PROJECT EXECUTIVE SUMMARY
GEF COUNCIL WORK PROGRAM SUBMISSION

WORLD BANK PROJECT ID: GE-P075035

COUNTRY: People's Republic of China

PROJECT TITLE: Hai Basin Integrated Water and Environment Management

GEF IMPLEMENTING AGENCY: World Bank

OTHER EXECUTING AGENCY/AGENCIES:

Ministry of Water Resources (MWR); State Environmental Protection Administration (SEPA); Municipalities of Beijing and Tianjin; Province of Hebei

DURATION: 5 years

GEF FOCAL AREA: International Waters

GEF OPERATIONAL PROGRAM:

OP 10 (Contaminant-Based Program)

GEF STRATEGIC PRIORITY: IW 3 – Innovative demonstration of ways to reduce contamination from land-based activities and to address water scarcity.

ESTIMATED STARTING DATE: July 2004

IA FEE: US$ 1,629,000

FINANCING PLAN (IN US$):

GEF PROJECT/COMPONENT	
Project	17,000,000
PDF-A	n/a
PDF-B	350,000
PDF-C	n/a
Sub-total GEF:	**17,350, 000**
COFINANCING	
Government	72,141,800
World Bank	40,850,000
Subtotal Cofinancing	**112,991,800**
TOTAL PROJECT FINANCING:	**130,341,800**
FINANCING FOR ASSOCIATED ACTIVITIES	
Water Conservation	185,670,000
2nd Tianjin Urban Env.	21,280,000
TOTAL PARALLEL FINANCING:	**206,950,000**

CONTRIBUTION TO KEY TARGETS OF THE BUSINESS PLAN:

Additional priority demonstration project.

RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT:

Mr. Yang Jinlin, Ministry of Finance, former GEF Operational Focal Point for China, July 16, 2002

Approval on behalf of the World Bank: This proposal has been prepared in accordance with GEF policies and procedures and meets the standards of the GEF Project Review Criteria for Work Program inclusion.

for

J. Warren Evans, GEF Executive Coordinator,
The World Bank, October 6, 2003

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1. Project Summary

Rationale

The Hai River discharges into the Bohai Sea which adjoins the Yellow Sea. Both seas contain globally important ecological resources that provide significant fishery benefits to China, North and South Korea and Japan. The Hai River is also a major source of irrigation and drinking water for tens of millions of people who live in its basin. However, the river and its tributaries are severely polluted (most above Class V, the worst category), and the basin's groundwater resources are in some cases polluted and being rapidly depleted. Addressing the river basin's twin problems of water pollution and depletion is critical to the health and well-being of its inhabitants and to the environmental sustainability of the Bohai and Yellow Seas and the livelihoods of the many people who depend on their natural resources. One of the major barriers to tackling these problems is the lack of sectorally and institutionally integrated actions to address them.

Objectives

The Project's overall objective is to catalyze an integrated approach to water resource management and pollution control in the Hai River Basin in order to improve the Bohai Sea and Yellow Sea environments. Specifically, the Project will (i) improve integrated water and environment planning and management in the Hai Basin, (ii) promote institutionally-coordinated and effective local, municipal/provincial, and basin-wide water and environment planning and management, (iii) enhance local capacity in water and environment knowledge management and implementation, and (iv) reduce wastewater discharges from small cities along the rim of the Bohai Sea. The Project is intended to demonstrate new technologies and management approaches and to apply the lessons learned throughout the Hai Basin and in other basins boarding the Bohai and Yellow Seas. The Project will also complement and strengthen two related and on-going World Bank-financed water and environmental operations in the Hai Basin: the Second Tianjin Urban Environment and Development Project (TUDEP2 - FY03) and the Water Conservation Project (WCP - FY01).

Outputs

The Project will support the development of both top-down and bottom-up mechanisms for integrated water and environment management in the Hai Basin, based, to the extent possible, on existing institutional mechanisms. The Project will also promote the development of new horizontal coordination mechanisms at all levels that will adopt practical and pragmatic methods to overcome current institutional barriers to integrated water and environment management. The key innovative aspect of the Project is its maximization of both horizontal and vertical integration. Horizontal integration includes cross-sectoral cooperation and coordination of actions between water resources and environmental protection ministries/bureaus, as well as other key water-related institutions, including agriculture and construction ministries/bureaus. Vertical integration includes direct linking and constant interaction between the Central Government and Hai Basin institutions and the smaller jurisdictions of the ZhangWeiNan sub-basin, Tianjin municipality, and Beijing/Hebei counties. Parallel demonstration projects will test and demonstrate high priority collaborative actions between these different levels and the key institutions that are clearly needed throughout the basin to promote integrated water resource management and more effective control of land-based pollution.

Activities and outputs oriented towards producing direct financial and local benefits are described in the GEF Project Brief and Annex B, Project logical Framework, at the end of this note. The specific Project outputs, all interrelated and listed according to Project components, will be:

(i) Integrated Water and Environment Management (IWEM)

- Integrated Water and Environmental Management Plans (IWEMPs) for 10 counties in Beijing municipality and Hebei province and for Tianjin municipality, and follow-up implementation activities.
- Strategic Studies of policy, legal and institutional issues; environmental water needs; and of water quantity and pollution management at the central and Hai Basin levels.

- Strategic Action Plans (SAP) for the ZhangWeiNan sub-basin and Hai Basin.
- Demonstration projects on pollution control, administration of water rights and well permits, and "real" water savings.

(ii) Knowledge Management (KM)

- Establishment of a Water Knowledge Management system for the Hai Basin.
- Establishment of a Evapotranspiration (ET) Management system.

(iii) Tianjin Coastal Wastewater Management

- Technical support to Tianjin coastal wastewater management.

(iv) Project Management, Monitoring and Evaluation, and Training

- Established and improved existing water and environmental coordinating mechanisms at the county, Tianjin and Beijing municipal, and basin levels.
- Improved operational efficiency of water and environment programs.

Activities

The Project's four components comprise incremental activities proposed for co-financing by the GEF that would: (i) promote sustainable and Integrated Water and Environment Management; (ii) establish a comprehensive water knowledge management system; (iii) improve the Tianjin Coastal Wastewater Management; and (iv) advance general project management, monitoring and evaluation, and training efforts in the sector. See Annex A for the Incremental Cost Analysis.

Component 1: Integrated Water and Environment Management .

The IWEM component is divided into 3 subcomponents: (a) Strategic Studies at the central and Hai Basin levels; (b) integrated water and environment management planning; and (c) demonstration projects. All three of these subcomponents are very closely interrelated. The strategic studies would support and provide guidance to IWEMP and to the demonstration projects. The demonstration projects would provide important practical input into the IWEMPs. There would be constant interaction between these subcomponents to ensure that they are all working together in an integrated manner.

Strategic Studies

The seven strategic studies focus on four primary areas of concern at the Hai Basin level -- policy, legal and institutional issues; environmental needs for water, including the Bohai-Hai linkages; water quantity management; and pollution management. These will provide both the substantive framework for the entire Project as well as guidance for the IWEMPs. The time frame for the strategic studies allows both for horizontal linkages between the studies and with the IWEMP planning process.

Integrated Water and Environment Management Planning

The IWEMP subcomponent is the core of the Project. It would provide an example of the methods and benefits of this approach to China and to the receiving environment of the Bohai Sea. The subcomponent will provide the context within law, policy, institutional arrangements, and operational practices, for the development of practical approaches to IWEM at the basin, sub-basin, and county levels. The IWEM planning process for selected counties in Beijing and Hebei, and for Tianjin municipality would utilize the outputs of the strategic studies as a basis for developing specific IWEMPs for their respective jurisdictions. The demonstration projects (see below) would provide examples of how, in practice, specific aspects of the IWEMPs can be implemented. This subcomponent would be carried out in 2 phases, the first phase would take about 2 years and would involve the preparation of the plans and the second phase would take about 3 years and would include initial implementation of the IWEMPs. The main purpose of the subcomponent would be to improve the capacity of local governments and water and environment management entities to carry out IWEM, and to achieve specific and sustainable improvements in water and environmental outcomes.

