

**PROJECT INFORMATION DOCUMENT (PID)**  
**CONCEPT STAGE**

Report No.: PIDC1037

<b>Project Name</b>	GEF Mainstreaming Integrated Water and Environment Management (P145897)
<b>Region</b>	EAST ASIA AND PACIFIC
<b>Country</b>	China
<b>Sector(s)</b>	Agricultural extension and research (70%), Water supply (30%)
<b>Theme(s)</b>	Water resource management (60%), Other environment and natural resources management (40%)
<b>Lending Instrument</b>	Investment Project Financing
<b>Project ID</b>	P145897
<b>Borrower(s)</b>	The People's Republic of China
<b>Implementing Agency</b>	Ministry of Environment Protection Ministry of Water Resources
<b>Environmental Category</b>	B-Partial Assessment
<b>Date PID Prepared/Updated</b>	25-March-2014
<b>Estimated Date of Appraisal Completion</b>	March 2014
<b>Estimated Date of Board Approval</b>	October 2015
<b>Concept Review Decision</b>	15-August-2013
<b>Other Decision (as needed)</b>	

## **I. Introduction and Context**

### Country Context

1. In the last 30 years since implementing reforms and opening-up, China has made enormous progress in advancing socio-economic development. With an average annual GDP growth rate of 10% across this period, more than 600 million people have been lifted out of poverty and China is becoming a middle-income country. This rapid economic development has seen China become the world's largest exporter and second largest importer, and in 2011, it became the world's second-largest economy.

2. Although China's fast pace of economic development and corresponding structural transformations have benefited the country in many ways, a series of economic, social and environmental issues have also resulted. Poverty alleviation remains important. As of 2011, there are still 170 million Chinese people living on less than USD 1.25 a day, the world's

second largest population of the poor. Reducing the growing inequality between the rich and the poor thus remains an important social task for China. Economically, development has been led by heavy industry and manufacturing, hindering the development of the services sector and limiting investments in human capital. Environmentally, rapid development has come at a high cost, contributing to the draw-down of natural resources and serious pollution problems.

3. The need to efficiently and effectively utilize scarce land and water resources, while maintaining food security and further restoring and maintaining ecosystems and the services that they provide is a key challenge for future socio-economic development in China. The Government of China's 12th Five-Year Plan (2011-2015) seeks to address these challenges by: increasing the economic efficiency and sustainability of economic growth; improving energy efficiency and environmental protection; promoting inclusive development and social harmony; and deepening administrative reforms for better public administration and greater accountability.

4. The proposed project will work within this context to mainstream integrated water and environmental management, and to contribute to China's implementation of reforms to realize more energy and resource efficient, cooperative and environmentally-friendly modes of production.

#### Sectoral and Institutional Context

5. The lack of water resources has been a long-standing problem in China. China's current total yearly water use exceeds 600 billion m<sup>3</sup>, or 73.7% of its total available water resources, and there are limits to the further utilization. However demand for water is increasing with China's continuing socio-economic development. Irrigation is still China's top water user, accounting for over 60% of total water supply. Around 39% of the country's land area is arid or semi-arid, with relatively fragile environments that react strongly to disturbances from human activities, such as over-extraction of water, and that if degraded are difficult to restore. Groundwater is also seriously over-extracted, with 160 over-extracted areas nation-wide covering 190,000 km<sup>2</sup>, and an annual over-extraction of around 21.5 billion m<sup>3</sup>. Resulting problems include land subsidence, seawater intrusion and loss of water resources for agriculture and daily needs.

6. Water pollution and erosion problems are severe, and have led to degradation of aquatic environments in numerous areas around the country. Some water bodies have been interrupted or shrunk, and water quality is declining. In 2010, only 4.8% of China's rivers had water classified as Category I (the lowest level of pollution), while 30% were Category II, 26.6% were Category III, 13.1% were Category IV, 7.8% were Category V, and 17.7% were extremely polluted at above Category V levels. Several critical pollution incidents have also occurred, threatening public safety.

