

Project Name CHINA-Hai Basin Integrated Water and...  
Environment Management Project

Region East Asia and Pacific Region

Sector General water/sanitation/flood  
protection sector (50%); Irrigation &  
drainage (50%)

Project ID P075035

Implementing Agency Ministry of Water Resources  
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Environment Category C

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#### 1. Country and Sector Background

Degradation of the Bohai SeaThe Bohai Sea, located in the northwest corner of the Yellow Sea, is one of the world's most ecologically important, and stressed, bodies of water and the fishery resources are important to China, Japan, and North and South Korea. More than 40 rivers discharge into the Bohai Sea, of which the Yellow (Huang), Hai, and Liao rivers are the most significant. From an ecological perspective, the Bohai Sea is a large, shallow embayment of the Yellow Sea. The Yellow Sea, in turn, is a shallow continental sea of the Northwest Pacific Ocean. These relationships are important because of the physical and biological links between these systems. In particular, fish and shellfish stocks in the Yellow Sea are dependent on the Bohai Sea as a reproduction and nursery area. The open water environment in the Bohai Sea supports diverse marine life including invertebrates, fishes, marine mammals and birds. In the past, a major source of larvae and juveniles for the East China Seas came from the Bohai Sea, but this function has steadily diminished. Therefore, the ecological condition of the Bohai Sea is critically important for maintaining fishery stocks and biodiversity in China's northern fisheries. It is generally accepted that over-fishing, pollution, reduction of freshwater inflows and habitat loss have combined to reduce these eco-system functions. The Bohai Sea has historically been an important fishing area due to its location adjacent to major population centers, and its role as a seasonal spawning and nursery ground for the larger and more productive Yellow Sea fishery. The history of Bohai Sea fisheries is one of boom and bust scenarios, with the major impact being the introduction of motorized fishing vessels in the 1960s, and new types of fishing gear such as fine-mesh nets for prawns that also caught all kinds of juvenile

and larval fish. In 1988, prawn trawling was banned, and has been replaced now by thousands of kilometers of drift and set gill nets, which also have a negative impact on juvenile and larval fish. A major paradox of the Bohai Sea fishery is that despite its damaged condition, it is still attracting increasing numbers of fishermen due to lack of alternative employment in the region for many people. Today, the Bohai Sea is very heavily fished, with almost 90,000 registered fishing vessels in the provinces/municipalities surrounding the Sea. In contrast to the decline in the natural aquatic systems, aquaculture has grown rapidly, and the Bohai Sea and northern Yellow Sea now account for almost two-thirds of the PRC's total production. The major species cultivated are prawns, oysters, clams, mussels, cockles, abalone, and seaweed. Pollution, both from external sources and self-production, as well as diseases are increasingly affecting aquaculture production, and the threat of human disease and toxic contaminants are putting pressure on the government and the industry to clean up pollution problems. The Bohai Sea is subject to heavy land-based pollution from domestic, industrial, agricultural, and livestock sources. The Bohai Sea is subject to one-third of the wastewater and half of the pollutant loading discharged into seas bordering China. This amounts to 3 billion m<sup>3</sup> of wastewater and 700,000 tons of pollutants per year. The areas where pollutant concentrations exceed the national standards in the Bohai Sea, mainly for inorganic nitrogen and phosphorous, has been expanding and in 1997 it covered 43,000 km<sup>2</sup>, accounting for half of the total sea area. The most seriously affected areas include the estuaries and coastal shallows. Pollution has led to mass mortalities of aquaculture species and contributes to an increasing frequency of harmful algal blooms, commonly known as "red tides." In 1989 a "red tide" covering 1,300 km<sup>2</sup> formed in the Bohai Sea off the coast of Hebei; an even more massive "red tide" extending over 3,000 km<sup>2</sup> appeared in the Liaodung Gulf of the Bohai Sea in 1998. Water Pollution Surface and groundwater quality in China has been seriously degraded due to lack of effective pollution control, combined with rising population and industrial operations. Sixty-eight percent of the total river length in the north China plains is classified as polluted (i.e., unsuitable as raw water sources for drinking water), and 50% of the groundwater resource is polluted. Hai River is one of the most polluted river systems with more than 80% of the river reaches classified as polluted. Hai River discharges into the Bohai Sea and is a major contributor to its pollution loadings. The Chinese Government is beginning to address the serious water pollution problem in the Bohai Sea and the Hai Basin, both of which have been identified as priority areas in the 9th National Five Year Plan (1995-2000). SEPA has prepared the "Bo Hai Blue Sea Action Plan" and the "Water Pollution Prevention Program of Hai River Basin". Both plans include components of pollution control. The Government's efforts to control pollution has been focused on large industrial sources, with the major cities of Beijing, Tianjin, and Shijiazhuang now beginning to embark on large-scale wastewater treatment plant construction programs. Despite considerable reduction of pollution generated from these large point sources, water quality has continued to decline. This trend suggests that many other sources are contributing to water pollution. Reducing pollution from secondary towns is essential to improving water quality in the Hai Basin and the environment of the Bohai Sea. Although information on the impact on secondary towns on water quality is limited, it is estimated that - together with surrounding rural areas - they account for more than half of the total pollution generated