The subcomponent would support the formulation of an IWEM Strategic Action Plan (SAP) for the selected subbasin (ZhangWeiNan). The primary focus of the ZhangWeiNan SAP would be on water pollution, but water quantity aspects will also play an important role insofar as quality and quantity management intersect in virtually all aspects of pollution management. The subcomponent would also support the preparation of IWEMPs in 5 counties in Beijing, 5 counties in Hebei and in all of Tianjin. These plans would: (a) evaluate present surface and groundwater conditions in terms of both quantity and quality; (b) establish target objectives for improvements in water quantity and quality management including the definition of monitoring indicators and monitoring and evaluation requirements for tracking improvements; (c) prepare detailed plans for reaching targets using a 10 and 15 year horizon; and (d) define a set of initial actions to be implemented during the second phase of the Project. In the second phase of the Project, the subcomponent would support implementation of actions defined in the first phase which would include activities such as preparation of feasibility studies and designs, training an capacity building, and implementation of small civil works in activities which could include installation of measuring devices and monitoring stations, onfarm irrigation system improvements, land leveling, changes in agriculture practices, groundwater recharge, wells, wastewater collection and treatment, and environmental restoration. The subcomponent would facilitate the establishment of institutional coordinating mechanisms for IWEM in the Beijing and Hebei pilot counties and in Tianjin. The intention is to help to improve, develop, and implement a set of policies, and legal, administrative and institutional instruments at the county and municipal level. A basin-wide IWEM SAP would be prepared for the entire Hai Basin during the second phase of Project implementation after the strategic studies and the county and municipal IWEMPs have been prepared, and based on lessons learned from them, with focus on capacity building and basin integrated management, on the basis of the natural characteristics of the basin, the existing Bohai Action Plan, and the 10th Five Year Plan of Water Resources Protection and Water Pollution Prevention in Hai River Basin.

Demonstration Projects

This component would finance demonstration projects that will serve as experimental units to carry out the IWEMPs. The demonstration projects will be carried out in selected counties would address: (i) effective control of wastewater discharge, (ii) pollution control, combined with environmental improvements, (iii) "real" water saving; and (iv) effective management of water rights and well permits. These are all critical areas common to all Hai Basin counties and they will provide powerful examples on how to address these complicated issues in an effective manner at the county level. As these demonstration projects progress, they will provide guidance to the counties and municipality for how to address these issues in the IWEMPs.

Component 2: Knowledge Management.

The KM component will have 2 subcomponents: (a) KM Development; and (b) Remote Sensing and Evapotranspiration (ET) management systems. These subcomponents are very interrelated and need to be prepared and implemented in a coordinated manner. KM is the technical basis through which the Project will be implemented, and all KM activities at all levels are grouped together in this component. Further, to ensure that this remains a needs-driven and not technology-driven component, significant attention will be given to the management of the component.

Knowledge Management Systems.

This sub-component would provide a service function for all users and clients within the Project and would provide hardware and software tools to help Project participants to address their specific issues. The sub-component would improve data management, common information system platforms, standardized data transfer and security protocols, decision-support requirements, data acquisition including remote sensing, and purpose-specific systems such as water use and pollution discharge permitting and tracking. KM activities will strongly support the KM needs of Project pilot counties in Beijing and Hebei, Tianjin municipality and ZhangWeiNan sub-basin. This will include hardware, software and training aspects concentrating on GIS systems, data sharing and management, monitoring, modeling, remote sensing and water and environment planning.

Establishment of Remote Sensing (RS) Evapotranspiration (ET) Management System.

To improve the conservation of water resources and the water environment, and in order to achieve a rational water balance and its sustainable management, will require a focus on ET management. ET management is the principal innovative international cutting edge approach being introduced under the Project. The key to sustainable water quantity management in the Hai Basin is to reduce present amounts of ET to sustainable levels (i.e. reducing ET throughout the basin in order to eliminate groundwater overdraft and provide more surface water for ecological purposes including enhancing outflow to the Bo Hai Sea), and then, in the future, to manage ET within the basin to remain at these sustainable amounts. Many of the Project activities need to be solidly based on the ET management concepts including: (i) high-efficiency water utilization and "real" water savings, (ii) administration of water rights and well permits, and (iii) water quantity management within the IWEMPs in Tianjin and in the Beijing and Hebei counties.

Component 3: Tianjin Coastal Wastewater Management.

The component would assist Tianjin address a set of critical water pollution control issues in the coastal area, particularly for activities closely related to the TUDEP2, which directly provides an additional US$98.25 through associated parallel financing to this component. A *Coastal Wastewater Management Study* will cover institutional, financial, and technical studies for wastewater management programs. The *Dagu Technical Assistance* activity would assist the TUDEP2 on technical aspects related to the renovation and remediation of the 83 km-long Dagu Canal system which has served as the main wastewater canal for Tianjin City for four decades and which discharges directly into the Bohai Sea. The total cost for the Dagu Canal renovation is estimated at US$55.15 million, which will be financed under the TUDEP2. The *Dagu Catchment Industrial Pollution Control* program will support an industrial pollution control and pre-treatment study, and improve monitoring and enforcement of discharges into Dagu canal. Control of industrial pollution is essential for the successful renovation of Dagu canal, and the proper operation of municipal collection and treatment systems. A *Small Cities Financial Incentives* program will be established to assist cities in meeting their financial obligations. Instead of providing construction subsidies, the basic concept is to provide output based aide to small cities during the early years of their service agreements with wastewater treatment companies. In order to receive these subsidies, however, the small cities must demonstrate they have: i) a functional wastewater treatment plant, ii) plans to develop a comprehensive collection system network; and iii) a comprehensive industrial pollution pre-treatment program within the network collection area. TUDEP2 will provide an estimated US$43.10 million to finance small city wastewater treatment facilities associated with the incentive program.

Component 4: Project Management, Monitoring and Evaluation, and Training.

The Project management component would support coordinated and integrated actions by the Ministries/Bureaus of environmental protection and water resources at the various levels. All Project Management Offices (PMOs) would have Joint Expert Groups to assist the PMOs in coordination, review, supervision and in some cases execution of technical activities under the Project. The Central PMOs would be supported by an international expert panel with broad experience in water quality and quantity management, water and environment planning and knowledge management. The PMOs will also arrange international and domestic study tours and international and domestic training on a variety of topics related to IWEM, river basin management, knowledge management, “real” water savings and ET management, pollution control, water rights and well permits, wastewater treatment, wastewater canal clean up, wastewater reuse, ecological restoration, etc. The Project will also support PMO operations, monitoring and evaluation (for more detail see section ‘Monitoring and Evaluation’) and other Project management aspects mainly through counterpart funding.

Key Performance Indicators, assumptions, and risks

Key performance indicators are:

i. Decreased water pollution in pilot counties (tons of reduction);
ii. Reduced Groundwater overdraft in pilot counties (rate of water table lowering reduced);
iii. Reduced pollution loading to the Bohai Sea from coastal counties;

iv. Formulated Integrated Water and Environmental Management Plans (IWEMPs) for 10 selected counties in the Hai Basin and for Tianjin Municipality;
v. Produced seven Strategic Studies at central and Hai Basin levels and integrated findings into IWEMPs;
vi. Carried out four Demonstration Projects and integrated findings into IWEMPs;
vii. Formulated Strategic Action Plans (SAP) for the ZhangWeiNan subbasin and Hai River Basin;
viii. Established river reach data management system for the Hai Basin;
ix. Established a functional Evapotranspiration (ET) Management system for the Hai Basin;
x. Provided technical support to Tianjin coastal wastewater management.

Assumptions and Risks:

Bottom-up water resources management at the county and municipal level will not be replicable and will not contribute to IWEM at the basin level. (Mitigation: The Chinese Government is committed to strongly support replication of successful IWEMP).

An improved policy environment at the central level will not contribute to improved IWEM and planning (Mitigation: The Project is designed to plan and implement Project activities at grass roots level in accordance with policies and improved policies).

Improvements in KM and ET management will not contribute to better IWEM (Mitigation: The KM and ET management subcomponents have been designed to provide direct service to IWEM at the county, municipal and sub-basin levels).

Wastewater Treatment Plants will not operate as planned (Mitigation: Project will include technical assistance to ensure that adequate financial and operational aspects are addressed during the planning phase).

Counterpart funding will not be adequate and not available on time (Mitigation: Assurance will be sought prior to grant agreement negotiation, so that counterpart funding is adequate and available on time).

County and municipal governments don't support IWEMPs and their implementation, as well as new institutional coordinating mechanisms (Mitigation: Assurance will be sought prior to grant agreement negotiations, so that support for the Project and new coordinating mechanisms, from all levels of local Governments, is obtained).

Hai Basin Commission does not exercise strong ownership in KM design and improvements and does not provide necessary support to other components (Mitigation: Assurance will be sought prior to grant agreement negotiations, so that the Hai Basin Commission would provide strong support to Project activities and exercises strong ownership in KM design).

