ALBANIA
Intergrated Water & EcoSystems Management GEF

GEF Project Brief

Europe and Central Asia Region
ECSIE

Date: March 28, 2003
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Project ID: P075156
Focal Area: M

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Sector(s): General water, sanitation and flood protection sector (100%)
Theme(s): Biodiversity (P), Pollution management and environmental health (P), Other environment and natural resources management (S)

Project Financing Data

[ ] Loan [ ] Credit [X] Grant [ ] Guarantee [ ] Other:

For Loans/Credits/Others:
Amount (US$m):

Financing Plan (US$m): Source	Local	Foreign	Total
BORROWER/RECIPIENT	0.72	0.00	0.72
EC: EUROPEAN INVESTMENT BANK	0.00	6.64	6.64
GLOBAL ENVIRONMENT FACILITY	0.00	4.87	4.87
Total:	0.72	11.51	12.23

Borrower/Recipient: GOV'T. OF ALBANIA
Responsible agency: PIU
World Bank Water PIU
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Estimated Disbursements (Bank FY/US$m):

FY								
Annual								
Cumulative								

Project implementation period: 5 years
Expected effectiveness date: **Expected closing date:**

A. Project Development Objective

1. Project development objective: (see Annex 1)

The main objective of the project is to assist the Government of Albania in improving the management of uncontrolled wastewater discharging into international waters which is threatening the global significant ecosystems along the coastline of Albania. The project will contribute to increase global environmental benefits by: (i) reducing sewage pollution loads generated by urban settlement areas of the three coastal cities Durres, Lezha and Saranda and (ii) promoting and improving the management of the tidal Kune-Vain marshland (near Lezha).

The global environmental objective is to improve the health and habitat conditions of globally significant marine and coastal ecosystems along the coastline of Albania in an integrated manner by significantly reducing pollution from uncontrolled municipal wastewater generated by urban settlements of the three coastal cities of Durres, Lezha and Saranda that are discharging into international waters and improving the management of the tidal marshland of Kune Vain (near Lezha).

The objectives would be achieved through: (i) reduction of sewage pollution loads through the development and establishment of low cost water treatment technologies (Constructed Treatment Wetlands) producing environmental incremental benefits; (ii) promoting the establishment and improve the management of the Kune-Vain protected marshland; (iii) develop a scheme for dissemination and replication of project achievements.

2. Key performance indicators: (see Annex 1)

Progress towards the project objective will be measured by the following key performance indicators:

- Reduction of pollution and improvement of the environmental conditions in the participating areas. The effect on the significant ecosystem will be measured through the following ecological indicators: (i) nutrient (Nitrogen/Phosphorus) removal, i.e., percentage reduction in nutrient loads in water inflow and outflow; (ii) BOD_5 removal ratio in water inflow and outflow.
- Increased number and size of endangered species population in the participating coastal areas and the Kune-Vain marshland.
- Implementation of a basic monitoring system of the coastal areas.
- Preparation and implementation of an effective Management Plan for Kune-Vain natural reserve.

B. Strategic Context

1. Sector-related Country Assistance Strategy (CAS) goal supported by the project: (see Annex 1)

Document number: 24189-ALB **Date of latest CAS discussion:** July 31, 1998

The project is included in the CAS of 2002 that emphasized poverty alleviation and social cohesion as the underlying conditions to assure sustainable development in Albania within a stable Southeast European Region. Ensuring environmental sustainability and sustainable management of natural resources are one of the main objectives of Albania's National Strategy for Social and Economic Development (NSSED) that is the foundation for the new CAS.

The main emphasis of the on-going CAS consultation is on accelerating poverty alleviation in connection with economic growth, improving governance, building capacity in the institutions, and improving natural resource management. In promoting effective natural resource management, the projects supports the NSSED and CAS goals. Also, in line with the decentralization strategy in the NSSED and CAS, this

project will promote environment management at the local level by setting up transparent and inclusive mechanisms at the municipality and community level for decision-making, implementation and management of natural resources.

Also, the government is making an effort to highlight environmental-poverty linkages in the NSSED, which emphasizes the need to reverse environmental degradation, rehabilitate heavily polluted areas that jeopardize health, and ensure the sustainable use of natural resources. The National Environmental Agency was upgraded in August 2002 to a Ministry of Environment, and an updated National Environmental Action Plan was approved by the government in January 2002. Within this context, there is an opportunity to strengthen the government's regulatory capacity, help the government demonstrate its commitment to the environment through visible actions, and further increase public environmental awareness.

1a. Global Operational strategy/Program objective addressed by the project:

The project is fully consistent with the Global Environment Facility (GEF) Operational Program No.12 (Integrated Ecosystem Management) with linkages to the Operational Programs No.2 (Coastal, Marine, and Freshwater Ecosystems); No.9 (Integrated Land and Water Multiple Focal Area); and No.10 (Contaminated-Based).

In particular, the project entails:

- abating pollution to international waters;
- conserving and promoting biodiversity in coastal and marine ecosystems;
- helping to protect and increase the habitat for endangered water birds, halophyte plants and other species of coastal marshes;
- restoring and preventing destruction of tidal marshland that are currently polluted at unsustainable levels by untreated sewage;
- avoiding difficult and costly restoration of tidal marshland in the future.

The coastal marshlands of Albania constitute one of the more important ecosystems of the Region, as stated in GEF project “Conservation of Wetland and Coastal Ecosystems in the Mediterranean Region”. In particular endangered and endemic species as the Pygmy cormorant (Phalacrocorax pygmaeus), the Mouse-ear bat (Myotis miotis) and the Otter (Lutra lutra) live in these habitats and should be considered as flag species.

Water pollution which is caused by the inflow of untreated sewage is the main threat to these ecosystems. The impact of the eutrophication on the marine communities (plankton, benthos, fish) relationships is not monitored in Albania to the same level of detail as on the wetland communities. However it has been pointed out that the coastal water pollution, particularly untreated waste waters, heavily affects Posidonia oceanica meadows and the related communities (e.g. the endangered species Pinna nobilis, see Annex 3).

Regional GEF projects have focused part of their activities on the conservation of biodiversity of Albanian wetlands and lagoons as the project Conservation of Wetland and Coastal Ecosystems in the Mediterranean Region Project (UNDP) and the Lake Ohrid Conservation Project. Taking into consideration the international relevance of these habitats, other GEF projects have been planned on other Albanian wetlands as on the lake Prespa, and on the Karavasta lagoon. Very few activities have been planned for the Albanian marine habitats. This is probably because of the scarcity of data and information on these areas, although it is known that these habitats are inhabited by many live endangered species (e.g. Monk Seal (Monachus Monachus) and Sea Turtle (Caretta Caretta)). Because

of the urgency of the situation from the environmental and health point of view, this project is focusing on the planning of constructed wetlands for wastewater treatment to reduce the water pollution and health risks and on wildlife management measures supporting the biological diversity of the following wetlands/marine areas:

(i) Kune-Vain Marshland and Coastal Area, Kanella Lake
(ii) Durres Porta Romana and Rrushkull marine environment;
(iii) Saranda bay and Ksamili bay;

All these areas are components of the network of Albanian Protected Areas, described in the document "Biodiversity Strategy and Action Plan (BSAP)", approved by Government of Albania in the year 2000.

Although the project is presented in a separate path it has to be seen as an integral part of the recently approved Municipal Water and Wastewater Project (MWWP). The development objective of the MWWP is to improve water supply and sanitation services through the introduction of a new incentive based multi-city management contract designed to achieve financial viability in the participating water utilities. The MWWP targets the same cities as this project with the addition of the city of Fier. The private operator introduced under the MWWP will be responsible for the sustainable operation of the proposed constructed treatment wetlands.

2. Main sector issues and Government strategy:

2.1 Background

The Albanian coastal region contains two geographic entities: the Adriatic and the Ionian Sea coastal areas. The total length of coastline is about 429 km and the national waters confined to territorial waters of 12 miles width. The continental shelf lies entirely within the exclusive zone. The shelf is wider in the north (Adriatic sea), up to 25 miles across, and narrower in the south (Ionian sea), 2-3 miles width. Beyond 25 miles, sea depth exceeds 1000 m in the international channel.

Wind patterns are variable in the coastal plain. In winter, the most frequent one blows from the Southeast and in the summer season, the prevailing wind blows from the north-western direction. There are three types of rather weak currents in the Adriatic sea: continuous currents, tidal currents, and wind-driven currents. Strong winds persisting for a couple of days may create temporary currents running in the opposite direction to steady and tidal currents.

The Adriatic coastal area (the northern part of the Albanian coast) is generally characterised by coastal lowlands (alluvial plains) intersected by rivers, and flanked by hills along its upland boundary. The coast is made of long sandy beaches, deltaic river mouths and lagoons. The coastal waters are shallow, receiving water from the rivers and several drainage canals. At sea, the water depth increases slowly, with first a sandy bottom with the associated biocenosis which becomes muddy with increasing depth.

On the sandy or muddy bottoms, the marine flora is scarce or occupies specific areas where currents or waves have less action. The extensive seagrass beds of *Posidonia oceanica* are an important part of the Albanian marine ecosystem, often occupying a considerable part of the littoral zone. *Posidonia oceanica* and very well developed marine communities are found along Porto Romano bay and Shengjini bay (adjacent to the Kune-Vain marshland). The underwater rocky bottoms at Rodoni and Lagji Capes (Durres), and the eastern side of Vlora bay host patches of *Posidonia oceanica*.

2.2 Main Sector Issues

Water pollution is mainly generated by an increasing population concentrated along the Adriatic coastline. It has caused considerable deterioration of the natural inland ecosystems and the biological productivity of the coastal areas of Albania. This in turn is a serious threat to the biological diversity and productivity of the natural habitats of the coastal wetlands, rivers and sea, as well as a potential risk to public health. Indeed, in all towns sewage waters are discharged without any treatment, directly into rivers or drainage canals, that in turn convey the untreated sewage directly into tidal marshlands or to the nearby marine coastal zone.

The Government of Albania is facing one of the most challenging tasks in comprehensive water management, dealing with water quality and ecological issues in estuaries and coastal waters and therefore has decided to give particular priority to addressing the issues of wastewater management in three coastal cities of Durres, Lezha and Saranda, and to improving the management of important natural reserves, in order to protect the habitats of endangered species along the coastline of Albania.

2.3 Government Strategy

The Government of Albania recently endorsed the updating of the National Environmental Action Plan (NEAP). The general objectives of the overall updating of the NEAP are aimed at identifying key environmental problems, setting priorities and helping to develop a comprehensive national environmental policy on the basis of a participatory approach.

The key environmental issues identified by the NEAP are:

- surface water contamination, due to the lack of proper wastewater treatment and discharges of untreated industrial and domestic wastewater;
- loss of biodiversity caused by lack of proper management of natural resources (parks, forests, protected areas, coastal resources, etc.);
- soil erosion in terraced hillsides and in grazing areas, as well as deforestation due to uncontrolled cutting of trees for heating supplies;
- emissions of toxic gases and particulate from power plants and industrial facilities

In order to develop an environmental management policy it was recognized that the following areas of intervention are key for the Government of Albania:

- restructuring economic incentives to encourage and improved, efficient resource utilization;
- preparing environmental legislation, including general and specific laws, and regulations on the protection of the environment;
- institutional strengthening of the Albanian environmental authorities and line ministries and institutions, both at central and local level;
- developing strategies to reduce the adverse effects of soil erosion and deforestation;
- developing strategies to improve water management and reduce water pollution problems;
- developing strategies to improve coastal zone and natural resource management;
- developing strategies for the dissemination of environmental information to increase public awareness.

Within this overall framework the Ministry of Environment has identified priority actions that can significantly and rapidly contribute to the protection of the environment and control of impacts.

Specifically the measures will be aimed at: (i) developing institutional and regulatory framework in line with work already progressing on institutional and legislative framework; (ii) strengthening the institutions responsible for the environment; (iii) evaluating and identifying economic instruments to be implemented in the field of environmental protection and impact mitigation; (iv) assessing and mitigating pollution at severe environmental hot spots; (v) developing demonstration projects on mitigation of of soil pollution from chemicals and on natural resources management against deforestation; and (vi) developing proposed public awareness actions, at both central and local level.

3. Sector issues to be addressed by the project and strategic choices:

The Integrated Water and Ecosystem Management Project will extend and deepen the ongoing Government actions in the environmental sector. The key strategic choices made during project preparation were to:

- Link the project with the currently ongoing Bank financed Municipal Water and Wastewater Project. The project will provide the water utilities of three of the cities targeted by the MWWP with low cost wastewater treatment facilities. The private operator recruited under the MWWP will be instrumental to develop capacity in the water utilities to use this environmental friendly wastewater treatment technology. It is expected that this will contribute to the introduction of environmentally sustainable wastewater treatment technology in other cities in the region. Furthermore, in order to guarantee continuity between the two projects and optimization of resources a common PIU has been established.

- Address environmental issues in water sector reform by integrating close-to-nature wastewater treatment options with management and monitoring of areas with globally important biodiversity. In the present economic situation with an underdeveloped civil society, lacking a politically active and environmental conscious elite to actively steer the country toward an environmentally conscious development, it is unlikely that nature conservation will be sufficiently promoted in the near future. Therefore it is important that present and future coastal zones and wetland conservation programs in parallel with sanitation measures lay the ground for decentralized and financially self sufficient management units with a strong involvement of local civil society. In this context, the project will explore the possibility of introducing an innovative management scheme for Albanian wetlands by building upon previous studies such as the EU PHARE financed Karavasta Lagoon – Wetland Management Project. If successfully implemented, this should provide a model, which can be adapted to particular requirements of other Albanian wetlands and sanitation needs.

- Address broad environment sector reform issues by including a component for TA to improve the management of natural Reserves. This in turn will develop opportunities for promoting protected areas management and sustainable use of natural resources that is politically and financially justified and socially sustainable.

- Build national, regional and local capacity in assisting the Government in meeting its international obligations on transboundary pollution and biodiversity conservation.

C. Project Description Summary

1. Project components (see Annex 2 for a detailed description and Annex 3 for a detailed cost breakdown):

The project will assist the Government of Albania to: (i) reduce sewage pollution loads generated by the

three coastal cities of Durres, Lezha and Saranda through the development and establishment of environmentally-beneficial low cost wastewater treatment technologies; (ii) improve environmental management and monitoring; (iii) promote nutrient reduction investments in other parts of Albania and neighboring countries; and (iv) Project Management

Component	Indicative Costs (US$M)	% of Total	Bank financing (US$M)	% of Bank financing	GEF financing (US$M)	% of GEF financing
1. Sewage Pollution Reduction	10.74	87.8	0.00	0.0	4.38	89.9
2. Environmental Management and Monitoring	1.20	9.8	0.00	0.0	0.20	4.1
3. Public Awareness and Replication	0.20	1.6	0.00	0.0	0.20	4.1
4. Project Management, Monitoring&Evaluation	0.09	0.7	0.00	0.0	0.09	1.8
Total Project Costs	12.23	100.0	0.00	0.0	4.87	100.0
Total Financing Required	12.23	100.0	0.00	0.0	4.87	100.0

All costs without taxes and duties which will be reimbursed by the Government. Estimated to be US$2.5 million

Component 1: Sewage Pollution Reduction (Total: US$10.74 million; GEF: US$4.38 million, EIB (to be confirmed): US$5.64 million, GoA: US$0.72 million). This component represents an innovative aspect of the proposed project and, if successful, has an high replication value throughout Albania and the region. The component consists of two main parts: (i) the establishment of Constructed Treatment Wetlands and related facilities; and (ii) the construction of the sewage main collectors required to connect the current sewerage systems to the new treatment facilities.

The sites selected for the establishment of the Constructed Treatment Wetlands (CTW) have been carefully considered through a process of public consultation that has involved local authorities, local communities, civil society and sector ministries. In consultation with the Ministry of Environment specific criteria were established and each alternative site weighed according those criteria. Criteria included: potential nutrient reduction capacity, land availability, distance from built-up areas, adequacy of the site in terms of present and future needs, absence of physical constraints and proximity to sites for discharging treated water. Other sites, initially considered to be included in this project, were not selected due to the lack of potential generation of global benefits, conflicts over land use or technical implementation difficulties.

The GEF funds will support the creation of 92 ha of Constructed Treatment Wetlands (CTWs) in three already identified sites in proximity of the urban areas of Durres, Lezha and Saranda. Mechanisms that occur in these ecosystems (sedimentation, adsorption, flocculation, precipitation and biological decomposition) decrease the concentration of polluting substances flowing through the wetlands and reduce the impact of untreated wastewaters of urban origin on the international waterways and coastal marshlands. The artificial wetlands offer the opportunity to realize a low cost wastewater treatment systems that rely on natural processes and reduce the need for energy supply. The evaluation of alternatives has been carried out through a multicriteria approach that included: environmental impacts, project costs, local conditions, institutional framework, training and monitoring requirements, hydro geological and health risks. Specifically the funds will enable the construction works for the three facilities. The construction works will include civil works, equipment and construction of infrastructure which will regulate water flows through the wetlands - allowing for controlled flooding that optimize nutrient trapping and biodiversity restoration.

Financial support from the European Investment Bank (EIB) has been identified and will be confirmed before appraisal. It will finance activities related to the construction of sewage collectors to connect the

sewerage outflows of the three urban areas of Durres, Lezhe and Saranda to the constructed treatment wetlands as well as to the enhancement of the pretreatment facilities to improve the overall performance of the natural system. The construction of those sewerage infrastructures will halt the uncontrolled sewage discharge directly into the coastal lagoon systems that is currently occurring and constitutes the most relevant threat for the survival of the globally important coastal marine ecosystem and tidal marshlands. Furthermore the EIB will support the establishment of a conventional treatment plant in the Shengjini area. Shengjini represents an important natural ecosystem characterized by the precence of marshlands, the Kanalla Lake and by a long beach with a litoral pine-wood on the coastal dunes. The peculiar morphological configuration do not offer sufficient space for the creation of a CTW and therefore the establishment of a conventional treatment system represents the more appropriate option for this area.

The Government of Albania will contribute with the availability of the lands needed for the establishment of the CTWs.

Component 2: Environmental Management and Monitoring (Total: US$1.2 million; GEF: US$0.2 million, EIB (to be confirmed): US$1.0 million). This component represent a valuable opportunity to provide support in promoting a prototype initiative of environmental management of natural resources to be extended in the future to other Albanian Protected Areas. The component will assist the Ministry of Environment and the Ministry of Agriculture and Food in enhancing the management of Natural Reserves as well as to strengthen the protection of coastal areas involved by intervention works under this project.

Specifically the GEF funds will finance a program aimed to enforce an integrated and sustainable management of the Kune-Vain wetland and Kenalla lake Protected Areas. The activities under this component are aimed to integrate the conservation of the important tidal marshland with the sustainable management of regional tourism and area's natural resources, through an innovative management system. The program will address: (i) development of legislative framework for Kune-Vain Managed Area (KVMA) implementation; (ii) institutional strengthening for KVMA Management Board and Administration; (iii) development of the protected area Management Plan; (iv) implementation of the KVMA Management Plan starting with the identified priority measures; and (v) strengthening monitoring programs for water quality, biodiversity and socio-economic indicators within the protected areas and the coastal zones involved in the project.