in the Hai Basin. However, pollution from secondary towns is largely uncontrolled. Almost none of the secondary towns has wastewater treatment facilities. Township and Village Enterprises (TVE) and other small industries located in these towns have very little pollution control infrastructure. In 2001, SEPA formulated the 10th Five Year Plan of Water Pollution Prevention and Treatment in the Hai Basin, briefly named the Hai River Plan. The Hai River Plan is based on a Program of Water Pollution Prevention in the Hai Basin approved by the State Council in March 1999. In this plan, the programmed water quality goals of some river reaches were revised, a control target index of gross amount of pollutant for 2005, COD and NH<sub>3</sub>-N were added, and some necessary water pollution treatment items were supplemented. The Hai River Plan identified that the key needs are to substantially reduce the gross amount of pollutant discharge in Hai Basin, to guarantee drinking water source areas reach standards, to address cross-provincial water quality disputes, and to establish a control system for the gross amount of NH<sub>3</sub>-N pollutant. Water Scarcity and Groundwater Mining

Water resources in China are unevenly distributed. While water resources are quite abundant in the south, water availability in the north is very limited. In the Hai Basin, water availability is only 305 m<sup>3</sup> per capita which is about 13% of the national average. A 2001 study sponsored by the World Bank, "Agenda for Water Sector Strategy for North China" estimates current economic losses from water shortages of approximately 60 billion Yuan per year in the three major river basins in North China: the Hai, Huai, and Huang (Yellow). Total abstraction of groundwater in the Hai Basin is estimated to be around 26 bcm per year, which is approximately 9 bcm more than the sustainable yield. The Government has started to take measures to address water scarcity problems, including improving irrigation efficiency and creating "real water savings," increasing the price of piped water to encourage conservation and improve the finances of public water utilities, and encouraging wastewater reuse. One of the most ambitious measures is the proposed "The South-North Water Transfer Project" (SNWT Project). This project, when completed, will transfer 20 bcm water from the Yangtze River system to North China, including the Hai Basin, at an estimated cost of around U.S. \$10-15 billion. China's leadership, in particular Premier Zhu Rongji, is making a point of emphasizing the need to combine the construction of the SNWT Project with redoubled efforts on water use efficiency, pollution clean-up and prevention, and appropriate (i.e., higher) pricing. The official slogan emerging from the high-level study session in October 2000 where it was decided to go ahead with the Eastern and Central Routes is "first save water, then transfer water; first treat pollution; then move water; first protect the environment, then use water." In order to safeguard sustainable development of the social economy in capital city of Beijing and surrounding areas, the Capital Water Resources and Sustainable Utilization Plan for 2001-2005 for the Early Part of 21st Century was approved by the State Council. The water consumption in Beijing has exceeded bearing capacity of the water resources and the ecological system due to rapid population and economic growth and the high speed of urbanization. Therefore, in view of the water ecological system, the Plan emphasized the need for coordinated attention to population, resources and the environment. The Plan aims to achieve a general balance of water resources supply and demand in terms of the water supply systems and the configuration of water resources in local region, in order to guarantee sustainable development of the social economy in Beijing and surrounding areas. The Plan will include integrated policies

