Project Administration Manual

Project Number: 47070-002
Loan Number:
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People's Republic of China: Hunan Dongjiang Lake Integrated Environmental Protection and Management Project

CONTENTS

Project Administration Manual Purpose and Process

The project administration manual (PAM) describes the essential administrative and management requirements to implement the project on time, within budget, and in accordance with the government and the Asian Development Bank's (ADB) policies and procedures. The PAM should include references to all available templates and instructions either through linkages to relevant URLs or directly incorporated in the PAM.

The Zixing City Government (ZCG), the executing agency; and the Zixing City Urban and Rural Environmental Protection Investment and Financing Center (ZIFC), the implementing agency, are wholly responsible for the implementation of the ADB-financed projects, as agreed jointly between the borrower and ADB, and in accordance with the government's and ADB policies and procedures. The ADB staff is responsible to support implementation, including compliance by ZCG and ZIFC of their obligations and responsibilities for project implementation, in accordance with ADB policies and procedures.

At loan negotiations, the borrower and ADB shall agree to the PAM and ensure consistency with the loan agreement. Such agreement shall be reflected in the minutes of the loan negotiations. In the event of any discrepancy or contradiction between the PAM and the loan agreement, the provisions of the loan agreement shall prevail.

After the ADB Board approval of the project's report and recommendations of the President, changes in implementation arrangements are subject to agreement and approval pursuant to relevant government and ADB administrative procedures (including the project administration instructions) and upon such approval they will be subsequently incorporated in the PAM.

ABBREVIATIONS

ADB	–	Asian Development Bank
C&P	–	consultation and participation
CSC	–	construction supervision company
DMF	–	design and monitoring framework
EIA	–	environmental impact assessment
EMDP	–	ethnic minority development plan
EMP	–	environmental management plan
EPB	–	environmental protection bureau
FMA	–	financial management assessment
GAP	–	gender action plan
GRM	–	grievance redress mechanism
ha	–	hectare
HPFD	–	Hunan Provincial Finance Department
HPG	–	Hunan Provincial Government
IWRM	–	integrated water resources management
km	–	kilometer
km^2	–	square kilometer
LAR	–	land acquisition and resettlement
LIBOR	–	London interbank offered rate
LIEC	–	loan implementation environmental consultant
m^2	–	square meter
m^3	–	cubic meter
M&E	–	monitoring and evaluation
NCB	–	national competitive bidding
O&M	–	operation and maintenance
PAM	–	project administration manual
PIU	–	project implementation unit
PMO	–	project management office
PPMS	–	project performance management system
PPTA	–	project preparatory technical assistance
PRC	–	People's Republic of China
RRP	–	report and recommendation of the President
SDAP	–	social development action plan
SOE	–	statement of expenditure
SPS	–	Safeguard Policy Statement
WSP	–	water supply plant
WWTP	–	wastewater treatment plant
ZCG	–	Zixing City Government
ZIFC	–	Zixing City Urban and Rural Environmental Protection Investment and Financing Center

I. PROJECT DESCRIPTION

A. Project Rationale

1. One of the greatest challenges facing water management in the People's Republic of China (PRC) relates to freshwater lakes, as many of them are severely polluted. Since the mid-1990s, the Government of the PRC has made substantial efforts to address the problem, with emphasis on three lakes—Chao, Dianchi, and Tai lakes—but the water quality of these lakes has not improved significantly. The government realized the importance of pollution prevention in lakes by drawing lessons from the rehabilitation of polluted lakes, including the Chao, Dianchi, and Tai lakes, which were rehabilitated at very high cost. Experience has shown that it is very difficult and ineffective to restore water quality in large lakes once they are polluted.

