

**GLOBAL ENVIRONMENT FACILITY  
DRAFT CONCEPT DOCUMENT FOR GEF PIPELINE  
April 6, 2001**

<b>Country</b>	China
<b>GEF Focal Area:</b>	International Waters, OP #10 Contaminant Based Operational Program
<b>Project Title:</b>	Integrated Water Resources Management around the Bo Hai Sea
<b>Requesting Agency:</b>	World Bank
<b>Country Implementing Agency:</b>	Ministry of Water Resources State Environmental Protection Agency
<b>Total Project Cost (tentative):</b>	US\$ 40.0 million
<b>Financing Plan (tentative):</b>	US\$ 20.0 million, GEF US\$ 20.0 million, Government of China (GOC)
<b>Project Duration (tentative)</b>	Five years
<b>Preparation Costs (tentative):</b>	US\$ 700,000
<b>PDF Block B Funds Requested:</b>	US\$ 350,000
<b>PDF Co-financing:</b>	US\$ 350,000 (GOC)
<b>Block A Awarded:</b>	No

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**A. BACKGROUND**

1. The Bo Hai 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. The two largest basins draining into the Bo Hai Sea are the Hai and Liao basins. The Hai Basin is the historical heartland of China, and one of the most important agricultural and industrial regions in the country. Spread over four provinces: Hebei, Henan, Shandong and Shanxi, and the municipalities of Beijing and Tianjin, the Hai Basin is home to 117 million people and accounts for 15% of China's GNP. The Hai Basin is also one of the most water-stressed basins in China and suffers from severe groundwater overdraft. The Liao Basin spans the provinces of Jilin and Liaoning, has a population of around 42 million, and is rich in natural resources, particularly oil and gas. The water resources in the Liao Basin have been badly depleted and polluted by heavy industries. Given the scope of the water resource management problems and degradation of the Bo Hai Sea, the proposed project will focus primarily on the Hai Basin, with some attention to the Liao Basin.

2. The Hai river system is composed of Chao, Yungting, Taching, Tzuya, Zhangwei, Tuhai and Majia rivers, of which, Chao, Yungting, Taching and Tzuya come together at, or just upstream of, the city Tianjin and discharges into the Bo Hai Sea. The system has a drainage area of approximately 200,000 km<sup>2</sup>, approximately 60% of which is mountainous and 40% is plains.<sup>1</sup>

3. The plains area drained by the Hai River System is flat. The rivers have low gradients and because of extensive diking are often built up above the level of the surrounding land by the sil. Flows in the rivers are variable because of seasonal variations in rainfall, with dry winters (during which many of the rivers dry up) and heavy summer rainfall. The Hai River channel itself is inadequate to carry the amount of floodwater discharged, and for centuries destructive floods have been an annual occurrence. Since 1963, the Hai Basin has been the subject of a comprehensive water-control program. On the upper courses of the tributary rivers, some 1,400 dams have been constructed, several of them of considerable size (over 1 bcm) and designed as multi-purpose flood control, hydropower, and irrigation storage reservoirs. In the plain itself, the major rivers have been embanked, and their channels cleared and canalized using massive mobilization of local labor. As a result, many of the Hai River's tributaries have been directed into new channels and given separate outlets. The Hai River thus no longer has to carry the entire flow of all these rivers during floods. These works have been integrated with large-scale construction of subsidiary drainage and irrigation works designed to reduce flooding and ameliorate droughts. A huge number of wells have also been sunk to provide supplemental irrigation.

4. China is nearing the limits of water resources development in the Hai Basin, and must now grapple with a set of complex and interrelated water management problems. Groundwater, which accounts for half of the Basin's exploitable water resources, is being mined and polluted at unsustainable rates. The consequences are manifest throughout the Basin: falling water tables, land subsidence, contaminated aquifers, and seawater intrusion. Groundwater degradation threatens public health, urban and rural water supplies, irrigated agriculture, and freshwater and marine ecosystems. The overdraft situation is particularly severe in Hebei, Beijing and Tianjin, where groundwater accounts for around two-thirds of the water used. In Beijing, the cone of depression extends over an area of 1718 km<sup>2</sup>, with annual rate of subsidence of 88 mm/yr (1980 rate). The situation is even worse in Tianjin, with the cone of depression extending 6,341 km<sup>2</sup>, and accumulated settlement in the center reaching 2.1 meters—leading to breaks in underground piping, drainage problems, and vulnerability to coastal zone surges.