7. Cooperation between the different sectors responsible for water resources and environmental management needs to be strengthened. These responsibilities are split between the two key departments, the Ministry of Water Resources (MWR) and the Ministry of

Environment (MEP), with involvement also from the Ministry of Agriculture and the State Forestry Administration. For example, MWR is responsible for the water quality of water functional areas, while MEP manages wastewater emissions. A lack of integration in planning, target-setting and data-sharing makes it difficult to ensure a balance between water resource utilization and environmental protection. The proposed project will involve the cooperation of a number of sectors, but is focused on water resources and the environment.

8. The Government of China, and other institutions and stakeholders, increasingly recognize the urgent need to address these challenges. In 2011, the State Council released its “Decision on Accelerating Water Resources Reform and Development”, outlining phases, principles, goals and measures for the next 10 years of water resources reforms. The State Council’s National Water Resources Integrated Plan (2010-2030) also sets out goals and targets under the 12th Five-Year Plan and to 2030.

9. In a further indication of the importance placed on managing China’s water crisis, on January 2012, the State Council released a “State Council Proposal on Implementation of a Stringent Water Resources Management System”, which asks the government at all levels to implement water resources management systems to the strictest levels, in order to achieve what is known as the “three red lines”: to strictly control the increase in water use, to focus on improving the water efficiency rate, and to strictly control the amount of pollution entering water bodies.

10. Balancing the competing demands on China’s water resources and fostering cooperation between sectors will be vital in ensuring more sustainable and stable development in the future. The size of the water resource is basically fixed, so decisions must be made on how to allocate resources with trade-offs between demands for economic development, food security, social equality and environmental protection. Innovations in technology and management will be needed to maximize the benefits flowing from resource utilization and to minimize negative economic, social and environmental impacts. Importantly, there is a growing recognition in China and elsewhere that controlling water extraction does not necessarily control water consumption. Addressing this issue requires not only increasing efficiency but also moving to a water consumption based accounting of water resources, as well as increasing water productivity. This involves transforming traditional, imprecise and inefficient modes of agricultural and industrial production to new, precise and efficient modes.

#### Relationship to CAS

11. This proposed project is aligned with the Bank’s China Country Partnership Strategy (2013-2016), and is closely related to Strategic Theme One: Supporting Greener Growth, Outcome 1.5 for Demonstrating Sustainable Natural Resource Management Approaches - Implementing approaches of integrated water resources management at the river basin level, addressing multiple uses: water scarcity, flooding, pollution, water demands, economic instruments, and institutional aspects; and building on the recent China Country Water Resources Partnership Strategy (2013-2020) prepared jointly by the World Bank and the Chinese government.

12. Value added - Under this project, a brand new approach on integrated water and environment management improved with strict control of actual water consumption under a cap of target ET (evapotranspiration) and of water pollution discharges under a cap of target EC (environment carrying capacity) will be adopted and up-scaling at the national, river basin, county and water user levels. Through implementation of the strategic action plans (SAPs) at the river basin level and integrated water and environment management plans (IWEMPs) at the county level at pilot areas, this approach will be up-scaled to cover more areas of water scarcity and pollution areas to facilitate a shift from the current resources-intensive pattern to a more resources-efficient pattern to produce the same or higher quality products with less water consumption and less pollution discharges, as strongly requested by the Government of China recently.

## **II. Proposed Global Environmental Objective(s) (Display Only - Pulled from PCN)**

Proposed Global Environmental Objective(s) (From PCN)

13. The PDO is to control water consumption and reduce pollution discharges in selected pilot areas with ET/EC technology-based integrated water and environment management approach, and to up-scale the approach to cover more areas in the Hai Basin and Liao Basin to minimize the negative impacts on the ecosystem of Bohai Sea.