2. Located in south Hunan Province, Dongjiang Lake is a reservoir formed after the construction of Dongjiang Dam in 1986 on the Leishui River, a tributary of the Xiang River. Dongjiang Lake is a multipurpose reservoir for hydropower, flood control, water supply, and irrigation. It has a surface area of 160 square kilometers (km^2) and a total storage capacity of about 8.12 billion cubic meters (m^3). The catchment area of the Dongjiang Lake is 4,719 km^2.

3. The government's priority is to protect the water resources of Dongjiang Lake from pollution. Dongjiang Lake has been selected as one of five river basins for nationwide pilot testing of the government's eco-compensation policy framework, to which the Asian Development Bank (ADB) has provided continuous support since 2009. Dongjiang Lake was prioritized for support in the National Plan for Relatively Good-Quality Lake Ecological and Environmental Protection, 2013–2020, jointly released by the Ministry of Environmental Protection, the Ministry of Finance, and the National Development and Reform Commission.

4. Dongjiang Lake is a strategic water source for supporting resource-saving and environment-friendly social development in Hunan Province. Maintaining healthy environmental services in Dongjiang Lake is vital to achieving sustainable development of the Xiang River basin, one of the major regions of the government's Yangtze River Economic Belt Initiative. The Xiang River basin is home to about 40 million people and accounts for over 70% of Hunan Province's total gross domestic production. In addition to supplying water to Chenzhou Municipality and Zixing City, Dongjiang Lake serves as a backup water source for Hunan Province's major cities of Changsha, Xiangtan, and Zhuzhou in the Xiang River basin to improve the water security of 13 million people in these cities. The lake's large storage capacity greatly improves flood and drought management for the downstream cities and navigation of the downstream Xiang River. It also helps dilute water pollution in the downstream of Xiang River by releasing water.

5. Hunan Provincial Government (HPG) and local governments have prioritized environmental protection of Dongjiang Lake. Protection zones have been established in the Dongjiang Lake basin in accordance with the provincial-approved Dongjiang Lake Basin Water Environmental Protection Regulation (2002). The regulation imposes controls on the development of the basin and restricts various activities in different protection zones that may cause adverse impact on the water environment. Since 2002, HPG and local governments have invested nearly CNY1 billion in protection of the lake, including closure of mines, removal of cage fishing, ship renovation and improvement, and job training for nonfarming opportunities. Continued efforts by HPG, local governments, and local people help maintain the good water quality of the lake to meet national standards for drinking water sources.

6. However, heavy agricultural activities and growing urbanization in the lake basin have posed greater risks of water pollution in the lake. The water quality of Dongjiang Lake has been deteriorating since the 1990s as a result of agricultural nonpoint source pollution, inadequate wastewater treatment facilities, lack of solid waste management, and significant soil erosion around the lake. The trophic state index for Dongjiang Lake was 25.8 in 1991 and 29.5 in 2010.[1] Although the 2010 trophic state index is acceptable for drinking purposes, the value in 2010 was significantly higher than in 1991. A review of 15 monitoring stations from 1991 to 2010 has shown that Dongjiang Lake is generally in the oligotrophic to mesotrophic conditions. However, among the 15 locations, water quality in 12 locations was poorer in 2010 than in 1991. Water quality fluctuations are random and without a significant seasonal pattern or synchronization, so the pollution challenges are not likely from a single source.

7. **Point and nonpoint source pollution.** Agriculture is the major source of pollution in the lake catchment, accounting for about 48% of the total pollutants. Other sources include domestic wastewater (25%), industry (14%), water transportation (9%), and tourism (4%). Every year, the pollutants discharged into the Dongjiang Lake area contain 9,038 tons of chemical oxygen demand, 1,741 tons of ammonia, and 363 tons of total phosphorus. Only a few townships have wastewater treatment facilities, and the wastewater from most townships and villages scattered around the lake is directly discharged to the streams that drain to the lake.