Political will does not exists to support program of Integrated Wastewater Management Measures (Mitigation: Initial steps in the Tianjin small cities and the Dagu Canal rehabilitation support that are undertaken under the 2nd Tianjin Urban Environment Project will demonstrate commitment).

Project management is not adequate and there is no cooperation between the various agencies (Mitigation: Assurance will be sought prior to grant agreement negotiations, so that the cooperation between agencies is optimal; Project preparation has been carried out with various agencies and joint management, working, and implementation groups have been established and worked well together).

2. Country Ownership

Country Eligibility

The Project has been designed to have maximum country ownership. Firstly, integrated water and environment management in the Hai Basin is a priority goal for the Chinese Government. Secondly, the activities will be carried out directly by MWR, SEPA, and lower level water resources and environmental protection bureau personnel, supported through consultancy contracts on specific tasks, as well as training, equipment, software, etc. This is a capacity building Project in integrated water and environment management. During preparation, major progress has been made in cooperation between the line agencies

and lower levels, and they are all very eager to have their capacity developed so that they can carry out these tasks in the future. Large consultancy contracts to carry out complete studies will be avoided in order to support ownership and capacity building of the line agencies to the maximum extent possible.

Country Driven-ness

The Chinese Government has placed very high priority on dealing with water quantity and quality management problems in northern China and particularly the Hai Basin. There is a strong desire on the part of the Chinese Government to break through barriers and achieve good integrated water and environment management in the Hai Basin if possible prior to the 2008 Olympics and completion of the planned South to North Water Transfer Project. The Chinese Government has recognized that to achieve IWEM in the Hai Basin will be difficult and that there is a need for international expertise and knowledge. To this end, MWR, SEPA and MOF have strongly requested World Bank assistance in solving their major water quantity and water quality management problems in recognition of the Bank's broad international knowledge and convening power in these areas. MWR, SEPA and MOF proposed that the Bank seek GEF assistance and that the Bank be the Implementing Agency for the grant.

3. GEF Program & Policy Conformity

Project Design

The proposed Project falls under the GEF International Waters Focal Area, and specifically under Operational Program Number 10: Contaminant-Based Program. The Project will contribute to the Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-based Activities. One of the Chinese leaders in the national response to the GPA is actively involved in the preparation of this Project. The Project directly responds to the needs of the GPA by seeking to reduce pollutant loadings to the Bohai Sea through integrated water and environment management. The Bohai Sea is a semi-enclosed sea with globally important ecological resources that provide significant fishery benefits to China, North and South Korea, and Japan. The GEF Operational Program objective of the Project is to improve water resources management and reduce land-based sources of pollution to the coastal and marine environment of the Bohai Sea. Furthermore the Project would also consider the need for environmental flows in rivers, flood plains, wetlands, and into coastal and estuary waters.

The integrated water resource management framework that will be developed by the Project will promote better understanding of important surface-subsurface and water quantity-quality interactions, and facilitate important new management approaches. Consistent with paragraph 10.5 of OP 10, the Project will "play a catalytic role in demonstrating ways to overcome barriers to the adoption of best practices limiting contamination of international waters." OP 10 is also the only International Waters program which does not require the Project to be tied to a multi-country collaborative effort. The global benefits are the improvements of the Bohai Sea coastal and marine environment, and the demonstration-dissemination-replication nation-wide and region-wide of compliance with the GPA. Close cooperation with on-going GEF-financed efforts, such as the Yellow Sea Large Marine Ecosystem (YSLME) Project and the Partnerships for the Environmental Protection and Management of Asian Seas (PEMSEA) / Bohai Sea Project, would be maintained during implementation. During Project preparation, linkages have already been established between the different project management offices, and periodic interactions will take place during implementation. The long-term objective of the former Project is ecosystem-based, by supporting environmentally-sustainable management and use of the Yellow Sea. The proposed Project will contribute to YSLME Project's long-term objective and to PEMSEA's objective to control land-based sources of pollution of the Bo Hai Sea and to establish inter-jurisdiction coordinating mechanisms to address environmental issues in the Bo Hai Sea.

Sustainability (including Financial Sustainability)

Counties and municipalities participating in the Project will establish institutional mechanisms to coordinate across sectors to prepare and implement IWEMPs. Implementation of the IWEMPs will continue after Project

completion and the IWEMPs will include financing plans for their implementation. Successful preparation and initial implementation of IWEMPs under the Project with sound institutional mechanisms will be a powerful incentive for sustainability and also for replicability in other counties and municipalities in the basin and throughout China. Successful implementation of KM systems including data sharing mechanisms and particularly the coding and river reach file systems under the Project will be adopted by MWR and SEPA and utilized throughout the basin and elsewhere in China. Having Government budgeting for Project activities including KM and ET management through counterpart funding will help to ensure their sustainable funding after Project completion.

Investments in wastewater treatment for secondary towns under the Project will be financed through a combination of self-financing, IBRD loans, and GEF grants (the terms and conditions of the GEF grant will be determined). Financial management and operational development plans are a condition for financing and will be monitored during Project implementation.

The Chinese government has provided assurances about the priority nature of this Project and their commitment to ensure adequate government support including financial resources for sustainability after the Project is completed of the successful Project actions.

Replicability

The Project is designed to be highly replicable. The development of demonstration projects and IWEMPs at the county level provides an excellent opportunity for replicability because first, the water and environment issues in most of the Hai Basin counties are very similar to the Project pilot counties and second, the governmental set up in all Chinese counties is highly uniform. Successful demonstration projects and IWEMPs will therefore be very replicable. The Chinese government has provided assurances that they will take full advantage of successful results of the Project and promote broad replication. The Project will include a good deal of interaction between the Project pilot counties in the form of study tours and workshops to the different Project counties so that they can learn from each other. Once successful experiences have been achieved other counties form the Hai Basin and from elsewhere in China will be invited to visit and to learn. Adequate financial resources have been including in domestic training and study tours to cover these costs. At the Basin level, the experiences learned will be highly replicable to other China basins (such as the Liao) with similar water scarcity and water pollution issues. In addition the practical integrated water and environment approaches implemented in the Project address problems of water scarcity and pollution that are common in many parts of the world. Therefore the potential for replicability is very large.

Stakeholder Involvement

During the initial phase of Project implementation, IWEMPs for about 10 counties, the Tianjin Municipality, and a key subbasin (ZhangWeiNan) will be prepared, which will include consultation with these stakeholders through surveys and working sessions to ensure their adequate involvement and input. The IWEMPs will be designed to take into account all the different water uses and the entire range of threats to water quality including point and diffuse pollution sources, which will be determined through data collection and extensive stakeholder participation. The IWEMPs will also include stakeholder participation to ensure that alternative solutions are evaluated in terms of economic, environmental and social considerations, taking maximum advantage of stakeholder knowledge ideas, as well as building in stakeholder ownership. IWEMPs will have involvement by existing political/administrative entities (townships, counties, prefectures, municipalities, provinces, ministries) including their respective technical/administrative bureaus (water, environmental protection, agriculture, construction, etc.) because these are the entities with direct line responsibility for management. Participation of water users and polluters in water resources management will also be emphasized. Water User associations will play an important role.

The IWEMPs and demonstration projects will include a significant amount of capacity building for farmers. The ET management, “real” water savings and groundwater management aspects will include comparisons of irrigation/agriculture/onfarm management practices by different farmers, and those with better practices will be held up as examples to those with poor practices. There will also be a considerable amount of awareness raising of farmers and other water users in regard to the sharing of limited water resources and the need to use them in a sustainable manner in terms of both quantity and quality.

During Project preparation, a detailed consultation process was undertaken in two of the Project pilot counties that are representative of typical plain area and mountain area counties. This consultation involved identification of water resources, water environment, agriculture and income aspects. A specific problems analysis of water and environment conditions was undertaken in these counties and potential solutions were discussed with stakeholders. This consultation and problems analysis is illustrative of what will be done in each IWEMP county during the initial stages of IWEMP preparation.

The Chinese Government has provided assurances that wide stakeholder involvement will be promoted under particularly the IWEMP and Demonstration Projects sub-components. The TORs being prepared for these activities specifically address detailed needs for stakeholder involvement and adequate resources have been included in the IWEMP and Demonstration Projects budgets to cover these costs.

