

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

Report No.: PIDA71555

<b>Project Name</b>	Poyang Lake Basin Town Water Environment Management Project (P153604)
<b>Region</b>	EAST ASIA AND PACIFIC
<b>Country</b>	China
<b>Lending Instrument</b>	Investment Project Financing
<b>Project ID</b>	P153604
<b>Borrower(s)</b>	People's Republic of China
<b>Implementing Agency</b>	Jiangxi Provincial Development and Reform Commission
<b>Environmental Category</b>	A-Full Assessment
<b>Date PID Prepared/Updated</b>	06-Dec-2016
<b>Date PID Approved/Disclosed</b>	07-Dec-2016
<b>Estimated Date of Appraisal Completion</b>	
<b>Estimated Date of Board Approval</b>	16-Mar-2017
<b>Appraisal Review Decision (from Decision Note)</b>	The Decision Review meeting chaired by Bert Hofman, Country Director, EACCF was held on October 6, 2016.
<b>Other Decision</b>	The Country Director advised the team to take note of the guidance offered at the meeting during project appraisal and authorized the pre-appraisal mission which will be retroactively upgraded to appraisal mission once the RSS clears the safeguard documents and approves the ISDS at the appraisal stage.

## I. Project Context

### Country Context

China's rapid urbanization over the past three decades has facilitated impressive economic and social gains. The country is the second largest economy in the world, with over half of its population now living in cities. Between 1981 and 2012, the World Bank estimates that roughly 767 million people were lifted out of poverty. Further transition is projected to add another 300 million to China's urban population by 2030 and continue boosting economic growth.

Unfortunately, China's economic gains came at a significant cost to the environment, with serious implications on health and quality of life, as environmental depletion and degradation were overlooked during China's impressive economic growth period. The cost of environmental degradation and resource depletion in China is estimated to approach 10 percent of gross domestic product, of which water pollution accounts for over 2 percent, based on China 2030 study estimates (2013). The Government of China (GoC) has recognized that it cannot continue on this road and has put in place plans to ensure the environmental sustainability of its economic development

pathways.

Over the past 10 years, the World Bank has been an important partner with the GoC on programs to promote water sector capacity, most notably, the formulation of the China Country Water Resources Assistance Strategy (2002), which provided a review of the major water resource challenges and related government priorities. This laid the groundwork for a comprehensive World Bank-supported water program. Following this, the China Country Water Resources Partnership Strategy (2013 - 2020) was prepared, which included a road map for cooperation to be carried out by partners committed to the goal of enhancing water security, using international best practices for integrated water resources management, particularly to tackle water scarcity and water quality.

### **Sectoral and institutional Context**

The water sector in China suffers from both water quantity and quality challenges. With regard to water quantity, China holds 20 percent of the world's population but only 7 percent of its freshwater; hence, water scarcity is a major problem for sustainable urban development in China. Due to the environmentally unsustainable development trajectory pursued over the last three decades, a significant portion of China's freshwater sources are polluted. In 2014, nearly 30 percent of water sampled in the country's major river basins was unfit for use; about 9 percent was so severely polluted it was unfit for any use. Over 76 percent of monitored groundwater sites did not meet quality standards. Similar figures are reported for the quality of other water bodies in the country, including lakes.