Component 3: Public Awareness and Replication (Total: US$0.2 million; GEF: US$0.2 million). This component will help to raise awareness in the three cities of Saranda, Durres, and Lezha, on the benefits of using Constructed Wetlands as biological wastewater treatments and promote its adoption in other areas of Albania or other countries of the Mediterranean region, where existing pollution loads are threatening coastal marine ecosystems and natural wetland systems critical for globally important biodiversity.

To increasing the sustainability of the project and achieve this goal the GEF will finance an environmental education and communication program designed to address different stakeholders. This will also include: a) environmental education activities for schools and local communities; b) teacher's training and programs in the fields of Ecology and Environmental Science; c) a scheme for stakeholder participation in the management of the natural resources of Kune and Vaine; d) c oordination with the communication activities undertaken, within the framework of the Municipal Water Project, by the private operator and the municipalities, aimed at building

consensus on the need to pay for water and sanitation services, and increase informed participation from consumers.

The GEF funds will also finance the dissemination of the project's findings to other cities of the region and investigations to expand the project's approach. The proposed project design has a high potential for replication in Albania. Natural wastewater treatment using Constructed Wetlands may become a demonstration area for similar projects in Albania as well as other developing countries of the Mediterranean region.

Component 4: Project Management, Monitoring and Evaluation (Total: US$0.09 million; GEF: US$0.09 million). This component will support a Project Implementation Unit (PIU) within the Ministry of Territorial Adjustment and Tourism (MTAT) to coordinate, manage and monitor the activities under the project. The project will use the current World Bank Water PIU which is already successfully implementing the Water Supply Urgent Rehabilitation Project and the Municipal Water and Wastewater Project. The PIU will have a central office in Durres and significant physical presence in the other cities and will have full responsibility for: (i) procurement, financial management and disbursement related to the activities funded by the GEF grant; (ii) financial management reporting of overall project; (iii) monitoring-evaluation and reporting of overall project progress implementation; (iv) coordination with central ministries and their regional and local branches.

A detailed description of the components is provided in annex 2.

2. Key policy and institutional reforms supported by the project:

The Government of Albania is investing considerable effort in developing laws and regulations to address environmental issues. The environmental legal framework is covered by a new Law "On Environmental Protection" approved by the Parliament on September 2002. A draft Law "On Environment Impact Assessment" is currently in the Parliament for the final approval. Within the existent institutional framework the overall responsibility for managing and monitoring the natural wetlands and coastal areas lies with the Ministry of Agriculture and Food. This is regulated by the new "*Protected Area Law*" (n°8906 dated 6/6/2002), and "*Protection of Marine Environment from Pollution*" (n°8905 dated 6/6/2002). The project will assist the Government of Albania to strengthen national, regional and local administrations in managing natural protected areas - such as environmental management planning, increased management capacity and the standardization of monitoring and reporting procedures. Also, the project will help to improve coordination between the central, regional and local governments, local communities and municipalities on the use of natural resources. It will also help to develop processes to better involve the public in the decision-making process not only for project activities but also for sustainable resource management and use within natural protected areas.

At the same time the Government of Albania assisted by the Bank and other donors is undertaking an ambitious program of economic reforms, promoting a public-private partnership in key infrastructures, mainly in the water supply and sanitation sector. The reform will lead to the establishment of a pro-private sector participation (PSP) regulatory and policy framework at the state and municipal level and the introduction of a PSP regime beneficial for the poor through the use of a Management Contract (MC). The reform also aims at integrating wastewater management. Four major metropolitan areas, including Durres, Lezha and Saranda, are involved in the reform process. The presence of the private operator that will hand over responsibility in managing water systems in the above mentioned areas will enable in turn to establish a proper operation and maintenance of the Constructed Treatment Wetlands to be financed through this project.

The Government of Albania has approved the important document "Biodiversity Strategy and Action Plan (BSAP)". This document, granted by GEF, is an important step for Albania towards implementing the **Convention on Biological Diversity (CBD).** More recently, in the frame of institutional reform, the Directorate of Management of Albanian Protected Areas was established within the General Directorate of Forests and Pasture (GDFP). This Directorate in collaboration with other relevant agencies, in particular with the Unit of Environmental Management Forest Project, is working to implement rules and duties regarding management of the Protected Areas in Albania.

The very recent approval of the Law "*On Protected Areas*" (n°8906, 06/06/2002) opens up new interesting opportunities for advanced and integrated management of protected areas, extending all over the whole Albanian territory. Contacts and consultations are at present in progress between the Ministry for Environment and the Ministry for Agriculture and Food, in order to define and agree on joint rules and procedures for the *Administration of Protected Areas in Albania*, regulated by the Duties, Tasks and Functions. The Law "*On Protected Areas* " will allow GoA to set up management of protected areas by means of a Decree (By-Law act), including the definition of the program related economic financing plan. The present project is a good opportunity to provide general recommendations and suggestions to promote a prototype initiative of environmental management of natural resources, to be extended in the future to other Albanian Protected Areas.

3. Benefits and target population:

At the global level, benefits will be increased through the reduction of transboundary pollution into the Adriatic Sea which is currently endangering the numerous species hosted in the coastal and marine environment. Based on the technical assessment of the nutrient trapping capacity of the constructed treatment wetlands to be financed under this project, about 245 tons of Nitrogen and Phosphorous and 768 tons of BOD5 could be reduced annually. Significant global biodiversity benefits are expected. The constructed wetlands represent a new natural habitat for flora and fauna and therefore increase the biodiversity of the area. Also, they represent a continuity corridor with currently existing ecosystems, and a buffer zone against the uncontrolled spread of the urbanization. Specifically the wetlands will have a positive impact on:

- Endangered marine ecosystems and habitats, in medium and infralittoral level (particularly Shengjini-Lezha area, Porto Romano bay and Saranda bay);
- Endangered coastal ecosystems: sand dunes, delta rivers (particularly Drini-Lezha), alluvial and wet forests, lagoons (Kune and Vaini) and coastal lakes (Kenalla);
- Risks and adverse impacts on biodiversity. Some of the major adverse impacts have been: habitat loss and fragmentation, damage (Porto Romano bay and Saranda bay) and degradation (Kenalla lake) of habitats and ecosystems, loss of species or the threat of their extinction - i.e. the *monk seal* and the *sea turtle* ranked by IUCN respectively as critically endangered and endangered, living in the waters of Corfu Island, Saranda, Ksamili and Kakome bay; the mouse ear bat, the otter, the ferruginous duck, the pygmy cormorant, and the pallid harrier living in Kune-Vain marshland, Durres-Rrushkull-Erzeni River Managed Natural Reserve, Butrinti lake area;
- Protection of the *Posidonia Oceanica* meadows, particularly in the Shengjini- Lezha and Saranda-Ksamili area, but also in the Porto Romano and Lalzi bay. This in turn will have a positive impact in protecting beaches from erosion as well as providing hatchery and nutrients for endangered species.
- Development of some algae populations (*Ulva and Enteromorpha*), particularly in Saranda bay, Shengjini bay and Porto Romano bay;
- Protection from *eutrophication* in the Saranda bay, Shengjini area and Kenalla lake;

At the regional level the project will have a demonstration impact contributing to creation of additional wetlands and protected areas along the coastlines of Albania and neighbouring countries. Additional benefits result from sharing experiences with neighbouring countries on the use of constructed wetlands for nutrient treatment, and on protected areas and wetlands management. Also, the project will contribute to developing regional natural resource management strategies and regional eco-tourism opportunities. In addition, at national level there will be progress towards compliance with EU directives and enhanced capacity of central, regional and municipal institutions to preserve and manage protected areas and wetlands.

At the local level the principal beneficiaries from cleaner water resulting from nutrient reduction will be Albanians living in the areas affected by the current damaged environment. In fact the local populations will benefit from reduced health risk and odor nuisance from untreated wastewater. Also, the Albanian population at large will benefit from improved water quality suitable for environmentally sound recreational use at beaches and coastal areas and wetlands. In particular the improved water quality at beaches will contribute to Albania's economic development by laying the foundation for further development of the tourist sector. Apart from the above mentioned benefits to the general population and the population in the area covered by the component (approx. 260,000), the poor will benefit especially from the improvements because more of them than the average of the population, live close to open ditches conveying untreated wastewater.

4. Institutional and implementation arrangements:

The outline of the institutional framework to be created for the management of the Kune-Vain Lagoon has been agreed with the Ministry of Environment (MOE) and the General Directorate of Forestry and Pastures (GDFP). At present, responsibility for protection and administration of the area lies with the GDFP (under the Ministry for Agriculture and Food). The very recent approval of the Law "*On Protected Areas*" (n°8906, 06/06/2002) opens up opportunities for an advanced and integrated management of protected areas, Kune-Vain lagoon included. The Ministry of Environment has drafted a decree in the framework of the above mentioned law that would transfer all "Hunting Reserves", including Kune-Vain, into "Managed Reserves". The objective of the Kune-Vain Managed Area (KVMA) is conservation and sustainable management of the Kune-Vain wetland and the Kenalla lake, with the goal of integrating the conservation of the important bird habitats with the sustainable management of regional tourism and area's natural resources, through an innovative management system. It is expected that the MOE will present the above mentioned decree to the Council of Ministers (CM) by February 25, 2003 and CM approval is expected by March 14, 2003.

A second decree under the law "On Protected Areas", which is expected to be approved by the CM by March 14, 2003 together with the decree mentioned above, will set the framework for creating an administrative entity for each "Managed Reserve". This decree would allow the MOE and GDFP to establish a new administration and management board for Kune-Vain. This Board will include representatives from key ministries, the Districts with territory within the Area, the Municipalities/Communes and a formal representation of the users of the KVMA. The KVMA Board will be accountable for planning the management of KVMA and for establishing regulations on the use of natural resources. The area will be separated into different zones with allowable activities defined for each zone. The Management Board will act as a committee responsible for the selection of the most suitable Management Plan. The Management Board will receive TA under the project to prepare the Management Plan. The board will also coordinate definition of tasks, rules, planning processes and operational procedures**.**

It is proposed that the administrative entity for the KVMA be established under the budget of the General

Directorate of Forestry and Pasture. The responsibilities of the KVMA Administration will be to introduce the new participatory protected area planning approach to the site, to build capacity within local user groups and other stakeholders to implement protect activities, and to undertake monitoring and regulatory functions. These responsibilities will be identified in the Management Plan which will be prepared under the Project.

Consultations are at present in progress between the Ministry of Environment and the Ministry for Agriculture and Food in order to define and agree on joint rules and procedures for the Administration of Protected Areas in Albania. Also under discussion between the MoE and the General Directorate of Forest and Pasture is the possibility to immediately stop the hunting in the area of Kune-Vain.

The overall coordination of the GEF funded Integrated Water and Ecosystem Management component will be carried out by the Ministry of Territorial Adjustment and Tourism in close cooperation with the Ministry of Environment and the Ministry of Agriculture and Food. The management of this component will be entrusted to the existing Water PIU under the Ministry of Territorial Adjustment and Tourism. In order to cover the non-engineering aspects of this project, the PIU will be strengthened by recruiting a biologist/environmental engineer. The existing Water PIU will be responsible also for the financial management and the procurement under the project.

The GEF grant will be forwarded by the Ministry of Finance to the Ministry of Territorial Adjustment and Tourism. The works and goods procured under this component will be handed over to the General Directorate of Forestry & Pastures (GDFP), the General Directorate of Fisheries (GDF) and the Ministry of Environment for ecosystem management and monitoring, and for the CTWs to the water utilities.

The General Directorate of Forestry & Pastures (GDFP) and General Directorate of Fisheries (GDF) will provide the Bank with annual monitoring and evaluation reports regarding the achievements under this component. In addition the operator of the CTWs will conduct self-monitoring of the CTWs.

D. Project Rationale

1. Project alternatives considered and reasons for rejection:

During project preparation various design alternatives were considered and evaluated. These include:

CTW versus Conventional Wastewater Treatment Systems: The option of conventional wastewater treatment plants was considered. This proved to be unaffordable by the Government of Albania in its current economic situation. The preferred alternative, constructed treatment wetlands require significantly lower construction and maintenance costs than wastewater treatment plants and thus offers the opportunity to create a low cost municipal wastewater treatment system relying on natural processes and reducing to the minimum the operational need for mechanical devices and energy supply.
This will also contribute to lower operation costs for the water utilities, making the process more affordable for all the other utilities that will want to follow the example of the present project. Moreover, constructed wetlands represent an additional natural habitat for globally endangered species as well as a continuity corridor toward already existing ecosystems contributing to generate additional global benefits. Also it is pointed out that constructed wetlands are not unable to coexist with conventional wastewater treatment systems since they are widely used as tertiary stages of complete sewage treatment systems. The flexibility they have in easily adapting layout and hydraulic characteristics will allow the integration of the wetlands as part of a more complex and effective solution for future development.

Selection of Sites: The sites selected for the establishment of the Constructed Treatment Wetlands

(CTW) have been carefully considered through a process of public consultation that has involved local authorities, local communities, civil society and sector ministries. In consultation with the Ministry of Environment specific criteria were established and each alternative site weighed according those criteria. Criteria included: potential nutrient reduction capacity, land availability, distance from built-up areas, adequacy of the site in terms of present and future needs, absence of physical constraints and proximity to sites for discharging treated water. Other sites, initially considered to be included in this project, were not selected due to the lack of potential generation of global benefits, conflicts over land use or technical implementation difficulties.

2. Major related projects financed by the Bank and/or other development agencies (completed, ongoing and planned).

Sector Issue	Project	Latest Supervision (PSR) Ratings (Bank-financed projects only)	
		Implementation Progress (IP)	Development Objective (DO)
Bank-financed			
Water and Sanitation	Water Supply Urgent Rehabilitation Project.	S	S
	Municipal Water and Wastewater Project.	S	S
Biodiversity	(GEF, World Bank) Albania Biodiversity Enabling Activity Completed		
Other development agencies			
Wetland Conservation	Conservation of Wetland and Coastal Ecosystems in the Mediterranean Region (GEF, UNDP Regional Project) Ongoing		
Capacity building	Strategic Action Program for the Mediterranean Sea (GEF, UNDP Regional Project) Ongoing		

IP/DO Ratings: HS (Highly Satisfactory), S (Satisfactory), U (Unsatisfactory), HU (Highly Unsatisfactory)

3. Lessons learned and reflected in the project design:

Project design reflects the Bank's experience in the preparation and implementation of water and ecosystem management programs in Europe and around the world. Some of the critical lessons learned and applied in this Project's preparation recommend that:

- The early involvement in project concept design of key stakeholders from across the water, agriculture and environment sector as well as of local communities is essential in order to ensure ownership, build lasting commitment and achieve successful project implementation. A participatory approach has been implemented through a process of consultation that has represented an innovative avenue to arrive to common understanding of the issues related to wastewater management and environmental protection. This approach has, in turn, broadened the public consensus and helped in selecting the most socially/politically/environmentally acceptable sites for the construction of the wetlands in the three cities as well as promoting dialogue within the authorities for the management of the natural protected areas.
- The rationale, benefits and objectives of the project should be made known to all stakeholders through effective public awareness programs. The benefits of sustainable wastewater treatment need

to be demonstrated and the results widely disseminated.

- Maintaining support from central government working with the Ministry of Territorial Adjustment and Tourism, Ministry of Environment and Ministry of Agriculture and Food, but emphasizing decentralized responsibility for financial and local project management (for both CTWs and Kune-Vain Managed Area) helps to build local ownership and sustainability of project activities.
- The project needs to focus on activities which promote replication, sustainability and resource mobilization beyond the life of the project. The replication of the project will be highly encouraged extending the analysis to other potential sites suitable for wetlands construction, to reduce wastewater effluent problems. The project will help to promote and eventually expand the use of CTWs in areas where existing pollution loads are threatening ecosystems critical for biodiversity.

4. Indications of borrower and recipient commitment and ownership:

The Government through the Council of Ministers, the Ministry of Territorial Adjustment and Tourism, the Ministry of Environment, the General Directorate of Forestry and Pastures and the water utilities and municipalities of Durres, Lezha and Saranda have all indicated their full support of the project objectives. To this end the above mentioned stakeholders have taken the following actions:

- Law "On Environmental Protection" (2002), Draft Law "On Environment Impact Assessment", Protected Areas Law (2002), Protection of Marine Environment from Pollution (2002).
- The Ministry of Environment has drafted a decree that would transfer all "Hunting Reserves" into "Managed Reserves". It is expected that the decree will be presented to the Council of Ministers at the end of February.
- The Ministry of Environment has prepared a decree to be submitted to the Council of Ministers in order to set the framework for creating an administrative entity for each "Managed Reserve". It is expected that the above mentioned decree will be approved by the end of March.
- Consultations are in progress between the Ministry of Environment and the Ministry of Agriculture and Food in order to achieve an immediate stop to hunting in the area of Kune-Vain.
- The Executive Committee has awarded an incentive based multi city management contract to a private operator. This will improve water supply and sanitation services and achieve sustainability in the participating water utilities.
- All the participating utilities have agreed to take over the accountability for the management of constructed treatment wetlands.
- All the municipalities have agreed to a substantial tariff increase for water supply services and have introduced of a wastewater tariff.
- The Government has a strong commitment to necessary sector reform and has requested the Bank's assistance for developing a comprehensive National Water Supply and Sanitation Strategy and Water Sector Action Plan.

5. Value added of Bank and Global support in this project:

The design of the proposed project has been tailored to support sector reforms, while responding to the constraints in Albania. It is quite innovative in its approach and brings into fruition the sector expertise that the Bank has accumulated in Albania and other developing countries. In particular the Bank has:

- broad international experience in integrated water and ecosystem management;
- the experience to coordinate closely with other donors and mobilize additional sources of funds; and
- policy development expertise and experience in the design of institutional reforms in the water and sanitation sector.

E. Summary Project Analysis (Detailed assessments are in the project file, see Annex 8)

1. Economic (see Annex 4):

○ Cost benefit NPV=US$ million; ERR = % (see Annex 4)

○ Cost effectiveness

● Incremental Cost

○ Other (specify)

The objective of the project is to reduce the sewage pollution load from the three cities of Durres, Lezha and Saranda in order to protect and improve the environmental conditions of coastal and marine habitats. The great part of the ecosystems considered under the project have been ranked at international level according with the Ramsar convention. The project supports the creation of constructed wetlands for wastewater treatment as well as improved managemnt of the natural protected area of Kune Vain that has globally significant biodiversity.

Two economic analysis have been carried out to demonstrate that this project is a worthwhile investment: (i) an Incremental cost analysis and (ii) a cost-effectiveness analysis. The detailed Incremental Cost Analysis is provided in Annex 11.

The first analysis utilizes the typical incremental cost assessment approach. The without-project scenario can be summarized as follows:

Water pollution, mainly generated by the increasing population concentrated along the Adriatic coastline, has considerably degraded the natural inland ecosystems and the biological productivity of the coastal areas. This in turn represents a serious threat to the biological diversity of the natural habitats of the coastal wetlands, rivers and sea water, as well as a potential risk to public health. Albania lacks any wastewater treatment facility and existing raw sewage outfalls are located either directly on the seacoast, on the bank of coastal rivers or on drainage ditches that after a short distance discharge directly into globally significant tidal marshlands and/or the sea.

