>

Date/ Time	Location / Participants	Subject / Documents received
	Mr. Fritz Schwaiger	Revised and agreed project time schedule (07/97-06/99)
We. 16.06.99 10:30 – 11:30	<u>ICPDR office, VIC</u> Mr. Hellmut Fleckseder, Technical & Scientific Director, Mr. Francois van Hoof Mr. Fritz Schwaiger	Status of the Danube river and the Black Sea; monitoring; <u>Documents received:</u> Eutrophication in the Black Sea: causes and effects
We. 16.06.99 13:30 – 15:30	<u>VIC</u> Mr. Reinhard Wanninger, Financial Consultant to the PCU Mr. Fritz Schwaiger	Objective 4 of the project; data collection, calculations, conclusions
We. 16.06.99 16:00 – 17:00	<u>Ministry of Agriculture and Forestry, Vienna</u> Mr. Wolfgang Stalzer, ICPDR President Mr. Stanislaw Manikowski Mr. Francois van Hoof Ms. Ester Park Mr. Fritz Schwaiger	Performance and benefits of the project to ICPDR, future activities needed.
We. 16.06.99 18:00 – 19:00	<u>Vienna</u> Mr. Wilhelm Kittinger, past President of ICPDR Mr. Francois van Hoof Mr. Fritz Schwaiger	Performance and benefits of the project to ICPDR, future activities needed.
Th. 17.06.99 10:00 – 15:00	<u>KfW, Frankfurt</u> Mr. Jürgen H. Lottmann, Chief of the Environment and Public Health Division, Mr. Dieter Schulze-Vornhagen, Senior Project Manager, Promotional Banks Mr. Fritz Schwaiger	Feasibility Study on the Danube Environmental Fund.
Fr. 18.06.99 10:00 – 11:00	<u>VIC</u> Mr. Joachim Bendow Mr. Fritz Schwaiger	Clarification of questions, future input needed from UNDP/GEF <u>Documents received:</u>
Fr. 18.06.99 10:00 – 11:00	<u>VIC</u> Mr. Stanislaw Manikowski Mr. Fritz Schwaiger	Debriefing of the Team Leader

Developing the Danube River Basin Pollution Reduction Programme

TERMINAL REPORT

Sept. 10, 1999

Basic programme/project information :

Programme/Project number and title:	RER/96/G31/A/1G/31
Designated institution:	Developing the Danube River Basin Pollution Reduction Programme
Project starting date:	Sept. 1, 1997
Originally planned:	
Actual:	
Project completion date:	
Originally planned:	Dec. 31, 1998
New:	Sept. 30, 1999
Total budget (\$):	
Original:	3,900,000 US Dollars
Latest signed revision:	3,900,000 US Dollars
Period covered by the report:	Sept. 1, 1997 to Sept. 30, 1999

PART I: NUMERICAL RATING

Rate the relevance and performance of the programme or project using the following scale:

- | | |
|---|--------------------|
| 1 - Highly satisfactory | 4 - Unsatisfactory |
| 2 - Satisfactory | X - Not applicable |
| 3 - Unsatisfactory, with some positive elements | |

Place your answers in the column that corresponds to your role in the programme or project.

SUBSTANTIVE FOCUS	Rating by Project Manager	Comments - Project Manager
A. RELEVANCE		
1. How relevant is the programme or project to the development priorities of the country?	1	The project is highly relevant to efforts to build regional cooperation, improve water quality as well as to prepare most Danubian countries for entry into the European Union. It fits well into regional and national plans of DRB countries.
2. How relevant is the programme or project to the promotion of sustainable human development? Indicate your rating on the thematic focus which the programme or project was designed to address. (a) Poverty eradication and sustainable livelihoods (b) Protection and regeneration of the environment (c) Gender in development (d) Promoting an enabling environment for SHD, including governance	1 a) X b) 1 c) X d) 2	The programme is very relevant to the promotion of SHD, via capacity building, use of national experts, development of cooperation with national counterparts etc. b) Project contributed via activities leading to nutrient reduction to the Black Sea, and positive impacts on water quality in the DRB. d) Achieved positive result due to use of participatory approach, NGO involvement and activities to strengthen NGOs in the Danube.
3. To what extent are appropriate beneficiary groups being targeted by the programme or project, based on the following considerations? (a) Gender (b) Socio-economic factors (c) Geographic location	a) X b) X c) 1	c) All Danube Countries participated actively in the project with a particular emphasis on integrating Bosnia-Herzegovina. NGOs and the civil society were involved as well as national focal points from the respective governments
4. Given the objectives of the programme or project, are the appropriate institutions being assisted?	1	The appropriate institutions have been involved with a particular focus on the ICPDR, focal points at the national level and NGOs.