5. Groundwater management is the Basin's most pressing issue—but it must be tackled in an integrated way that takes into account the surface water and water quality dimensions. The surface-subsurface interactions are important for a number of reasons. Overdraft of groundwater reduces or eliminates base flows into rivers, which are often necessary for maintaining downstream environmental conditions. Infiltration of polluted river water or seawater intrusion can adversely affect groundwater and wetland water quality.

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<sup>1</sup> The Hai Basin is also a Chinese hydrographic unit which includes the Hai river system, and a number of smaller river systems covering another 100,000 km<sup>2</sup> to the south which also drain into the Bo Hai Sea. There are a number of aquifer and canal connections between the Hai River system and the other smaller river systems, thus complicating the definition of the "Hai Basin." The geographical scope of the project will be determined during project preparation.

6. Water availability in Hai Basin is only 340m<sup>3</sup> per capita, placing the Basin among the most water scarce areas in the world on par with North African countries such as Tunisia and Algeria. Under existing management and pricing policies, the demand for water in Hai Basin (including unmet irrigation and M&I needs) is estimated at 49 billion m<sup>3</sup>/yr, while the available supply for a normal year is only 32 billion m<sup>3</sup>/yr, resulting in an imbalance of 17 bcm per year.<sup>2</sup> Even with proposed large scale water transfers from the Yangtze River and full exploitation of regional water resources, future water imbalances are projected to grow in the future. Improved water resources management including demand management and increased water use efficiency and productivity are the pressing needs in the basin.

7. Surface and groundwater quality in the Hai basin, as in the rest of China, has been seriously degraded due to lack of effective pollution control combined with increasing population, industrial output, and intensification of agriculture and livestock production. Over 80% of the river stretches in the Basin are classified as polluted (i.e., unsuitable as a raw water sources for drinking water), and rivers which pass through urban areas are essentially sewers during the dry season. Groundwater contamination of drinking water aquifers is a widespread, yet poorly understood, problem in the Hai Basin. Degradation of urban water supply aquifers can have large-scale public health impacts and destroy a valuable resource. Contamination of shallow aquifers from agricultural runoff and use of polluted irrigation water threatens the water supply source for many rural communities. There is also extensive seawater intrusion on the littoral plain of Hebei, threatening irrigation, rural, and urban water supplies. Discharge of pollutants into the Bo Hai Sea, particularly around the mouth of the Hai River near Tianjin, have resulted in large and frequent “red tide” incidents which can contaminate shellfish and poison humans that consume them. In 1989 a “red tide” covering 1,300 km<sup>2</sup> formed off the coast of Hebei; an even more massive “ride tide” extending over 3,000 km<sup>2</sup> appeared in the Liaodung Gulf of the Bo Hai Sea in 1998.

8. China is starting to address some of its water quality problems. The municipality of Beijing has recently completed an ambitious and comprehensive “Water Quality Management Plan,” which calls for full secondary treatment of wastewater by 2015. Although Beijing may be able to finance such large investments, other cities in the Hai Basin would probably not have the resources to adequately treat their wastewater in the near term. Although China has a comprehensive system of industrial pollution control regulations, effective implementation is lacking in most cases. The problem is confounded by the fact that most large polluting industries are SOEs which are not profitable and can not afford pollution control investments. Small-scale industries (TVEs), livestock operations, and agricultural runoff account for over half of the pollutant loading in the Hai Basin, yet existing regulations do not adequately address these problems.