Poyang Lake is the largest freshwater lake in China with a maximum surface area reaching 5,050 km<sup>2</sup> and a storage capacity of 30 billion m<sup>3</sup>. The basin area of the lake is about 162,200 km<sup>2</sup> covering over 97 percent of the land area of Jiangxi Province. Jiangxi has a population of 45.62 million (of which, 51.6 percent live in urban areas) and a gross domestic product of US\$253.6 billion in 2015. Its main industrial activities include car production, aviation, metallurgy, and pharmaceutical manufacturing and its main agriculture produces include paddy, wheat, rapeseed, and tea. Poyang Lake plays many vital functions in terms of environmental, social, cultural, and economic activities. The livelihood of more than 40 million people is closely linked to the water and environment of the lake. Poyang Lake feeds into the Yangtze River in the middle reach at Hukou, Jiujiang County, and plays a pivotal role in the seasonal flow regulation of the Yangtze River. The average amount of lake water entering the Yangtze River is about 150 billion m<sup>3</sup>, amounting to 15.6 percent of the mean annual runoff of the river. Poyang Lake is also a wetland of national and global importance, which provides a key habitat for half a million migratory birds. It houses over 95 percent of the world's white cranes, 60 percent of white-napped cranes, 55 percent of hooded cranes, 60 percent of the white storks, and 96 percent of the swan goose population. It is also a species gene pool with 156 kinds of aquatic plants, 136 planktons, 230 kinds of benthic animals, 58 kinds of fishes, and 89 kinds of water birds.

The water environment conditions are declining, mostly due to increasing pollution from municipal water discharges but also from increased industrial, and rural discharges. Currently, the Poyang Lake water is mainly used for irrigation (61.8 percent), industrial (23.5 percent), domestic consumption (8.2 percent), and other purposes (6.5 percent). While its water quality has been comparatively good - with 83 percent falling under Class I-III, 13 percent under Class IV, and 4 percent under Class V, recent studies under the World Bank-supported China Economic Reform Implementation Project and available monitoring data of the Ministry of Environmental Protection

show a disturbing trend of water quality deterioration, with chemical oxygen demand (COD) and ammonia-nitrogen (NH<sub>3</sub>-N) increasing and dissolved oxygen (DO) decreasing.

Key pollutants in the lake basin include COD, NH<sub>3</sub>-N, and phosphorus (P). Heavy metal pollution is also a growing concern. Data from the Jiangxi Environment Bureau (2011-2014) show annual average discharges of lead at 6,000 kg, mercury at 67 kg, cadmium at 1,740 kg, chromium at 830 kg, and arsenic at 7,300 kg. The COD pollution is determined to be the largest at roughly 730,000 tons per year. Data on COD discharge collected by the local governments in the lake basin show that domestic wastewater (400,000 tons or about 55 percent) and agricultural sources (230,000 tons or about 30 percent) are the main causes of water pollution. Key sources of nitrogen and phosphorus are mainly domestic wastewater and agricultural nonpoint pollution. Uncontrolled solid waste disposal and insufficient treatment, and improper fish feeding and farmland fertilization practices also cause severe water pollution. Based on the data from provincial environmental statistics, only 79 percent of domestic wastewater is treated in the urban areas of Jiangxi Province, which is much lower than the national average of 85 percent. Similarly, solid waste collection and treatment rate in the province is 69 percent compared to the national average of 80 percent.

Institutional management of Poyang Lake is also challenging. There are nine Jiangxi provincial authorities managing Poyang Lake with their assigned responsibilities. For example, the Provincial Development and Reform Commission (PDRC) is in charge of planning and programming; the Provincial Department of Finance (PDOF) is responsible for financial support and budget allocation; the Provincial Department of Water Resources (PDWR) is responsible for water resources planning and implementation; and the Provincial Department of Environmental Protection (PDEP) for environmental planning and activities. However, some of the functions overlap or are not well defined which leads to weak implementation of water management in an integrated manner.

Conclusions from recent research and studies identify the following key causes of increased pollution levels in the water bodies feeding into Poyang Lake: (a) lack of basin-wide integrated water/environment management; (b) weak water quality and pollution source monitoring and disclosure systems; (c) lack of public awareness and incentive mechanisms in the communities on environmental protection; (d) weak enforcement of regulations related to disposal of untreated industrial and domestic wastewater directly into water bodies; (e) lack of investment in infrastructure for wastewater collection and treatment systems in urban and rural areas as well as for solid waste management in the small cities and towns and rural areas; and (f) lack of good practices on proper domestic solid waste disposal and excessive fertilizer use and improper application practices in agriculture. The GoC and the Government of Jiangxi (GoJ) recognize the need to protect the lake and a sustainable economic development in Jiangxi and have adopted a series of measures at the national, provincial, and county levels. In 2009, the GoC issued the Poyang Lake Ecological Economic Zone Development Plan, which provides an implementation plan and 18 specific sector plans, including water quality management aimed at ecologically sustainable development of this area.