SUBSTANTIVE FOCUS	Rating by Project Manager	Comments - Project Manager
B. PERFORMANCE		
<p>1. Using the following indicators, rate the contribution of the outputs to the achievement of the immediate objectives: ^{a/}</p> <p>(Indicator 1) Completion of knowledge base for priority setting</p> <p>(Indicator 2) Policy review for protection of the Danube River Basin and the Black Sea</p> <p>(Indicator 3) Increase in Public Awareness and Public Participation</p> <p>(Indicator 4) Development of financing for a Pollution Reduction Programme within the Danube SAP</p>	<p>1</p> <p>2</p> <p>1</p> <p>1</p>	<p>Knowledge base for priority setting significantly improved and expanded. The Pollution Reduction Programme represents a large step forward in the knowledge of priority pollutants (emphasis on N and P) as well as hot spots and identification of priority projects and measures. The new level of information, has been placed in a databank which the ICPDR will now be updating and improving regularly.</p> <p>National and Regional policies for protection and improvement of the Danube River Basin/Black Sea reviewed and recommendations for improvements prepared. National policies were reviewed and recommendations for improvement were developed in the frame of National Review reports and inter-sectoral National Planning Workshops including national stakeholder representatives. The Strategic Action Plan was also developed by reviewing National outputs in a regional context. The SAP was finalized in a regional participatory workshop. Further joint technical working group Danube-Black Sea provided the base for development of basin-wide policies.</p> <p>Public Awareness and Public Participation increased. NGOs were included in important elements of the project including national NGO consultation workshops, National Planning Workshops etc.</p> <p>Financing for the Pollution Reduction Programme developed. Financing mechanisms of all DRB countries reviewed. Regional mechanisms in the frame of Danube Environment Financing Facility developed. Investment portfolio prepared and donors meeting planned.</p>
2. Rate the production of target outputs.	1	Outputs expected from Project document largely achieved within the constraint of very tight time limits.
3. Are the management arrangements of the programme or project appropriate?	1	Management arrangements of the programme functioned very well with excellent cooperation with the ICPDR, DRB countries, PHARE/TACIS Danube programme, World Bank etc.

^{a/} The programme or project manager must list the indicators as reflected in the programme support document or project document or agreed on by the stakeholders.

SUBSTANTIVE FOCUS	Rating by Project Manager	Comments - Project Manager
4. Are programme or project resources (financial, physical and manpower) adequate in terms of: a. financial resources b. physical resources c. manpower (a) quantity? (b) quality?	 1 1 2 1	adequate for tasks required equipment, office space etc. met project needs Project support (i.e. secretary) missing at project start Project team worked well as a team and identified and cooperated well with large team of international and national experts
5. Are programme or project resources being used efficiently to produce planned results?	1	Project resources were allocated efficiently with an emphasis on utilizing national expertise where possible which was also more cost effective
6. Is the programme or project cost-effective compared to similar interventions?	1	The GEF Danube Pollution Reduction Programme has been very cost effective particularly in comparison to the previous GEF intervention in the Danube.
7. Based on its work plan, how would you rate the timeliness of the programme or project in terms of: (a) Production of outputs and initial results? (b) Inputs delivery?	 1 2	Outputs were timely with all major outputs completed by June 1999. Mainly satisfactory however there were some difficulties with UNOPS concerning contracts and services

Please indicate your overall rating of the programme or project using the following numbers:

1 - Highly satisfactory

3 - Unsatisfactory, with some positive elements

2 - Satisfactory

4 - Unsatisfactory

5 - Not applicable

	Rating by Project Manager	Comments - Project Manager
OVERALL RATING OF THE PROJECT	1	The Project Objectives were significantly achieved. The results have been well received by the ICPDR as well as Danube River Basin Countries assuring the sustainability of results. The results provide an excellent basis for implementing pollution reduction measures in the future.

Explain the basis of your rating, which need not be limited to, or which may be different from, the relevance and performance criteria rated above. For the last year of the programme or project, the overall rating should include an assessment of the potential success of the programme or project as well as its relevance and performance.

PART II: TEXTUAL ASSESSMENT

1. What are the major achievements of the programme or project vis-à-vis the expected results? Please explain them in detail in terms of potential impact, sustainability of results and contribution to capacity development.