In the context of the described baseline scenario there are no current financial resources allocated by the Government of Albania to create wastewater treatment facilities to reduce the pollution load of the global ecosystem and therefore the incremental cost of achieving global benefits has been estimated equal to the project cost of US$12.23 million.

	GEF	EIB	GoA	Total
Sewage Pollution Reduction	4,380,000	5,640,000	720,000	10,740,000
Environmental Management and Monitoring	200,000	1,000,000		1,200,000
Public Awareness and Replication	200,000			200,000
Project Management, M & E	90,000			90,000
Total	**4,870,000**	**6,640,000**	**720,000**	**12,230,000**

The expected global benefits of the proposed project is the improvement of the health and habitat of globallly significant marine and coastal ecosystems along the coastaline of Albania by reducing pollution from uncontrolled municipal wastwater generated by the urban settlements of the cities of Durres, Lezha and Saranda that are discharging into the Adriatic sea and improving the managment of the tidal marshland of Kune Vain near Lezha.

The second analysis compares the cost-effectiveness ratios of removing nitrogen and phosphorous flowing in the Adriatic sea, defined as the ratio of cost (capital and operational and maintenance cost) to the volume of nitrogen and phosphorous removed during the life of the project (a period of 20 years has been assumed). The estimates of cost-effectiveness ratios are presented in the table below. The cost-effectiveness ratios, based on the assumption presented in Annex 11, were found to be in the order of US$2.5-1.0 per kilogram of nitrogen removed and US$ 9.2-3.8 per kilogram of phosphorous removed. Since the cost per kilogram of nutrient removed for this project are expected to be lower compared to the costs born in similar projects in the region, it is safe to say that the CTW construction will be highly-effective for pollution reduction in the Adriatic sea.

Volume of nutrient removed for 1° year operation (2004) and 20° year operation (2023)

Coastal cities	Reference Year CTW operation	Estimate population	*Volume of nutrient removed* ***(tons/years)***
			NitrogenPhosphorus
Durres	***2004***	150,000	87.5024.50
	2023	250,000	276.0077.00
Lezhe	***2004***	18,000	10.502.90
	2023	30,000	31.508.80
Saranda	***2004***	30,000	17.504.90
	2023	60,000	65.5018.00

Cost-effectiveness during the life of the project (20 year operation from 2004 to 2023)

		Durres	**Lezhe**	**Saranda**
Incremental effects				
Total Nutrient removed in 20 years operation:				
-(Nitrogen/N) (20 years/ton)	Tons	3,550	411	808
-(Phosphorus/Ph) (20 years/ton)	Tons	991	114	223
Abatement costs				
Total incremental costs (capital and O&M cost)	US$	5,663,000	1,057,000	858,000
Abatement costs ton/Nitrogen	US$ per Tons	1,595	2,575	1,061
Abatement costs ton/Phosphorus	US$ per Tons	5,712	9,244	3,846

Cost Benefit

The technical analysis of EIRR clearly shows that Durres, Lezha and Saranda are highly acceptable. The same conclusion can be made using ENPV as a yardstick. The sensitivity analysis stresses that the value increase and the number of properties affected are the main determining variables in the project outcomes. Significant alterations in project benefits and initial investments can be made for Durres and Saranda without losing the objective of minimal ten percent EIRR, however, this extreme flexibility in project benefits and investments does not hold for Lezha.

As said, the economic analysis only includes benefits at a local level and significant positive externalities of the projects are foreseen in terms of global environmental benefits. The most important project benefit is the increase in the value of real estate and as such the project is aligned with the notion that improved water supply and sanitation are basic requirement for a sound and stable economic development of the country as underpinned in the next section.

In summary, it can be said that the local economic benefits equal the local environmental benefits. The regional, national and global environmental benefits are thus not included. The present calculation gives only an impression of the significant environmental global benefits obtained with this project.

Cost-benefits

	Durres	**Lezhe**	**Saranda**
eIRR (%)	21%	17%	32%
Sensitivity of eIRR	Very robust	Robust	Very robust

2. Financial (see Annex 4 and Annex 5):

NPV=US$ million; FRR = % (see Annex 4)

In terms of financial viability the project has to be seen as an integral part of the recently Bank approved Municipal Water and Wastewater Project (MWWP). The above mentioned project is designed to introduce in Albania a new incentive based multi city management contract to improve water supply and sanitation services and achieve financial viability in the participating water utilities. The wastewater treatment facilities to be financed through the present GEF operation will be operated and maintained by the water utilities targeted under the MWWP. This in turn will provide the sufficient soundness to make this project affordable. The current situation shows that the four water companies are financially in poor conditions, with working ratios between 1.4 and 2.6. The major financial problems in the four water companies are caused by extremely low water tariffs and no existing sewerage tariffs, these are made worse by especially low collection rates, combined with high operational and maintenance cost. Increase of collection rates, tariff increases and a change in the tariff structure will be necessary to turn the four companies into financially viable autonomous entities. These are essential if the companies are to recover the increasing operational and maintenance costs for the provision of water and sanitation services and to contribute counterpart funds for investments. Due to the current financial situation of all four water utilities, an immediate revenue increase leading to full cost recovery in the first year of project implementation is not achievable. The draft financial analysis indicates that full cost recovery cannot be achieved before year three of implementation. The financial gap at the beginning of the project has to be bridged by declining state subsidies.

Fiscal Impact:

3. Technical:

The technical challenge is to design constructed treatment wetlands that maximize the positive impact on globally important biodiversity by at the same time minimizing investment and operation costs. In addition a detail management enhancement concept for the natural wetlands will be developed during

project preparation.

4. Institutional:

4.1 Executing agencies:

The proposed project will be implemented jointly by the four water utilities and the Ministry of Public Works and Tourism.

4.2 Project management:

This component will be implemented by the Ministry of Public Works and Tourism in close cooperation with the Ministry of Food and Agriculture and the Ministry of Environment. The existing World Bank Water PIU will be the implementing agency.

4.3 Procurement issues:

The Ministry of Public Works and Tourism will use the existing World Bank Water PIU as the implementing agency. The staff from the Ministry of Food and Agriculture and the Ministry of Environment will be participating in writing Terms of Reference, evaluation of technical proposals and supervision of environmental management and monitoring activities. All other tasks will be carried out by the procurement experienced PIU staff. Therefore no major issues that requires special attention are anticipated.

4.4 Financial management issues:

The PIU implementing the Water Supply Urgent Rehabilitation Project (WSURP) will be also responsible for the financial management of the Municipal Water and Wastewater Project (MWWP) by integrating the function of the CMU and Pilot RWSA into the PIU.

The implementation of the MWWP under the same PIU will allow the establishment of the financial management system for this new project on the computerized system currently in use by the WSURP. In other words, there will be a centralization of the financial management system within the same PIU that will create synergy by sharing the same software, capitalizing on the skills of the accountant but although maintaining the financial management systems of the two components separated.

The financial management arrangements for the WSURP are based on a computerized system of accounting. This system has been implemented with the assistance of a consulting firm that has also trained the accountant in the use of the system and of the financial management requirements of the Bank. Since the beginning of the project, the accountant has significantly improved her skills and is now handling all the accounting and disbursement transactions.

Based on this system, the PIU will open two Special Accounts for the MWWP. One for IDA funds (Management Contract and Rural Pilot Components) and the other for the GEF funds (GEF Project).

Prior to appraisal the existing computerized system within the PIU will need to be customized - with the assistance of a consulting firm - adapting the Chart of Accounts and the reporting, to the components of the MWWP. The peculiarities for these three components will be:

- Management contract component: Each of the participating water utilities will have to establish a sound financial management system and the PIU/CMU, in addition of managing the Special Account and project funds, will be responsible for managing the Revenue Account for each water utility.

- GEF Project: The PIU will open a separate Special Account for the funds disbursed under this project.

5. Environmental: Environmental Category: B (Partial Assessment)

5.1 Summarize the steps undertaken for environmental assessment and EMP preparation (including consultation and disclosure) and the significant issues and their treatment emerging from this analysis.

The project will finance the construction of low cost ecologically based wastewater treatment technologies, with the major environmental objective to reduce the amount of nutrients discharged into the Adriatic sea; making the project environmentally beneficial. The project will address global benefits by reducing pollution in coastal areas and protecting the marine ecosystem from destruction.
Apart from earth embankments for the constructed treatment wetlands and earth dykes planned to protect the CTW from the floods, no new physical structures of significant size will be built and no major adverse environmental impacts are expected. Nonetheless, potential negative environmental impacts are expected to be localized or able to be mitigated. Given the nature of the CTW's work, the project has been classified as Environmental Category "B". In accordance with the Bank policy on Environmental Assessment, the Ministry of Territorial Adjustment and Tourism in collaboration with the Ministry of Environment is currently carrying out the Environmental Impact Assessment of the project. A combination of quantitative and qualitative assessment techniques (ranging from desk-based analysis, to water and social survey) have been undertaken. The EA will reflect the environmental guidelines and standards of IDA since such standard are not enacted yet in Albania. A detailed legislation and guideline for Environmental Impact Assessment is under discussion in the Parliament, and is expected to be approved by next year. The EIA will describe existing environmental conditions at the three project sites (including climate, hydrology, soil and water quality, groundwater and biodiversity) and assess the potential impacts on these conditions from implementation of the project, during the construction and operation phases.

An Environmental Management Plan (EMP) will be prepared to identify mitigation measures and monitoring activities that will address potential impacts and therefore provide an adequate safeguard for environment. The EIA will analyze whether the proposed activities are in compliance with the environmental requirements of both the Government of Albania and the Bank with the respect to restoration developments of this nature.

5.2 What are the main features of the EMP and are they adequate?

An Environmental Management Plan (EMP) will be prepared prior to appraisal. The EMP will include monitoring and mitigation activities for the three constructed treatment wetlands during project preparation and implementation. The EMP will include: (i) a contingency plan to address problems that could develop during facilities' construction and operation. The contingency plan will include measures for determining and remediating nuisance conditions, addressing any toxicity observed in the wetland, and dealing with construction, or operational errors, or unpredictable events; (ii) establishment of a comprehensive monitoring program for potential dangers to the wetland ecosystem, such as bioaccumulation, avian botulism and other avian diseases, vector problems, invasion of non-native plants and animals, debris accumulation, and nuisance conditions; (iii) guidelines for sustainable management of the water regimes in the wetlands, such as procedures in the event of accidental pollution, floods, provision of optimal treatment capacity; (iv) soils removal and selection of suitable landfills for waste disposal from the construction phase; (v) evaluation of flooding risks and implications for ground water protection; (vi) environmental management guidelines for contractors; and (vii) procedures for sludge removal and disposal.

5.3 For Category A and B projects, timeline and status of EA:
Date of receipt of final draft: March 7, 2003

An Environmental Impact Assessment (EIA) for this project is currently under preparation and will be finalized prior to appraisal. It will be reviewed and commented on by the ECA Safeguard Compliance Unit.

5.4 How have stakeholders been consulted at the stage of (a) environmental screening and (b) draft EA report on the environmental impacts and proposed environment management plan? Describe mechanisms of consultation that were used and which groups were consulted?

The preparation of this project built first on the social assessment that was carried out for the Municipal Water and Wastewater Project and included focus group meetings and a stakeholder workshops. In addition a public consultation process involving central and local authorities, municipalities, communities affected by the project, NGOs and local environmental specialists is currently on-going. As described in other part of this document the participatory approach involves all the above mentioned stakeholders. The aim is to increase awareness of environmental issues and build public consensus to help selecting the most environmentally acceptable solutions/sites for the construction of the wetland in proximity of the three cities.

Also it is expected that consultation with beneficiaries will be on a continuous basis during project implementation through public relations campaigns conducted by the private operator under the Municipal Water and Wastewater Project.

The draft EMP will be distributed to relevant government bodies, institutions and NGOs. To facilitate access of the EMP, copies will be distributed to local municipalities for public review and a newspaper announcement will be made to inform about the key issues and the availability of the draft EMPF.

5.5 What mechanisms have been established to monitor and evaluate the impact of the project on the environment? Do the indicators reflect the objectives and results of the EMP?

Environmental indicators will be monitored annually and obligations for implementation in accordance with the 1993 Law on Environmental Protection and OP 4.01 will be included in the contract with the private operator. Most likely, consultants (or NGOs) will be engaged to monitor project implementation and conduct periodic environmental audit.

6. Social:

6.1 Summarize key social issues relevant to the project objectives, and specify the project's social development outcomes.

Environmental problems in Albania, like in most other transition countries, still take a secondary place in the order of priorities. The GEF-Integrated Water and Ecosystem Management Project, by reducing land-based pollution from the three cities of Saranda, Lezhe and Durres and introducing low cost ecologically based wastewater treatment technologies to protect, restore and enlarge endangered coastal and marine habitats would put forward the idea of environmental protection as a public good with significant social (health), and economic (eco-tourism) effects. Thus the rationale behind using constructed wetlands for natural wastewater treatment should be well communicated to and understood by the authorities and the public at large, since the long term effects of environment-related activities affect the entire population.

A needs assessment was carried out to analyze the knowledge, attitudes, practices, and barriers to change the views of all relevant stakeholders. This involved segmenting audiences based on their position, understanding actors' interests and framing the issues. This assessment helped design a public consultation program and set the agenda for the discussion on the project activities.

The sanitary and environmental conditions of the communities living near the Chukka channel in Saranda, and those living by the open-air sewerage canal in Durres are very poor. The communities showed interest as they found out that the living conditions might improve as a result of the project. In Durres the project will produce visible and tangible benefits in their livelihood as the channel will be dried and the waste water redirected. A random sample of inhabitants interviewed welcomed the initiative. Those inhabitants, mostly coming from the Kosovo area, established their residence in an area, which belongs to the Ministry of Agriculture, thus raising issues of land ownership.

In Saranda the Chukka channel community, comprised of several ethnic groups including Albanians, Greeks and Gypsies lives in very difficult conditions, in proximity to a natural wetland that provides potable water to the households and it does not get access to any public service of the city of Saranda. The main concern of the community leaders was the proximity of one of the proposed sites to their village.

During the communication assessment other issues raised by representatives of local authorities were whether the capacity of the CTW would be in line with future population growth and the location in compliance with urban development plans; how the problem of mosquito and odor control would be handled; and what would be the advantages/disadvantages of investing in a constructed treatment wetland system vis-à-vis a conventional system. In Lezha particular concerns regarded the advantages/disadvantages of the selected alternative; the issue of landownership, the lifespan of the selected system as well as the treatment of the sewage waters of the commune of Shengjin.

6.2 Participatory Approach: How are key stakeholders participating in the project?

The project is promoting a participatory approach through a process of consultation that will represent an innovative avenue to arrive at a common understanding of the issues related to wastewater management and environmental protection. This approach will, in turn, broaden the public consensus and help selecting the most socially/politically/environmentally acceptable site for the construction of the wetland in the three cities as well as promoting dialogue within the Management Board for the management of the natural protected areas. Building consensus over these issues ultimately will broaden constituencies support for the water sector reform program currently put in concrete form in the National Water Supply and Sanitation Strategy of the Albanian Government. By increasing public awareness on the issue of environmental protection and ecosystem management, the consultations will make a major contribution to improve environmental governance in Albania.

Three separate consultations - structured in two phases - have been held under the auspices of the municipalities of Saranda, Lezha and Durres, organized around the following lines: 1) promoting the use of man made wetlands for wastewater treatment; 2) promoting a dialogue among public institutions and an effective collaborative decision making within the framework of the proposed Management Board for the management of the natural protected areas of Lezha; 3) identifying in a partecipatory manner the main issues of concern and possible areas of improvements.

Participants in the first phase included: a) local authorities (Inspectors of the Ministry of Environment, General Directorate of Forestry and Pasture, Municipal Representatives, Water Utilities) and Albanian experts; b) local communities affected by the project; c) local NGOs and

environmental specialists. Participants in the second phase include the self-selected representatives from the three groups and the four level of decision making: 1)Council of Territorial Adjustment, 2) Ministry of Environment, 3) Ministry of Territorial Adjustment and Tourism, 4) local municipal authorities. Furthermore, during the implementation of the project, a consultation process will be established to promote dialogue and build consensus between the Management Board of the natural protected areas of Lezha and all the other involved stakeholders for the preparation and selection of the most suitable Management Plan for the natural protected areas of Lezha.

6.3 How does the project involve consultations or collaboration with NGOs or other civil society organizations?

In addition to the participation of local NGOs, the National network of Environmental NGOs has been involved in the process in order to guarantee a fair representations of the views and concerns of civil society organizations. A meeting has been convened by the Ministry of Environment, with authorities from the three cities to discuss issues raised by the members of the network and inform the decision making process.

To increase transparency in government/civil society relations the Bank, within the Municipal Water and Wastewater Project, is also assisting the MTAT to develop a public communication program. The policy dialogue component of the program includes the creation of a public information system for water and wastewater issues as a venue for input and comment by stakeholders. Specifically, this entails a website, an information point in the Ministry as well as in other major cities, support to central public information center, establishment of a hotline for information on water, publicizing of tendering procedures.

6.4 What institutional arrangements have been provided to ensure the project achieves its social development outcomes?

The Municipal Water and Wastewater Project will establish a Consumer Panel (CP) in each of the four cities to enable the population, particularly the poor, to interact directly with management about problems and opportunities. The CPs will help channel constructive suggestions and feedback of consumers' specific needs to the utilities. CPs meetings' findings/recommendations about improvement of service quality, affordability and other issues would be communicated to all service users.

6.5 How will the project monitor performance in terms of social development outcomes?

The GEF project will be included in a public opinion research within the Municipal Water and Wastewater Project that will be carried out to gauge public perception and understanding of the government process, to assess what are the major concerns and priorities of the general public regarding the involvement of the private sector in the provision of water services in Albania. This will constitute the baseline to establish a Social Impact Monitoring & Evaluation system.
A series of polling will be carried out throughout the project to evaluate the social impact as well as the public acceptance of the new system. In particular these attitudinal surveys will: 1) identify, evaluate and monitor critical social indicators measuring the social impacts of the project; 2) test and value public awareness, support, satisfaction and concerns towards the project as well as perceptions of water services linked with health and environment (water quality); 3) compare the value of water and wastewater services with other public services (continuity,

reliability, etc.).

7. Safeguard Policies:

7.1 Are any of the following safeguard policies triggered by the project?

Policy	Triggered
Environmental Assessment (OP 4.01, BP 4.01, GP 4.01)	● Yes ○ No
Natural Habitats (OP 4.04, BP 4.04, GP 4.04)	○ Yes ○ No
Forestry (OP 4.36, GP 4.36)	○ Yes ● No
Pest Management (OP 4.09)	○ Yes ● No
Cultural Property (OPN 11.03)	○ Yes ● No
Indigenous Peoples (OD 4.20)	○ Yes ● No
Involuntary Resettlement (OP/BP 4.12)	○ Yes ● No
Safety of Dams (OP 4.37, BP 4.37)	○ Yes ● No
Projects in International Waters (OP 7.50, BP 7.50, GP 7.50)	● Yes ○ No
Projects in Disputed Areas (OP 7.60, BP 7.60, GP 7.60)*	○ Yes ● No

7.2 Describe provisions made by the project to ensure compliance with applicable safeguard policies.

Environmental Assessment: An Environmental Assessment and Environmental Management Plan (EMP) will be completed before project appraisal.