Monitoring and Evaluation

Monitoring and evaluation of Project implementation will be a responsibility of the PMOs at the various levels. Annual information relative to Project implementation will be collected and evaluated by the PMOs and consolidated into an annual report. The project management information system will be used for managing and interchanging data on monitoring and evaluation. The international Expert Panel and semi-annual Bank supervision missions will also play an important role in monitoring evaluating Project implementation, as well as making recommendations for improvements.

Each IWEMP and demonstration project will include a monitoring and evaluation component that will specifically address the implementation and effectiveness of the IWEMPs and demonstration projects. The monitoring and evaluation plans for these activities will be prepared during the first phase of Project implementation and will identify monitoring sites, parameters and targets. IWEMPs and demonstration projects will include baseline surveys/inventories of surface and groundwater quantity and quality conditions, uses and trends and establish specific objectives, timelines and indicators for IWEMP and demonstration Project implementation both during the life of the Hai Basin Project and beyond.

4. Financing Modality and Cost Effectiveness

The total cost of the Project is approximately US$ 129.99 million. The total Project costs include: (i) US$ 98.25 million attributable to the Dagu Canal Rehabilitation and Suburban Sewerage components of TUDEP2 (US$40.85 million IBRD loan and US$57.4 million from the Chinese government); and (ii) US$32.74 million of direct Project financing (GEF co-financing of US$17.00 million and US$14.74 million from the Chinese government).

Co-financing Sources

Name of Co-financier (source)	Classification	Type	Amount (US$)	Status*
Government of China	Local	Cash and In-Kind Support	14.74 million	To be committed at Negotiations (?)
Government of China	Local	Cash and In-Kind Support	57.40 million	Already committed under TUDEP2
IBRD	Multilateral	Cash	40.85 million	Already committed under TUDEP2
Sub-Total Co-financing			112.99 million	

* Reflect the status of discussion with co-financiers. If there are any letters with expressions of interest or commitment, please attach them.

5. Institutional Coordination & Support

Core Commitments & Linkages

The proposed Project is consistent with the World Bank's Country Assistance Strategy (CAS) for China. The sector-related goal is the sustainable development and management of water and other natural resources. The Project is consistent with several aspects of the Strategy, including environmental protection, strengthening of institutions and tools for improved environmental management, and financing of environment-related investments that will produce rapid benefits.

The executing agencies will be MOF, MWR, and SEPA at the central level, and Beijing and Tianjin Municipalities and Hebei Province at the provincial level.

A Project Coordinating Committee led by MOF and with participation from MWR, SEPA, Beijing, Hebei and Tianjin will be responsible for coordinating the overall implementation of the Project. High-level Steering Committees headed by Vice Ministers, and Project Management Offices in MWR and SEPA will be responsible for implementing their parts of the Project in coordination with each other, and with the Project provinces/municipalities, counties and sub-basin. Leading groups and Project Management Offices will be responsible for their parts of the Project in Tianjin, Beijing, Hebei, Hai Basin Commission, ZhangWeiNan and in each of the Beijing and Hebei pilot counties, all in coordination with each other, and with the central level PMOs. All of these entities have already been formally or informally established and where informal, will be formalized before grant agreement negotiations.

During Project implementation, quarterly workshops will be held in the different IWEMP and demonstration project counties on a rotating basis. These will include participation from all the PMOs and Joint Expert Groups from the central level, the Hai Basin Commission, Tianjin, ZhangWeiNan and the Beijing and Hebei pilot counties. The purpose of these workshops will be to exchange ideas, learn from each other and listen to and discuss presentations and training on various Project aspects. In addition to other coordination and reporting requirements, these workshops will ensure good coordination and collaboration between the various Project entities.

The establishment of a Project web site according to the International Waters LEARN standards will be launched before WB Board Approval.

During Project preparation, linkages have been established with the Project management offices of the related UNDP/GEF Yellow Sea Large Marine Ecosystem (YSLME) Project and the IMO/UNDP/GEF Partnerships for the Environmental Protection and Management of Asian Seas (PEMSEA) Project. These relations will be maintained and deepened during Project implementation.

Annex A: Incremental Cost Analysis

Overview

The overall objective of the GEF alternative is to catalyze a more integrated approach to water resource management and pollution control in the Hai River Basin in order to improve the Bohai Sea environment. Specifically, the Project would: Improve integrated water and environment planning and management in the Hai Basin; Support institutional aspects related to effective local, municipal/provincial, and basin-wide water and environment planning and management; and support reduction of wastewater discharges from small cities along the rim of the Bohai Sea. Specific Project components, all interrelated include: (i) Integrated Water and Environment Management (IWEM); (ii) Knowledge Management (KM); (iii) Tianjin Coastal Wastewater Management; and (iv) Project Management, Monitoring and Evaluation, and Training. The GEF Alternative intends to achieve these outputs at a total incremental cost of US$ 129.99 million and focuses on high-priority issues for the Chinese government and international environment protection.

Broad Development Goals

The Hai Basin, home to over 117 million people and accounting for 15 percent of China's GDP, is spread over four provinces and the municipalities of Beijing and Tianjin. The area that would be covered by the Project is one of the country's most important river basins and one of the most important industrial and agricultural regions of China. Water has played a pivotal role in the development of the Basin, and sustainable development is heavily dependent on water resource management. Like many other areas in China, the Hai River Basin is facing serious water-related problems, including water pollution, water scarcity, and flooding. Over-exploitation of groundwater, estimated by some to be 9 Billion cubic meters annually, and overuse of surface water resulting in inadequate environmental flows, along with increasing groundwater and surface water pollution, are contributing to the decline and deterioration of water resources and damage to freshwater and in coastal environments in the Hai Basin. Present water use patterns in the Hai Basin are not sustainable and continued rapid economic growth is jeopardized.

The Basin discharges into the Bo Hai Sea and is a major contributor to pollutant loadings. The sea is an important eco-system and fishery resource, reflecting its role as a seasonal spawning and nursery ground for the larger and more productive Yellow Sea. However, heavy land-based pollution from urban, industrial, agricultural, and other sources in the Hai River Basin, combined with over-fishing, reduction of freshwater inflows, and habitat loss, threatens the fishery and has steadily diminished many of the Bo Hai Sea's eco-system functions.

The Chinese Government is committed to corrective action. China's 9th Five Year Plan (1995-2000) included provisions for improving water resource management in the Hai River Basin and restoring the Bo Hai Sea – notably pollution control measures. Other measures include greater efficiency in water use, water diversions from the Yellow River to the Hai Basin, and improved flood control measures. While these initiatives are vital, they address problems of immediate concern and insufficiently provide for longer-term challenges. The south north transfer of water from the Yangtze River to northern China including the Hai Basin is a more long-term solution, but would still be inadequate to meet demands without major improvements in water resources management.

Baseline Scenario

This scenario comprises previously agreed plans and initiatives of the Chinese Government to address water related problems at national and local levels. It reflects the likely situation concerning the Hai Basin and Bo Hai Sea in the absence of GEF support. There are various national programs and more detailed investment programs, generally formulated by sector management agencies and local governments, to implement the national plans. It has to be taken into account that these national plans are highly ambitious and are sometimes not fully realized. The related activities are often carried through to the next planning period and tend to be large scale investments, leaving out the medium to small scale investment level. Another important issue is the institutional fragmentation of water resource management as it involves amongst others, the following agencies: the Ministry of Water Resources (MWR), the State Environment Protection

Administration (SEPA), the Ministry of Construction (MOC) and the Ministry of Agriculture (MOA). Each agency has its own planning process, frequently leading to overlapping and/or inconsistent plans and programs.