Table: Major Achievements vis a vis Expected Results

Expected Results (per Project Document)	Major Achievements	Potential Impact	Sustainability of Results	Contribution to Capacity Development
1. National and basin-wide pollution reduction programmes for substances causing eutrophication (especially nitrogen and phosphorus) coming from municipalities, industry and agriculture;	<p>a) <i>National Reviews</i> completed, hot spots of pollution (N and P) identified and projects planned; <i>National Planning Workshops</i> held to develop national strategies and programme for pollution reduction resulting in an agreed national approach for reduction of nutrients;</p> <p>b) <i>Pollution Reduction Programme</i> developed containing 421 projects for reducing N and P and quantifying reduction</p>	<p>a) Impact expected to significantly focus and stimulate implementation at the national level;</p> <p>b) Expected to lead to greater implementation of pollution reduction projects in the Danube Basin. Allows a basis for monitoring results (project database) and to quantify achievements.</p>	<p>a) Results should be sustainable and long lasting. Use of participatory approach ensures “ownership of results”.</p> <p>b) Project Database developed to allow for countries to constantly improve information about projects in the Pollution Reduction Programme, as well as allows for projects to be added and subtracted based on implementation and consistent review at both the national and regional levels.</p>	<p>a) National capacities were strengthened given the project’s approach of primarily using national expertise to collect and analyze data and information at the national level under guidance of international experts.</p> <p>b) Consistent use of methodology for data collection and analysis in each country harmonized approach. Regional workshop to develop PRP integrated and strengthened national capacities throughout the basin.</p>
2. Revised Danube River Basin Strategic Action Plan (SAP) which includes a policy direction for the Danube River Basin;	a) The Strategic Action Plan for the Danube River Basin was revised based on a participatory approach based on input from all DRB stakeholders. The national policies and strategies for pollution reduction developed in a consistent approach at the National Planning Workshops were integrated and placed in a regional context.	a) The revised SAP is expected to serve as the guiding policy document for the implementation of the Danube River Protection Convention by the ICPDR.	a) The SAP should be a living document and reflect the current environmental, socio-economic and political situation in the Danube River Basin. Thus it is expected that revisions are to be done periodically to “revise” the SAP to new circumstances. The SAP revision 1999 reflects the current policy and strategic needs in the Danube River Basin and should serve as the guiding policy instrument until the next revision in 2003.	a) Only experts from the Danube River Basin were involved in developing the SAP as well as the national plans that form the basis of the 1999 revision. This unique cooperation using a logical framework approach, strengthened national capacities in developing coherent, logical, target oriented policies and strategies.

Expected Results (per Project Document)	Major Achievements	Potential Impact	Sustainability of Results	Contribution to Capacity Development
3. National and basin-wide pollution reduction and ecological rehabilitation programmes for priority wetlands, floodplains, and adjacent groundwater resources, and demonstration projects in cooperation with the European Union's Phare and Tacis Programmes	a) Danube River Basin Wetland Inventory completed and a Basin-wide Wetland and Floodplain Rehabilitation Programme was developed. Programme was developed in close cooperation with the EU's PHARE and TACIS programmes which have initiated demonstration projects in wetland rehabilitation.	a) This relatively small component of the GEF Programme will have a very important impact in stimulating wetland rehabilitation activities in the Danube River Basin. It provides concrete rehabilitation projects that can be supported by national governments, NGOs as well as be presented to interested donors.	a) Given the direct involvement of national and regional NGOs in developing the programme, the activities in wetland rehabilitation should not only be sustainable but also expanded in the future. Efforts to develop a Lower Danube Green Corridor are currently underway to rehabilitate wetlands in Bulgaria, Romania, Moldova and the Ukraine with significant donor interest and involvement.	a) National wetland focal points were utilized to collect and verify data and information at the national level using a consistent methodology. The project results were strengthen capacities of national governments to appropriately integrate wetland rehabilitation and protection projects and measures into national pollution reduction programmes.
4. Transboundary Analysis of actual water pollution and its effects from country to country and to the Black Sea;	a) Transboundary Analysis (TDA) of Water Pollution in the Danube River Basin was completed. b) Danube Water Quality Model (DWQM) greatly improved as a tool to analyze transboundary pollution (from country to country) as well as to evaluate potential rehabilitation measures.	a) The TDA provides the first comprehensive basin wide analysis of transboundary pollution problems in the Danube and lays the technical basis for identifying remedial and preventative measures; b) The DWQM is a tool that improves the ability to identify, quantify and to evaluate transboundary pollution.	a) This first TDA provides a comprehensive framework for collecting and analyzing transboundary water pollution. It is expected that this will continuously be improved and updated in the future as better more consistent water quality data is collected in the DRB.	a) National experts were used to collect and analyze data and information working in multidisciplinary teams. Experts participated in a regional target oriented planning workshop to finalized the Danube Transboundary Analysis.
5. Increased public awareness and participation in pollution reduction activities related to the SAP and improved information accessibility and transparency;	a) National NGO Workshops held in 11 Danube Countries; b) National Planning Workshops held in 11 Danube Countries; c) 5 issues of Danube Watch published (including special editions on the Transboundary Analysis and the SAP/Pollution Reduction Programme respectively); d) ICPDR Information System (DANUBIS) developed in part to disseminate results.	a) Both NGO and National Planning Workshops ensured broad participation from all stakeholders as well as provided a vehicle to build public awareness at the national level. b) same as above c) Used to inform the interested public about Danube Pollution Reduction Programme activities. d) A primary goal of the new ICPDR Information System	a) The activities developed a framework for bringing NGOs together at the national level which should be utilized again in the future. b) National Planning Workshops sets the basis for multidisciplinary, inter-sectoral planning in the future. c) Successfully started using the sale of advertisements to reduce the cost of producing the Danube Watch with the ultimate goal of self-sufficiency.	a) Experience in conducting and participating in target oriented planning workshops provided to national NGOs. b) Experience in conducting and participating in multidisciplinary, inter-sectoral target oriented planning workshops provided to Danube Stakeholders. c) Experts and journalists from the Danube River Basin provided input to Danube Watch. d) Danube River Basin experts