such as water conservation, water recycling, utilization of rainfall and flood waters, conjunctive use of surface water and groundwater, water resources protection, integrated water resources management systems and adjustments in water pricing. Water and Environmental Management InstitutionsThe complex and interrelated nature of water pollution, water scarcity, groundwater overdraft, and flooding in the Hai Basin calls for an integrated approach to water and environmental management. An integrated approach will lead to better understanding of important surface/subsurface and water quality interactions, and facilitate new management techniques. However, integrated water and environmental management techniques are problematic because of difficulties in inter-jurisdictional and inter-administrative cooperation along several dimensions. Water and environment management involves many central-level ministries and agencies: MWR, SEPA, MOC, MOA, and others. While the MWR has the primary responsibility for overall management of the nation's water resources, there are considerable overlapping jurisdiction problems with other ministries and agencies concerning urban water supply, groundwater management, water quality, pollution control, and operation of reservoirs for hydropower. The management role of central ministries is further limited by the increasing powers of provinces following the decentralization process. According to the official government structure, local and provincial agencies have vertical technical interaction with central ministries. However, the local and provincial agencies report and depend on provincial and lower-level governments, especially in relation to administration of laws and most importantly for funding. Well-meaning principles (such as water allocation at the basin level or polluter-pays-principle) are often in conflict with the economic interests of the provinces and lower-level governments. Administrative bodies--whose financial viability depends on provincial budgets--empowered by laws to enforce regulations at the local level are often under pressure to act in the interest of local governments to the detriment of sound overall water or environmental resource management.China also has a number of River Basin Commissions (RBCs) for its major basins. While the RBCs have been established pursuant to the 1988 Water Law, they are commissions only in name, having no separate governing board or corporate status. The RBCs are agencies of MWR and perform those functions that MWR delegates to them. It is difficult for the RBCs to enforce provisions of basin plans on other sector ministries and provincial governments, and the functions they perform overlap with activities undertaken at the provincial and local level. In principle, RBCs prepare basin development and operating plans in full consultation with the provinces, sectoral ministries, and other stakeholders. In practice, there are few formal consultation mechanisms, and the main directives affecting RBC activities are received vertically from MWR.

## 2. Objectives

The overall objective 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 will reduce wastewater discharges from small cities along the rim of the Bohai Sea, improve integrated water and environment planning and management in the Hai Basin, and support institutional aspects related to effective local, municipal/provincial, and basin-wide water and environment planning and management. The project is intended to demonstrate new technologies and management approaches, with the lessons learned applied throughout the

Hai Basin and other basins boarding the Bohai and Yellow Seas. The project will also serve as a complement and link on water and environmental management issues for two on-going World Bank-financed operations in the Hai Basin: Tianjin Urban Environment Project (FY03) and the Water Conservation Project (FY01).