National Plans

- *9th National Five Year Plan (1995-2000):* China's environmental improvement priorities were defined as: three rivers (Huai, Hai, and Liao), three lakes (Tai, Cao, and Dianchi Lake), two air quality issues (SO2 and acid rain), one municipality (Beijing), and one marine area (Bo Hai Sea). (Planned Investment: US$ 22.2 billion)
- *10th National Five Year Plan (2000-2005):* Emphasizes the need for sustainable management and use of water resources, especially intensifying agricultural water-saving and wastewater reuse efforts. (Planned Investment: US$ 30.5 billion)
- *China Trans-Century Green Program:* Emphasizes construction of urban environmental infrastructure. The Program has three phases, spanning 15 years. Formulated through joint efforts of SEPA, The State Development Reform Commission (SDRC), and the State Economic and Trade Commission, it is an umbrella program for all pollution control initiatives in China, including water pollution control of the Hai River Basin. (Planned Investment: component of National Five Year Plan)
- *The South-North Water Transfer Project (SNWT Project):* This proposed Project would address the serious water scarcity problems in North China, including the Hai Basin. The intention is to transfer 20 bcm water from the Yangtze River system to North China. (Planned Investment: US$ 10-15 billion)
- *Bo Hai Blue Sea Action Plan:* The plan seeks to influence urban development, the economic structure, and the adoption of clean production technologies. High priority is given to the control and prevention of land-based pollution. The intention is to invest in new and improve existing sewage treatment plants, recycling and reuse of waste, and the adoption of various "clean" technologies. (Planned Investment: US$ 7.2 billion)
- *Water Pollution Prevention Program of Hai River Basin:* The Program endeavors to ensure that all industries abide by national discharge standards and improve water quality. (Planned Investment: US$ 5.3 billion for water pollution control)
- *Hai Basin Comprehensive Management Plan:* The Plan incorporates flood control, water resource management, and soil and water conservation. (Planned Investment: US$ 1.5 billion)
- *National Irrigated Agriculture Water-Saving Program:* The Program endeavors to rehabilitate irrigation systems and improve irrigation technologies in 300 counties, identified as demonstration sites. (Planned Investment: US$5.2 billion)

Beijing Municipality

- *Plan for Sustainable Use of Water Resources in the Capital in the 21st Century (2001-2005):* It focuses on the development and protection of water resources. By 2005, Beijing Municipality plans to achieve water savings of 790 million cbm, reuse of 645 million cbm of treated wastewater, supply of 150 cbm of water from rain and flood sources, achieve groundwater balance in the city, and ensure that the water quality of the city suburbs reaches national standards. (Planned Investment: US$ 3 billion)

Tianjin Municipality

- *Hai Basin Tianjin Municipality Wastewater Treatment Project:* The Project will complete the Municipality's 1958 Sewerage and Drainage Master Plan, which designates six drainage zones, a WWTP in each zone, and separate sanitary and storm sewers. (Planned Investment: US$274 million)

Hebei Province

- The Hebei Provincial Government has outlined an ambitious environment protection plan for the province up to the year 2010 to be implemented in three phases. The plan is consistent with national environmental plans including the Trans-century Green Engineering Plan and the Hai River Pollution Control and Prevention Plan, which are mentioned above. (Planned Investment: TBD)

Related Projects financed by the World Bank and the Asian Development Bank

- Water Conservation Project
- 2nd Tianjin Urban Environment Project
- 2nd Beijing Urban Environment Project
- FY01 Hebei Urban Environment Project
- Agenda for Water Sector Strategy for North China
- Tianjin Wastewater Treatment and Water Resources Protection Project
- Coastal Resource Conservation and Environment Management Project for the Bo Hai Sea

The cumulative effect of the Government's initiatives outlined above will be considerable, particularly with regards to reduction of pollution of water resources in the Hai Basin. COD loadings from major sources in the Hai Basin are estimated to be reduced by 17 and 25 percent in 2010 and 2020, respectively, compared with the 2000 levels. However, reductions in loads will not be sufficient to improve water quality to the extent needed for public health, environmental needs, and restoration of the marine environment of the Bo Hai Sea.

Table 1: Hai Basin COD Loads from Major Pollution Sources

	1997	2000	2010	2020
Urban Industry	2,289	2,213	1,435	1,225
Urban municipal	401	488	656	713
Rural industry	1,623	1,607	1,266	858
Livestock	643	663	730	848
Rural municipal	239	254	276	292
Total COD	5,195	5,225	4,361	3,935

Baseline Scenario: 1000 tons/year (Agenda Water Sector Strategy for North China, April 2, 2001)

Global Environmental Objectives

Success in managing the Hai River Basin and restoring and protecting the environment of the Bo Hai Sea is of global importance, because the trans-boundary effects of water pollution are severe. The Bo Hai Sea and the Yellow Sea are a single large marine ecosystem and interdependent fishery. Approximately 600 million people live in the basins that drain into the Yellow Sea. Many depend on it as a source of livelihood. Damage to the Bo Hai Sea's function as a nursery area for fish and shellfish stocks damages the resource wealth of the Yellow Sea. The implications are even more widespread, for pollution of the Bo Hai Sea ultimately affects the East China Sea. The Bo Hai Sea, the Yellow Sea, and the East China Sea are connected, forming a continuous circulation system.

The deterioration of the water resources in the Hai Basin is severely impacting the quality of life of millions of people in a river basin with major population, industrial production and agriculture production. Water pollution and water scarcity impact on agricultural production and human and environmental health.

Deterioration of the environment is also hampering poverty reduction, the most seriously impacted are often the most vulnerable.

The GEF Alternative Project will assist China to significantly improve its water resource management practices. From a global perspective, this improvement would result in the following benefits:

- It would help improving the Bo Hai Sea environment, contributing thereby to maintaining fishery stocks and biodiversity of the Yellow Sea and the East China Sea more generally;
- Poverty reduction enhances social stability which, if not addressed, has national and potential international implications.
- An integrated approach to water resources management in the Hai Basin would provide a model for wider application in China;
- Success in China would encourage other developing countries to draw upon the lessons learned.

GEF Alternative

The proposed GEF Program for the Hai Basin and Bo Hai Sea will encourage a more comprehensive integrated water resource management approach than outlined under the baseline scenario. This will help give direction to and ensure that various plans of the agencies involved in the Hai Basin are coordinated and properly integrated. The central focus of the GEF alternative would be the support of the formulation of Integrated Water Resource Management Plans (IWEMPs) in pilot counties and at the sub-basin and basin levels. Attempts to improve water resources management in China have been very top down, with strong laws, policies, regulations and large investments, but with insufficient bottom up implementation at the grass roots level. The purpose of the IWEMPs is to address integrated planning and to implement practical bottom up actions that translate top down initiatives into bottom up results. The IWEMPs will include water user participation and local government ownership in the development of plans that address: (i) water quality management aspects, concentrating on point and non-point sources of pollution through the implementation of discharge controls, industrial restructuring to clean industries, wastewater treatment in small cities, industrial wastewater treatment, and agricultural and livestock production related pollution controls, (ii) reuse of treated wastewater, (iii) improvements in water use efficiencies that result in "real" water savings by reducing non-recoverable losses particularly evapo-transpiration (ET), (iv) implementation of effective water rights and well permits systems, (v) increasing water pricing combined with volumetric measurement, (vi) conjunctive use of surface run-off and groundwater, and (vii) ecological restoration.

The IWEMPs would also, where appropriate, provide revisions to laws, regulations, standards, and other factors related to water quality and water quantity management at basin and local levels. In addition, Demonstration Projects would be implemented in selected counties to deepen experience in key complicated areas including: (i) "real" water savings, (ii) administration of water rights and well permits, (iii) pollution control, and (iv) ecological restoration. Strategic Studies at the basin level would address important basin policies, programs and approaches in order to ensure adequate governmental support to the lower levels to implement to plan and implement the IWEMPs and demonstration projects. Lessons learned from the pilot counties and demonstration areas would be shared with other counties throughout the Hai Basin and elsewhere in China. An integrated approach would furthermore lead to a better understanding of important surface/subsurface and water quality interactions, and facilitate new management techniques.

Without GEF support, integrated water resource management at the county level is unlikely to be achieved because of the already mentioned difficulties in inter-jurisdictional and inter-administrative cooperation and inadequate programs to implement government policies at the grass roots level. Each agency has its own programs with generally ineffective bottom up implementation and inadequate coordination because of lack of adequate vertical and horizontal integration of activities. Water resource management involves many agencies. While the MWR has the primary responsibility for overall management of the nation's water resources, and SEPA has overall responsibility for pollution control. There are considerable overlapping jurisdiction problems between these agencies and with other ministries and agencies concerning urban water supply, water pollution control, groundwater management, and irrigated agriculture. MWR's and SEPA's management role is further limited by the increasing powers of provinces following the decentralization

process. The GEF Program would provide a powerful demonstration effect and an incentive to break through institutional barriers.

The GEF alternative has already resulted in a breakthrough during Project preparation whereby Project related cooperative mechanisms have been established between MWR and SEPA. The Project would include an integrated program to improve basin-wide measurement, monitoring, modeling, and data sharing that will greatly enhance water resources management. River reach files with a common coding system will be developed and implemented that will allow for the sharing of information that will satisfy both SEPA and MWR needs, as well as the lower-level needs at the county level. Applications will also be developed that support the needs of integrated water resources management for the different entities. These activities under the Project are referred to as Knowledge Management (KM). KM improvements are needed because an adequate system of data collection and analysis is critical to integrated water resources management. Monitoring is another serious problem in the Hai Basin. Without effective monitoring and enforcement, it is impossible to have an adequate system of water rights administration or volumetric pricing.