Expected Results (per Project Document)	Major Achievements	Potential Impact	Sustainability of Results	Contribution to Capacity Development
		being developed in the frame of GEF assistance, is to significantly increase the ability of the public to access information produced in the PRP as well as to provide a better way for building public awareness and support for the PRP.	d) The information system will be owned and operated by the ICPDR, a permanent institution funded by member countries assuring the further operation of the information system.	responsible for developing ICPDR information system. Training to be provided to primary users within the ICPDR.
6. Strengthened capacity of environmental non-governmental organizations (NGOs) involved in Danube and Black Sea issues;	<ul style="list-style-type: none"> a) National NGO Workshops held in 11 Danube Countries; b) NGOs participated in National Planning Workshops in 11 Danube Countries; c) Danube Environmental Forum was re-established and framework developed for sustainable operation; 	<ul style="list-style-type: none"> a) Both NGO and National Planning Workshops ensured broad participation from all stakeholders as well as provided a vehicle to build public awareness at the national level. b) same as above c) National representatives to the DEF were chosen at the National NGO Workshops. Two regional DEF meetings were held. DEF representatives participated in the regional workshops. 	<ul style="list-style-type: none"> a) The activities developed a framework for bringing NGOs together at the national level which should be utilized again in the future. b) National Planning Workshops sets the basis for multidisciplinary, inter-sectoral planning in the future. c) Slovakian NGO supporting DEF Secretariat. DEF developed statutes and then established itself as a legal entity in Slovakia. Proposal developed and presented to donors for the further development of DEF. 	<ul style="list-style-type: none"> a) Experience in conducting and participating in target oriented planning workshops provided to national NGOs. b) Experience in participating in multidisciplinary, inter-sectoral target oriented planning workshops provided to Danube Stakeholders as well as representing civil-society interests. c) Strengthened ability of Danube River Basin NGOs to organize themselves at the regional level.
7. Improved international cooperation in the sustainable management of the Danube river Basin and Black Sea, including the integration of Bosnia-Herzegovina and the Federal Republic of Yugoslavia in international management of the Danube River Basin.	<ul style="list-style-type: none"> a) GEF programme supported the ratification process of the ICPDR; b) Both Bosnia-Herzegovina and the Federal Republic of Yugoslavia were successfully integrated into all GEF Pollution Reduction Programme activities. 	<ul style="list-style-type: none"> a) DRPC ratified, ICPDR established with a permanent secretariat which will strengthen regional cooperation. b) Valuable cooperation as well as much needed technical information gained from B-H and Yugoslavia's participation providing comprehensive information needed for the Transboundary Analysis, SAP revision and the completion of the PRP. 	<ul style="list-style-type: none"> a) Permanent Secretariat of the ICPDR established financed by member country contributions assuring continued regional cooperation in the DRB; b) Strong institutional contacts as well as contacts at the expert level established providing the basis for further cooperation in the future despite the conflict in the region. The functioning of this network in the FRY after the war indicates the sustainability of the cooperation established. 	<ul style="list-style-type: none"> a) Improved ability to cooperate with donor organizations; b) Provided national experts with experience with cooperating at the regional level as well as with working with international organizations. Experience in target oriented planning workshops provided as noted above.

Expected Results (per Project Document)	Major Achievements	Potential Impact	Sustainability of Results	Contribution to Capacity Development
<p>8. Prepared project documents and financing packages for a series of priority pollution reduction projects, and mechanisms for attracting additional international support;</p>	<p>a) Pollution Reduction Programme developed consisting of 421 priority projects as well as important policy measures that will lead to the reduction of priority pollutants in the Danube River Basin.</p> <p>b) Danube Partnership Programme, a portfolio of 60 priority investment projects, prepared for presentation to donors;</p> <p>c) National review of financing mechanisms conducted and a detailed proposal for the development of a Danube Environmental Financing Facility (DEFF) was completed and presented to donors.</p>	<p>a) Expected to lead to greater implementation of pollution reduction projects in the Danube Basin. Allows a basis for monitoring results (project database) and to quantify achievements;</p> <p>b) Provides basis for presenting prepared projects to interested international financial institutions (IFIs) and donors;</p> <p>c) Provided clear understanding of what are the strengths and weaknesses of existing national financing mechanisms. Reviewed possible regional financing mechanisms resulting in a proposal for the DEFF.</p>	<p>a) Project Database developed to allow for countries to constantly improve information about projects in the Pollution Reduction Programme, as well as allows for projects to be added and subtracted based on implementation and consistent review at both the national and regional levels.</p> <p>b) Donor conference scheduled to assure implementation of part of investment portfolio;</p> <p>c) Sound analysis of what options would be sustainable in the future.</p>	<p>a) Consistent use of methodology for data collection and analysis in each country harmonized approach. Regional workshop to develop PRP integrated and strengthened national capacities throughout the basin;</p> <p>b) Provided experience to national experts in preparing investment projects with sufficient documentation and level of detail for presentation to IFIs and donors;</p> <p>c) Strengthened the ability to identify the strengths and weaknesses of existing and proposed financing mechanisms.</p>