International Waterways: The Government of Albania will notify the riparian countries about the project.

F. Sustainability and Risks

1. Sustainability:

The project will achieve sustainability by promoting an integrated appraoch to management of wastewaters and natural resources. The main purpose is to optimize the ecological, economic and social benefits of the proposed interventions to better preseve the coastal and marine ecosystems. Environmental sustainability will be achieved by physically reducing the discharges of nutrient into the coastal lagoon system and sea, improving the monitoring of the ecosystem health (water quality and biodiversity status), and implementing a management plan for the Kune Vain protected area. Institutional sustainability will be achieved by working at local level with a wide range of stakeholders, building capacity of the water utilities to manage the constructed wetlands, strengthening the capacity of the local water quality monitoring institutions and the staff of the Kune Vain protected areas as well as working with the local communities, farmers, and user groups. Financial and economic sustainability will be achieved by introducing a private sector based management approach to water and wastewater utilities, government financial support to protected areas as foreseen by the new legislation and by exploring other economic instruments for management of the Kune Vain protected areas. The project builds on several ongoing government programs and donor-supported projects that will help sustain the project activities.

1a. Replicability:

Replication of the project, extending the analysis to other potential sites suitable for the wetland construction, to reduce wastewater effluent problems, is highly encouraged. The project will help to promote and eventually expand the use of CTWs in areas where existing pollution loads are threatening natural ecosystems critical for biodiversity. The proposed project has a high potential for replicability in Albania. Natural wastewater treatment using constructed wetlands may become a demonstration area for

similar projects in Albania as well as other developing countries in the Mediterranean region. The institutional framework created to strengthen the management of Kune-Vain should represent a model to be replicated for the creation of new natural protected areas. The project will fund an environmental education and communication program to build consensus on CTW and ensure the dissemination of information in other areas of Albania and Mediterranean countries.

2. Critical Risks (reflecting the failure of critical assumptions found in the fourth column of Annex 1):

Risk	Risk Rating	Risk Mitigation Measure
From Outputs to Objective		
Lack of continuing commitment from the Government of Albania to the project	N	Regarded as low because the Government has undertaken significant commitments in the environmental sector. Continuing dialogue on the benefits of pollution reduction and natural areas protection.
Consumers unwilling/unable to pay for water and wastewater services	S	1) Willingness-to-pay study shows that willingness-to-pay is high and tariffs are affordable 2) Private Operator is expected to launch public awareness campaign 3) Metering in combination with adequate tariff policy will allow poor customers to reduce consumption and pay less
From Components to Outputs		
Lack of commitment of local communities to protected areas regimes.	M	Comprehensive protected areas Management Plan will be prepared following a participatory planning approach and mechanisms will be established for stakeholders' consultation. Strategies will be developed to prepare local population for new job opportunities arising throughout the project area.
Inadequate resources for management and maintenance of CTWs and the protected areas.	M	The operation and maintenance of the CTWs will be handed over to the water utilities involved in the Municipal Water and Wastewater Project. Government of Albania is making considerable commitment in addressing environmental issues. Administrations will receive support to develop fund-raising plans for long-term financial sustainability
Inadequate donor co-financing of project activities	S	The project activities to be supported by project's cofinanciers will not have bearing on the activities supported by the GEF grant, but they are an integral part of the project.

Overall Risk Rating	M	

Risk Rating - H (High Risk), S (Substantial Risk), M (Modest Risk), N(Negligible or Low Risk)

3. Possible Controversial Aspects:

The project is not considered controversial, since the proposed interventions have the support from local communities and authorities. One possible controversial aspect is the potential indirect impact caused by the community perception of restricted access to resources in the protected areas. Both the detailed design of the treatment facilities and the development of protected areas management regime will be done in close consultation with local stakeholders. The participatory planning approach that started during the preparatory phase will continue during project implementation.

G. Main Conditions

1. Effectiveness Condition

2. Other [classify according to covenant types used in the Legal Agreements.]

H. Readiness for Implementation

☐ 1. a) The engineering design documents for the first year's activities are complete and ready for the start of project implementation.
☐ 1. b) Not applicable.

☐ 2. The procurement documents for the first year's activities are complete and ready for the start of project implementation.
☐ 3. The Project Implementation Plan has been appraised and found to be realistic and of satisfactory quality.
☐ 4. The following items are lacking and are discussed under loan conditions (Section G):

I. Compliance with Bank Policies

☐ 1. This project complies with all applicable Bank policies.
☐ 2. The following exceptions to Bank policies are recommended for approval. The project complies with all other applicable Bank policies.

Andreas Rohde	Motoo Konishi	Orsalia Kalantzopoulos
Team Leader	**Sector Manager**	**Country Director**

Annex 1: Project Design Summary

ALBANIA: Intergrated Water & EcoSystems Management GEF

Hierarchy of Objectives	Key Performance Indicators	Data Collection Strategy	Critical Assumptions
Sector-related CAS Goal: ● Improve infrastructure and create institutional environments conducive to infrastructure sustainability. ● Promote environmental sustainability and sustainable use of natural resources	**Sector Indicators:** ● Framework developed for protection of natural resources ● Enforcement of environmental regulations improved ● Concrete decentralization of environmental services to local government - quantified ● Integration of environmental considerations in sectorial policies - number of environmental units established - effectiveness of environmental units	**Sector/ country reports:** ● Project Status reports ● Project's Implementation Completion Report ● Country reports	**(from Goal to Bank Mission)** ● Government committed to environmental sustainability.
GEF Operational Program: OP12: Integrated Ecosystem Management. OP2: Coastal, Marine and freshwater Ecosystem OP9: Integrated Ecosystem Management	**Outcome / Impact Indicators:**		
Global Objective: The global objective of the project is to improve the health and habitat conditions of the global significant ecosystems along the coastline of Albania, by significantly reducing uncontrolled wastewater discharged into international waters and improving the management of	**Outcome / Impact Indicators:** ● Increased number and size of endangered species population in the participating coastal areas and the Kune-Vain marshland. ● Decrease nutrient load to the marine environment in the project area and the	**Project reports:** ● Project Status reports. ● Project's Implementation Completion report. ● Coastal Monitoring report. ● Kune-Vain Monitoring report.	**(from Objective to Goal)** ● No additional negative environmental impact will occur in the project area, e.g. oil spill from tanker. ● Local and Central Government are continuing their commitment to environmental protection in the area.

the tidal marshland of Kune-Vain. **Project Development Objective** The Project Development Objective is to improve wastewater services in the cities of Durres, Lezhe and Saranda. (This objective will be achieved through the components financed by EIB and the IDA credit for the Albania - Municipal Water and Wastewater Project.)	Kune-Vain tidal marshland as follows: Nitrogen: 115 t/a Phosphorus: 32 t/a ● Integrated Management Plan implemented for Kune-Vain Protected Area. ● Wastewater collection and discharge in the participation cities improved.	● Project Status reports. ● Project's Implementation Completion report. ● Annual Kune-Vain Report.	● Government honors their commitment to support the water and wastewater utilities in the participating cities. ● Management Contract with Private Operator successfully implemented (under separate IDA project). ● Commitment of all stakeholders to implement Kune-Vain Management Plan continues.
Output from each Component:	**Output Indicators:**	**Project reports:**	**(from Outputs to Objective)**
Sewage Pollution Reduction Component ● Reduce sewage pollution load into coastal areas and Kune-Vain marshland. **Environmental Management and Monitoring Component** ● Prepare Management Plan for the Kun-Vain wetland. ● Improve environmental monitoring capacity in coastal areas. ● Improve environmental monitoring capacity in Kune-Vain Managed Area.	● CTW constructed and operational. ● Removal efficiency of CTWs: 50 percent for Total Nitrogen, and 25 percent for Total Phosphor. ● Management Plan prepared and selected priority measures implemented ● Monitoring capacity strengthened in coastal areas. ● Monitoring capacity strengthened in The Kune-Vain Managed	● Project Status reports. ● Project's Implementation Completion report. ● Project Status reports. ● Project's Implementation Completion report.	● Government Counterpart funds provided in a timely manner. ● No flaws in design of CTW. ● Land provided by Government in a timely manner. ● Incentives for rangers in place to participate in the training and stay in the job afterwards. ● Sufficient monitoring capacity available in the country, e.g. Tirana University.

● Increase capacity to manage the protected Kune-Vain wetland. **Replication and Public Awareness Component** ● Increase awareness for protecting the biodiversity in the project area. ● Promote replication of the project in other areas of Albania and the region. **Project Management Component** ● Project Management, Monitoring and Evaluation established and operational.	Area. ● All rangers trained. ● Monitoring equipment supplied. ● Environmental Education and Communication Program delivered. ● Replication Strategy developed and implemented. ● Information disseminated to beneficiaries and decision makers at potential replication sites. ● Workshop with decision makers conducted. ● PIU operational. ● Project progress reports delivered on schedule.	● Project Status reports. ● Project's Implementation Completion report. ● Project Status reports. ● Project's Implementation Completion report.	● Replication potential exists. ● Substantial number of interested decision makers can be identified and mobilized. ● Operational support from key government agencies provided.
Project Components / Sub-components: **Sewage Pollution Reduction** ● Wetlands ● Main collectors ● Land acquisition **Environmental Management and Monitoring** **Replication and Public Awareness Component** **Project Management**	**Inputs: (budget for each component)** **Budgets in US$:** **<u>Incremental Cost:</u>** **GEF**: Wetlands: 4,380,000 Env. Manag./Monit.: 200,000 Replication: 200,000 Project Management: <u>90,000</u> **4,870,000**	**Project reports:** ● Project Status reports. ● Project's Implementation Completion report.	**(from Components to Outputs)** ● High qualified PIU staff can be maintained at all times.

GoA:
Land acquisition:
720,000

720,000

EIB:
Main collectors:
4,300,000
Pretreatment:
640,000
Convent. Treat. Plant
700,000
Env. Manag./Monit.:
1,000,000

6,640000

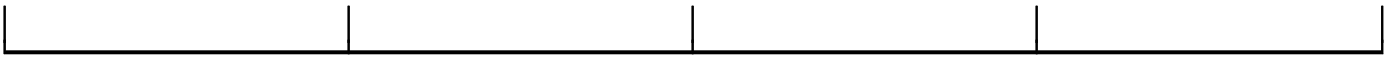
Baseline:

IDA:
Management Contract which includes the operation of the sewage systems is financed by IDA under the Municipal Water and Wastewater Project

21,930,000

Total Project cost:
GEF:
4,870,000
GoA
720,000
EIB:
6,640,000

12,230,000



Annex 2: Detailed Project Description

ALBANIA: Intergrated Water & EcoSystems Management GEF

The detailed project description by component is provided in the main text. Below is a description of the ecosystems that are part of the project.

1. Global Significance of the Project Area

The Integrated Water Management Project concerns the water treatment by "naturalistic methods" in three well identified areas, which experience high naturalistic values. Their peculiar features can be express as follows:

- Lezhe/shengjin (Kune-Vaini lagoon): The endangered species living in the proposed Managed Nature Reserve are: (i) the globally treatened *Phalacrocorax pygmaeus* (Pygmy cormorant); (ii) *Myotis-myotis* (Mouse-ear bat); (iii) *Rana balcanica and Rana lessonae* (Frogs); (iv) *Lutra-lutra* (Eurasian river otter).
- Durres (Rrushkull lagoon): The area has been identified as Important Bird Area (IBA) for over 10,000 waterbirds.
- Saranda Bay and Butrinti lake: 96 endangered species do occur in this area that are included in the IUCN Red List of Threatened Animals.

Furthermore, these areas, already affected by pollution problems, represent the territories for further residential settlement, agricultural activities and mainly potential touristic development. These are factors to be taken into account in the project analysis and alternatives set up and selections, mainly concerning the impact on the environment.

In particular, **Durres area** is progressively affected by a noticeable urban settlement, which is experienced by an uncontrolled expansion. Former use of the plain had a prevailing agricultural destination and a regular network of surface natural canals was built in order to allow surface run-off to drain into a central main channel. This channel finally discharges at sea by means of a hydrovore, to keep the plain dried during and after important rainfalls, due to the presence of a surface aquifer. The central open channel is now the final receptor of all sewage waters of the Durres District, whose discharge at sea can provoke pollution effects and damages to the marine environment in the area of Porto Romano. The plain is limited eastward by the Erzeni River, westward by the system of coastal hills and northward by the rather complex system of coastal wetlands and dunes of the Lalzi bay. All natural district is threatened by the direct and indirect impacts provoked on all environmental components by the advancing spreading of the uncontrolled urban settlement. The western side of the plain is characterized by the older urban as well as industrial settlement, now completely idle, but land and surface aquifer contamination represent major problems not yet solved. In the middle part of the plain embankments of an old fishing pond still remain, which represent a physical constraint to the chaotic expansion of the urban settlement. Being not the settlement advances suitably planned , the required infrastructures in terms of roads, energy and water supply, sewage water collection, etc are completely lacking, which implies a strong impact on soil, surface and underlying waters and a threat to the natural resources of the marine as well as wetland ecosystems.

Saranda bay represents the most attractive coastal area of Albania , where eco-tourism potential is higher and strategies of sustainable development can be profitably implemented in the short and medium term, with an interesting return for the local economics. Coastal Zone Integrated Management (CZIM) of Saranda District, extending to Butrinti Lake, Bistrica Spring and hydrographic catchments and existing

wetlands, can be put forward and implemented only if sanitation problems and waste water treatment and protection of the natural and marine environment are accomplished. As a consequence an action plan combining main sewage water trunk line (covered by PHARE Funds) with a waste water treatment by naturalistic processes is highly envisaged, to preserve the marine environment from existing pollution effects. The area identified for the construction of the artificial wetland is located in the proximity of the Ceka canal, where several solutions can be proposed.

Lagoon of Kune-Vaini is an important Protected Area, of great naturalistic value. City of Lezhe, the intensive agricultural activity developed in the alluvional area as well as the progressive population increase and future settlements, represent potential threats to the natural equilibrium and to the biodiversity preservation of the aquatic ecosystems. Indeed, the sewage waters of Lezhe directly discharge into the surface waters of the Drini River, whose spreading at sea can affect the environmental conditions of all the coastal zone surrounding the river mouth, and consequently the lagoon. Direct effects of contamination of the lagoon waters can also occur by surface run-off of the agricultural fields and a hydrovore, installed to keep the fields dried after rainfall events, can increase the contaminant's flow. As a consequence the eutrophication process can arise sometime in the lagoon waters. A coordinated intervention, combining the waste waters treatment of Lezhe sewage waters by an artificial wetland, with the accomplishment of a network of natural "filter streep", in order to intercept the surface drainage of waters of agricultural origin into the lagoon, should provide positive results for the preservation and protection of the natural resources.

It is also necessary to mention the **naturalistic site of Kanalla Lake**, being a natural spring of karstic waters existing at the toe of the hills, within the lagoon. This a typical transitional water body, highly polluted for the direct discharge of sewage waters coming from the village of Shengjin.
In such a case the solution cannot adopt the peculiarities of the natural wetlands, being the lagoon itself a protected area and therefore no artificial ponds can be built inside. Conventional water treatment plants have to be proposed.

2. General Description of the Albanian Marine Ecosystem

The Albanian coastal region contains two geographic entities: the Adriatic and the Ionian Sea coastal areas. The total length of coastline is about 429 km and the national waters confined to territorial waters of 12 miles width. The continental shelf lies entirely within the exclusive zone. The shelf is wider in the north (Adriatic sea), up to 25 miles across, and narrower in the south (Ionian sea), 2-3 miles width. Beyond 25 miles, sea depth exceeds 1000 m in the international channel.

There is no particular wind that prevails in the coastal plain. In winter, the most frequent one blows from the Southeast and in the summer season, the prevailing wind blows from the north-western direction. There are three types of rather low currents in the Adriatic sea: continuous currents, tidal currents, and wind-driven currents. Strong winds persisting for a couple of days may create temporary currents running in the opposite direction with respect to steady and tidal currents.

The Adriatic coastal area (the northern part of the Albanian coast) is generally characterised by coastal lowlands (alluvial plains) intersected by rivers, and flanked by hills along its upland boundary. The coast is made of long sandy beaches, deltaic river mouths and lagoons. The coastal waters are shallow, receiving water from the rivers and several drainage canals. At sea, the water depth increases slowly, with first a sandy bottom with the associated biocenosis which becomes muddy with increasing depth.

On the sandy or muddy bottoms, the marine flora is scarce or occupies specific areas where currents or

waves have less action. The extensive seagrass beds of *Posidonia oceanica* are an important part of the Albanian marine ecosystem, often occupying a considerable part of the littoral zone. *Posidonia oceanica* and very well developed marine communities are found along Porto Romano bay and Shengjini bay. The underwater rocky bottoms at Rodoni and Lagji Capes (Durres), and the eastern side of Vlora bay host patches of *Posidonia oceanica*.

Porto Romano and Rrushkull-Erzeni River Outlet (Durres Area)

The area of Porto Romano and Lalzi bay is a narrow, reclaimed part of the coastal plain. There are some natural habitats left along the coastline, such as a belt of pine trees, temporary marshes, roadbeds and salt marshes. In addition to the loss of large wetland parts by land reclamation, the quality of natural environment of that area continues to deteriorate due to the input of the polluted Erzeni river (contaminated mainly by sewage disposed upstream), direct discharge of untreated urban and industrial wastewater in the Porto Romano bay, excessive felling of trees for fuel, and uncontrolled hunting and fishing.The underwater rocky bottoms at Rodoni and Lagji Capes host patches of *Posidonia oceanica*.

The Lalzi bay with the Erzeni river mouth is an environmentally sensitive area. The coastline of the Rodoni-Bishti i Palles Capes, of which 35 % are cliffs exposed to mild erosion stretching along both capes. The remaining parts of this unit are alluvial beaches (actually, the Lalzi bay) of which 18 % is exposed to erosion and 47 % to deposition. Any intervention altering the quantity of the material carried by the Erzeni river will affect the littoral, generating new erosion processes. The Porto Romano bay also is a section attacked by erosion.

Drini Outlet (Lezhe-Shengjin Area)

This unit has about 15 km of the coastline, from Shengjini harbour to the southern part of Vaini lagoon (including the Drini river), oriented in N-S direction. The shore are sandy and sediment is coming both from the Buna and Drini rivers transported by the longshore currents. The marine slope is gentle reaching the 20 m isobath at average of 2.0 km offshore. Kenalla, Kune and Vaini lagoons are separated from the shallow coastal waters by the narrow sandbars, low and mobile dunes, and the planted pine tree belt (*Pinus halepensis, Pinus pinea*).