In 2014, the GoJ updated its provincial development plan with more effort on ecological development. In this plan, it has prescribed a series of actions and targets to reduce pollution by 2020. Based on the plan, COD would be decreased by 5 percent compared to the 2015 baseline, the wastewater treatment ratio would reach 90 percent, and urban solid waste treatment ratio would reach 85 percent by 2020. Also, the newly adopted 13th five-year plan for Jiangxi Province and the

project counties stipulate that improvement of ecological conditions is one of the important goals, with binding targets for water quality improvement established. Following the series of plans, the GoJ has already been implementing six major ecological environment protection programs (wetland and biodiversity protection, lake-rim green belt, pollution prevention, blue sky, circular economy, and ecological culture), which have been focusing on decreasing the flow of waste into the water bodies in Jiangxi Province, particularly from the industrial and agricultural nonpoint pollution sources.

The project will greatly contribute to the achievement of these aspirations and targets and is expected to contribute to the reduction of 5.5 percent COD loads discharged from the project counties into Poyang Lake and increase of solid waste collection rate in project areas from about 51 percent currently to nearly 80 percent at the end of the project. Similarly, the lake and river restoration activities supported by the project would enhance the habitat for a sustainable function and growth of the native aquatic and terrestrial species.

The project component on restoration of lake and stream water environment deploys various measures to reduce nonpoint sources of pollution into the lake and stream bodies. These measures complement several ongoing pollution control programs initiated by the Departments of Agriculture and Finance of Jiangxi Province, including the pilot subsidy program for a soil-based prescriptive fertilizing practice in all counties in Jiangxi Province.

The project will finance local government priorities within an integrated and participatory water management design framework. The project will complement large investments by the GoJ and project county governments in building wastewater treatment plants (WWTPs) and solid waste treatment facilities. The project will also complement the ongoing World Bank-financed Jiangxi Poyang Lake Basin and Ecological Economic Zone Small Town Development Project, which aims to improve key public services in participating small towns of Jiangxi Province through improvements to priority infrastructure. These include construction and upgrading of urban and rural roads, dike strengthening, and improvement of drainage system and restoration of river and wetland environments. The proposed project would expand the coverage to include seven additional counties, and will particularly focus on water environment management and solid waste management infrastructure.

## II. Proposed Development Objectives

The project development objectives are to reduce the pollutant discharge into selected waterways, and improve management of water quality in selected counties in the Poyang Lake basin within Jiangxi Province.

## III. Project Description

### Component Name

Component 1: Institutional Strengthening for Water Management

### Comments (optional)

- (a) Establishment of the Lake Management Platform designed to strengthen the Poyang Lake Basin's management, institutional, and knowledge sharing architecture
- (b) Establishment of water environment monitoring systems, through installation of monitoring stations, provision of monitoring equipment and facilities, establishment of integrated information monitoring system and early warning system

- (c) Preparation of studies related to ecological protection of Poyang Lake
- (d) Preparation of vulnerability assessment of Poyang Lake ➤ ( s water quality to factors such as land use, urbanization and demographic changes, tourism and industrialization impacts, and climate change
- (e) Enhancement of participatory sustainable lake basin management by the public and grassroots level organizations

**Component Name**

Component 2: Lake and River Restoration and Improvement of Wastewater Management

**Comments (optional)**

This component will restore river and lake environment for Yugan, Poyang, and Duchang Counties and improve domestic wastewater system in Duchang, Jing ➤ ( an, Fengxin, and Jishui Counties.