This is the first GEF initiative of this kind. A further global benefit, therefore, is the important demonstration effect of solving problems related to water resources through adopting a comprehensive integrated management approach for a globally important river basin. The Project would help to provide the management framework for integrated water resources management, which is indispensable for a long-term sustainable approach to water use in the Hai Basin and to reducing pollution into the Bohai Sea. Although government policy calls for an integrated framework, experience has shown that inter-jurisdictional, and inter-administrative cooperation often proves difficult. The GEF grant would provide an incentive to break through institutional barriers and intends to provide a powerful demonstration effect. The Project would help to provide international expertise to provide Chinese counterparts with a broad range of management experiences and instruments to draw upon.

The rationale for GEF involvement is that, without support, the Government tends to focus on measures that are visible and with immediate effect, thus geared towards investment in infrastructure rather than management activities and research (see baseline scenario). The Government and research institutes have limited practical experience in designing integrated water resources management instruments resulting in sustainable use of water resources and environmental protection/restoration. The international expertise that accompanies GEF Projects would provide Chinese authorities with a broad range of management experiences and instruments to draw from.

In addition to the global benefits described above, the Project would also generate significant supplementary benefits for China. The IWEMPs formulated under the Program will enable government agencies at various levels to better manage and use water resources in the Hai Basin. The improved knowledge management system, including ET management, for the Hai River Basin will help government agencies to formulate efficient and sustainable water resources policies and ensure effective enforcement of water pollution regulations and laws. These benefits are not in the baseline scenario because of inadequacy of financing and institutional capacity limitations. ET management using remote sensing is a principal innovative international cutting edge approach being introduced under the Hai Basin Project. The key to sustainable water quantity management in the Hai Basin is to reduce present amounts of ET to sustainable levels, and the Project provides a practical feasible approach for achieving this objective. Eventually reducing ET to sustainable levels will result in stabilization of groundwater systems and the long-term provision of water for environmental purposes including delivery of fresh water to the Bo Hai Sea.

The wastewater management for small cities and industries along the coastal area (component 3) will directly address GEF's Operational Program #10 by demonstrating ways to reduce land based-sources of marine pollution, in this case to the Bohai Sea. China presently pays very little attention to small cities and suburban industrial pollution, concentrating almost exclusively on pollution control in large urban areas. The Project would attempt to leverage GEF funds by supporting infrastructure investments in small cities and suburban areas financed under the World Bank-financed Tianjin Urban Environment and Development Project (TUDEP2). In addition this component will support cleanup of the Dagu Canal system which has served as the main wastewater canal for Tianjin City for four decades and which discharges directly into the Bohai Sea. China has many of these large sewerage discharge canals that need to be renovated and the Project will

provide a demonstration on technically and environmentally sound approaches for this. Success of this component will provide powerful demonstrations of how to begin to address these huge and presently largely un-addressed pollution problems.

Although the scope of the proposed GEF Program is small compared to the enormity of reducing pollution of the Bo Hai Sea, it will provide important demonstration effects. It will support technical assistance to control pollution from secondary cities, and suburban and rural areas, which account for more than half the pollution loadings entering the Bo Hai Sea. The global benefit, therefore, will be laying the groundwork for substantial reduction of pollution of the Bo Hai Sea and an improved marine environment. This, in turn, will contribute to sustainable management of the Bo Hai Sea and maintaining fish stocks and the biodiversity of the Yellow Sea and East China Sea.

Related GEF Projects

The proposed GEF Project builds upon, fills in gaps, and complements other related initiatives in the region that are supported by GEF. By contributing to improvement of the Bo Hai Sea environment, the Program addresses an important missing link in the China/GEF relationship. China is a participating state in two GEF/UNDP Projects for improvement of the Bo Hai Sea environment: "Building Partnerships for the Environmental Protection and Management of Asian Seas" (PEMSEA); and "Reducing Environmental Stress in the Yellow Sea Large Marine Ecosystem" (YSLME). The proposed GEF alternative also complements initiatives supported by other international agencies. Some of these projects are listed above.

The PEMSEA Project is designed to assist the East Asia Sea Region to collectively protect and manage the coastal and marine environment through intergovernmental and inter-sectoral partnerships. It involves ten countries in Asia, including China. A key element is to facilitate development of institutional capacity, management strategies and action plans to deal with land-based pollution. The Bo Hai Sea is identified as a sub-regional sea under stress and a pollution "hot spot". A demonstration site has been established to reduce waste discharges and to address environmental problems common to adjacent provinces and municipalities. The proposed GEF Program for the Hai Basin and Bo Hai Sea complements the PEMSEA Project in two important ways:

- It will contribute to PEMSEA's objective to control land-based sources of pollution of the Bo Hai Sea;
- It will complement PEMSEA's efforts to establish inter-jurisdiction coordinating mechanisms to address environmental issues in the Bo Hai Sea by promoting integrated water resource management in the Hai Basin.

The YSLME Project is a regional effort involving China and the Republic of Korea to formulate and implement a regional Strategic Action Program (SAP). The Democratic People's Republic of Korea has also been invited to participate in the Project, although it has so far declined formal involvement. The long-term objective of the Project is ecosystem-based, by supporting environmentally-sustainable management and use of the Yellow Sea. As mentioned earlier, the Bo Hai Sea is critical to maintaining the fish stocks and biodiversity of the Yellow Sea. The Hai, Liao, and Yellow Rivers have important effects on salinity in the western Yellow Sea. Therefore, the SAP must involve the Bo Hai Sea and the Hai River Basin. The proposed GEF alternative will contribute to YSLME Project's long-term objective and support the formulation and implementation of the SAP.

Incremental Costs

As discussed in the Baseline Scenario section above, the Government of China has plans or is in the process of implementing billions of dollars in investments that will result in improvements in water quantity and water quality conditions in the Hai Basin with consequent improvements to the Bo Hai Sea. These investments will not appreciably contribute to the Project objectives of moving towards integrated water resources management in the Hai Basin and small city and suburban wastewater treatment. For the purpose of this incremental cost analysis it was decided to only include in the Baseline Scenario those investments related to the closely-linked TUDEP2 and Water Conservation Project (WCP), that would contribute to the Project objective of integrated water and environment management. In this regard, using data from TUDEP2 and WCP, the total cost of the Baseline Scenario is US$ 206.95 million, including Government of China

expenditures of US$ 118.72 million and IBRD financing of US$ 88.23 million. (Note: The Baseline Scenario included all of WCP and only the Water Reuse and Institutional Development components of TUDEP2). For the GEF Alternative, the total cost is US$129.99 million, including US$ 72.14 million from the Chinese government (US$ 57.40 million under TUDEP2 and US$14.74 million direct), US$ 40.85 million of IBRD loans under TUDEP2, and the GEF grant of US$ 17 million. (Note: The Dagu Canal Rehabilitation and Suburban Sewerage components of TUDEP2 were included in the GEF Alternative because their successful implementation is dependent upon the GEF Project.) All of these funds would be incremental to the baseline scenario. Table 2 shows the incremental cost distribution according to Project component.