2. What factors affected the achievement of programme or project results?

While we rate the project overall to be a very good success, the achievements were affected by the following:

- *Data gaps as well as inconsistency and the lack of good quality, verifiable data from country to country.* This made it difficult at times to compare.
- *Lack of information on diffuse sources of pollution.* Due to the negligible level of information on diffuse sources, it was generally not possible to adequately include concrete measures to address diffuse sources of pollution in the final Danube Pollution Reduction Programme.
- *Short project time frame.* The project had a very tight implementation period (initially 16 months) that even after extension was perhaps too tight. The results might have been even stronger given more time.

3. What lessons (both positive and negative) can be drawn from the experience of the programme or project?

We saw the need to develop national review databases consisting of 5 individual databases: Emissions, Water Quality, Socio-Economic data, financial information as well as a Project database. These databases will respond to the need for:

- a) periodically updating national information and to fill data gaps,
- b) an incentive for countries to improve data provided or to provide data in the future where currently it does not exist and
- c) tools to monitor implementation.

This will help to insure the sustainability of the Pollution Reduction Programme.

4. What are the views of the target groups with regard to the programme or project? Please note any significant gender-based differences in their views.

The main target groups of the UNDP/GEF assistance were the participating countries particularly as represented by the ICPDR. They have indicated satisfaction with the results and feel that it has strengthened cooperation between countries as well as within the framework of the ICPDR itself. It should also be said that the main beneficiaries i.e. the countries, were also primary contributors to the programme. Thus the ICPDR and the participating countries are also “owners” of the successful outputs of the Pollution Reduction Programme.

5. If the programme or project has been evaluated, what is the implementation status of the recommendations made by the evaluators?


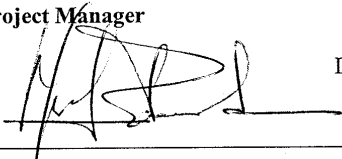
As we have just received the project evaluation, we have not yet had time to respond to the recommendations.

6. What activities or steps do you recommend as follow-up to the project?

Follow-up activities to the GEF Danube River Basin Pollution Reduction Programme should focus on primarily the support the further development of the ICPDR and include activities to stimulate implementation of the PRP with a particular focus on facilitating the necessary policy changes in DRB countries for nutrient reduction.

7. Provide any other information that may further support or clarify your assessment of the programme or project. You may include annexes as you deem necessary.

Please see the project evaluation report.

For target group (ICPDR):	
Name:	GERHARD VERCOVCH
Title:	Executive Secretary
Signature:	 Date: 10.09.99
For the project manager:	
Name:	Joachim Bendow
Title:	Project Manager
Signature:	 Date: August 30, 1999

ANNEX 13 Endorsement Letters

MINISTRY OF THE ENVIRONMENT
OF THE SLOVAK REPUBLIC
Department of Air Protection
Ivan Mojík, Director

August 31st, 2000
No: 794/2000-2.1

Subject: Project proposal "*Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation*" - GEF focal point endorsement letter

This is to confirm our interest in and support of the project proposal "Strengthening the implementation capacities for nutrient reduction and transboundary cooperation" you have submitted for our endorsement for funding by the Global Environment Facility.

The overall objective of the Project is to complement the activities of the International Convention for Protection of the Danube River required to provide a regional approach and global significance to the development of national policies and legislation and the definition of priority actions for nutrient reduction and pollution control with particular attention to transboundary effects within the Danube River Basin and the Black Sea area.

In line with the immediate objectives, the particular project components of the proposed Regional Project can be grouped as follows :

- development of nutrient reduction policies, legal instrument and measures for exacting compliance
- institutional strengthening and capacity building for transboundary cooperation in nutrient reduction
- awareness raising and reinforcement of NGO participation in nutrient reduction activities
- strengthening the monitoring and information mechanisms related to transboundary pollution control and nutrient reduction

Main benefits of the project are improvement of Danube river basin water quality and water quality of the Black Sea, from point of view of nutrient and toxic pollutants and the strengthening of transboundary cooperation through monitoring and pollution control of water.

Taking this into account, hereby I endorse the project "Strengthening the implementation capacities for nutrient reduction and transboundary cooperation" for funding by the Global Environment Facility.