14. The above objective will be achieved through the following specific activities:

- To prepare and implement SAPs at the river basin level and IWEMPs at the county level in the pilot sub-river basins, integrating the use of target ET and target EC to guide and control water extraction, utilization and pollution emissions;
- To carry out research on the application of policies, innovative technologies to up-scaling the approach to cover more areas of Hai and Liao Basins, encouraging a shift towards more efficient modes of production;
- To up-scale the innovative technologies and policy interventions tested at the pilot sub-river basins to cover more areas of the Hai and Liao Basins (20-30% of the problem areas in the Hai and Liao Basins<sup>1</sup>) to improve water productivity, reduce water pollution and strengthen environmental protection;
- To strengthen the capacity of the central and local governments for integrated water and environmental management; and
- To construct civil works or infrastructure (to be fully financed by government counterpart funds during the second or third year of project implementation) to increase water productivity and reduce pollution discharges during the second or third year of project implementation in line with SAPs and IWEMPs prepared during the early stage of project implementation.

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<sup>1</sup> The first GEF Hai Basin Project covered 6.25% of the problem areas of Hai Basin

### Key Results (From PCN)

15. The primary beneficiaries of this project are the poor in rural and urban areas of the project, together with other beneficiaries along the costal lines, which will benefit from more stable access to water resources and improved water quality. The central, provincial and local-level departments for water resources, environmental protection and other relevant departments will also benefit from increased capacity to manage water resources and the environment in an integrated manner, as well as access to innovative technologies and approaches to improve resource utilization and environmental protection.

16. The project will develop and up-scale the new technologies and approach to address the local issues to protect the ecosystem of the Bohai Sea, which could provide valuable experiences and lessons to resolve the multi-country or international trans-boundary issues in the world, because of the similarity of the issues. The key results will include:

- ET/EC- based IWEM approach developed and tested to increase water productivity and reduce pollution discharges from the river basin level town to the county and water users /polluter levels;
- Effective joint decision making conference system / mechanism established and tested between the water resource department and environment department and other stakeholders to implement ET/EC-based SAPs and IWEMPs;
- Policies formulated and technologies developed, which are applied to support the implementation of ET/EC-based SAPs and IWEMPs;
- Reduction of water consumption and pollution discharges observed as key outcomes of the implementation of ET/EC-based SAPs and IWEMPs;
- Up-scaling of the new approach to have a large-scale interventions in the Hai and Liao Basins

### III. Preliminary Description

#### Concept Description

17. The proposed project falls under the GEF International Waters Focal Area (as same as the GEF Hai River Project completed), and specifically addresses issues, which have adversely and seriously impacted the ecological environment of Bohai Sea.

- Continued degradation of the Bohai Sea in the future is likely to result in adverse impacts on the neighboring water bodies of other countries. The 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 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;

- Ecological environment of the Bohai Sea has been seriously degraded with the decreasing fresh outflows and increasing pollution discharges to the Bohai Sea from its surrounding river basins including Hai River basin and Liao River Basin. For example, the average annual fresh outflows to the Bohai Sea have been reduced by over 50%, which resulted in a big impact on the Bohai's ecological balance. There are altogether 105 pollution discharge outlets around the Bohai Sea, through which highly polluted water is flowing directly into the Sea. As a result, the Bohai's offshore pollution areas increased from 3,600 km<sup>2</sup> in 2002 to 13,800 km<sup>2</sup> in 2008, accounting for 18% of the total area of Bohai Sea. The offshore pollution areas are still increasing in recent years due to the increased amount of pollution discharges to the Bohai Sea. So far, the total annual average pollution discharges to the Bohai Sea have reached to 2.8 billion tons, accounting for 32% of the total pollution discharges along the China's coastal lines.
- The selected pilot sub- river basins (2-3) in Hai Basin and Liao Basin under the proposed project would provide significant interventions to reduction of water consumption and pollution. The pilots will be up-scaled to cover about 20-30% of the problem areas of the basins, in addition to 6.25% of the problem areas covered by the first GEF Hai Basin Project (2005-2012). Each of the sub-river basins selected would adopt and enhance the innovative concept and approach, which have successfully addressed local water and pollution issues in the GEF Hai River Project, to significantly increase the outflows and reduce the pollution discharges to the Bohai Sea;
- To protect the ecosystem of the Bohai Sea, the local water scarcity and pollution issues are key issues to be addressed among the provinces/counties within the selected pilot sub-river basins. The proposed project would help implement the multi-province or multi-county agreed Strategic Action Plan (SAP) at the sub-river basin level with shared visions for specific surface and groundwater systems and ecosystems within the sub-river basin. Specifically, all administrative units within the sub-river basin will need to reach agreement on the SAP to share the targets ET and target EC and other related targets derived at the sub-river basin level. Based on the shared targets each administrative unit will prepare and implement Integrated Water and Environment Management Plan (IWEMP) to lower the actual water consumption and pollution discharges to be under the targets so that more outflows and less pollution discharges will be made to the Bohai Sea.