Table 2: Incremental Cost Matrix

Component	Cost Category	US$ Million	Domestic Environmental Benefit	Global Environmental Benefit
1. Integrated Water and Environment Management (IWEM)	Baseline	187.85	(i) Water conservation in irrigation agriculture and reduction in surface and groundwater overuse.	Some improvement of Bo Hai Sea marine and coastal environment and protection of fish stocks and biodiversity.
	With GEF Alternative	202.15	(i) Demonstration effect of adopting integrated water management measures to control water pollution and deal with water shortage and other related problems; (ii) Reduction of marine pollution caused by land-based sources, especially pollution from secondary towns and their associated industries (iii) Improvement of public health because of better water quality and pollution reduction; (iv) Improvement of the environment of the Hai River Basin; (v) Protection of fish stocks and biodiversity; (vi) Enhanced habitat & species protection.	Demonstration effect of adopting integrated water and environment management measures to control water pollution and deal with water shortages. Further improvement of Bo Hai Sea marine and coastal environment and greater protection of fish stocks and biodiversity.
	Increment	14.30		
2. Knowledge Management	Baseline	3.82	Improved Knowledge Management in Water Conservation and Pollution Control.	
	With GEF Alternative	10.33	Improved Integrated Knowledge Management System for the Hai Basin and improvements in the conservation of water resources and the water environment.	Demonstration effect of adopting integrated water management measures to control water pollution and deal with water shortage and other related problems.
	Increment	6.51		
3. Small Cities Wastewater Treatment Support	Baseline	0.00		
	With GEF Alternative	103.00	Improvement of the water quality of the Hai River Basin and improvement of public health because of better water quality and pollution reduction.	Reduction of marine and coastal pollution caused by land-based sources, especially pollution from secondary towns and their associated industries.
	Increment	103.00		

4. Project Management and Training	Baseline	15.28	Improved Public Sector capacity for water conservation and pollution control.	
	With GEF Alternative	21.46	Increased public sector capacity for Integrated Water and Environmental Management and improved institutional arrangement for integrated water resource planning and management.	
	Increment	6.18		
TOTAL	**Baseline**		**206.95**	
	With GEF Alternative		**336.94**	
	Increment		**129.99**	

Annex B: Project Logical Framework

Hierarchy of Objectives	Key Performance Indicators	Data Collection Strategy	Critical Assumptions
Sector-related CAS Goal:	**Sector Indicators:**	**Sector/ country reports:**	**(from Goal to Bank Mission)**
Sustainable development and management of water and other natural resources			Sustainable management will reduce poverty
GEF Operational Program:	**Outcome / Impact Indicators:**		
Improve integrated water and environmental management in terms of water quantity and water quality in the Hai Basin and reduce land-based sources of pollution to the coastal and marine environment of the Bohai Sea	• Decrease water pollution in pilot counties • Reduce Groundwater overdraft in pilot counties • Reduced pollution loading to the Bohai Sea from coastal counties	• Annual monitoring and evaluation reports	Improvements in water and environmental planning and management will result in sustainable management of water resources
Global Objective:	**Outcome / Impact Indicators:**	**Project reports:**	**(from Objective to Goal)**
Catalyze a more integrated approach to water resources management and pollution control in the Hai Basin in order to improve the Bohai Sea environment	• Improved cooperation and integration of WRM and pollution control activities at the county level with support from upper levels (prefectures, provinces, HRBC, ZhangWeiNan, MWR and SEPA) • Adoption of improved WRM and pollution control approaches at the county level with support from upper levels (prefectures, provinces, HRBC, ZhangWeiNan, MWR and SEPA) including ET management, river reach data sharing, KM applications, water rights and discharge control administrative systems, real water savings, pollution reduction • Improved small city wastewater management and discharge canal cleanup activities	• Annual monitoring and evaluation reports	Improvements in water and environmental planning and management will result in sustainable management of water resources

Output from each Component:	Output Indicators:	Project reports:	(from Outputs to Objective)
1. Integrated Water and Environment Management (IWEM) • IWEMPs for 10 counties and the Tianjin Municipality • Improved institutional coordinating mechanisms for IWEM created • Strategic studies conducted: 1. Policy and legal framework and institutional arrangements; 2. Bohai Sea Linkage; 3. Countermeasures for the Protection and Measurement of the Water Ecological System 4. Water Savings 5. Water Rights and Well Permits, and Sustainable Groundwater exploitation; 6. Wastewater Reuse 7. Water Pollution and planning. • SAP for Hai Basin and for ZhangWeiNan subbasin • Demonstration Projects carried out: 1. Real Water Savings 2. Management of Water Rights and Well Permits 3. Control of Wastewater Discharge 4. Pollution Control and Water Environmental Improvements • Policies, mechanisms and instruments	• Prepared and initial implementation has started • Established and functional • Prepared and findings integrated into IWEMPs • Prepared, distributed and initial implementation has started • Prepared and findings integrated into IWEMPs • Defined and implemented	• Semi-annual reports on physical and financial progress • Annual monitoring and evaluation reports • Bank/GEF supervision mission reports	•Bottom-up water resources management at the county, subbasin and municipal level will be replicable and contribute to IWEM at the basin level •An improved policy environment at the central level will contribute to improved IWEM and planning
2. Knowledge Management • Development Integrated Water Resource – Water Quality Information Management System • Development Application Systems for the former • Develop a functional ET Management System • Create Mechanisms for the Continuation of Systems after the Projects	• Created and implemented • Established and functional • Established, tested and functional • Working Groups in existing agencies have been trained and use technology	• Semi-annual reports on physical and financial progress • Annual monitoring and evaluation reports • Bank/GEF supervision mission reports	•Improvements in KM and ET management will contribute to improved IWEM

finalization			
3. Tianjin Coastal Wastewater Management • Provide TA for the Renovation and Remediation of the Dagu Canal • Dagu Catchment Industrial Pollution Control • Binhai Wastewater Management Study • Small Cities Financial Incentives	• Provided and carried out • Carried out and integrated into IWEMP • Carried out and integrated into IWEMP • Incentive mechanism tested	• Semi-annual reports on physical and financial progress • Annual monitoring and evaluation reports • Bank/GEF supervision mission reports	• Wastewater Treatment Plants will operate as planned
4. Project Management, Monitoring and Evaluation, and Training • Joint Expert Groups • Conduct Training, Workshops and Study Tours • Monitoring and Evaluation, specifically of IWEMPs and Demonstration Projects	• Set up and functional • Carried out • Adequate System in Place	• Semi-annual reports on physical and financial progress • Annual monitoring and evaluation reports • Bank/GEF supervision mission reports	• An improved policy environment at the central level will contribute to improved IWEM • Project management setup can guide water and environmental planning and management in the Basin
Hierarchy of Objectives	**Key Performance Indicators**	**Data Collection Strategy**	**Critical Assumptions**
Project Components / Sub-components:	**Inputs: (budget for each component)**	**Project reports:**	**(from Components to Outputs)**
1. Integrated Water and Environment Management (IWEM)	• Support formulation of County Integrated Water and Environmental Plans (IWEMPs) • Support preparation of pre-investment studies and implementation of some planned actions • Support establishment of institutional coordinating mechanisms for IWEM • Support formulation of SAP for ZhangWeiNan subbasin • Support formulation of SAP for Tianjin Municipality (Total budget: US$ 14.30 million)	• Semi-annual reports on physical and financial progress • Annual monitoring and evaluation reports	• Counterpart funding will be adequate and on time • County and municipal governments strongly support IWEMPs and their implementation as well as new institutional coordinating mechanisms

2. Knowledge Management	• Support strategic planning and technical investigations at the basin level through improved data collections, GIS, river reach data systems, river basin models, ET management and other KM applications • Support formulation of County IWEMPs through improved data collections, GIS, river reach data systems, models, ET management, and other KM applications (Total budget: US$ 6.51 million)	• Semi-annual reports on physical and financial progress • Annual monitoring and evaluation reports	• Hai Basin Commission will exercise strong ownership in knowledge management design and improvements and provide necessary support to other components
3. Tianjin Coastal Wastewater Management	• Support establishment of institutional coordinating mechanisms for IWEM (Construction Commission, Environmental Protection Bureau, Water Bureau) • Support formulation of a Municipal IWEMP • Support preparation of pre-investment studies and implementation of some planned actions • Support the rehabilitation of the Dagu Canal • Support small city wastewater management (Total budget: US$ 103.00 million)	• Semi-annual reports on physical and financial progress • Annual monitoring and evaluation reports	• Political will exists to support program of Integrated Wastewater Management Measures
4. Project Management, Monitoring and Evaluation, and Training	• Support the development of policy, legal and administrative mechanisms and instruments for improving IWEM • Support Project Management, Monitoring and Evaluation • Provide training (Total budget: US$ 6.18 million)	• Semi-annual reports on physical and financial progress • Annual monitoring and evaluation reports	• Project management at all levels will be adequate and involve good cooperation between the various agencies

Annex C

(a1) Bank Task Team's Responses to GEF Secretariat Comments at Concept Agreement Review.

The full proposal should present a detailed program, including what sustainability mechanisms will be promoted, how, where and how long will they be experimented and demonstrated.

The key to sustainability is ownership. The Project has been designed so that the coastal wastewater systems, KM/ET systems, IWEMPs and demonstration projects will be seen and adopted as integral parts of the government programs at the different levels. See "sustainability" section above and in Project Brief.

The Project Brief will include specific activities and resources aimed at facilitating wide replication.

The Project has been designed to ensure maximum replicability. The problems being addressed are typical of most areas in northern China. The practical feasible approaches being promoted in the Project along with the strong government commitment to solve these problems and replicate successes provide a strong basis for replicability. See "replicability" section above and in Project Brief.