### 3. Rationale for Bank's Involvement

The Bank is helping the Chinese Government to develop and implement an integrated cross-sectoral approach to water and environment management. The Project would address an important missing link in efforts to improve the Bohai Sea Environment. Other GEF and Chinese initiatives are addressing the marine and coastal issues (PEMSEA and the Yellow Sea Marine Ecosystem Project). Large Chinese cities, such as Beijing and Tianjin, often with partial World Bank financing, are beginning to construct wastewater treatment systems to reduce land-based sources of pollution into the Bohai Sea. The proposed project will complement these efforts by financing pilot activities to control pollution for secondary towns and rural areas, and develop a framework for comprehensive management. More than half of the pollutant loading into the Bohai Sea comes from secondary towns and rural areas. The general approach taken will be to develop an integrated water and environmental management framework, which deals with water scarcity, groundwater mining, and water pollution. Management improvements will take place from the bottom-up with pilot counties, at the middle administrative levels through Tianjin, and from the top-down at the basin and national levels. While developing this comprehensive framework, the proposed project also finances specific pollution control measures in secondary towns to provide immediate benefits to the Bohai Sea. The Project builds upon, fills in the gaps, and links two Bank-financed projects, the WCP and TUEP, and fits into the overall framework for improving the Bohai Sea. It would also help provide the management framework for integrated water resources management in the Hai Basin, which is indispensable for a long-term, sustainable approach to rescuing the Bohai Sea. Reducing pollution into the Bohai Sea is best done within an integrated water resources framework. Although government policy calls for an integrated framework, inter-jurisdictional and inter-administrative cooperation often proves difficult in practice, and the GEF grant will provide an incentive to break through institutional barriers and provide a powerful demonstration effect. The Bank is helping to provide international expertise to provide Chinese counterparts with a broad range of management experiences and instruments to draw upon.

### 4. Description

The Project would be designed to support top-down and bottom-up aspects of integrated water and environment management in the Hai Basin taking advantage of existing institutional mechanisms to the extent possible. According to the natural characteristics of the Hai Basin, the proposed project includes five components. Namely: (a) water and environment management in Tianjin Municipality; (b) water and environment management in a key subbasin of the Hai Basin; (c) water and environment management at the county level; (d) water and environment management at the Hai Basin level; (e) institutional development at the central level. Component 1: Water and Environmental Management in Tianjin Municipality (US\$9 Million). As one of the leading urban areas in China, Tianjin has a special administrative status which makes it similar in many respects to a province. The Municipality has a total population of 10 million, but only

the 4 million people that live within the city boundaries of Tianjin have (or will have) adequate wastewater treatment. The component would finance three activities. First, the GEF grant would provide partial grant financing for 2-3 wastewater treatment plants in secondary cities in Tianjin Municipality. Most of the financing for these plants would be provided by the FY03 TUEP, which is also financing wastewater investments in the city of Tianjin. The small amount of GEF grant financing would be used as an incentive to encourage a first set of pioneer small cities to invest in wastewater treatment facilities. The Secondary Cities program is considered essential to addressing the municipality's (and the Bohai Sea's) water pollution problems. Second, the GEF grant would finance technical assistance for the remediation of the 70-km long, highly contaminated, Dagu Canal which starts in the city of Tianjin and discharges directly to the Bohai Sea. This canal has served as the main sewage canal for Tianjin for the last four decades, and is silted up with highly contaminated sediment. The FY03 TUEP will finance the remediation of the canal, including the dredging, dewatering effluent treatment, and sediment disposal. The TUEP is also financing the construction of wastewater treatment plants in Tianjin City, but it is necessary to also remove the sediment in Dagu Canal in order to reduce pollutant inflows into the Bohai Sea. Third, the component would facilitate the establishment of institutional coordinating mechanisms for integrated water and environmental management and support the formulation of a Municipal Integrated Water and Environmental Management Plan (IWEP). The IWEP would develop programs for: i) water quality management and pollution control, including: wastewater planning for secondary cities, industrial wastewater, and agricultural pollution; ii) treated wastewater reuse; and iii) groundwater management. Based on the IWEP, the component would also fund the implementation of specific management activities, and pre-investment studies for innovative projects, such as additional small city wastewater treatment plants, artificial groundwater recharge, livestock wastewater treatment, pollution prevention and industrial pretreatment technology, hazardous waste treatment and disposal, irrigation water conservation, etc. Since Tianjin is the area directly bordering the Bohai Sea in the Hai Basin, any pollution control activities will have a direct beneficial impact on coastal water quality. Component 2: Water and Environment Management in a Key Subbasin (US\$5 Million). During project preparation a subbasin of the Hai Basin will be selected for an integrated water resources utilization and water pollution prevention demonstration project. The subbasin selected should have crucial problems related to water resources and the water environment. Addressing and solving these problems will in itself improve the water utilization and water environment in the Hai Basin, and in addition will provide a demonstration for carrying out similar programs in the rest of the Basin and elsewhere in China. In accordance with the Hai River Plan mentioned above, the whole basin is divided into 9 subbasin planning zones. The selection of the subbasin to be supported in the Project will be based on whether water in subbasin reaches is used for drinking water (preference, yes), the present status of water quality in the different subbasin reaches (preference, poor water quality), the present gross amount of pollutant discharge (preference, large amounts), the control target index for gross amount of pollutant (preference, strict target), the influence of the subbasin on the downstream environment including the Bohai Sea (preference, substantial influence). With the objective of addressing key problems in the selected subbasin, an integrated program and