Posidonia oceanica meadows and *Penaeus kerathurus* populations are reduced due to the polluted industrial and urban discharges into this area((1) Albania Coastal Zone Management Plan : Final Report - Phase One, 1995.1). The breeding grounds of *Posidonia oceanica* have also deteriorated because of changes in the structure of the fishing fleet((2) Albanian Convention on Biological Diversity -1999.2). Fishing activities occur in the coastal waters including the trawlers from Shengjini and small local fishing boats. As in other places, the local population is collecting *Bivalves* along the shores.

The coastal wetlands of Drini river (Kenalla-Kune-Vaini lagoons) are a part of an environmentally sensitive area. Inland of the Shengjini beach lies the Kenalla lake surrounded by a dike with the open lake and a dried-up part with salinity tolerant vegetation. Through a pipeline, the urban sewage of Shengjini is directly drained into the lake. Further south lies the Kune lagoon extending up to Drini river mouth. The coastal reach in the northern part of Shengjini has presented an coastal erosion phenomena. After that, until some 2.5 km south of Shengjini, the coast is relatively stable or slightly receding.

Saranda Bay and Ksamili Bay (Saranda Area)

The coastline of Saranda bay to Ksamili bay can be divided into several sections: the area including the town of Saranda shows a recent development on the northern bluff near the entrance to the harbour; the

area south of Saranda where the cliffs are steep and cut with caves and intermittent sandy beaches; the abandoned citrus plantations and deforested areas in the vicinity of Ksamili; the Ksamili islands, with small sandy beaches, wind-sculpted maquis forests, and extensive *Posedonia oceanica* meadows covering the shallow areas of the bay of Ksamili. The whole area from Ksamili Islands to Stillo bay could be integrated in a protected and managed area with interconnected areas. In Ksamili bay and inlets, a marina and environmentally sound resort place could be settled.

3. General Description of Natural Wetlands Ecosystems

3.1 Kune–Vain Wetland and Kenalla Lake

The Kune–Vain wetland and Kenalla Lake or complex Kune–Vain lagoon represent one of the important coastal Albanian wetland. Area of Kune–Vaini wetland and Kenalla lake represents a wetland area of multiple ecological and economic values and uses, as provide fish and wildlife habitats, support complex food web, absorb water to reduce flooding and damage from storms, provide erosion control, improve the quality of water ed in particularly provide open space & aesthetic value. The Drini River is the longest river of Albania, and the Kune-Vain lagoon complex has been built by the accumulation of the river sediments. This area is comprised in the network of Albanian Protected Areas, as described in the document "Biodiversity Strategy and Action Plan (BSAP)", approved by Government of Albania in the year 2000. The delta of Drini is recognized internationally as an Important Bird Area (IBA) and a Specially Protected Area (SPS) and represent the area of Kune-Western part of Kune lagoon, defined in the network of Albanian Protected areas as Scientific Reserve, according to the 1st category of IUCN. The site of delta of Drini is one of the most important areas of Albania for wintering waterbirds; the most important site for the nesting of herons (Ardeidae), and potential breeding site for the cormorants. including pygmy cormorant (Phalacrocorax pygineus). The other two parts of this lagoon complex, Kenalla–Eastern part of Merxhani lagoonand Drini River Outlet with Ceka (part of Vain wetlands) and Vaini wetlands are defined as Managed Nature Reserve, in according to the 4th category of IUCN.

Ecological Description of the Kune Lagoon and Kenalla Lake

The lagoon of Kune presents rich floristic and faunistic values. In the group of fauna are included: vertebrates (animals, birds, reptiles, amphibian, fish) and non-vertebrates (mollusks, crustaceans). The macrobenthos of this lagoon is characterized mainly by an intense growth of Annelids, Tubuliferae, Hydroids and *Carcinus aestuarii.* Also this area is rich of the birds as *Rallus aquaticus, Gallinula chloropus*, *Nycticorax Ardeola ralloids*. Besides the main other bird species are present (see Annex 10 and 17). The diversity of the species is higher compared with the other part of the ecosystem (Kune-Vain lagoon and Kenalla lake). The micro algae biomass level indicates high quantity of phytoplankton with a relatively great number of species). Some of the diatoms are determined Dinoflagellates are presented in few species (see Annex 10 and Annex 17). Regarding flora and vegetation, they mainly consist of: aquatic vegetation; hydro-hydrogrophylic vegetation; halophyl vegetation; the psamophyl or sandy-dune vegetation; forest vegetation. The amphibian are represented mainly by *Rana lessonae, Rana dalmatina, Triturus vulgaris, Rana balcanicaetc.* Different kinds of reptiles, usually threatened, can be mentioned, like Sea turtle and Earth tortoise. The observation of fishery catches and hypoeutectic salinity gradient divide Kune lagoon in three main sub areas corresponding to fish species in these sub area (see Annex 10). The main fish specie are the eurohaline species: (*Sparus aurata*) gilthead seabream, *Dicentrarchus labrax*, Mugilidae spp., *Anguilla anguilla* etc.

Ecological Description of the Vain Lagoon

The lagoon of Vain presents rich floristic and faunistic values. In the group of fauna are included:

vertebrates (mammals, birds, reptiles, amphibian, fish) and non-vertebrates (mollusks, crustaceans). The zooplankton was found on low quantity in general. The lagoon of Vain has vegetation similar to the lagoon of Kune. More than half of the water surface is covered by flooded *Phragmites communis* beds with *Thypha latifolia*, the banks are composed of sedge communities, riparian woods of black alder galleries with *Alnus glutinopsa, Populus alba, Ulmus campestris, Fraxinus angustifolia, Salix alba* and *Quercus sp.* which are replaced over time by pine plantations. Maquis is composed mainly of: *Tamarix parviflora, Cornus mass, Juniperus macrocarpa, Rubus ulmifolium, Ruscus aculeatus;* the herbaceous vegetation of the marshland is characterized by *Cynadon dactylon, Dactylis glomerata, Agrostis sp., Phragmites communis, Juncus acutus, Salicornia fructicosa*. The birds species observed in the lagoons are: *Phalocrocorax carbo sinensis, Nycticorax nycticorax, Egretta garzetta, etc (*see Annex 10). Regarding the mammals can be found in the area: *Mustela nivalis, M. putorius* and *Vulpes vulpes*. The dominant fish species are *Anguilla anguilla* and *Mugil cephalus,* and this lagoon presents lower salinity than Kune lagoon. Also are present in this lagoon, in the low quantity the other eurohaline species as: (*Sparus aurata)* gilthead seabream, (*Solea vulgaris*) common sole, *(Liza aurata*) golden grey mullet, (*Liza saliens*) leaping mullet, (*Chelon labrosus*) thicklipped grey mullet, (*Dicentrarcus l*abrax) european seabass, etc.

3.2 Rrushkulli–Erzeni River Outlet

The Rrushkulli-Erzani River Outlet area is situated in Lalzi bay, the central part of the Adriatic coast of Albania, between Rodoni cape in the north and Bishti Palles cape in the south. It is boarded in the north and east by a hilly ridge reaching a maximum height of 225 m, while in its south-east it continues with the drained fields of Qerreti and Durresi, formerly salt marshlands. The catchments area of the Lalzi bay is estimated at about 250 km2. Some parts of the area, close to the coast, are depressions reaching up to -1.5 m. They are kept dry by the actively pumping water through the pumping station near Hamalla village. The most of the area is occupied by the agricultural land, while the once well developed hygrophilic flood plain forest has almost disappeared; some small spots of it are still present only along the coastline north of Erzeni river mouth. Sand dunes relatively well developed, halo-phyte and hygro–phyte vegetation, and a planted pine forest can be found in this area. Waterbird and waterfowl censuses of the last two years have identified this area as an important IBA (over 10000 waterbirds and wetlands birds have been counted here). The Erzeni River Delta is important for migratory fish species breeding in freshwater. Posidonia meadows, *Posidonia oceanica*, and very well developed marine communities are found along the rocky littoral and Porto Romano Bay.

Ecological Description of the Area

The area of Rrushkull-Erzeni River outlet is originated from the alluvial sediments of the Erzeni river, which meanders across the area. The sub area Rrushkull–Hammalla lays in the Lalzi bay, from outlet (mouth) of Erzeni river in the South to the overflow of the Tarini stream in North and in the East in some cases, it lays for many kilometres, and it is limited from the agricultural land of the ex state agriculture farm Sukth (Hamallaj, Rrushkull, Jubë). The terrestrial environment of this area presents these types of habitats: sand dunes, salt tolerant vegetation, flood plain and pine forests, and wetlands/marshlands. Sand dunes occupy a belt from 10 to 50 m in width along the entire coastline. There are two main types of the dune vegetation: Plant community dominated by *Cakile maritima*, in the form of isolated spots, 4-5 m distant from each other, closer to the shoreline. Plant community dominated by *Elymus farctus*, on the well developed dunes, in which apart from the Dominant species, are present other species like; *Eryngium maritimum. Echinophora spinosa, Euphorbia paralias*, etc. Salt tolerant vegetation is mainly present in the left hand side of the Erzeni river mouth. This type of vegetation is characterized by succulent plants like: *Arthrocnemum fruticosum, A. perenne, Salicornia europaea, Halimione portulacoides, Limonium vulgare, Inula crithmoides* etc. The dominant species are *Pinus pinaster* and *P.*

halepensis. This formation is generally not so dense and rather young. The area contains also some rare and endangered plant species as: *Quercus robur, Fraxinus excelsior, Juniperus oxycedrus, Matthiola tricuspidata, Pancriatium maritimum, Quercus ilex, Adiantium capillus-veneris, Butomus umbellatus, Salix triandra.* The coastal area presents the important fishing site for *Mugil sp., Liza sp., Dicentrachus labrax, Umbrina. cirrosa, Lichia amia, Sparus sp., Alosa phalax, Anguila anguila* and for crustaceans *Paeneus ceraturus* and for bivalves *Venus galina* and *Donax trunculus.*

3.3 Butrinti Lake and Related Wetland Environment

This area includes Butrinti lagoon, Ksamil Island and Stillo Island and cape in the zone from Cape Qefali to the Greek border. This area belongs to the District of Saranda and covers 35 km of coastline. The relief is not very important with an altitude of 363 m at about 4.5 km of the coast east to Butrinti lake. In Butrinti area, grey herons, gulls, egrets, ducks and snipes are seen on the mudflats and saltmarshes bordering the mouth of the Butrinti canal and river up to 4 km inland. The phytoplankton population of the lagoon is abundant and mainly composed of diatoms *Cheatoceros sp., Cyclotella sp.* and Peridinates *Prorocentrum sp.* and *Peridinium sp.*. The accumulation of phanerogam *Zostera noltii* foliage is an indication of its extensive presence within the lagoon. Balanidae are very common among Crustacea and *Mytilus galloprovincialis* among Molluscs. The birds seen in the area are: *Larus cachinnans, L. argentatus,* sparrows *Passer hispaniolensis, P. montanus* on the lake. While in marshland and the mudflats at the estuary are reported marsh harriers *Circus aeruginosus, Acrocephalus scirpaceus,* etc. Great concentrations of migratory birds occur in fall and winter, waders on the mudflats, saltern and in the estuary of the channel while Anatids assemble in large colonies on the lake during the coldest months. This area is also the richest of Albania for amphibians and reptiles. Otters have been recorded in the lagoon. The terrestrial vegetations are characterized by associations of *Caxilo xanthum italici* (*Caxile maritima, Xanthium stumerium*), *Crithmo-Limonictum anfract.* (*Crithmum maritimum, Limonium anfractus),* associations of *Crithmetum (Crithmum maritimum),* associations of *Ammophiletum arundinaceae (Ammophila arerrari, Medicago marina, Echinophora spinosa),* of *Salicornictum fructicosae (Arthrocnemetum fructicosum), Salicornictum radicentis (Arthrocnemum perenne), Juncetum maritimi (Juncus maritimus), Juncetum acuti (Juncus acutus)* and of *Sporoboletum (Sporobolus pungeus)* .

4. Surface Water Quality and Pollution Loads

During the study a water/wastewater and seawater quality examinations have been performed, in order to confirm or adjust available water quality data. The examination mainly concerned raw sewage and receptor water-bodies quality. The sea water quality have been investigated in terms of indices on water, sediments and biota. The analyzed sewage samples taken at project's sites wastewater facilities can be characterized as *strong-moderate* with typical domestic composition. The analyses and assessment of existing studies, as well as the analyses performed during the study, show the degradation of the quality of water resources by pollution from land-based activities (nutrients, pathogens and oxygen demanding wastes), in the all coastal cities of Durres, Lezhe and Saranda. The results of the water/wastewater and sea quality examinations are fully described in Annex 4. The expected wastewater pollution effects on the marine environment are described in following paragraph 5.

5. Wastewater Pollution Effects on the Ecosystem

Environment is an end user of water resources which poses therefore sometimes severe restrictions particularly on the emission of wastewater from other water use sectors. High BOD loads and suspended materials may influence biochemical and light conditions in the marine environment; industrial micropollutants may be directly toxic for aquatic life and fish; and pollution from excess agrochemicals

may have similar effects.

The marine ecosystem, though almost certainly damaged by uncontrolled wastewater emission of coastal urban concentrations, industry and polluted rivers, is still generally in a reasonable condition and its ecological and economic value may be considerable. Unfortunately, studies about the value and eventual degradation of the marine ecosystem are rare and an overall inventory has never been executed. The Biodiversity Action Plan has as a priority the mapping of the sea meadows with *Posidonia oceanica* and the study of animal groups and plants, because of lows scale of knowledge of a considerable part of these plants.

Little is known in Albania about marine environment along the Adriatic Coast and the effects of the considerable pollution of the last 30 years, both by discharge into the sea of polluted river water and by direct discharge of untreated urban and industrial wastewater. Except for smaller areas along the coast in the vicinity of cities and industrial concentrations, inspection shows in general visually clear and unaffected waters. However, systematic research on marine ecosystems and the effect of pollution has never been executed.

The problem of pollution in the marine environment becomes ever more serious. Adriatic Sea is easily exposed to pollution because of restricted water exchange and long shore lines. Areas with stagnant or partly stagnant conditions are especially sensitive to pollution due to slow water exchange. Organic wastes from communities and industries will cause an oxygen reduction process in the water. Oxygen is utilised for oxidation of the organic matter and nutrients bound in the matter will be released. This process will cause an increase of the primary plankton production in the area. This again will increase the oxygen utilisation. A secondary oxygen reduction process will begin, where the new organic matter is oxidised. This secondary oxygen reduction may require two to five times more oxygen than the primary process. This secondary process is not accounted for in the conventional BOD techniques.

The enrichment of natural waters by nytriens (eutrophication), primarily nitrogen in marine waters but also phosphorus, has been associated with incresed primary productivity and nuisance algal growth in coastal zones and semi-enclosed and enclosed areas of seas. Increased loads of nutrients to coastal waters have caused increasing eutrophication and the major sources of nutrients to coastal waters are from sewage disposal. The primary production increases until the light penetration limits it. The consequences of eutrophication can be incresead frequency of algal blooms (sometimes toxic), increased water turbidity, slime production, oxygen depletion in deep waters and mass fish and benthic fauna kills. Signs of such *eutrophication* can be observed in the Saranda bay, Shengjini and Kenalla. The relatively low concentrations of dissolved oxygen in Saranda bay (approx. 7.63 mg/l), in Shengjini bay, Kenalla Lake (approx.8.46 mg/l) and Drinit river (9.70 mg/l), are to be related to pollution by organic matter. Also the results of the chemical analysis into the sea near the points of sewage discharge (see Annex 4) demonstrate the presence of nitrites. Particularly in Saranda bay, Shengjini bay and Porto Romano bay, it was observed((3) Kashta L. and Mio A., 1992-Tirana University.3) the development of some nitrofile algae populations (*Ulva rigida and Enteromorpha spp.),* and this is an other demonstration of eutrophication in this waters. Ammonia can be converted to organic nitrogen by these resident algae *(Ulva, Enteromorpha). Ulva* blooms can become so luxuriant that the algal decay products are more unpleasent than the sewage itself. Sewage pollution is directly responsible for the closure of many *molluscan shellfish* growing areas in Europe. Sellfish can accumulate and retain pathogenic organisms and toxic organic and inorganic substances present in the growing areas. During the last years mussel breeding was practically stopped, both for internal organisational reasons, but above all because of the block on exports imposed by the EC for sanitary reasons, in October 1994 for all living products of the fishery sector. The main requirement for the export of live mussels to the EU is the setting up of a shellfish monitoring system to guarantee the safety of bivalves harvested from water bodies. Currently Albania

faces a ban due to a previous outbreak of cholera in live molluscs. This issue is now being addressed through the development of a monitoring system to certify the areas on the Albanian coastline and the marine waters that can harvest and export mussels. This is covered by EC/91/492 on placing live bivalves on the EU market.

Posidonia oceanica meadows populations are reduced due to the polluted industrial and urban discharges into this area, particurarly in the Shengjini- Lezha and Saranda-Ksamili area, but also in the Porto Romano and Lalzi bay. This has been associated with an increase in water turbidity (Secchi disc. 1.25-1.50 m, Annex 4) reducing the amount of light exposure on the sea bed and this caused reduction in the *Posidonia oceanica* beds over the last decades (Kashta L., 1998). In sea areas with a low nutrient content a release of organic wastes may cause eutrophication of the surface water in the whole area. The increased biological production may be beneficial to the surface water by increasing the fish yield, but it can have serious effects on conditions in the deep water. Increased decaying organic matter there may lead to oxygen deficiency and can destroyed bottom fauna. It seems to be very difficult for nature to restore oxidising conditions when such a fertilisation cycle has started.

In Albania, the major types of endangered ecosystems and habitats are not only coastal (sand dunes, river deltas, alluvial forests, lagoons, and coastal lakes), but also marine ecosystems at medium and infralitoral level ((1) Albania Coastal Zone Management Plan : Final Report - Phase One, 1995.1). The *Posidonia* meadows represents an important ecosystem in the Adriatic Sea. The fundamental role played by the marine phanerogam meadows and in particular by Posidonia, can be summarised in the following points: stabilisation of the sea-bed through the development of an effective radical and stoloniferous apparatus; reduction of the intensity of movements of water with consequent maintenance of coastal balance, thanks to the softening effect of the “matte” and the layer of vegetation; high production of oxygen and organic material by means of photosynthesis; direct and indirect source for numerous organisms and starting point for a complete food web; habitat of choice for numerous commercially important species, such as fish, cephalopods and crustaceans.

Information from all three project areas gives quite a clear picture of the organic load of the respective coastal zones. In all the project areas the urban centres discharge sewage directly into the sea (Saranda, Porto Romano-Durres and Shengjini bay) or into the wetlands (Kenalla) or into the river (Drini-Lezhe) at short distances from the sea and discharged sewage is not treated. The situation is particularly severe in Saranda, Shengjini and Kenalla. In the city of Saranda, urban and industrial waste is discharged directly in the central part of Saranda bay, and through the Cuka channel ((2) According EU Phare Program-“Emergency Measures-Saranda Water Supply and Sanitation”-see Annex 92) into the sea. The waste plume spreads across the bay of Saranda, in a northern direction, polluting waters in front of Saranda.