Full project proposal will detail how stakeholder involvement will be achieved and in particular confirm the cross-sectoral nature of water management units to be established under the Project.

Cross-sectoral management units at the different levels along with the joint expert groups are designed to promote integrated participation of the various sectors. Stakeholder and particularly water user participation as well as a large amount of training of both Project staff and water users will be a very important part of the success of the IWEMPs and demonstration projects. Much attention has been given to these issues during Project preparation. See "stakeholder" involvement section above and in Project Brief.

For major demonstrations the Project should include the definition of the background environmental status (water quality, depth of groundwater, etc.) and the application of processes learned in other on-going GEF Projects in the region and from other GPA related initiatives should be discussed and if necessary incorporated.

See "monitoring and evaluation" section above and in Project Brief. Linkages have been established with the Bohai Sea Project of the Partnerships for the Environmental Protection and Management of Asian Seas (PEMSEA), which will be producing a study on overall requirements for reduction of land based pollution to the Bohai Sea based on environment function zones in the sea. Once this study is completed, it will be used and cross-referenced in the Bohai Sea strategic study that will be produced under the Project to specifically address Hai Basin pollution contributions to the Bohai Sea and interrelationships with Project activities. The Project will directly contribute to the objectives of PEMSEA's Bohai Sea initiative by addressing land based sources of pollution from the Hai Basin to the Bohai Sea. The other GPA Project similar to the Hai Basin Project is the Rio Sao Francisco Project in Brazil. Both projects deal with interjurisdictional coordination between provincial government units and include coordinating mechanisms. IWLearn will provide a good means for cross referencing activities on the two projects as they progress.

(a2) Bank Task Team's Responses to GEF Secretariat Comments at Work Program Submission.

Provide a more articulate conceptual explanation of the incrementality of the GEF funding to the Project.

The incremental analysis and matrix have been revised.

Revisit and more clearly present co-financing.

Project co-financing presentation has been revised .

Mention should be made to the establishment of a Project web site designed according to IW-Learn standards.

The establishment of a Project web site according to IW-LEARN standards will be launched before WB Board Approval.

(b) Bank Task Team's Responses to GEF STAP Reviewer Comments.

If measures to address pollution in the region, such as wastewater treatment, are only applied in the most downstream parts, the resulting consequences for the environment in upstream areas might still be less advantage then anticipated. Such issues need to be addressed in the Integrated Water and Environment Management framework as need the necessity of not exceed the ecological carrying capacity for the region.

Pollution control measures will be addressed not only in the 3 Tianjin coastal counties but also in: (a) the IWEMPs in 10 pilot counties in Beijing and Hebei and in all of Tianjin municipality; (b) in the ZhangWeiNan Strategic Action Plan and demonstration projects in 3 ZhangWeiNan counties; and (c) in the overall Hai Basin Strategic Action Plan.

The demonstration sites have been chosen to address issues of effective control of wastewater discharge, pollution control combined with environmental improvements, "real" water savings (application of ET management), and effective management of water rights and well permits. As these issues are crucial for Project implementation the choice of demonstration sites to be able to demonstrate such techniques are essential.

The demonstration sites have been selected in areas where pollution control, "real" water savings, and administration of water rights and well permits are critically important issues in their respective counties. Another important criteria was strong interest and support from the county governments.

There are some references to Monitoring and Evaluation, M&E, of the Project and the project documentation is including a presentation of Key Performance Indicators that might be used in such a process. There is, however, no plan for the Monitoring and Evaluation process. Such a process needs to be initiated early on in the project process and an M&E plan needs to be incorporated in the Project documentation, including in the Project Brief.

The monitoring and evaluation write up in the executive summary and Project Brief have been improved and additional attention will be given to this issue during appraisal, grant agreement negotiations and Project implementation.

In cooperating with local stakeholders, including with farmers on the ET management and with municipal stakeholders on wastewater treatment and reuse, awareness, training and capacity building should be important issues. The documentation does not clearly describe how this critical aspect will be addressed although it clearly demonstrates the need to involve all groups. Detailed plans for such participation will need to be worked out and spelled out in the IWEM plans.
The documentation does not provide information about capacity building of different stakeholders such as water users and farmers. Such capacity is essential and would need to be ensured to secure Project sustainability.
The Project documentation does not, however, specify how such training should be organized and how the different PMOs themselves should be trained in order to ensure compatibility not only in data and methodology but also in the approach to problem-solving.

Stakeholder and particularly water user participation as well as a large amount of training of both Project staff and water users will be a very important part of the success of the IWEMPs and demonstration projects. Much attention has been given to these issues during project preparation. The

write-up in the executive summary and Project Brief has been enhanced and additional attention will be given to this issue during appraisal, grant agreement negotiations and Project implementation.

(c1) Bank Task Team's Responses to UNDP Comments at Concept Agreement Review.

Linkages should be made with the GEF-UNDP-IMO PEMSEA Programme; the proposal should more specifically refer to and coordinate with PEMSEA's Bohai Sea Pollution Hot Spot/Demonstration Site, with its obvious linkages to strengthening the environmental management of the Hai River Basin. Consultation should be done with the PEMSEA/Bohai site to identify specific strategies and mechanisms for coordination and cooperation. It should be noted that the GEF Yellow Sea LME Project does not include the Bohai Sea in its geographic coverage. Nevertheless UNDP appreciates the Bank's intentions to establish linkages between the Hai River Project and the GEF-UNDP-YSLME Project.

Close cooperation with the PEMSEA - Bohai Sea Programme will be maintained during Project implementation. Of particular relevance are the targets for pollution load reduction from land-based sources that will emerge from the plan for wastewater reduction that will be produced in the near future under the PEMSEA - Bohai Sea Programme. This information will be a key input to the Bohai Sea Strategic Study that will be prepared under the Project. The Bohai Sea Strategic Study will summarize the current status of the Bohai Sea in general, and the coastal zone contiguous to the Hai Basin, with the specific objective of determining the long-term and short-term reductions in pollutants and water fluxes from the Hai Basin to the Bohai Sea that will have meaningful environmental results. The preparation of these two specific studies will be coordinated very closely to ensure complimentarity. During Project preparation, linkages have already been established between the Project management offices and periodic interactions will take place during implementation. The Project will contribute directly to PEMSEA's objectives of (i) controlling land-based sources of pollution of the Bohai Sea and (ii) establishing coordinating mechanisms to address environmental issues in the Bohai Sea.

Interactions and exchange of information with YSLME will also be sustained during Project implementation. The long-term objective of the later project is ecosystem-based, by supporting environmentally-sustainable management and use of the Yellow Sea. The proposed Project will contribute to YSLME Project's long-term objective.

The Project can further be strengthened if it can stress that this initiative is in line with the "Sustainable Development Strategy for the Seas of East Asia", with which the World Bank is a collaborative partner. PEMSEA has also offered to assist the World Bank in promoting multi-stakeholder involvement in the Project.

The Project objectives are fully in line with PEMSEAS goals/visions of (i) protecting the life support systems of the Seas of East Asia, (ii) contributing towards the sustainable use of their renewable resources through interagency and intersectoral partnerships, and (iii) implementing strategies and action plans that ensure that the seas of East Asia can continue contributing to the well being of the people of the region. As mentioned above, cooperation will be continued during implementation.

The preliminary Project cost figures in Table 1 are confusing; the GEF total is provided as US$17 million but one can sum the figures and arrive at US$21 million or 14.5 million.

Project costs have been updated and refined. The total cost for the GEF grant remains at US$ 17 million, whereas the total Project costs are US$ 129.99 million.

(c2) Bank Task Team's Responses to UNDP Comments at Work Program Submission.

UNDP notes that there is no mention of economic instruments or financing arrangements that would entice investment in the proposed IWEM Plan. This may not have been specified in the Project summary, but it

seems to us that it is essential. Obviously, if water were priced at an appropriate level, there would be less waste/misuse of the resource. Technology aside, it is human behaviour that must change.

Finally, where can the private sector play a role? Are the systems being proposed limited to public sector investment, or is there an opportunity for a business venture. When designing the demonstration projects, it may be helpful to test the feasibility of public-private partnerships and or private sector investment.

> *The IWEMPs that will be prepared under the Project will include economic and financial analyses and year-by year financing plans with sources of financing including private sector participation where applicable. These IWEM plans will also evaluate water and discharge pricing and penalty instruments.*