implementation plan will be developed for water resources utilization and pollution control, including institutional mechanisms for integrated management, industrial structural adjustments, integrated utilization of water resources, wastewater reuse, institutional development, emergency systems and ecological environment rehabilitation. Following completion of the program and implementation plan, activities will be selected for implementation under the project which will serve as a demonstration for other areas. The implementation of these activities will be carried out with the participation of the various existing institutional entities and will include the participation of several counties in the subbasin.

Component 3: Water and Environment Management at the County Level (US\$7 Million). This component would support integrated water and environment management in about 10 selected counties in Beijing Municipalities and Hebei Province. Preference would be given to counties included in the FY01 Bank-financed Water Conservation Project and where possible to counties that are located in small tertiary tributary systems or long groundwater flow units within the Hai Basin that include one or several counties. The selection of the counties should also be based on the seriousness of the water problems in the counties and on there being a reasonable hydrographic sub-zone for study purposes. The component would support preparation of an Integrated Water and Environment Plan (IWEP) to help to improve and implement help develop a set of policies, and legal, administrative and institutional instruments for county-level integrated water and environment management, including the development of institutional mechanisms for integrated management, definition of management objectives, information exchange and definition of investment needs, and surface and groundwater management including both quantity and quality aspects. The component will also develop capacity building for integrated water and environment management. Based on the IWEP, the component would also fund the implementation of specific management activities, and pre-investment studies for innovative projects, such as water saving irrigation, integrated protection and management of small river course, agriculture non-point (surface runoff) pollution control, livestock wastewater treatment, pollution prevention and industrial pretreatment technology, hazardous waste treatment and disposal, artificial groundwater recharge, etc. Experience obtained at the county level could be extended throughout the Hai Basin to develop a water resources and environmental management system from the bottom-up. Extension of the experience will be along tributaries and groundwater flow units because of the need for coordinated action in regard to shared resources.

Component 4: Water and Environment Management at the Hai Basin Level (US\$9 Million). The component will support formulation of a basin action plan with focus on capacity building and basin integrated management, on the basis of the characteristics of the basin, Bohai Action Plan and the 10th Five Plan of Water Resources Protection and Water Pollution Prevention in Hai River Basin. The component would also facilitate the establishment of institutional coordinating mechanisms for integrated water and environmental management. The component would improve basin-wide measurement, monitoring, modeling, and database management for water and environmental management (hereinafter referred to as Knowledge Management, or KM). Specific KM activities could include improving basin-wide water quality monitoring and modeling systems, and water ecological environment monitoring system for river reaches and other water bodies in the Basin, including a coastal water quality model; basin-wide network of flow monitoring stations coupled with a simulation