18. The proposed project will build on the success of the Hai River Basin Project, which implemented an integrated approach to water resource management and pollution control in the Hai River Basin in order to improve the Bohai Sea environment. Based on the lessons learnt about traditional approaches to water use and pollution control, the proposed project will seek to implement and mainstream cooperation for integrated water and environment management at the national, provincial and local levels, and to further integrate the use of target ET and target EC to optimize water allocations and pollution control targets from the river basin level to local administrative and water user levels. It will make a direct contribution to achieving the government's 'three red lines' of control the increase in water use, to focus on improving the water efficiency rate, and to strictly control the amount of

pollution entering water bodies. This will facilitate a shift from current resource-intensive development patterns to more resource-efficient patterns, maximizing the economic value of each drop of water while minimizing negative environmental impacts, for the purpose of green growth and sustainability.

19. **Mainstreaming IWEM:** The proposed project will further standardize IWEM approaches and multiple sector cooperation in China. At each level of the project, from the national level down to the stakeholder level, innovative technologies and management measures will be introduced, adapted to the Chinese context and applied. These will include research and development of policies and regulations to facilitate IWEM, integrated river basin planning, remote sensing technologies, and water treatment facilities, among others. The project will also seek to work with the different sectors of the Chinese government to move beyond consultation to authentic cooperation, and to provide tools and mechanisms to achieve this, such as management information systems, shared databases and a platform for negotiations and prioritization of water resources.

20. **Effective IWEM:** it requires planning start at the river basin or watershed level and implementation start at water user and polluter level with participatory approach. The project recognizes that administrative boundaries and river basin boundaries rarely align, and so will demonstrate how river basin management can be practically implemented with close cooperation among central and local, government departments in different sectors, as well as water users and polluters. This will include water and environmental assessments and the development of Strategic Action Plans (SAPs) for the pilot sub-river basins, and the translation of SAPs into Integrated Water and Environment Management Plans (IWEMPs) at the county and water user / polluter levels.

21. **Integrating ET and EC into management of water resources and the environment:** In many water-scarce areas, policies and measures aimed at reducing the use of water have in reality contributed to increased water consumption or groundwater depletion. Traditional water-saving approaches, such as measures to reduce water losses and inefficiency in irrigation, do not always result in genuine water savings: instead of water losses returning to the system (e.g. to replenish groundwater) they are retained and often used to expand irrigation, industry or residential areas. These activities increase the level of evapotranspiration (ET) and thus water consumption also increases. Therefore, this project will focus on reducing consumptive use of water or ET, while using EC to determine targets for pollution reduction. Remote sensing technology will be used to measure ET across the pilot sites, and modeling will convert this into water withdrawal patterns to make it operational by water users. EC will also be assessed for the pilot river basins, as well as basic ecological needs for water (i.e. environmental flows). The maximum sustainable levels of ET and EC will be determined, and it will be the responsibility of authorities (environment and water resources departments and other stakeholders) in the basin to achieve these targets coordinated and cooperated by the established joint decision making conference system and mechanisms. A platform will also be established to allow the different stakeholders to consult and negotiate how these targets will be met and water resources allocated. Innovations in technology and management will be piloted to help achieve new ET and EC-based targets in the basins.