9. Water resource management problems in the North China plain also have an important food security dimension. The Hai Basin is one of three major basins in the North China plain, the other two being the Huang (i.e., the Yellow), and Huai basins. These three basins are collectively known as the 3-H Basins, and all experience the same basic set of water resource problems. The 3-H Basins account for 67% of China’s wheat production (but only 14% of China’s rice production.) Emerging water shortages in the North China plain could potentially

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<sup>2</sup> Water balance estimates are based on the draft MWR/World Bank “3-H Basin Water Management Study” and thus are not yet finalized.

(although not necessarily) reduce wheat production and increase China's demand for grain imports. Increased imports by China could have a large impact on international grain markets.

## **B. RATIONALE FOR PROJECT**

10. The technical challenges outlined above are well-known in China, but the country is just now beginning the decades-long journey to create a modern water resources management system. The proposed project would provide a catalyst for fostering new management approaches, promoting inter-sectoral cooperation, and preparing an investment program for high priority infrastructure. The economic benefits of improving water management would be enormous, with preliminary estimates of around 6-10 billion Yuan (US\$0.75-1.25 billion) per year for groundwater and 27 billion Yuan (\$3.4 billion) per year for water quality.<sup>3</sup> Given the magnitude of the problems and the size of the Basin, the value of the project is its "demonstration" affect. Technical and management approaches which prove effective under the project can be scaled-up and expanded throughout the Basin, the North China plain, and the rest of China.

11. The Ministry of Water Resources (MWR) has initiated a National Irrigated Agriculture Water-Saving Program, and the FY01 "Water Conservation Project," which is partially financed by the World Bank, is a key effort to create "real water savings" in the North China plains. The concept of real water savings in irrigation revolves around i) reducing non-recoverable losses such as evaporation during delivery and obtaining more crop production per unit of crop evapo-transpiration (ET), and ii) ensuring that water savings is used to reduce unsustainable groundwater mining—and not to extend the area under irrigation. In Hai Basin, as well as other arid, semi-arid and semi-humid areas of China suffering from severe water resources shortage, the first set of activities are referred to as "efficiency water savings" and the second set as "resource savings." The proposed project would help establish aquifer management systems which would build upon existing efforts to conserve irrigation water.

12. Groundwater in the Hai Basin can not be managed independently of surface water or water quality. Conjunctive water management, meaning the coordinated use of both surface and ground water, is a cornerstone of modern water management. During the times of year when surface water supplies are sufficient, groundwater should not be used and, if possible, the surface water can be used to recharge the aquifer. Conversely, when surface water is scarce, groundwater reserves can be called upon. Pollution and water quality are important issues when the aquifer is used to supply drinking water. Currently, there are no (or very few) management mechanisms for aquifer protection or conjunctive use in China. The proposed project would help develop such integrated management systems.

13. Management of coastal waters of the Bo Hai Sea, known as "tidewater management" in China, is still in its infancy. Discharges from polluted rivers account for more than 80% of the pollutant loading. The Hai Basin, along with the Liao Basin in the north, including the cities and towns around the Bo Hai Sea, are the largest sources of contamination. Currently, there is a lack of institutional mechanisms and planning to prioritize efforts to reduce land-based emissions into the Bo Hai Sea. The proposed project would help establish a

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<sup>3</sup> These are preliminary estimates by MWR which cover the entire 3-H Basin, not just the Hai Basin.

management mechanism and plans to use scarce financial resources to address the most important pollution problems. Although any water savings through improved surface or groundwater management would immediately go to stem the groundwater overdraft, the proposed project would also consider the long-term environmental flows needs into coastal, estuary, and wetland areas. The aim is to gradually improve the water environment in the Bo Hai Sea by addressing the most important and tractable problems first.

14. There have been many reports on China's water sector which provide a broadly consistent diagnosis of problems and prescribe comparable broad strategies and policies. The Institute of Water Resources and Hydropower Research (IWHR) in Beijing completed two reports in 1999 which provide long-term water demand and supply projections for all of China, and present strategic options for the water sector. In 1999, the Ministry of Water Resources (MWR) and the Asian Development Bank (ADB) drafted a "China Water Policy Study." In 2001, MWR and the World Bank will complete a "Water Management Study for the Hai, Huang, and Huai Basins" (i.e., the 3-H Basins in the North China Plains) in Water Action Plan in China, which provides analysis and policy recommendations on integrated water resources management.