model for real-time reservoir management and water allocation; regional groundwater models; GIS mapping; satellite imagery for improved resources management, etc. The specific KM needs will be defined during project preparation. The component will also include studies that address major problems in Hai Basin. The studies to be included will be determined during project preparation, but could include the development of policies and strategies for: (a) integrated institutional mechanisms for water and environment management in the Hai Basin; (b) determining the water environment sustainable capacity for different reaches and water bodies; (c) determining targets for control of the gross amount of pollutants for different reaches and water bodies; (d) industrial structural adjustments; (e) integrated utilization of water and specifically how to guarantee adequate water for ecological purposes; (f) wastewater discharge licensing systems and penalization of polluters; (g) bulk water pricing; (h) countermeasures for protection and management of the water ecological system of river courses and wetlands; (i) establishing and maintaining safe drinking water quality zones; (j) evaluation and sustainable management of groundwater; (k) wastewater reuse; (l) municipal, industrial and agriculture water conservation; and (m) flood and drought management. A consolidated report on integrated water and environment management incorporating aspects of the above would also be produced. These studies will help to identify appropriate approaches for improving water and environment management in the Hai Basin and will also help to identify and prioritize management actions and investment needs that will serve as a reference for the Chinese Government and the international donor community.

Component 5: Institutional Support at the Central Level (US\$2 Million). The component would support the development of policy, and help to define legal, administrative and institutional mechanisms and instruments for integrated water and environment management. The component would provide support to MWR and SEPA to establish policy, mechanisms and instruments for improved water resources and water environmental management at the basin, provincial/municipal and county level. Examples of potential activities include policy framework of integrated management of water utilization and water pollution prevention, guidelines for water and water environment management, developing improving national standards on wastewater reuse, Reestablishment of sound data management and monitoring processes and procedures, etc.

1. Water and Environment Management in Tianjin Municipality.
2. Water and Environment Management in a key subbasin.
3. Water and Environment Management at the County Level.
4. Water and Environment Management at the Hai Basin Level.
5. Institutional Support at the Central Level.

#### 5. Financing

Total ( US\$m)

BORROWER \$15.00

IBRD

IDA

GLOBAL ENVIRONMENT FACILITY \$17.00

Total Project Cost \$32.00

#### 6. Implementation

The implementation arrangements would build upon the existing management structures for the Tianjin Urban Environment Project (TUEP) and the Water Conservation Project (WCP). A Project Leading Group would be established

consisting of high level representatives from the following agencies: ñ Ministry of Water Resources (MWR)ñ State Environmental Protection Agency (SEPA)ñ Ministry of Construction (MOC)ñ State Oceanic Administration (SOA)ñ Ministry of Agriculture (fisheries)ñ Ministry of Financeñ Beijing Municipalityñ Tianjin Municipalityñ Hebei Provinceñ Hai River Basin Commission (under the MWR)MOF will play the role of general project coordinator. Project preparation activities will be managed by an MOF-MWR-SEPA Coordination Unit. Two PMOs will be established: one in the CPMO of the Water Conservation Project of MWR; and one in the CWCP of the Foreign Economic Cooperation Office (FECO) of SEPA, respectively for routine managing and operation work. The Coordination Unit and PMOs will be responsible for central coordination and Hai Basin level activities as well as for overall coordination to the municipal/provincial and county levels. PMOs will also be established in Tianjin and Beijing Municipalities and in Hebei Province, as well as in counties involved in the Project. The World Bank will provide funds to one special account. The Coordination Unit will distribute funds to five locally administered special accounts by the PMOs in MWR, SEPA, Tianjin, Beijing and Hebei.

#### 7. Sustainability

Investments in wastewater treatment for secondary towns under the project will be financed through a combination of self-financing, loans, and GEF grants (the terms and conditions of the GEF grant will be determined during project preparation). All sewerage companies or departments will be required to repay the loans and cover O&M costs through wastewater tariffs. Financial management and operational development plans are a condition for financing and will be monitored during project implementation. Counties and municipalities participating in the project will establish institutional mechanisms to coordinate across sectors to prepare and implement Integrated Water and Environment Plans. The Hai River Basin Commission has existed since the mid-1980s, and the best financing method for maintaining the KM systems funded through the project will be identified and implemented during implementation.