The main activities include the following:

- (a) Restoration of lake and river environment in Zhuhu Lake, Pipa Lake, and Zoujiazui lakes and stream - located respectively in Poyang, Yugan, and Duchang Counties
- (b) Enhancement of wastewater management.

The wastewater collection system will connect to county wastewater treatment plants (WWTPs), which have sufficient treatment capacity and satisfactory operations

**Component Name**

Component 3: Improvements in Solid Waste Management

**Comments (optional)**

This component will improve solid waste collection and transportation systems in the rural and urban areas of Duchang, Yugan, Jing ➤ ( an, and Shangli Counties, to reduce solid waste disposal to the lake/river systems of the Poyang Lake basin. The collected solid waste will be treated and disposed to local landfills in Yugan and Jing ➤ ( an Counties. The main activities include:

- (a) Provision of solid waste bins and construction of solid waste collection stations
- (b) Provision of solid waste collection vehicles
- (c) Construction of nine solid waste transfer stations
- (d) Installation of local solid waste management information system in Shangli, Duchang, and Jing ➤ ( an Counties
- (e) Investments at the village level for the improvement of solid waste collection.

**Component Name**

Component 4: Project implementation support

**Comments (optional)**

Supporting the overall capacity of the Project Implementing Entity to coordinate, manage, and supervise the implementation of the project, including (a) provision of consulting services to enhance engineering design, construction supervision, and environmental and social management; (b) carrying out of capacity-building activities through workshops, training, and study tours; (c) carrying out of financial management (FM), procurement, contract supervision and monitoring and evaluation (M&E), including procurement of external social, resettlement and environmental monitoring services; and (d) the operation of Project Management Offices (PMOs) (including the purchase of office equipment).

**IV. Financing (in USD Million)**

Total Project Cost:	219.93	Total Bank Financing:	150.00
Financing Gap:	0.00		
<b>For Loans/Credits/Others</b>			<b>Amount</b>
Borrower			69.93
International Bank for Reconstruction and Development			150.00
Total			219.93

## V. Implementation

### A. Institutional and Implementation Arrangements

Project implementation arrangements have been set up at the provincial and county levels. Institutional responsibilities are summarized in the following paragraphs. The current institutional setup and details on proposed institutional responsibilities are described in detail in annex 3 of the Project Appraisal Document (PAD).

At the provincial level, a Provincial Project Steering Committee (PPSC), an interdepartmental joint committee, will be set up, comprising the PDRC (as the lead organization) and the provincial Departments of Finance, Housing, Land and Resources, Environmental Protection, Water Resources and Agriculture. The PPSC will convene meetings periodically to provide guidance and coordination on important aspects of the overall Poyang Lake management and specifically, project-related issues.

Project preparation and implementation have been delegated to the Provincial Project Management Office (PPMO), which is housed in the Foreign Investment Management Office of the Jiangxi Provincial Development and Reform Commission. This office has been managing several World Bank- and Asian Development Bank (ADB)-financed projects for the past 20 years and has accumulated rich experience in project management. This office is also the PPMO of the ongoing World Bank-financed Jiangxi Poyang Lake Basin and Ecological Economic Zone Small Town Development Project. It is fully resourced and adequately staffed (with a project coordinator and technical specialists for finance, procurement, and water resource management).

At the county level, all seven project counties have established their Project Leading Groups (PLGs) and County Project Management Offices (CPMOs). The PLGs are headed by the respective county mayors or standing vice mayors, and formed by various government line agencies. PMOs are established in the County Development and Reform Commission, Foreign Investment Management Office, or Poyang Lake Basin Management Office. Although Poyang and Yugan Counties have experience in managing World Bank-financed projects, other counties do not. To address this risk, an expert group comprising specialists in the areas of water environmental management, wastewater management, environmental monitoring, and solid waste management was hired by the PPMO. Moreover, training and capacity-building activities meant to clarify the role of each of the implementation party will be conducted early on in the project implementation.