15. The Hai Basin is considered the priority basin in North China, and the proposed project would provide important follow-up to the 3-H Basin Study and the on-going Water Conservation Project. In particular, the 3-H Study calls for the creation of a high-level River Basin Coordinating Council which would be charged with the responsibility for determining: i) water resources allocation; ii) development of broad policies with respect to flooding and drought relief, groundwater management, and pollution control; and iii) basin planning. The Study also recommends the creation of local "Groundwater Management Units" (GMUs) which have well-defined aquifer systems. One obstacle to sound water management in China is poor sectoral cooperation at the national and provincial levels. Another institutional hurdle is a relative disconnect between national level policies and local implementation, which is a consequence of China's decentralized administrative system. The proposed project would help break through these barriers and create an integrated water resources management system.

16. In addition to institutional recommendations, the 3-H Study presents a number of structural and non-structural actions, which are summarized in the table below. The list is long and addresses many different issues. The challenge now is energize the institutions involved, and then go through a systematic prioritization process to address specific issues in the Hai Basin and its associated sub-basins. The proposed project would assist in the process by providing support for further technical investigations, facilitating strategic planning, and supporting investment studies. The prioritized and prepared investments would be financed by the national and provincial/municipal governments with possible financing from the World Bank, ADB, and others.

**Preliminary List of Action Areas in the 3-H Study**

<i>Structural</i>	<i>Non-Structural</i>
Inter-Basin Water Transfers	River Basin Councils
Municipal Wastewater Treatment	Groundwater Management Units
Treated Wastewater Reuse	Inter-Sectoral and Inter-Basin Water Reallocations
Industrial Wastewater (Pre)Treatment	Databases: Groundwater, Water Quality, Industrial Waste, etc.
Cleaner Production Technology	Water Pricing and Service Delivery Reforms
Pollution Control for Rural Industries (TVE) and Towns	Discharge and Ambient Water Quality Standards and Monitoring Programs
Livestock Pollution Control	Improved Multi-Purpose Reservoir Operations
Artificial Groundwater Recharge	Water Rights and Markets

17. Improvement of water quality in the Liao Basin has been accorded a high priority by the Chinese government. The State Environmental Protection Agency (SEPA) has identified the Liao Basin as one of the three priority basins in China for environmental protection. The World Bank is helping Liaoning Province prepare a “Liao River Basin Environment Project.” The proposed GEF project would potentially assist in upgrading basin-wide water quality management, modelling and monitoring capabilities, and support for river basin management to complement physical investments in municipal and industrial wastewater treatment.

**C. PROJECT OBJECTIVES, IMPLEMENTATION ARRANGEMENTS, AND ACTIVITIES**

18. Objectives: The primary project objective is to initiate integrated water resources management in the Hai Basin in order to reduce the economic, social, and ecological impacts associated with water scarcity and environmental degradation. A secondary objective is support on-going efforts to improve water quality management in the Liao Basin. The two management focal areas are groundwater and land-based contamination of the Bo Hai Sea.

19. With respect to ground water management, the specific objectives are:

- Formulate and implement laws, regulations, and management mechanisms at provincial and local levels on the rational exploitation, protection and management of groundwater in around 10-15 counties/cities/districts with serious groundwater problems. This could involve legally establishing groundwater management units (GMUs), establishing and enforcing sustainable yield levels, assignment of water rights and possible tradeable rights, including rural-to-urban transfers. These types of innovative legal and institutional reforms are critical to improved groundwater management.
- To popularize the concept of “real water savings,” from both a water use efficiency and an overall resource perspective.
- Promote the use of conjunctive water use, artificial groundwater recharge, and treated wastewater irrigation.

All of these activities aim to stabilize and then reverse groundwater mining, and halt the decline in groundwater quality.