8. Solid waste collection and treatment facilities for townships and villages have yet to be established in the basin. As the population increases, garbage production also rises. Only a few villages have household trash collectors or collection bins in designated locations. Furthermore, public collection tanks are often not emptied on time and overflow of rubbish is common. Consequently, garbage is discarded on roadsides and open spaces around houses. This not only has an adverse visual impact on the surrounding environment, but also seriously threatens the health of local villagers. Because of the lack of transfer and disposal, rubbish has been stacked on unused land. Some villages burn their rubbish, causing significant adverse impacts to the surrounding environment and the living conditions of local residents.

9. **Inadequate water supply facilities.** A large number of residents, particularly rural communities in Zixing City, do not have access to piped water supply, although they are close to the lake. They use water drawn from various sources without proper treatment. This is not only a burden for the residents, but also exposes them to health risks and, in turn, affects the lake water quality. The existing water treatment plants in the towns of Zixing City use surrounding small-scale water reservoirs and mountain springs or rivers as water sources, but these are subject to seasonal changes and weak self-purification capacity during drought. The villages beyond the service area of existing water supply plants are served by small-scale temporary water supplies, which have lower safety standards. Most rural residents drink well water or stream water of poor sanitary quality, especially during rainy seasons when wells are often flooded, seriously polluted, and of extremely turbid water quality. Furthermore, some rural villages are located within high-fluorine and high-arsenic areas.

10. **Low flood protection level.** With the large flood storage capacity of Dongjiang Lake, the downstream of the lake has been protected from major floods. However, the flood protection of the upstream and surrounding areas of the lake is low, with capacity only against flood recurrence of about 2 years. The rivers have been frequently impacted by floods over the years, resulting in river blockage and bank erosion that reduce flood discharge capacity. Most of the

[1] The trophic state index is a measure of how much nutrient, such as nitrogen and phosphorus, is in a lake or other body of water. A lake can be put into one of three possible classes: oligotrophic, mesotrophic, or eutrophic.

rivers do not have bank protection, which results in erosion of neighboring farmland during floods and causes sedimentation in the rivers. Frequent floods have brought extreme impacts on the lives and production of the riparian villagers. Farmers particularly suffer from loss of properties, farmlands, or even life. For example, a severe flood in July 2006 caused 142 casualties, 2,563 collapsed houses, and 200 hectares (ha) of damaged farmland.

11. **Soil erosion and ecosystem.** Limited livelihood and employment opportunities and lack of arable land result in the conversion of slopes for farming by local communities. In the areas around Dongjiang Lake, soil erosion is intensifying and occurrence of natural disasters is increasing. Soil erosion in the project area covers 1,087 km^2 and average annual soil erosion reaches 4 million tons, causing river siltation in some sections of the rivers and even forming sand deltas at some river estuaries to Dongjiang Lake. The 55,000 ha of national and provincial public forest around the lake area greatly contribute to water and soil conservation. However, fires and pest disasters often occur because of the low quality of the forest, and the eco-efficiency of the forest is relatively low. The lake areas are abundant with bamboo resources, and can be a major source of income for local residents while protecting the environment.

12. **Inadequate institutional coordination and capacity.** Dongjiang Lake basin covers Zixing City and the counties of Guidong, Rucheng, and Yizhang in Chenzhou Municipality. The Dongjiang Lake environmental protection bureau was established under the Chenzhou Municipal Government in 2003 to coordinate environmental protection in the basin. However, the bureau does not have (i) adequate tools and capacity for coordinating and monitoring environmental protection activities in the entire basin, or (ii) an ecological and environmental monitoring and management information system. It needs to be empowered with adequate human and financial resources to assume responsibility for environmental management of the entire lake basin.