### B. Results Monitoring and Evaluation

The primary tool to monitor and evaluate project results will be the Results Framework, which is detailed in annex 1 of the PAD. The Jiangxi PPMO will consolidate information and data at the

project level to measure the project performance and the achievements of the targets set, and prepare semiannual progress reports. A monitoring and evaluation system (MES) will be developed and established under the project and will be implemented by the PPMO and the CPMOs and include the following:

- (a) Management Information System (MIS). A computer-based MIS will be developed by the PPMO and installed in all PMO offices for progress monitoring and reporting physical and financial progress. MIS data will be consolidated at the provincial level, and semiannual reports will be provided to the World Bank.
- (b) MES. A computer-based MES will be established to monitor project outputs and outcomes. The system will include a database for overall project outcome or PDO indicators and intermediate outcome indicators from each component, with baseline and target values.

### C. Sustainability

Sustainability will be achieved through strong government commitment, public participation and ownership of project interventions, and systematic analysis and design to ensure technical robustness, reliability, reproducibility, cost-effectiveness, and environmental sustainability.

Institutional sustainability. Jiangxi Province has established project organizations at the provincial and county levels and has identified sources of counterpart funding for project implementation and operations and maintenance (O&M) of assets. The province is familiar with the complexity of this institutional framework, having three decades of partnership with the World Bank and implementing about 30 projects aggregating over US\$1.5 billion. The level and quality of services provided for wastewater and solid waste collection in the project counties vary and are considered relatively low mainly because there is still heavy reliance on the local governments' limited resources. Some counties such as Shangli, Jinggan, and Duchang have started to tap the services of private sector firms for solid waste management. Institutional sustainability will be enhanced through public participation and intensive consultation with a wide range of stakeholders and through capacity building for implementing agencies, PMOs, line agency staff, and beneficiaries.

Local institutional setup and capacity assessment of the agencies who would be responsible for the O&M of invested assets has been carried out during project preparation. Efforts have been made to separate the service provision function from local government agencies. Further, an assessment of the expected service provision function has been carried out and proposals made to further improve the capacity of relevant local agencies to ensure the sustainability of invested assets.

Sustainability of long-term O&M. To ensure sustainability of the long-term O&M, a well laid out plan for fund-raising, preparation of proper technical O&M manuals and asset transfer to the institutions that would be responsible for O&M of post-project operation have been incorporated as part of the preparation work. The tasks on restoration of lake and river environments incorporate the ecosystem measures (such as bio-retention trenches and constructed wetlands) as well as nonstructural measures (such as introduction of best farmland practice/regulations, and sound aquaculture practices). With regard to O&M, these practices are more cost-effective and sustainable than the conventional structural approach that only considers the feasibility of initial investment. Adequate maintenance plan and manpower provision should be established to achieve the goal of long-term enhancement of the lake and stream environment.

For the long-term O&M sustainability of solid waste management activities, considerations have been given to the selection of waste collection points that are convenient for residents; proposals for purchase of collection vehicles with high efficiency; optimization of collection route; cost optimization to decide whether a transfer station is needed; facility and vehicles sharing at the township level; and institutional setup (at the township level or at the county level).

In addition, the rural sewage treatment and solid waste management facilities will be managed by the villagers, which based on experience from other Bank operations, including those in China, such as Ningbo New Countryside Development Project, is a precondition for ensuring sustainability beyond project life.

Technical sustainability. The design of each component and major subprojects will be optimized to ensure technical robustness and cost effectiveness. The project is being designed based on the concept of (a) accurately identifying and analyzing the problems and their systematic resolution; (b) applying an integrated and participatory approach for sustainability of environmental management; (c) combining investment and institutional capacity-building measures; and (d) introducing technical and management innovation, building on lessons learned from other similar projects.

## VI. Safeguard Policies (including public consultation)

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

**Comments (optional)**

## VII. Contact point

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