20. With respect to management of coastal waters, the specific objectives are to:

- Revise, on a localized and trial basis, laws, regulations, and management mechanisms related to water quality management. This could involve establishing special “water quality management areas” which would prioritize water quality improvement actions, by identifying the most realistic and important pollution control activities (municipal, industrial, livestock, solid waste, etc.) and establishing appropriate discharge and ambient water quality standards tailored for the specific environmental objectives in the area.
- Ensure the implementation of priority actions through sustainable financing, supervision, and monitoring of municipal, industrial, livestock, solid waste, and agricultural sources of pollution. Emphasis will be placed on the development and enforcement of appropriate and financially viable standards in critical areas—this will be a key institutional change in China.

These activities aim to reduce the frequency and magnitude of “red tides” in the Bo Hai Sea, and gradually improve the water quality and ecological health of the Sea.

21. Implementation Arrangements: During project preparation, with the assistance of a GEF PDF-B grant, the implementation arrangements will be finalized. The approach for project implementation at this time (for the Hai Basin) consists of: working out of a detailed Project Implementation Plan, including compilation of detailed Task Force Report, Working Outline, Feasibility Study Report, Operational Rules of each project and tour study plan, and establishment of Project Coordination Groups, Project Management Office and Project Specialist Team etc., at each level.

22. *Project Coordination Groups:* at the central, provincial/municipal, and county/city levels would be established with the following basic membership:

- The Basin Coordination Group could consist of, among others: Ministry of Finance, State Planning Commission, Ministry of Water Resources, the State Environmental Protection Agency, Ministry of Agriculture, the Hai River Commission (a MWR Department), Song-Liao Rivers Commission, Beijing and Tianjin Municipalities, Hebei Province and, Shangdong Province and Liaoning Province.
- Members of each Provincial/Municipal Project Coordination Group could consist of, among others: Financial Department, Planning Commission, Water Resources Department/Bureau, Environmental Protection Bureaus and other departments.
- The County Government/City Government would be responsible for establishing Project Implementation Group.

23. *Implementing Departments:* This would include the Ministry of Water Resources, Water Resources Department of each province/municipality, the State Environmental

Protection Agency (SEPA), and Water Resources and Environmental Protection Bureaus for each county and city.

24. *Project Management Office and Specialist Team:* consisting of International and Domestic experts, will be established in each department undertaking the project.

25. *Stakeholder Participation and Consultations:* Consultation mechanisms, public outreach, and stakeholder representation on management committees will be key elements of the project. Non-governmental stakeholders include industry representatives, citizen advisory groups, environmental groups, and scientific and academic institutions.

26. Activities: The proposed project would finance the following set of activities (to be more precisely defined during project preparation)

27. *Institutional Development and Support for Integrated Water Resources Management.* The project will finance the establishment and associated start-up costs for the new management mechanisms. This would include international and local consultants; offices, vehicles, and equipment; public outreach program; stakeholder consultations; study tours, seminars, etc. An important goal is to create stable funding sources for these new management structures, probably through some combination of user fees and government commitment through the general budget.

28. New instruments such as floodplain zoning; transferable water rights and water banks; well driller licensing; economic regulation of water service organizations; strategic planning methodologies; public disclosure of non-compliance with environmental standards; use of revolving funds; appropriate discharge and ambient water quality standards; etc. will be introduced and analyzed for their suitability in the Hai Basin.

29. Because of the huge number of wells and farmers, bottom-up institutional mechanisms will be key to establishing a regimen of good groundwater management. Following on the experience of the Water Conservation Project, County Water Resources Management Plans focusing mainly on groundwater will be developed and implemented in selected demonstration counties in the Hai basin. At the farmer level, water user organizations will be organized within the context of the county Water Resources Management Plans.

30. *Technical Investigations and Planning.* This component would encompass a range of technical investigations such as: aquifer studies and well inventories for the GMUs; a basin-wide simulation model for real-time reservoir/water management; improvements to the hydrological and water quality monitoring systems; water use cadastres; industrial and agricultural pollutant databases, etc. The objective of the technical investigations would be to fill in information gaps necessary for the formulation of water management policies and plans. These plans could include Basin (sub-basin) development, drought and flood emergency, local groundwater management, water quality improvement, water conservation, coastal zone management, surface-subsurface interactions, instream and wetland environmental flow requirements, etc.