These discharges of untreated domestic sewage can significantly add to the total loads of contaminants. Due to the breakdown of organic matter, such discharges can cause immediate problems to marine life from high oxygen demands in the water column and sediments and through toxic effects of ammonia. Of immediate concern to humans is the presence of large numbers of pathogens that can cause illness and disease. Also associated with the presence of pathogens is the potential contamination of seafood, particularly shellfish, which in Saranda bay and Butrinti lagoon (mussel *Mytilus galloprovincialis) and* in areas like Porto Romano, Lalzi and Shengjini (clams *Chamelea gallina, Ruditapes decussatus* etc) are commercially very important for Albanian fishery.

Pollutants may affect *reproduction* in many different ways. Teratological development of embryos may result in deformed or malfunctioning larvae which do not survive hatching. Reproduction may be influenced by behavioural changes of the adults during the mating season. Their behaviour, the

production of eggs and sperm, the secretion of egg membranes, eggshells and production of egg nutrients, may be all affected by changes of hormone function and enzyme activity. Changes in the ecosystem may influence reproductive success when vitellogenesis is directly influenced by the availability of food. In the coastal area of Shengjini bay (particularly northern part-Rana e hedhun), in Porto Romano and Lalzi bay and near the Saranda and Ksamili bay there are very important areas for reproduction of some fish species, first of all for sea bass (Dicentrarchus labrax).

6. Synthesis of the Pollution Effects in the Project Areas

According the available data and observations, the pollution effects by uncontrolled and increased urban wastewater discharges into the marine environment can provide negative consequences both at the environmental level and to the institutional and economic ones.

A list of potential problems is put forward in the following:

- **endangered marine ecosystems and habitats**, in medium and infralittoral level (particularly Shengjini-Lezha area, Porto Romano bay and Saranda bay);
- **endangered coastal ecosystems**: sand dunes, delta rivers (particularly Drini-Lezha), alluvial and wet forests, lagoons (Kune and Vaini) and coastal lakes (Kenalla);
- **risks and adverse impacts on biodiversity**, and some of the major adverse impacts have been: habitat loss and fragmentation, damage (Porto Romano bay, Shengjini and Saranda bay) and degradation (Kenalla lake) of habitats and ecosystems, loss of species or the threat of their extinction etc.;
- **reduction of the *Posidonia oceanica*** meadows populations, particularly in the Shengjini- Lezha and Saranda-Ksamili area, but also in the Porto Romano and Lalzi bay;
- **development of some algae populations** (*Ulva and Enteromorpha*), particularly in Saranda bay, Shengjini bay and Porto Romano bay;
- observation of some ***eutrophication*** in the Saranda bay, Shengjini area and Kenalla lake;
- **probability to affect reproduction of the fish species** (*e.g. sea bass*) in the marine ecosystems of Shengjini bay (particularly northern part-Rana and hedhun), in Porto Romano and Lalzi bay and near the Saranda and Ksamili bay, etc.;
- negative consequences **on the eco-tourism development;**
- **delay** for the implementation of the **Coastal Zone Integrated Management and of the economic development;**
- difficulties in **implementing institutional strengthening measures** in order to implement the sustainability and biodiversity maintenance policies.
-

By Component:

Project Component 1 - US$ million

Additional GEF Annex 3: Incremental Cost Analysis
ALBANIA: Intergrated Water & EcoSystems Management GEF

Project Background

The aim of this project is to reduce the sewage pollution load from the 3 cities of Durres, Saranda, Lezhe in order to protect and improve the environmental conditions of coastal and marine habitats. The great part of the ecosystems considered by the project have been ranked at international level according with the Ramsar convention. The project will support an integrated approach to ecosystem management based on the reduction of nutrients through the construction of artificial wetlands for wastewater treatment, as well as improved management of the protected area of Kune-Vain.

Sector Context and Baseline Scenario

Albania's water infrastructure is in urgent need of improvement, in technical short term rehabilitation and in medium and long term technical and managerial improvements. Water quality could be improved significantly with a reliable supply of chemicals. Under existing conditions excessive water losses have resulted from lack of maintenance and repair and lack of metering and operational control. . Wastewater treatment facilities do not exist in Albania and raw sewage is discharged untreated into sea and rivers.

Several causes for these conditions of Albania's water sector are:

- Lack of revenues: Tariffs below the true cost of water and lack of tariff collection enforcement in the last decade have significantly reduced the income of the water supply companies. Water and sanitation systems have received virtually no maintenance in the last ten years.
- Over consumption: Flat rates rather than metered consumption resulted in massive water waste and also the collapse of the irrigation system has contributed to a sharp increase in water demand in the last ten years. On top of this, a massive migration to urban centres, with illegal tapping and no incentive to reduce water consumption, augmented the water sectors problems.
- Inadequacy of the physical infrastructure: Due to the lack of appropriate materials/equipment and insufficient consideration of the economic aspects in the design, the existing systems are expensive to run and to maintain.

The Government of Albania (GoA) has embarked on a water sector strategy, that involves a two-tier approach focusing in the short term on urgent repairs to the systems and on medium term program to support sector reforms. Within this medium term program, the World Bank recently approved a US$ 21.9 million Municipal Water and Wastewater Project aiming at improving the water and sanitation services in Albania.

Albania is characterized by the presence of very relevant coastal and marine ecosystems (lagoons, hygrophilous forests, Posidonia meadows) where the biodiversity value is menaced by the presence of urban settlements in the surroundings and the associated environmental impacts (in particular the eutrophication of water due to the existing raw sewage outfalls). The coastal lagoon system of Albania constitutes one of the most important wetlands of the Mediterranean Region. In particular endangered and endemic species as the Pygmy cormorant (Phalacrocorax pygmaeus), the Mouse-ear bat (Myotis miotis) and the Otter (Lutra lutra) live in these habitats and should be considered as flag species.

Water pollution mainly associated with the flow of untreated sewage is one of most relevant threats of

these ecosystems which has considerably deteriorated the natural inland ecosystems and the biological productivity of the coastal areas. Albania lacks of any wastewater treatment facilities and existing raw sewage outfalls are located either directly on the seacoast, on the bank of coastal rivers or on drainage ditches that after a short distance discharge directly into globally significant tidal marshlands and/or the sea. This has the effect of upsetting the biological balance and also increases the subsequent eutrophication phenomena of wetlands. It is also known that coastal water pollution with particular reference to the untreated waste waters heavily affects Posidonia oceanica meadows and the related communities (e.g. the endangered species Pinna nobilis).

The Government is committed to biodiversity conservation and the water sector is one of priorities at national level in line with the Strategic Principles of the Albanian Biodiversity Strategy. However, urban population is growing rapidly with increased pressure on the quality of the surrounding water ecosystems (sea, wetlands). The Government of Albania has very limited financial resources to create wastewater treatment facilities.

As a consequence of the current course of action coastal areas will likely continue to be under the growing pollution effects of uncontrolled and increased urban wastewater which can be described as follows:

- **endangered marine ecosystems and habitats**, in medium and infralittoral level (particularly Shengjini-Lezha area, Porto Romano bay and Saranda bay);
- **endangered coastal ecosystems**: sand dunes, delta rivers (particularly Drini-Lezha), alluvial and wet forests, lagoons (Kune and Vaini) and coastal lakes (Kenalla);
- **risks and adverse impacts on biodiversity**, and some of the major adverse impacts have been: habitat loss and fragmentation, damage (Porto Romano bay, Shengjini and Saranda bay) and degradation (Kenalla lake) of habitats and ecosystems, loss of species or the threat of their extinction etc.;
- **reduction of the *Posidonia oceanica*** meadows populations, particularly in the Shengjini- Lezha and Saranda-Ksamili area, but also in the Porto Romano and Lalzi bay;
- **development of some algae populations** (*Ulva and Enteromorpha*), particularly in Saranda bay, Shengjini bay and Porto Romano bay;
- observation of some ***eutrophication*** in the Saranda bay, Shengjini area and Kenalla lake;
- **probability to affect reproduction of the fish species** (*e.g. sea bass*) in the marine ecosystems of Shengjini bay (particularly northern part-Rana e hedhun), in Porto Romano and Lalzi bay and near the Saranda and Ksamili bay, etc.
- negative consequences **on the eco-tourism development;**
- **delay** for the implementation of the **Coastal Zone Integrated Management and of the economic development;**
- difficulties in **implementing institutional strengthening measures** in order to implement the sustainability and biodiversity maintenance policies.

Regional GEF projects have focused part of their activities on the conservation of biodiversity of Albanian wetlands and lagoons, like in the case of the Conservation of Wetland and Coastal Ecosystems in the Mediterranean Region Project (Karaburun, Orikumi, and Narta habitats) and the Lake Ohrid Conservation Project. Taking into consideration the international relevance of these habitats, other GEF projects have been planned on other Albanian wetlands as on the lake Prespa, and on the Karavasta lagoon. Very few activities have been planned for the Albanian marine habitats. This is probably associated with to the scarcity of data and information on these areas, although live endangered species as the Monk seal (Monachus monachus) and the Sea turtle (Caretta caretta) do occur in these areas.

Global Environmental Objective

Based on the present economic situation and the lack of active environmental pressure groups, it is likely that biodiversity conservation will not be sufficiently promoted in the near future. This project promotes and expands the use of CTW's in areas where existing pollution loads are threatening natural wetland systems critical for biodiversity. The coastal cities of Durres, Lezhe, Saranda do not have any wastewater treatment facilities, as such the project aims to capture global benefits by reducing land-based pollution from the three cities and protect and restore endangered coastal and marine habitats by introducing low cost ecologically based wastewater treatment.

The global objective of the GEF alternative is to improve the health and habitat conditions of globally significant marine and coastal ecosystems along the coastline of Albania in an integrated manner by significantly reducing pollution from uncontrolled municipal wastewater generated by human settlements of the three coastal cities of Durres, Lezha and Saranda that are discharging into international waters and improving the management of the tidal marshland of Kune Vain (near Lezha).

In order to achieve its objectives the GEF alternative will implement four main activities: (i) Sewage pollution reduction through construction of low cost environmentally-friendly waste water treatment facilities (CTW); (ii) environmental management and monitoring through improved monitoring of water quality and biodiversity indicators and institutional strengthening of the Kune-Vain protected area management administration; (iii) public awareness and replication and (iv) project management, monitoring and evaluation.

The CTW provides a noticeable reduction of the pollution loads into the receiving water bodies, which represents the major contribution to the protection and restoring actions in the endangered coastal zone and marine habitats. According the analytical calculation, the following Removal Efficiency (RE%) are expected: BOD 70%, and fecal coliform removal of 95%, studies show the CTW are effective at removing nutrients such as nitrogen (Re=50%) and phosphorous (Re=25%). Tab. 1/a and 1/b provides an estimation on the quality of waste water in case of implementation of the constructed wetlands according with Project Preliminary Design. In Tab. 1/a are shown the Removal Efficiency (RE%)((*) RE% is the ratio of the out-let concentration versus the in-let concentration of the wastewater pollutant.*) of the CTW according to the *"fully natural"* wastewater treatment system (i.e. oxidation ponds interconnected with a Free Water Surface system). Whereas in Tab.1/b are shown the Removal Efficiency (RE%)20.3/a according CTW wastewater treatment option with *"mechanical aerated ponds"* (i.e. aerated ponds interconnected with a Free Water Surface system).

Table 1/a-Quality of wastewater in Durres, Lezhe, Saranda after project intervention on Project *CTW basic scheme-fully natural solution*

Main Parameter	*Assumed Sewage Inlet concentration (mg/l)*	*Expected median of RE%*	*Expected median Outlet concentration (mg/l)*
BOD	250-200	70%	75-60
N-total	60-50	50%	30-25
P-total	27-20	25%	20-15

Table 1/b-Quality of wastewater in Durres, Lezhe, Saranda after project intervention on Project *CTW option with aerated ponds*

Parameter	*Assumed Sewage Inlet concentration (mg/l)*	*Expected median of RE%*	*Expected median Outlet concentration (mg/l)*
BOD	250-200	85% (range 30%-95%)	50-30
N-total	60-50	75% (range 20%-80%)	15-10
P-total	27-20	65% (range 20%-70%)	15-10

In addition, the GEF alternative is designed to improve management of wetlands and possibly restoring precious habitats by strengthening the management of the Kune Vain protected area. The conservation measures of the proposed GEF alternative are actions which are 'additional' to the baseline. These additional actions will complement existing and planned activities consistent with the Strategic Principles of the Albanian Biodiversity Strategy and the implementation of the constructed wetlands.

Costs: The total cost of the GEF alternative is estimated at US$ 12,230,000.

	GEF	**EIB**	**GoA**	**Total**
Sewage Pollution Reduction	4,380,000	5,640,000	720,000	10,740,000
Environmental Management and Monitoring	200,000	1,000,000		1,200,000
Replication Promotion	200,000			200,000
Project Management	90,000			90,000
Total	**4,870,000**	**6,640,000**	**720,000**	**12,230,000**

Benefits: The implementation of the GEF Alternative would provide the means to protect unique coastal landscape and marine habitats, as well as restoring high priority wetlands (Kune-Vain) and several habitats for important bird species. Benefits generated from the project would include those of local nature such as protection of local and regional environmental resources and increased public awareness of environmental issues as well as those of global nature such as reduction of nutrients in flow waters and the protection of rare and unique ecosystem. The GEF grant has helped leverage funds from other donors for additional activities.

Incremental Costs

The difference between the cost of Baseline scenario (US$ 21,930,000) and the cost of the GEF Alternative (US$ 34,160,000) is estimated at US$ 12,230,000. This represents the incremental cost for achieving sustainable global environmental benefits. Of this amount, the Government of Albania has committed to finance US$ 720,000, while US$ 6,638,000 is leveraged from the European Investment Bank. The amount requested form GEF is US$ 4,870,000.

Table 4 - Incremental Cost Matrix

Component	US $	Domestic Benefit	Global Benefit
Sewage Pollution Reduction (through construction of artificial treatment wetlands)	Baseline: US$ 21,800,000	Improvement in water and wastewater services, including improved management of water utilities and rehabilitation of existing water infrastructure. Improvement in wastewater collection will have no significant impact on nutrient reduction and therefore environmental deterioration of water and land and their ecosystem will continue.	
	With GEF Alternative: US$ 32,540,000		Waste water treatment through artificial wetlands will yield significant nutrient reduction and will help restore endangered coastal and marine habitats and protect globally significant biodiversity

	2023	30,000	1,262,900	177.0031.508.80
Saranda	2004	30,000	700,800	98.0017.504.90
	2023	60,000	2,628,000	368.0065.5018.00

Table 7 - Cost Effectiveness-Durres

Incremental effects			
Total BOD 5 reduction (20 years/ton)	24.846		
Total Nutrient reduction (Nitrogen/N) (20 years/ton)	3.550		
(Phosphorus/Ph) (20 years/ton)	991		
Abatement costs	**US$**		**Lek (*1000)**
Total incremental costs	5.663.000		792.820
Abatement costs ton/BOD5	228		32
Abatement costs ton/Nitrogen	1.595		223
Abatement costs ton/Phosphorus	5.712		800
Total annual cost per inhab (capital costs + M&O)	5,13		0,718
Investments per inhab.	38		5,285
Average Incremental Costs per cu m treated	0,04		0,006

Table 8 - Cost Effectiveness-Lezhe

Incremental effects			
Total BOD 5 reduction (20 years/ton)	2.302		
Total Nutrient reduction (Nitrogen/N) (20 years/ton)	411		
(Phosphorus/Ph) (20 years/ton)	114		
Abatement costs	**US$**		**Lek (*1000)**
Total incremental costs	1.057.000		147.980
Abatement costs ton/BOD5	459		64
Abatement costs ton/Nitrogen	2.575		360
Abatement costs ton/Phosphorus	9.244		1.294
Total annual cost per inhab (capital costs + M&O)	7,70		1,078
Investments per inhab.	59		8,221
Average Incremental Costs per cu m treated	0,06		0,009

Table 9 - Cost Effectiveness-Saranda

Incremental effects			
Total BOD 5 reduction (20 years/ton)	4.539		
Total Nutrient reduction (Nitrogen/N) (20 years/ton)	808		
(Phosphorus/Ph) (20 years/ton)	223		
Abatement costs	**US$**		**Lek (*1000)**
Total incremental costs	858.000		120.120

Abatement costs ton/BOD5	189		26,467
Abatement costs ton/Nitrogen	1.061		149
Abatement costs ton/Phosphorus	3.846		538
Total annual cost per inhab (capital costs + M&O)	3,77		0,528
Investments per inhab.	29		4,004
Average Incremental Costs per cu m treated	0,03		0,004

Additional GEF Annex 4: STAP Roster Technical Review
ALBANIA: Intergrated Water & EcoSystems Management GEF

STAP Review of the GEF Project component

GOVERNMENT OF ALBANIA: INTEGRATED WATER & ECOSYSTEMS MANAGEMENT

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Scientific and technical soundness

The detail provided on the operational design of constructed treatment wetlands was limited, but the scientific and technical basis of using wetlands to reduce the level of sewage pollution contaminants flowing through to environmental waterways is sound. The project is linked with the Bank's Municipal Water and Wastewater Project and addresses the critical issue of reducing nutrient pollution resulting from untreated discharges from the cities of Durres, Lezha and Saranda. It makes an important environmental linkage by also addressing the preparation and implementation of an effective Management Plan for Kune-Vain natural reserve.

The basic premise is to implement environmentally sustainable natural wastewater treatment and link this with improved management and monitoring of areas with globally important biodiversity. If successful it will address an important element of the environment/poverty linkage and should contribute to building national awareness of the importance and benefits of addressing environmental issues.

The proposal is also linked with the EU PHARE financed Karavasta Lagoon – Wetland Management Project and the UNDP GEF project on Conservation of Wetland and Coastal Ecosystems in the Mediterranean Region. It also links with the Mediterranean Action Plan (MAP) funded and coordinated by the United Nation Environment Program (UNEP) and within MAP to the Program for the Assessment and Control of Pollution in the Mediterranean Region More broadly, it builds upon and should extend the practical demonstration of implementation and benefits of comparable pollution reduction projects being undertaken in catchments draining into the Baltic and Black Seas.

Global environment benefits and costs

Nutrient pollution of enclosed seas has been identified as an environmental issue of global significance. Major changes in the Adriatic Sea have been attributed to very high levels of eutrophication with impacts on the habitats of endangered species and biological diversity generally. If this project achieves its objectives it will have clear benefits in addressing a significant source of nutrient pollution of the Adriatic Sea from Albania.

The context of GEF goals and guidelines

The project clearly addresses the issues of surface water contamination within the context of environmental-poverty linkages. It should bring early benefits through improvements to public health and the living conditions of some of the poorest people. With adequate attention to information and education it should help to generate understanding of the social and economic importance of the benefits of good environmental management.