Ivan Mojík
GEF Operational Focal Point

Permanent Secretariat ICPDR
International Commission for the Protection
of the Danube River
Vienna International Centre
P.O. Box 500
1400 Vienna, AUSTRIA

MINISTRY OF THE ENVIRONMENT OF THE CZECH REPUBLIC
Department of Global Relations
Vršovická 65, 100 10 Praha 10
Tel: (00420 2) 67 12 29 16, Fax: (00420 2) 67 31 03 07

Prague, September 17, 2000
Ref. No. 1694/920/00

Subject: Letter of Endorsement for the Project Proposal:
"Strengthening Implementation of Nutrient Reduction Measures and Transboundary Cooperation in the Danube River Basin"

Dear Mr. Bendow,

I wish to acknowledge with thanks receipt of your Fax message Ref. No. 02459 of 6, September 2000, advising us on additional explanation in the matter of financial budget items before we will be able to confirm the Project.

Hereby I would like to inform you that Ministry of the Environment of the Czech Republic is pleased to endorse the above mentioned project. We will be glad to participate in its implementation.

We consider that the project will further support the activities of the International Convention for Protection of the Danube river and all other Danube countries to develop and implement policies and strategies for pollution control and nutrient reduction, which will facilitate our country efforts towards harmonization process with European Union Water Framework Directives and other related environmental legislation.

We are looking forward to our next cooperation.

Yours sincerely,


Martina Motlová

Director of Global Relations Department

Mr. Joachim Bendow
Executive Secretary
ICPDR Permanent Secretariat
Vienna International Center
D-0412, PO Box 500
A- 1400 Vienna, Austria

MINISTRY FOR ENVIRONMENT

H – 1011 Budapest, Fő u 44 – 50, Hungary
Phone: + 36 1 201 3843;
Fax: +36 1 201 2846

Budapest, August 30, 2000


Mr. Christopher Briggs
GEF Regional Coordinator
UNDOP-PBEC
New York

Subject: Endorsement of the project brief for the Danube regional projekt
"Strengthening the Implementation Capacities for Nutrient Reduction and
Transboundary Cooperation in the Danube River Basin" (Submitted by the
Secretariat of the Danube River Protection Convention)

Dear Mr. Briggs,

As a designated GEF Focal Point for Hungary hereby I endorse the referred above
project proposal expressing our readiness to participate in its implementation.

Sincerely yours



László Becker
Head of Department

C/C
Mr. Joachim Bendow
Executive Secretary
ICPDR Permanent Secretariat
Vienna

31. Aug. 2000

02452



REPUBLIC OF SLOVENIA
MINISTRY OF THE ENVIRONMENT AND SPATIAL PLANNING

Dunajska c. 48, SI-1000 Ljubljana, Slovenia
Phone: +386 1 478 7332 • Fax: +386 1 478 7422

Reference: 922-00-19/97

Date: 29 August, 2000

ICPDR Permanent Secretariat
Vienna International Center
D-0412, PO Box 500
A- 1400 Vienna, Austria

Subject: **Letter of Endorsement for the Project Proposal:**
"Strengthening Implementation of Nutrient Reduction Measures and Transboundary Cooperation in the Danube River Basin"

Dear Sirs,

hereby I would like to inform you that Slovenia supports the UNDP-GEF initiative for the above mentioned project and we will be glad to participate in its implementation.

As the designated GEF Focal Point for Slovenia, I am pleased to endorse the project proposal: "Strengthening Implementation of Nutrient Reduction Measures and Transboundary Cooperation in the Danube River Basin" as presented in the documents dated August 2000.

Yours sincerely,




Emil Ferjančič
International Relations,
GEF Political and Operational Focal Point

14/09 '00 THU 08:44 FAX 38516151821

DRZ. UPRAVA ZA VODE

02468

001

FROM : MIN. ZAST. OKOL. I PROST. UR.

PHONE NO. : 537 203 114. Sep. 2000 SEP. 06 2000 12:02PM P2

Mr. Bendow

431 26060 5895



REPUBLIC OF CROATIA
MINISTRY OF ENVIRONMENTAL
PROTECTION AND PHYSICAL PLANNING
10000 Zagreb, Croatia, Ulica Republike Austrije 20
Phone: +385 1 3782-444 Fax: +385 1 3772-822

Class: 018-04/00-01/48
Reg.No.531-04/1-00-1
Zagreb, 29. August, 2000

Mr. Joachim Bendow
ICPDR Secretariat
1400 Vienna
Austria

SUBJECT: Endorsement for the GEF Danube Regional project "Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation"

Dear Mr Bendow,

We would like to express our endorsement for the GEF Danube Regional Project "Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation" whose long-term objective is to contribute to sustainable development in the Danube River Basin through reinforcing its capacities of the participating countries in developing effective mechanisms for regional cooperation and coordination in order to ensure protection of international waters, sustainable management of natural resources and biodiversity.

The overall objective of this Project is to help providing a regional approach and global significance to the development of national policies which can contribute Croatia's efforts to join the EU.

The economic transition process in Croatia has caused significant reduction of industrial and agricultural production; thus temporarily reducing production-related pollution loads, which has created an opportunity to establish and integrate environmental objectives into industrial and agricultural policies and legislation in line with EU guidelines.