13. **Strategic fit.** The project is consistent with the government's goal of building a harmonious and prosperous society through regionally balanced and environmentally sustainable growth. The project supports the government's Yangtze River Economic Belt Initiative to construct an ecological ecosystem corridor along the river by improving watershed management, water pollution control and prevention, and ecological rehabilitation.[2] It conforms to the strategic priorities of ADB's Midterm Review of Strategy 2020,[3] and the Water Operational Plan, 2011–2020 to increase coverage and improve services for water supply and sanitation, and promote integrated water resources management (IWRM).[4]

14. **Lessons.** The project design has incorporated lessons from previous ADB-financed projects and policy-oriented studies on IWRM, environmental and ecosystem improvement, wetland and lake management, and urban–rural integration in the PRC. Major lessons include (i) an integrated approach of structural and nonstructural measures to water resources management; (ii) wide community participation and increased public awareness for environmental improvement; (iii) linking environmental protection with livelihood opportunities; (iv) coordinated management of urban–rural planning, and management of resources and services to facilitate integration and linkage to infrastructure; (v) an institutional and cost recovery mechanism for effective operation and maintenance (O&M) of the facilities; and (vi) eco-compensation as an effective tool for maintaining environmental services.

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[2] State Council of the People's Republic of China. 2014. *Guide on Promoting the Development of the Yangtze Economic Belt*. http://www.gov.cn/zhengce/content/2014-09/25/content_9092.htm.

[3] ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific.* Manila.

[4] ADB. 2011. *Water Operational Plan, 2011–2020.* Manila.

15. **Innovation and special features.** The project is expected to scale up and/or demonstrate the following good practices in the PRC: (i) IWRM and comprehensive monitoring, (ii) environmental protection linked with livelihood improvement, and (iii) eco-compensation. In addition, during project preparation, policy dialogue was conducted and recommendations provided for revising the Dongjiang Lake Basin Water Environmental Protection Regulation.[5]

(i) **Integrated water resources management.** Under the IWRM framework, the project attempts to coordinate and integrate the structural and nonstructural measures in a manner that ensures their consistency and results in synergies where the total impact is greater than the sum of the individual actions. To meet the water quality targets as requested in the national good water quality lake program, pollutants discharged into the lake have to be reduced. The project will take a holistic approach to tackling these challenges by preventing different types of pollution sources, and land degradation and soil erosion, with a comprehensive environmental monitoring system to support integrated lake management.

(ii) **Linking environmental protection with livelihood opportunities.** The project will not only maintain environmental and ecological services to the local residents and the downstream Changsha–Zhuzhou–Xiangtan city cluster, but also improve local farmers' income by directly supporting livelihood opportunities, such as bamboo forest development, fish stocking, and technical and vocational education and training in alternative livelihood activities for 30,000 rural residents around the lake. Without such benefits, the willingness of local farmers to comply with environmental regulations around the lake would not be fully effective.

(iii) **Eco-compensation.** Dongjiang Lake performs crucial watershed functions for Hunan Province. An eco-compensation pilot scheme will be tested under the project to compensate those responsible for the collection and treatment of solid waste and sewage, and engagement of greener agricultural production, by setting up an eco-compensation fund to be raised from tourist entry fees. HPG and Zixing City Government (ZCG) also agreed to explore more eco-compensation schemes for better protection of Dongjiang Lake during project implementation.

B. Impact and Outcome

16. The impact will be the achievement of sustainable economic development of the Xiang River basin in Hunan Province. The outcome will be the achievement of integrated environmental protection in Dongjiang Lake basin.

C. Outputs

17. The project will have five outputs: (i) improved pollution control, (ii) establishment of an urban–rural water supply system, (iii) a rehabilitated river course, (iv) establishment of integrated ecosystem rehabilitation and management, and (v) strengthened environmental and project management capacity.

18. Output 1 will include (i) construction of six township wastewater treatment plants with a total capacity of 2,000 m^3/day, and associated sewage collection pipes of 38.1 kilometers (km);

[5] The regulation is being revised by the local governments and will be submitted to Hunan People's Congress for approval in about 2 years. Most of the recommendations were accepted by the Zixing City Government.