The project is consistent with the objectives GEF Operational Programs No.2 *Coastal, Marine, and Freshwater Ecosystems*; Number 8, "*Waterbody Based Operational Program"*, which focuses "on seriously threatened water-bodies and the most important trans-boundary threats to their ecosystems". No.9 *Integrated Land and Water Multiple Focal Area*; No.10 *Contaminated-Based* and No.12 *"Integrated Land and Water Multiple Focal Areas Operational Program"*. It applies the guidelines with respect to incremental costs and the log-frame.

Regional Context

The project is important in the context of addressing eutrophication and other pollution related threats to the **Adriatic** and **Ionian** Seas.

Replicability

This project builds on experience of projects addressing conservation and management of wetlands in catchments draining into the Black and Mediterranean Seas. It is replicating and extending this experience in the socioeconomic context of the development of Albania. The clearly stated intention in the design concept is that this will develop experience and capacity to replicate similar practices in other catchments draining into the Adriatic and Ionian Seas. The proposal addresses survey and selection of sites for replication.

Sustainability

The use of constructed treatment wetlands is part of a longer term strategy of progressing from the current situation of discharge of untreated sewage into marine and riverine waterways to advanced water treatment. It will bring some immediate environmental improvements.

In the longer term as the financial situation of the water cycle companies is stabilised the strategy envisages investment in secondary treatment facilities with the constructed and natural wetlands operating to provide advanced tertiary treatment with an increasing range of benefits from flows of unpolluted waters. Progress beyond this project to the complete treatment cycle will depend on community willingness to pay the consequent water and sewage charges. This in turn will depend upon demonstration to the community and continuing appreciation by decision-makers of the economic, environmental and social benefits of high quality management of water and sewage, and of the Kune-Vaine protected wetland.

Contribution to future strategies and policies

As discussed above, success with this project should contribute to the broader adoption of high quality water and sewage management and protection of environmentally significant wetlands in Albania.

Involvement of stakeholders

The project proposal recognises that at this stage of its development:

> "*environmental problems in Albania, like in most other transition countries, still take a secondary place in the order of priorities "*

and that Albania:

> "*lacks a politically active and environmental conscious elite to actively steer the country toward an environmentally conscious development".*

To achieve extension needed to secure the long term benefits of this project will require:

> "*decentralized and financially self sufficient management units with a strong involvement of local civil society."*

A key element for the future is willingness to pay. In this case that will depend on awareness of the social, economic and environmental benefits of water treatment and wetland management and of the costs of failure to manage.

The proposal indicates that

> *"the rationale, benefits and objectives of the project should be made known to all stakeholders through effective public awareness programs. The benefits of sustainable wastewater treatment need to be demonstrated and the results widely disseminated."*

There is no discussion of approaches to achieve this beyond:

> *" it is expected that consultation with beneficiaries will be on a continuous basis during project implementation through public relations campaigns conducted by the private operator under the Municipal Water and Wastewater Project."*

There is no provision for community or school based education in this process and this is a significant issue given the critical importance of developing the necessary understanding to achieve long term willingness to pay. Other environmental projects have demonstrated the benefits of accelerating the acceptance of information into communities through school children having good information and discussing it within family groups and through encouragement of discussion through local activities in the media, cultural and community groups.

Risk assessments

To the extent that I can judge, being unfamiliar with the field operating situation, the risks seem to be reasonably discussed and I generally concur with the assessments. In particular the identification of willingness to pay as a substantial risk suggests that, as discussed above, a more deliberate and costed education strategy would strengthen to the proposal.

Costs

I have insufficient operational experience in the target area to make substantial comment on the detail of funding allocations. However the budget for replication is very small $100K out of $5.5 million GEF or almost $13 million total. Given that replication funding will in any case be used for identifying and surveying additional sites for replication there is no effective provision for education in this item. It may be subsumed under another heading but that is not apparent. In the light of comments above on the role of school and community education in development of willingness to pay I would suggest that the design team consider making clear provision for an education component of the program.

Conclusion

This is an important project addressing the issues of sewage pollution, wetland in ways that reasonably reflect the operating constraints of the transitional status of Albania. Subject to adequacy of provisions for education as a means to address immediate and longer term willingness to pay I recommend that it should proceed.

R A Kenchington
RAC Marine Pty Ltd
1 March 2003

World Bank Response to STAP Reviewer Comments

The STAP Reviewer recognizes the importance of the project in addressing the issues of sewage pollution in coastal areas and the Kune-Vain tidal marshland. He further concludes that the project reasonably reflects the operating constraints of the transitional status of Albania. He points out the important environmental linkage aimed to promote and improve the management of the natural protected area of Kune-Vain. Also, he judges the risks assessment reasonably discussed and evaluated.

Nevertheless, the STAP reviewer emphasizes the critical importance of developing the necessary willingness to pay which in turn represent a key element for the future sustainability of the project. In particular he points out the lack of an education component in the project that would help to develop the necessary understanding towards the concepts of environmental protection and cost recovery and therefore to strengthen the willingness to pay of the communities.

As correctly noticed by the STAP Reviewer this project is linked with the Bank's Municipal Water and Wastewater Project (MWWP) of which is an integral part. The project benefits from the results of the socio-economic analysis carried out and the institutional and implementation arrangements established under the MWWP. The MWWP aims to increase the sustainability of water supply and sanitation services through the involvement of the private sector and the associated improvements in financial and operational management. On the other hand the presence of a knowledgeable international operator will contribute to create the local capacity in operating and managing the constructed treatment wetlands. According to the social assessment the willingness to pay is high. Most households are willing to pay the new tariff. In addition, almost all households are willing to pay the monthly fee to connect to the central sewage system and to receive septic-tank cleaning service. Preliminary financial calculations show that the wastewater treatment will increase the sewage tariff by only 2-5 cents/m3 and therefore will not have a negative impact on the willingness to pay. Furthermore the MWWP pays attention in establishing mechanisms that increase public awareness. Public communications activities, awareness campaigns on water and sanitation services and the need to pay for them are part of the contractual obligations of the operator. The project will also sponsor the establishment of a Consumer Panel (CP) to enable those who use water to interact directly with the management and to channel constructive suggestions back to the utilities.

The measures taken in the MWWP are to be considered a sufficient direct contribution to create the required public awareness and to guarantee the understanding of the principles of sustainability also for this project. Nevertheless the recommendations of the STAP Reviewer have been taken in consideration and the PAD has been revised and, subject to the GEF approval, the replication promotion component has been expanded to incorporate an education program aimed to accelerate the acceptance of the new concept of sustainable management into communities through dissemination of information in the schools and encouragement of discussion through local activities in the media, cultural and community groups.

The STAP Reviewer questioned on the implementation of a basic monitoring system of the coastal areas. Albania is among the contracting parties to the Barcelona "Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean", which revised in 1995 the "Convention for the Protection of the Mediterranean Sea against Pollution" , of 1977, still in force. Albania and the other contracting parties to the Barcelona Convention are also part of a comprehensive Mediterranean Action Plan (MAP) funded and coordinated by the United Nation Environment Program (UNEP) which, among others, has the objective to protect the Mediterranean Sea against chronic or accidental pollution. Under the responsibility of the Secretariat of the Mediterranean Action Plan one of the activities implemented

under the MAP is the Program for the Assessment and Control of Pollution in the Mediterranean Region (MED POL) for which a program to monitor marine pollution is carried out on regular basis for identified pollution "hot spots". For Albania the Faculty of Natural Science of the University of Tirana is implementing the program of collecting and analyzing environmental indicators. In addition the project will finance the establishment of a monitoring program for water quality, biodiversity and socio-economic indicators within the protected areas and the coastal zones involved in the project.

The STAP Reviewer asked clarifications on the criteria and budget for the decision making mechanism for the management of natural resources at the municipality and community level. According to the action plan that the Government is implementing towards an integrated and sustainable management of the protected areas, the Ministry of Environment and the General Directorate of Forestry and Pastures will establish a new administration and management board for Kune-Vain. This Board will include among others representatives of the Municipalities and Communes, civil society and a formal representation of the users of the KV Managed Area. It is proposed that the administrative entity for the KVMA should be established under the budget of the General Directorate of Forestry and Pasture.

Additional GEF Annex 13: Project Area Ecosystems
ALBANIA: Intergrated Water & EcoSystems Management GEF

1. Global Significance of the Project Area

The Integrated Water Management Project concerns the water treatment by "naturalistic methods" in three well identified areas, which experience high naturalistic values. Their peculiar features can be express as follows:

- Lezhe/shengjin (Kune-Vaini lagoon): The endangered species living in the proposed Managed Nature Reserve are: (i) the globally treatened *Phalacrocorax pygmaeus* (Pygmy cormorant); (ii) *Myotis-myotis* (Mouse-ear bat); (iii) *Rana balcanica and Rana lessonae* (Frogs); (iv) *Lutra-lutra* (Eurasian river otter).
- Durres (Rrushkull lagoon): The area has been identified as Important Bird Area (IBA) for over 10,000 waterbirds.
- Saranda Bay and Butrinti lake: 96 endangered species do occur in this area that are included in the IUCN Red List of Threatened Animals.

Furthermore, these areas, already affected by pollution problems, represent the territories for further residential settlement, agricultural activities and mainly potential touristic development. These are factors to be taken into account in the project analysis and alternatives set up and selections, mainly concerning the impact on the environment.

In particular, **Durres area** is progressively affected by a noticeable urban settlement, which is experienced by an uncontrolled expansion. Former use of the plain had a prevailing agricultural destination and a regular network of surface natural canals was built in order to allow surface run-off to drain into a central main channel. This channel finally discharges at sea by means of a hydrovore, to keep the plain dried during and after important rainfalls, due to the presence of a surface aquifer. The central open channel is now the final receptor of all sewage waters of the Durres District, whose discharge at sea can provoke pollution effects and damages to the marine environment in the area of Porto Romano. The plain is limited eastward by the Erzeni River, westward by the system of coastal hills and northward by the rather complex system of coastal wetlands and dunes of the Lalzi bay. All natural district is threatened by the direct and indirect impacts provoked on all environmental components by the advancing spreading of the uncontrolled urban settlement. The western side of the plain is characterized by the older urban as well as industrial settlement, now completely idle, but land and surface aquifer contamination represent major problems not yet solved. In the middle part of the plain embankments of an old fishing pond still remain, which represent a physical constraint to the chaotic expansion of the urban settlement. Being not the settlement advances suitably planned , the required infrastructures in terms of roads, energy and water supply, sewage water collection, etc are completely lacking, which implies a strong impact on soil, surface and underlying waters and a threat to the natural resources of the marine as well as wetland ecosystems.

Saranda bay represents the most attractive coastal area of Albania , where eco-tourism potential is higher and strategies of sustainable development can be profitably implemented in the short and medium term, with an interesting return for the local economics. Coastal Zone Integrated Management (CZIM) of Saranda District, extending to Butrinti Lake, Bistrica Spring and hydrographic catchments and existing wetlands, can be put forward and implemented only if sanitation problems and waste water treatment and

protection of the natural and marine environment are accomplished. As a consequence an action plan combining main sewage water trunk line (covered by PHARE Funds) with a waste water treatment by naturalistic processes is highly envisaged, to preserve the marine environment from existing pollution effects. The area identified for the construction of the artificial wetland is located in the proximity of the Ceka canal, where several solutions can be proposed.

Lagoon of Kune-Vaini is an important Protected Area, of great naturalistic value. City of Lezhe, the intensive agricultural activity developed in the alluvional area as well as the progressive population increase and future settlements, represent potential threats to the natural equilibrium and to the biodiversity preservation of the aquatic ecosystems. Indeed, the sewage waters of Lezhe directly discharge into the surface waters of the Drini River, whose spreading at sea can affect the environmental conditions of all the coastal zone surrounding the river mouth, and consequently the lagoon. Direct effects of contamination of the lagoon waters can also occur by surface run-off of the agricultural fields and a hydrovore, installed to keep the fields dried after rainfall events, can increase the contaminant's flow. As a consequence the eutrophication process can arise sometime in the lagoon waters. A coordinated intervention, combining the waste waters treatment of Lezhe sewage waters by an artificial wetland, with the accomplishment of a network of natural "filter streep", in order to intercept the surface drainage of waters of agricultural origin into the lagoon, should provide positive results for the preservation and protection of the natural resources.

It is also necessary to mention the **naturalistic site of Kanalla Lake**, being a natural spring of karstic waters existing at the toe of the hills, within the lagoon. This a typical transitional water body, highly polluted for the direct discharge of sewage waters coming from the village of Shengjin.
In such a case the solution cannot adopt the peculiarities of the natural wetlands, being the lagoon itself a protected area and therefore no artificial ponds can be built inside. Conventional water treatment plants have to be proposed.

2. General Description of the Albanian Marine Ecosystem

The Albanian coastal region contains two geographic entities: the Adriatic and the Ionian Sea coastal areas. The total length of coastline is about 429 km and the national waters confined to territorial waters of 12 miles width. The continental shelf lies entirely within the exclusive zone. The shelf is wider in the north (Adriatic sea), up to 25 miles across, and narrower in the south (Ionian sea), 2-3 miles width. Beyond 25 miles, sea depth exceeds 1000 m in the international channel.

There is no particular wind that prevails in the coastal plain. In winter, the most frequent one blows from the Southeast and in the summer season, the prevailing wind blows from the north-western direction. There are three types of rather low currents in the Adriatic sea: continuous currents, tidal currents, and wind-driven currents. Strong winds persisting for a couple of days may create temporary currents running in the opposite direction with respect to steady and tidal currents.

The Adriatic coastal area (the northern part of the Albanian coast) is generally characterised by coastal lowlands (alluvial plains) intersected by rivers, and flanked by hills along its upland boundary. The coast is made of long sandy beaches, deltaic river mouths and lagoons. The coastal waters are shallow, receiving water from the rivers and several drainage canals. At sea, the water depth increases slowly, with first a sandy bottom with the associated biocenosis which becomes muddy with increasing depth.

On the sandy or muddy bottoms, the marine flora is scarce or occupies specific areas where currents or waves have less action. The extensive seagrass beds of *Posidonia oceanica* are an important part of the

Albanian marine ecosystem, often occupying a considerable part of the littoral zone. *Posidonia oceanica* and very well developed marine communities are found along Porto Romano bay and Shengjini bay. The underwater rocky bottoms at Rodoni and Lagji Capes (Durres), and the eastern side of Vlora bay host patches of *Posidonia oceanica*.

Porto Romano and Rrushkull-Erzeni River Outlet (Durres Area)

The area of Porto Romano and Lalzi bay is a narrow, reclaimed part of the coastal plain. There are some natural habitats left along the coastline, such as a belt of pine trees, temporary marshes, roadbeds and salt marshes. In addition to the loss of large wetland parts by land reclamation, the quality of natural environment of that area continues to deteriorate due to the input of the polluted Erzeni river (contaminated mainly by sewage disposed upstream), direct discharge of untreated urban and industrial wastewater in the Porto Romano bay, excessive felling of trees for fuel, and uncontrolled hunting and fishing.The underwater rocky bottoms at Rodoni and Lagji Capes host patches of *Posidonia oceanica*.

The Lalzi bay with the Erzeni river mouth is an environmentally sensitive area. The coastline of the Rodoni-Bishti i Palles Capes, of which 35 % are cliffs exposed to mild erosion stretching along both capes. The remaining parts of this unit are alluvial beaches (actually, the Lalzi bay) of which 18 % is exposed to erosion and 47 % to deposition. Any intervention altering the quantity of the material carried by the Erzeni river will affect the littoral, generating new erosion processes. The Porto Romano bay also is a section attacked by erosion.

Drini Outlet (Lezhe-Shengjin Area)

This unit has about 15 km of the coastline, from Shengjini harbour to the southern part of Vaini lagoon (including the Drini river), oriented in N-S direction. The shore are sandy and sediment is coming both from the Buna and Drini rivers transported by the longshore currents. The marine slope is gentle reaching the 20 m isobath at average of 2.0 km offshore. Kenalla, Kune and Vaini lagoons are separated from the shallow coastal waters by the narrow sandbars, low and mobile dunes, and the planted pine tree belt (*Pinus halepensis, Pinus pinea*).

Posidonia oceanica meadows and *Penaeus kerathurus* populations are reduced due to the polluted industrial and urban discharges into this area((1) Albania Coastal Zone Management Plan : Final Report - Phase One, 1995.1). The breeding grounds of *Posidonia oceanica* have also deteriorated because of changes in the structure of the fishing fleet((2) Albanian Convention on Biological Diversity -1999.2). Fishing activities occur in the coastal waters including the trawlers from Shengjini and small local fishing boats. As in other places, the local population is collecting *Bivalves* along the shores.

The coastal wetlands of Drini river (Kenalla-Kune-Vaini lagoons) are a part of an environmentally sensitive area. Inland of the Shengjini beach lies the Kenalla lake surrounded by a dike with the open lake and a dried-up part with salinity tolerant vegetation. Through a pipeline, the urban sewage of Shengjini is directly drained into the lake. Further south lies the Kune lagoon extending up to Drini river mouth. The coastal reach in the northern part of Shengjini has presented an coastal erosion phenomena. After that, until some 2.5 km south of Shengjini, the coast is relatively stable or slightly receding.

Saranda Bay and Ksamili Bay (Saranda Area)

The coastline of Saranda bay to Ksamili bay can be divided into several sections: the area including the town of Saranda shows a recent development on the northern bluff near the entrance to the harbour; the area south of Saranda where the cliffs are steep and cut with caves and intermittent sandy beaches; the

abandoned citrus plantations and deforested areas in the vicinity of Ksamili; the Ksamili islands, with small sandy beaches, wind-sculpted maquis forests, and extensive *Posedonia oceanica* meadows covering the shallow areas of the bay of Ksamili. The whole area from Ksamili Islands to Stillo bay could be integrated in a protected and managed area with interconnected areas. In Ksamili bay and inlets, a marina and environmentally sound resort place could be settled.

3. General Description of Natural Wetlands Ecosystems

3.1 Kune–Vain Wetland and Kenalla Lake

The Kune–Vain wetland and Kenalla Lake or complex Kune–Vain lagoon represent one of the important coastal Albanian wetland. Area of Kune–Vaini wetland and Kenalla lake represents a wetland area of multiple ecological and economic values and uses, as provide fish and wildlife habitats, support complex food web, absorb water to reduce flooding and damage from storms, provide erosion control, improve the quality of water ed in particularly provide open space & aesthetic value. The Drini River is the longest river of Albania, and the Kune-Vain lagoon complex has been built by the accumulation of the river sediments. This area is comprised in the network of Albanian Protected Areas, as described in the document "Biodiversity Strategy and Action Plan (BSAP)", approved by Government of Albania in the year 2000. The delta of Drini is recognized internationally as an Important Bird Area (IBA) and a Specially Protected Area (SPS) and represent the area of Kune-Western part of Kune lagoon, defined in the network of Albanian Protected areas as Scientific Reserve, according to the 1st category of IUCN. The site of delta of Drini is one of the most important areas of Albania for wintering waterbirds; the most important site for the nesting of herons (Ardeidae), and potential breeding site for the cormorants. including pygmy cormorant (Phalacrocorax pygineus). The other two parts of this lagoon complex, Kenalla–Eastern part of Merxhani lagoonand Drini River Outlet with Ceka (part of Vain wetlands) and Vaini wetlands are defined as Managed Nature Reserve, in according to the 4th category of IUCN.