As well as other countries currently in the process of fulfilling the basic accession criteria, this Project shall assist Croatia to develop adequate policies and legislation for emission control with particular attention to nutrient reduction.

Sincerely yours,



Božo Kovačević

Minister

C.c.: - Mr. Željko Ostojić, Danube Convention Project Coordinator (State Water Directorate)
Ms Mojca Lukšić (State Water Directorate)

**Bosnia and Herzegovina
Federation of Bosnia and Herzegovina
Ministry of Physical Planning and Environment
Titova 9a, Sarajevo**

**Mr. Joachim Bendow
Executive Secretary
ICPDR
fax: 431 26060 5895**

Subject: Endorsement of the proposal for the project "Strengthening the implementation of nutrient reduction measures and transboundary cooperation in Danube river basin"

Dear Mr. Joachim Bendow,

This letter is to acknowledge that the Ministry of Physical Planning and Environment of Federation of Bosnia and Herzegovina is pleased to endorse the above referred project.

We consider that the project will further support the ICPDR and the Danube countries to develop and implement policies and strategies for pollution control and nutrient reduction, which will facilitate our country efforts towards harmonization process with EU Water Framework Directives and other related environmental legislation.

This is in my capacity, acting as the UNDP/GEF focal point, to endorse on behalf of the Ministry of Physical Planning and Environment of Federation of Bosnia and Herzegovina the above mentioned project.

Sincerely,



Mladen Rudež
GEF Focal Point of Bosnia and Herzegovina

Encl.

FROM :

PHONE NO. : 381 11 311 2909

Sep. 14 2000 01:32PM P1



СР Југославија
FR Yugoslavia

Савезно министарство за развој, науку и животну средину
Federal Ministry for Development, Science and Environment

YU-11070 Beograd Palata federacije Tel. *(381 11) 311 42 40, 311 11 70 Telex 11448 Fax: *(381 11) 311 29 09

m.s.

September 13, 2000

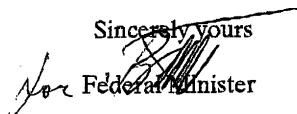
Mr. Christopher Briggs
Regional Co-ordinator
UNDP/GEF
Regional Bureau for Europe and CIS
United Nations Plaza 1
New York
Fax. 99 1 212 906 6595 / 6267

Subject: Danube Regional Project: Strengthening of Implementation Capacities
For Nutrient Reduction and Transboundary Cooperation

After consideration of the project brief for the elaboration of the above-mentioned project we would like to inform you that we endorse its realization and our readiness for full participation.

Accept, Sir, the assurance of my highest consideration.

Sincerely yours


Federal Minister

Prof. Dr Nada Šljapić

Cc.
Mr. Joachim Bendow
Executive secretary ICPDR
VIC Vienna, P.O. Box 500
Austria
Fax. 99 43 1 260 ~~260 5838~~

REPUBLIC OF BULGARIA



MINISTRY OF ENVIRONMENT AND WATER

September, 1, /2000

TO: Mr. Chris Briggs
GEF Regional Coordinator
Europe and CIS UNDP

CC: Mr. Antonio Viligante
Resident Representative
UNDP Bulgaria

ICPDR Secretariat, Vienna, Austria

BSEP -- PIU, Istanbul, Turkey

RE: Regional Projects endorsement

Dear Mr. Briggs,

Herewith the Government of the Republic of Bulgaria expresses its support for the PDF B proposals entitled "Strengthening Implementation of Nutrient Reduction Measures and Transboundary Co-operation in the Danube River Basin " and "Control of Eutrophication Hazardous Substances and Related Measures for Rehabilitation of the Black Sea ecosystem". Bulgaria is interested in participating in these initiatives and is very appreciative of the partnership between UNDP, World Bank, UNEP and the International Commission for the protection of the Danube River Basin.

As you will be aware, the final draft proposals will be presented at the forthcoming Steering Group meetings in Vienna, Austria and in Istanbul, Turkey, respectively, where the Bulgarian delegations will confirm the endorsement of the two project proposals.

We are looking forward to our future co-operation.

Yours Sincerely,

Neno Dimov
Deputy Minister
Ministry of Environment and Water
GEF Operational Focal Point

TABLE 1: SUMMARY OF THE PROJECTS

R O M A N I A



MINISTERUL APELOR, PADURILOR SI PROTECTIEI MEDIULUI
MINISTRY of WATERS, FORESTS and ENVIRONMENTAL PROTECTION

Cabinet Secretar General Adjunct Deputy Secretary General Office

Nr. 15246/ND/ 30.08.2000

To: Christopher Briggs
GEF Regional Coordinator
UNDOP-RBEC
New York
Fax 99 1 212 906 5539

Mr. Joachim Bendow
Executive Secretary
ICPDR
Fax 431 26060 5895

Subject: Endorsement of the proposal for the project " Strengthening the implementation of nutrient reduction measures and transboundary cooperation in the Danube river basin "

Dear Mr. Briggs/Mr. Bendow,

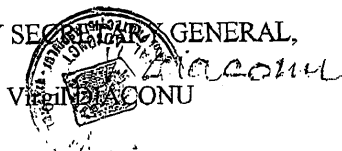
This letter is to acknowledge that the Ministry of Water, Forest and Environmental Protection is pleased to endorse the above referred project.