22. The total cost of the project is estimated at US\$104.5 million including US\$9.5 million<sup>1</sup> from GEF financing, and US\$95 million from government counterpart funding, which will come from the government's investment programs on water and environment management. Such investment programs will be implemented in conjunction with the GEF grant financed activities in the same project areas to support the achievement of the GEF Project Objectives.

23. Based on the proposed project development objective, and concept / approach as described above, it's planned that the project technical and management interventions will be piloted from central government level down to the water user / polluter level including the national, sub-river basin, and county and stakeholder levels. The pilot sub-river basin will be taken as a unit to develop and implement SAPs which will determine ET/EC targets. The counties and water users/polluters within the sub-river basin will prepare and implement IWEMPs based on the ET/EC targets. As shown in the project map attached to this project information document, the sub-river basins will be selected in 2-3 locations mostly in physical water scarcity and pollution areas in Hai River Basin and Liao River Basin involving the provinces of Hebei and Liaoning and 5-6 counties. The up-scaling activities are expected to cover more provinces and counties. It's planned that the project is made up of five components as follows:

***Component 1 – Studies and Policies on Scaling of ET/EC Technology-based IWEM***

- 1.1 Preparation of policies to support scaling of ET/EC technology-based IWEM
- 1.2 Application of existing new technologies to support scaling of ET/EC technology-based IWEM

***Component 2 – Implementation and scaling of ET/EC Technology-based IWEM System***

- 2.1 National water quantity and quality monitoring system with shared database
- 2.2 Knowledge Management (KM) systems with shared database
- 2.3 Strengthening operations of the Hai River Basin ET Center
- 2.4 Strategic Action Plans (SAPs) at sub-river basin level
- 2.5 Integrated Water and Environment Plans (IWEMPs) at the county level

***Component 3 – Infrastructure Construction (to be fully financed by government)***

- 3.1 Irrigated agricultural water savings
- 3.2 Reduction of water pollution discharges
- 3.3 Rehabilitation of on-farm works and water measuring facilitate for pilot WUAs

***Component 4 – Institutional Capacity Building and Exchanges for scaling of ET/EC Technology-based IWEM System***

- 4.1 Joint decision making conference system for sub-river basin
- 4.2 Project Management Organizations
- 4.3 Establishment of Water user associations (WUAs)
- 4.4 Consulting services to support project management

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<sup>1</sup> Including US\$0.30 million of PPG funds to be used during project preparation



- 4.5 International and domestic training and study tours
- 4.6 Domestic and international workshops
- 4.7 Management information system (MIS)
- 4.8 Project monitoring and evaluation
- 4.9 IWLEARN activities<sup>1</sup>

#### IV. Safeguard Policies that Might Apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	X		
Natural Habitats OP/BP 4.04		X	
Forests OP/BP 4.36		X	
Pest Management OP 4.09		X	
Physical Cultural Resources OP/BP 4.11		X	
Indigenous Peoples OP/BP 4.10		TBD	
Involuntary Resettlement OP/BP 4.12	X		
Safety of Dams OP/BP 4.37		X	
Projects on International Waterways OP/BP 7.50		X	
Projects in Disputed Areas OP/BP 7.60		X	

#### V. Financing (in USD Million)

Total Project Cost:	104.50	Total GEF Financing:	9.50
Total Cofinancing:	95.00	Financing Gap:	0.00
<b>Financing Source</b>			<b>Amount</b>
BORROWER/RECIPIENT			95.00
Global Environment Facility (GEF)			9.50
Total			104.50

#### VI. Contact point

##### World Bank

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<sup>1</sup> Setting up a website following the IWLEARN toolkit, and formulation of two experience notes, a results note and participation in relevant regional IWLEARN meetings as well as IWCs

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