Ecological Description of the Kune Lagoon and Kenalla Lake

The lagoon of Kune presents rich floristic and faunistic values. In the group of fauna are included: vertebrates (animals, birds, reptiles, amphibian, fish) and non-vertebrates (mollusks, crustaceans). The macrobenthos of this lagoon is characterized mainly by an intense growth of Annelids, Tubuliferae, Hydroids and *Carcinus aestuarii.* Also this area is rich of the birds as *Rallus aquaticus, Gallinula chloropus, Nycticorax Ardeola ralloids*. Besides the main other bird species are present (see Annex 10 and 17). The diversity of the species is higher compared with the other part of the ecosystem (Kune-Vain lagoon and Kenalla lake). The micro algae biomass level indicates high quantity of phytoplankton with a relatively great number of species). Some of the diatoms are determined Dinoflagellates are presented in few species (see Annex 10 and Annex 17). Regarding flora and vegetation, they mainly consist of: aquatic vegetation; hydro-hydrogrophylic vegetation; halophyl vegetation; the psamophyl or sandy-dune vegetation; forest vegetation. The amphibian are represented mainly by *Rana lessonae, Rana dalmatina, Triturus vulgaris, Rana balcanicaetc.* Different kinds of reptiles, usually threatened, can be mentioned, like Sea turtle and Earth tortoise. The observation of fishery catches and hypoeutectic salinity gradient divide Kune lagoon in three main sub areas corresponding to fish species in these sub area (see Annex 10). The main fish specie are the eurohaline species: (*Sparus aurata*) gilthead seabream, *Dicentrarchus labrax*, Mugilidae spp., *Anguilla anguilla* etc.

Ecological Description of the Vain Lagoon

The lagoon of Vain presents rich floristic and faunistic values. In the group of fauna are included: vertebrates (mammals, birds, reptiles, amphibian, fish) and non-vertebrates (mollusks, crustaceans). The

zooplankton was found on low quantity in general. The lagoon of Vain has vegetation similar to the lagoon of Kune. More than half of the water surface is covered by flooded *Phragmites communis* beds with *Thypha latifolia*, the banks are composed of sedge communities, riparian woods of black alder galleries with *Alnus glutinopsa, Populus alba, Ulmus campestris, Fraxinus angustifolia, Salix alba* and *Quercus sp.* which are replaced over time by pine plantations. Maquis is composed mainly of: *Tamarix parviflora, Cornus mass, Juniperus macrocarpa, Rubus ulmifolium, Ruscus aculeatus;* the herbaceous vegetation of the marshland is characterized by *Cynadon dactylon, Dactylis glomerata, Agrostis sp., Phragmites communis, Juncus acutus, Salicornia fructicosa*. The birds species observed in the lagoons are: *Phalocrocorax carbo sinensis, Nycticorax nycticorax, Egretta garzetta, etc (*see Annex 10). Regarding the mammals can be found in the area: *Mustela nivalis, M. putorius* and *Vulpes vulpes*. The dominant fish species are *Anguilla anguilla* and *Mugil cephalus,* and this lagoon presents lower salinity than Kune lagoon. Also are present in this lagoon, in the low quantity the other eurohaline species as: (*Sparus aurata)* gilthead seabream, (*Solea vulgaris*) common sole, *(Liza aurata*) golden grey mullet, (*Liza saliens*) leaping mullet, (*Chelon labrosus*) thicklipped grey mullet, (*Dicentrarcus l*abrax) european seabass, etc.

3.2 Rrushkulli–Erzeni River Outlet

The Rrushkulli-Erzani River Outlet area is situated in Lalzi bay, the central part of the Adriatic coast of Albania, between Rodoni cape in the north and Bishti Palles cape in the south. It is boarded in the north and east by a hilly ridge reaching a maximum height of 225 m, while in its south-east it continues with the drained fields of Qerreti and Durresi, formerly salt marshlands. The catchments area of the Lalzi bay is estimated at about 250 km2. Some parts of the area, close to the coast, are depressions reaching up to -1.5 m. They are kept dry by the actively pumping water through the pumping station near Hamalla village. The most of the area is occupied by the agricultural land, while the once well developed hygrophilic flood plain forest has almost disappeared; some small spots of it are still present only along the coastline north of Erzeni river mouth. Sand dunes relatively well developed, halo-phyte and hygro–phyte vegetation, and a planted pine forest can be found in this area. Waterbird and waterfowl censuses of the last two years have identified this area as an important IBA (over 10000 waterbirds and wetlands birds have been counted here). The Erzeni River Delta is important for migratory fish species breeding in freshwater. Posidonia meadows, *Posidonia oceanica,* and very well developed marine communities are found along the rocky littoral and Porto Romano Bay.

Ecological Description of the Area

The area of Rrushkull-Erzeni River outlet is originated from the alluvial sediments of the Erzeni river, which meanders across the area. The sub area Rrushkull–Hammalla lays in the Lalzi bay, from outlet (mouth) of Erzeni river in the South to the overflow of the Tarini stream in North and in the East in some cases, it lays for many kilometres, and it is limited from the agricultural land of the ex state agriculture farm Sukth (Hamallaj, Rrushkull, Jubë). The terrestrial environment of this area presents these types of habitats: sand dunes, salt tolerant vegetation, flood plain and pine forests, and wetlands/marshlands. Sand dunes occupy a belt from 10 to 50 m in width along the entire coastline. There are two main types of the dune vegetation: Plant community dominated by *Cakile maritima,* in the form of isolated spots, 4-5 m distant from each other, closer to the shoreline. Plant community dominated by *Elymus farctus*, on the well developed dunes, in which apart from the Dominant species, are present other species like; *Eryngium maritimum. Echinophora spinosa, Euphorbia paralias*, etc. Salt tolerant vegetation is mainly present in the left hand side of the Erzeni river mouth. This type of vegetation is characterized by succulent plants like: *Arthrocnemum fruticosum, A. perenne, Salicornia europaea, Halimione portulacoides, Limonium vulgare, Inula crithmoides* etc. The dominant species are *Pinus pinaster* and *P. halepensis*. This formation is generally not so dense and rather young. The area contains also some rare

and endangered plant species as: *Quercus robur, Fraxinus excelsior, Juniperus oxycedrus, Matthiola tricuspidata, Pancriatium maritimum, Quercus ilex, Adiantium capillus-veneris, Butomus umbellatus, Salix triandra.* The coastal area presents the important fishing site for *Mugil sp., Liza sp., Dicentrachus labrax, Umbrina. cirrosa, Lichia amia, Sparus sp., Alosa phalax, Anguila anguila* and for crustaceans *Paeneus ceraturus* and for bivalves *Venus galina* and *Donax trunculus*.

3.3 Butrinti Lake and Related Wetland Environment

This area includes Butrinti lagoon, Ksamil Island and Stillo Island and cape in the zone from Cape Qefali to the Greek border. This area belongs to the District of Saranda and covers 35 km of coastline. The relief is not very important with an altitude of 363 m at about 4.5 km of the coast east to Butrinti lake. In Butrinti area, grey herons, gulls, egrets, ducks and snipes are seen on the mudflats and saltmarshes bordering the mouth of the Butrinti canal and river up to 4 km inland. The phytoplankton population of the lagoon is abundant and mainly composed of diatoms *Cheatoceros sp., Cyclotella sp.* and Peridinates *Prorocentrum sp.* and *Peridinium sp.*. The accumulation of phanerogam *Zostera noltii* foliage is an indication of its extensive presence within the lagoon. Balanidae are very common among Crustacea and *Mytilus galloprovincialis* among Molluscs. The birds seen in the area are: *Larus cachinnans, L. argentatus,* sparrows *Passer hispaniolensis, P. montanus* on the lake. While in marshland and the mudflats at the estuary are reported marsh harriers *Circus aeruginosus, Acrocephalus scirpaceus,* etc. Great concentrations of migratory birds occur in fall and winter, waders on the mudflats, saltern and in the estuary of the channel while Anatids assemble in large colonies on the lake during the coldest months. This area is also the richest of Albania for amphibians and reptiles. Otters have been recorded in the lagoon. The terrestrial vegetations are characterized by associations of *Caxilo xanthum italici* (*Caxile maritima, Xanthium stumerium*), *Crithmo-Limonictum anfract.* (*Crithmum maritimum, Limonium anfractus)*, associations of *Crithmetum (Crithmum maritimum)*, associations of *Ammophiletum arundinaceae (Ammophila arerrari, Medicago marina, Echinophora spinosa),* of *Salicornictum fructicosae (Arthrocnemetum fructicosum), Salicornictum radicentis (Arthrocnemum perenne), Juncetum maritimi (Juncus maritimus), Juncetum acuti (Juncus acutus)* and of *Sporoboletum (Sporobolus pungeus)* .

4. Surface Water Quality and Pollution Loads

During the study a water/wastewater and seawater quality examinations have been performed, in order to confirm or adjust available water quality data. The examination mainly concerned raw sewage and receptor water-bodies quality. The sea water quality have been investigated in terms of indices on water, sediments and biota. The analyzed sewage samples taken at project's sites wastewater facilities can be characterized as *strong-moderate* with typical domestic composition. The analyses and assessment of existing studies, as well as the analyses performed during the study, show the degradation of the quality of water resources by pollution from land-based activities (nutrients, pathogens and oxygen demanding wastes), in the all coastal cities of Durres, Lezhe and Saranda. The results of the water/wastewater and sea quality examinations are fully described in Annex 4. The expected wastewater pollution effects on the marine environment are described in following paragraph 5.

5. Wastewater Pollution Effects on the Ecosystem

Environment is an end user of water resources which poses therefore sometimes severe restrictions particularly on the emission of wastewater from other water use sectors. High BOD loads and suspended materials may influence biochemical and light conditions in the marine environment; industrial micropollutants may be directly toxic for aquatic life and fish; and pollution from excess agrochemicals may have similar effects.

The marine ecosystem, though almost certainly damaged by uncontrolled wastewater emission of coastal urban concentrations, industry and polluted rivers, is still generally in a reasonable condition and its ecological and economic value may be considerable. Unfortunately, studies about the value and eventual degradation of the marine ecosystem are rare and an overall inventory has never been executed. The Biodiversity Action Plan has as a priority the mapping of the sea meadows with *Posidonia oceanica* and the study of animal groups and plants, because of lows scale of knowledge of a considerable part of these plants.

Little is known in Albania about marine environment along the Adriatic Coast and the effects of the considerable pollution of the last 30 years, both by discharge into the sea of polluted river water and by direct discharge of untreated urban and industrial wastewater. Except for smaller areas along the coast in the vicinity of cities and industrial concentrations, inspection shows in general visually clear and unaffected waters. However, systematic research on marine ecosystems and the effect of pollution has never been executed.

The problem of pollution in the marine environment becomes ever more serious. Adriatic Sea is easily exposed to pollution because of restricted water exchange and long shore lines. Areas with stagnant or partly stagnant conditions are especially sensitive to pollution due to slow water exchange. Organic wastes from communities and industries will cause an oxygen reduction process in the water. Oxygen is utilised for oxidation of the organic matter and nutrients bound in the matter will be released. This process will cause an increase of the primary plankton production in the area. This again will increase the oxygen utilisation. A secondary oxygen reduction process will begin, where the new organic matter is oxidised. This secondary oxygen reduction may require two to five times more oxygen than the primary process. This secondary process is not accounted for in the conventional BOD techniques.

The enrichment of natural waters by nytriens (eutrophication), primarily nitrogen in marine waters but also phosphorus, has been associated with incresed primary productivity and nuisance algal growth in coastal zones and semi-enclosed and enclosed areas of seas. Increased loads of nutrients to coastal waters have caused increasing eutrophication and the major sources of nutrients to coastal waters are from sewage disposal. The primary production increases until the light penetration limits it. The consequences of eutrophication can be incresead frequency of algal blooms (sometimes toxic), increased water turbidity, slime production, oxygen depletion in deep waters and mass fish and benthic fauna kills. Signs of such *eutrophication* can be observed in the Saranda bay, Shengjini and Kenalla. The relatively low concentrations of dissolved oxygen in Saranda bay (approx. 7.63 mg/l), in Shengjini bay, Kenalla Lake (approx.8.46 mg/l) and Drinit river (9.70 mg/l), are to be related to pollution by organic matter. Also the results of the chemical analysis into the sea near the points of sewage discharge (see Annex 4) demonstrate the presence of nitrites. Particularly in Saranda bay, Shengjini bay and Porto Romano bay, it was observed((3) Kashta L. and Mio A., 1992-Tirana University.3) the development of some nitrofile algae populations (*Ulva rigida and Enteromorpha spp.),* and this is an other demonstration of eutrophication in this waters. Ammonia can be converted to organic nitrogen by these resident algae *(Ulva, Enteromorpha). Ulva* blooms can become so luxuriant that the algal decay products are more unpleasent than the sewage itself. Sewage pollution is directly responsible for the closure of many *molluscan shellfish* growing areas in Europe. Sellfish can accumulate and retain pathogenic organisms and toxic organic and inorganic substances present in the growing areas. During the last years mussel breeding was practically stopped, both for internal organisational reasons, but above all because of the block on exports imposed by the EC for sanitary reasons, in October 1994 for all living products of the fishery sector. The main requirement for the export of live mussels to the EU is the setting up of a shellfish monitoring system to guarantee the safety of bivalves harvested from water bodies. Currently Albania faces a ban due to a previous outbreak of cholera in live molluscs. This issue is now being addressed

through the development of a monitoring system to certify the areas on the Albanian coastline and the marine waters that can harvest and export mussels. This is covered by EC/91/492 on placing live bivalves on the EU market.

Posidonia oceanica meadows populations are reduced due to the polluted industrial and urban discharges into this area, particurarly in the Shengjini- Lezha and Saranda-Ksamili area, but also in the Porto Romano and Lalzi bay. This has been associated with an increase in water turbidity (Secchi disc. 1.25-1.50 m, Annex 4) reducing the amount of light exposure on the sea bed and this caused reduction in the *Posidonia oceanica* beds over the last decades (Kashta L., 1998). In sea areas with a low nutrient content a release of organic wastes may cause eutrophication of the surface water in the whole area. The increased biological production may be beneficial to the surface water by increasing the fish yield, but it can have serious effects on conditions in the deep water. Increased decaying organic matter there may lead to oxygen deficiency and can destroyed bottom fauna. It seems to be very difficult for nature to restore oxidising conditions when such a fertilisation cycle has started.

In Albania, the major types of endangered ecosystems and habitats are not only coastal (sand dunes, river deltas, alluvial forests, lagoons, and coastal lakes), but also marine ecosystems at medium and infralitoral level ((1) Albania Coastal Zone Management Plan : Final Report - Phase One, 1995.1). The *Posidonia* meadows represents an important ecosystem in the Adriatic Sea. The fundamental role played by the marine phanerogam meadows and in particular by Posidonia, can be summarised in the following points: stabilisation of the sea-bed through the development of an effective radical and stoloniferous apparatus; reduction of the intensity of movements of water with consequent maintenance of coastal balance, thanks to the softening effect of the “matte” and the layer of vegetation; high production of oxygen and organic material by means of photosynthesis; direct and indirect source for numerous organisms and starting point for a complete food web; habitat of choice for numerous commercially important species, such as fish, cephalopods and crustaceans.

Information from all three project areas gives quite a clear picture of the organic load of the respective coastal zones. In all the project areas the urban centres discharge sewage directly into the sea (Saranda, Porto Romano-Durres and Shengjini bay) or into the wetlands (Kenalla) or into the river (Drini-Lezhe) at short distances from the sea and discharged sewage is not treated. The situation is particularly severe in Saranda, Shengjini and Kenalla. In the city of Saranda, urban and industrial waste is discharged directly in the central part of Saranda bay, and through the Cuka channel ((2) According EU Phare Program-“Emergency Measures-Saranda Water Supply and Sanitation”-see Annex 92) into the sea. The waste plume spreads across the bay of Saranda, in a northern direction, polluting waters in front of Saranda.

These discharges of untreated domestic sewage can significantly add to the total loads of contaminants. Due to the breakdown of organic matter, such discharges can cause immediate problems to marine life from high oxygen demands in the water column and sediments and through toxic effects of ammonia. Of immediate concern to humans is the presence of large numbers of pathogens that can cause illness and disease. Also associated with the presence of pathogens is the potential contamination of seafood, particularly shellfish, which in Saranda bay and Butrinti lagoon (mussel *Mytilus galloprovincialis) and* in areas like Porto Romano, Lalzi and Shengjini (clams *Chamelea gallina, Ruditapes decussatus* etc) are commercially very important for Albanian fishery.

Pollutants may affect *reproduction* in many different ways. Teratological development of embryos may result in deformed or malfunctioning larvae which do not survive hatching. Reproduction may be influenced by behavioural changes of the adults during the mating season. Their behaviour, the production of eggs and sperm, the secretion of egg membranes, eggshells and production of egg nutrients,

may be all affected by changes of hormone function and enzyme activity. Changes in the ecosystem may influence reproductive success when vitellogenesis is directly influenced by the availability of food. In the coastal area of Shengjini bay (particularly northern part-Rana e hedhun), in Porto Romano and Lalzi bay and near the Saranda and Ksamili bay there are very important areas for reproduction of some fish species, first of all for sea bass (Dicentrarchus labrax).

6. Synthesis of the Pollution Effects in the Project Areas

According the available data and observations, the pollution effects by uncontrolled and increased urban wastewater discharges into the marine environment can provide negative consequences both at the environmental level and to the institutional and economic ones.

A list of potential problems is put forward in the following:

- **endangered marine ecosystems and habitats**, in medium and infralittoral level (particularly Shengjini-Lezha area, Porto Romano bay and Saranda bay);
- **endangered coastal ecosystems**: sand dunes, delta rivers (particularly Drini-Lezha), alluvial and wet forests, lagoons (Kune and Vaini) and coastal lakes (Kenalla);
- **risks and adverse impacts on biodiversity**, and some of the major adverse impacts have been: habitat loss and fragmentation, damage (Porto Romano bay, Shengjini and Saranda bay) and degradation (Kenalla lake) of habitats and ecosystems, loss of species or the threat of their extinction etc.;
- **reduction of the *Posidonia oceanica*** meadows populations, particularly in the Shengjini- Lezha and Saranda-Ksamili area, but also in the Porto Romano and Lalzi bay;
- **development of some algae populations** (*Ulva and Enteromorpha*), particularly in Saranda bay, Shengjini bay and Porto Romano bay;
- observation of some ***eutrophication*** in the Saranda bay, Shengjini area and Kenalla lake;
- **probability to affect reproduction of the fish species** (*e.g. sea bass*) in the marine ecosystems of Shengjini bay (particularly northern part-Rana and hedhun), in Porto Romano and Lalzi bay and near the Saranda and Ksamili bay, etc.;
- negative consequences **on the eco-tourism development;**
- **delay** for the implementation of the **Coastal Zone Integrated Management and of the economic development;**
- difficulties in **implementing institutional strengthening measures** in order to implement the sustainability and biodiversity maintenance policies.