We consider that the project will further support the ICPDR and the Danube countries to develop and implement policies and strategies for pollution control and nutrient reduction, which will facilitate our country efforts towards harmonization process with EU Water Framework Directives and other related environmental legislation.

This is in my capacity, acting as the UNDP/GEF focal point, to endorse on behalf of the Ministry of Water, Forest and Environmental Protection the aforementioned project.

Yours sincerely,

DEPUTY SECRETARY GENERAL,



FROM :

PHONE NO. :

31. Aug. 2000

AUG. 31 2000 11:15AM P1

02453



MINISTERUL MEDIULUI ȘI AMENAJĂRII TERITORIULUI
AL REPUBLICII MOLDOVA

MINISTRY OF ENVIRONMENT AND TERRITORIAL
DEVELOPMENT
OF THE REPUBLIC OF MOLDOVA

30.08.2000 Nr. 225
La nr. _____ din _____

Mr. Joachim Bendow
Executive Secretary
Permanent Secretariat
International Commission for the
Protection of the Danube River

Endorsement Letter

Hereby, in my capacity of GEF Operational Focal Point in the Republic of Moldova, I would like to confirm that we support the project proposal "Strengthening of Implementation Capacities for Nutrient Reduction and Transboundary Cooperation" submitted by the International Commission for the Protection of the Danube River.


Arcadie Capcelea
Minister

МІНІСТЕРСТВО
ЕКОЛОГІЇ ТА ПРИРОДНИХ
РЕСУРСІВ УКРАЇНИ
Хрещатик 5, 252001, Київ-1
тел: +380 44-226-24-28; факс: 380 44-229-83-83
ел. пошта: mcn@mcn.FreeNet.Kiev.UA



MINISTRY
OF THE ENVIRONMENT AND NATURAL
RESOURCES OF UKRAINE
5 Khreshchatyk str., 252001, Kyiv-1
phone: +380 44-226-24-28; fax: +380 44-229-83-83
E mail Internet: mcn@mcn.FreeNet.Kiev.UA

1. 09. 2000 р.
N 09/х - 10 - 4

To: Dr. Mohamed T. El-Ashry
Chief Executive Officer and Chairmen
GEF Secretariat

From: Dr. Yaroslav Movchan
GEF


On behalf of the Ministry of the Environment and Natural Resources of Ukraine I let me present our compliments to GEF Secretariat and you personally.

I would like to inform you that after thorough studying in pursuant to GEF policies and procedures I confirm my approval of the block A PDF for elaboration of a Danube Regional Project Strengthening of Implementation Capacities for Nutrient Reduction and Transboundary Co-operation

The project is really addressed to the main problems in the eld of Institutional Strengthening field Capacity Building for transboundary co-operation. It rises a lot of issues have to be solved in the near future, in regards to the relevant policies and legal mechanisms development for nutrient control and reducing as well as harmonisation of water quality standards and methodology of water sampling and laboratory analysis.

Please, consider this letter as an official note of the GEF Operational Focal Point.

Yaroslav Movchan

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Mr. Christopher Briggs
Regional coordinator, GEF
United Nations Development Programme
Regional Bureau for Europe and the CIS
1 United Nations Plaza
New York NY 10017
USA

Vienna, 13 September 2000
Ref.no. 02472

**Subject: Endorsement of the proposal for the regional project " Strengthening
the implementation of nutrient reduction measures and transbound-
ary co-operation in the Danube river basin "**

Dear Mr. Briggs,

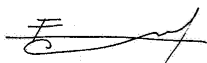
With reference to the Steering Group Meeting held on 4-5 September 2000 in Vienna, I would like to inform you that the International Commission for the Protection of Danube River is pleased to fully endorse the above-referred regional project.

Through this endorsement, we confirm that each recipient country of the Danube river basin have acknowledged the project goal, which is to contribute to sustainable human development in the Danube river basin through reinforcing the capacities of the participating countries in developing effective mechanism for regional co-operation and co-ordination in order to ensure protection of international waters, sustainable management of natural resources and biodiversity.

We consider that the project will further support the ICPDR, its structures and the Danube countries to develop and successfully implement policies and strategies for pollution control and nutrient reduction, with particular attention to achieving sustainable transboundary ecological effects within the DRB and Black Sea region.

This is in my capacity, acting as the president of the ICPDR, to endorse on behalf of the Danube countries, the aforementioned project

Sincerely,



Emil Marinov
President of the ICPDR

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Permanent Secretariat
Vienna International Center, D0412
P.O. Box 500, A-1400 VIENNA / Austria
Tel: ++43-1-26060-5738
Fax: ++43-1-26060-5895