#### 8. Lessons learned from past operations in the country/sector

The Bank has assisted in financing 17 water resources and irrigation projects in China and numerous water supply and sanitation projects over the last 15 years. Generally, these projects have been implemented efficiently, and time and cost overruns have not been excessive despite periods of sharp price escalation. In recent years the Bank has been supporting a institutional aspects of water and environmental management: (a) at the Basin level in the Yangtze Basin Water Resources Project, the Tarim Basin II Project, the Guanxi Urban Environment Project and the Liao Basin Environment Project; and (b) at the system level through self-financing irrigation and drainage districts and water supply and sanitation corporations in numerous projects. Key lessons from previous Bank-financed water resources projects in China are that: (a) detailed organizational and staff arrangements should be formulated and agreed before implementation; (b) counterpart funding should be committed before implementation, including the direct participation of the provincial Planning Commissions and Finance Bureaus; (c) projects should include institutional development support for the strengthening of provincial and local bureaus; (d) water and environmental management needs to have both bottom-up and top-down aspects; bottom-up activities need to have strong involvement by existing political/administrative entities (townships,

counties, prefectures, municipalities, provinces) including their respective technical/administrative bureaus (water, environmental protection, agriculture, construction, etc.) because these are the entities with direct line responsibility for management; top-down activities should be concentrated at the river-basin level and should establish the enabling policy and strategic environment for cross-sectoral and cross-administrative boundary coordination; (e) participation of water users in water resources management especially in the lower-level bottom-up aspects is crucial; and (f) data and knowledge management activities are critical to water and environment management and need to be widely shared and compatible. Experience with institutional development Project indicates that strong government support is necessary for its success, and that specialized TA during preparation and early implementation is important to help promote, teach and establish institutional reforms before full implementation begins. The 1993 World Bank Policy Paper on Water Resources Management and Chinese Government policy are compatible and emphasize the following principles: (a) water resources should be managed and developed in a comprehensive integrated manner and consider cross-sectoral issues with the goal of ensuring the sustainability of the water environment for multiple uses as an integral part of the country's economic development process; (b) water resources planning and management should be carried out considering the interrelationships between water, land and human resources with the objective of enhancing economic growth and development in an environmentally sustainable manner; (c) water is an economic resource and therefore should be managed in an economically efficient manner; (d) the river basin should be the basic unit for planning and managing water resources; (e) water users should participate directly in water resources management and development; and (f) water use should be efficient and environmentally sustainable.

#### 9. Environment Aspects (including any public consultation)

Issues : The overall objective 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 will reduce wastewater discharges from small cities along the rim of the Bohai Sea, help control groundwater mining, encourage wastewater reuse, and establish effective local, municipal/provincial, and basin-wide water management institutions. The project is intended to demonstrate new technologies and management approaches, with the lessons learned applied throughout the Hai Basin and other basins bordering the Bohai and Yellow Seas. Except for the Tianjin small city wastewater treatment plants, the Project will not include any infrastructure investment. All of the Project activities will contribute to overall environmental improvements, including reductions in pollution and improvements in water quality in water bodies including the Bohai Sea, reductions in groundwater over exploitation and improvements in monitoring, planning and water rights administration. Water and environmental management needs to 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 is also important. Information management and sharing are needed aspects of water and environment management. During the initial phase of Project implementation, IWEPs for about 10 counties, Tianjin Municipality and a key subbasin will be prepared, which will include consultation with these stakeholders through surveys and working sessions to ensure their adequate involvement and input. The TORs for these IWEPs will be prepared during Project preparation and will include requirements for consultation during IWEP preparation. Implementation of the IWEPs will also require significant participation, which will be defined in the IWEPs. The IWEPs 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. During preparation an action plan for knowledge management, and TORs for strategic planning studies, for technical assistance in the areas of policy and legal framework development and for guidelines for integrated water resources management will be prepared. These action plan and TORs will include requirements for consultation to ensure that relevant viewpoints are taken into account during the preparation of these activities during Project implementation.

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Note: This is information on an evolving project. Certain components may not be necessarily included in the final project.

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