31. MWR has already identified a number of specific locations for groundwater management interventions which span the range of issues, such as: i) shallow aquifers in urban areas vulnerable to pollution and overdraft; ii) shallow aquifers in rural areas



experiencing overdraft and contamination from sewage irrigation and agricultural chemicals; iii) deep aquifers in rural areas with overdraft; and iv) coastal zones suffering from seawater intrusion. Much more work will be needed to characterize these aquifers, their safe yields, contaminant sources, well inventories, etc. With respect to coastal water quality management, much more investigation and planning needs to be done to identify the most important sources and prioritize pollution prevention and control techniques based on available financial resources and regulatory capacity.

32. *Pilot Demonstration Projects.* This component would finance innovative demonstration projects such as artificial groundwater recharge, livestock wastewater treatment, pollution prevention and industrial pretreatment technology, hazardous waste treatment and disposal, irrigation water conservation, etc. The objective would be to demonstrate the technical and financial viability of new water conservation and protection technologies which could then be applied throughout the Hai Basin, as well as the rest of China.

33. *Pre-Investment Studies.* These studies would follow-up on the planning and pilot projects with feasibility studies for specific investments. Types of projects could include: irrigation rehabilitation and water conservation, unaccounted for water (UFW) reduction programs in major cities, catchment projects, large-scale groundwater recharge through percolation ponds or injection wells, small-scale intra-basin water transfers, rehabilitation of flood retention basins, treatment plants for municipal, industrial, and livestock wastewater, hazardous waste treatment and disposal facilities, pollution prevention programs, etc.

34. During project preparation these ideas will be developed with more precision through consultation with Chinese agencies and stakeholders, and building upon the recommendations of the 3-H Water Management Study in Water Action Plan in China, which will be finalized later in 2001.

#### **4. GEF ELIGIBILITY, CRITERIA AND COUNTRY COMMITMENT**

35. **Program Conformity:** The proposed project falls under the GEF International Waters Focal Area, and specifically under Operational Program Number 10: Contaminant-Based Program. The proposed project has direct relevance for the Global Programme of Action for the Protection of the Marine Environment from Land-based activities. As described earlier, the Bo Hai Sea is a semi-enclosed international sea with globally important ecological resources that provide significant fishery benefits to China, North and South Korea, and Japan. The primary objective of the project is to help set-up an integrated water resources management framework for the Bohai Sea, mainly referring to Hai Basin and Liao Basin, and demonstrate strategies for groundwater management and addressing land-based activities in the Hai Basin that degrade coastal waters. A secondary objective is to support efforts to improve water quality in the Liao Basin. The project would also consider the need for environmental flows in rivers, flood plains, wetlands, and into coastal and estuary waters. The integrated framework would allow better understanding of important surface-subsurface and water quality interactions, and facilitate important new management approaches. Consistent with Par. 10.5 for 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.

36. **Government Commitment:** Chinese authorities are aware of the precipitous decline of coastal and marine resources in its regional seas, including the Yellow Sea (which extends over the Bo Hai Sea), the East China Sea, and the South China Sea, and are committed—within the bounds of their limited resources and other pressing needs—to stemming the degradation. China endorsed the 1995 “Washington Declaration on Protection of the Marine Environment from Land-Based Activities.” China is a participating state in an on-going GEF-financed/UNDP implemented project (\$16 million) for “Building Partnerships for the Environmental Protection and Management of Asian Seas” (PEMSEA). China is also involved in the GEF-financed (\$8 million), UNDP implemented, project for the “Prevention and Management of Marine Pollution in the East Asian Seas.”

37. In addition to regional efforts, there are also specific projects dedicated to environmental protection in the Yellow Sea. PEMSEA has a program for controlling “pollution hot-spots” and the Bohai Sea is one of the demonstration areas. To mark the start of the project, a Bohai Sea Declaration was made in July 2000 with the governments of Shandong, Hebei, Liaoning provinces and the municipality of Tienjin, as well as the State Oceanic Administration, committing to improve the environmental management of the Bohai Sea. The GEF-financed/UNDP implemented (\$15 million), project for “Reducing Environmental Stress in the Yellow Sea” is taking an eco-system management approach and developing a Transboundary Diagnostic Study (TDA) and Strategic Action Plan (SAP). China is also preparing a “North China Marine and Coastal Resources Project” for possible ADB financing which, among other things, is designed to promote sustainable coastal and marine resources management in the Bo Hai Sea. As noted earlier, the municipality of Beijing has embarked on a long-term investment program for wastewater management.

38. GEF and the riparian countries have an evolving programmatic approach to ecosystem management of coastal and marine waters in the East Asian Seas. The program, to-date, has focused on coastal zone management, sustainable fisheries, and marine pollution control. The proposed project would add another important dimension to the program: control and reduction of land-based contaminants from the Hai and Liao Basins. Establishment of a framework for integrated water management in the Hai and Liao Basins, including ground and surface water and water quality, is an important step towards controlling discharges into the Bo Hai Sea and addressing the serious water scarcity and groundwater overdraft problems.

39. **World Bank Lending Program in Project Area:** Although there will not be a dedicated IBRD loan attached to the proposed GEF project, the project will help support and integrate a large water-related lending program. The World Bank is currently financing a number of wastewater projects in the Hai Basin, including the Beijing Environment Project (FY01, \$1.25 billion, with \$349 million IBRD financing) and the Hebei Urban Environment Project (FY01, \$293 million, with \$150 million IBRD financing). The World Bank is also assisting in the preparation of the Liao Basin Environment project (FY02, estimated at \$430m, with \$200 IBRD financing) and has started working with Chinese authorities to identify a wastewater project in the Tianjin municipality (FY03). The Bank is also financing the Water Conservation Project (FY01, \$185m, IBRD \$74 m) which promotes the more efficient use of irrigation water and improved groundwater management. To the extent

practical, the proposed GEF project will link with and support on-going World Bank financed projects.

40. **Incremental Reasoning:** There is a large investment program for water quality improvement and water conservation underway in the basins surrounding the Bo Hai Sea. The total investment cost for Bank-financed projects alone is around \$2 billion, with many other projects financed by Chinese sources and other international finance agencies, such as ADB. A weak link in this large investment program is appropriate intersectoral and interjurisdictional arrangements to manage water in an integrated manner. The Chinese government has supported the reform of water management mechanisms, and paid much attention to the water scarcity and pollution problems in the Hai and Liao Basins. With GEF incremental support, new management methods can be piloted to promote integrated water management and improve the environmental quality of the Bo Hai Sea.

41. **Sustainability:** An important objective of the proposed project is to develop mechanisms to ensure the financial sustainability of water resource management activities. This could be done through a combination of “management fees” associated with water abstractions or discharges, special taxes on activities impacting water management, or dedicated funding from the general budget. The selection of appropriate instruments to ensure financial sustainability will be key to the project. Given the enormous economic stakes which could result from improved management, and the emphasis on cost-effective solutions, governments and water users should have strong incentives to sustain management systems. For pollution control investments, emphasis would be placed on enforcement of appropriate standards in critical areas. Although the “polluter pays” principle will be applied, the selective use of subsidies and credits would be considered to create the proper incentive structure and as a complement to strict enforcement.

42. **Replicability:** The proposed project, by itself, will only make a dent in the large-scale water resources problems in the Hai and Liao basins and should be considered a pilot. If the approach tested in the proposed project proves effective, then the Government of China stands ready to scale-up the approach to different localities, particularly within the Hai Basin and to other areas of the North China Plains. The proposed project will systematically address different types of groundwater and pollution control problems in an effort to obtain broad enough experience to understand how best to replicate the lessons learned in other areas.

*The Draft Concept Document was compiled jointly by the Ministry of Water Resources of PRC and the World Bank.*

*Ministry of Water Resources of PRC*

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