(ii) construction of 2,856 small-scale wastewater treatment facilities for rural villages in 10 townships, and associated sewer pipes of about 330 km; (iii) procurement of solid waste collection and compaction equipment, and seven transfer facilities; and (iv) development of nonpoint source pollution management, including soil test and green fertilizer application, and green pest control measures application in 5,690 ha of farmland.

19. Output 2 will include (i) construction of the Yangdongxia water supply plant, with total water treatment capacity of 20,000 m^3/day for the water supply of 128,688 residents in five townships, associated water delivery and supply pipelines with a total length of about 700 km, and pressure regulating stations; (ii) construction of Chukou water supply plant, with capacity of 620 m^3/day for supply to 3,200 residents, and associated water delivery and supply pipelines of about 35 km; and (iii) procurement of O&M equipment.

20. Output 3 will improve the flood protection standard and reduce the soil erosion of five major rivers of Guangqiao, Lianping, Qingyao, Tian'eshan, and Xingning that flow into the lake, including block clearance and dredging of 653,692 m^3 (14.7 km), green embankment of 13.7 km, and landscaping along the riverbanks.

21. Output 4 will include (i) establishing aquatic facilities and management; (ii) constructing three wetlands for about 167 ha, and management facilities; (iii) conducting soil erosion control, including 1,000 ha of reforestation and revegetation, natural enhancement and management of 13,666 ha of public forest, constructing 590 km of fire breaks, and procuring firefighting facilities; (iv) improving 2,595 ha of bamboo forest; (v) conducting alternative livelihood training for 30,000 rural residents; and (vi) carrying out an eco-compensation pilot scheme.

22. Output 5 will support the (i) establishment of environmental, fishery, and forest firefighting monitoring centers; (ii) establishment of the Dongjiang Lake ecological and environmental protection research center; (iii) development of the Dongjiang Lake environmental monitoring and management information system; (iv) provision of project implementation consulting services, training, workshops, and study tours; and (v) establishment of a project monitoring and evaluation system.

23. A summary of the project outputs and components is given in Table 1 below:

Table 1: Summary of Project Outputs and Components

No.	Output/Component	Major Contents
Output 1: Pollution Control Improved		
1.1	**Wastewater Treatment**	
1.1.1	Town wastewater treatment plants (WWTPs)	
	(i) WWTPs	Six WWTPs with total capacity of 2,000 cubic meters (m^3)/day, including Chukou, 800 m^3/day; Dongping, 100 m^3/day; Lianping, 100 m^3/day; Longxi, 100 m^3/day; Qingjiang, 300 m^3/day; and Qingyao, 600 m^3/day
	(ii) Sewer network	38.1 kilometers (km) of sewer network, including 20.9 km of DN300HDPE, 10.0 km of DN400HDPE, 7.2 km of DN500HDPE, 33 pipeline crossing, and 1,280 check wells
1.1.2	Rural wastewater	
	(i) Small-scale wastewater treatment facilities	2,856 facilities, including 2,450 separate 4-tank systems; and 406 small-scale collective systems
	(ii) Sewer network	330 km of sewer network including 198.32 km of DN110HDPE,

No.	Output/Component	Major Contents
		132.15 km of DN200HDPE, and 11,013 check wells
1.2	**Solid Waste Management**	
1.2.1	Garbage collection and transfer facilities	
	(i) Transfer stations	Seven transfer stations: 2,950 square meters (m^2) of main structure; 2,842 m^2 of landscape; 1,832 m^2 of vehicle-operating ground; 1,400 meter (m) access road; 712-m fence; 7 transformers; 10 dumping tanks; 7 septic tanks; 542 m^2 of retaining wall; 8,300 m^3 of backfilling; 7 batches of utilities, including water and electricity
	(ii) Compressing equipment in transfer stations	Eleven sets of solid waste compressing equipment: two compressing equipment each for Longxi, Qingjiang, Qingyao, and Zhoumensi counties; one compressing equipment each for Chukou, Dongjiang, and Zhoutang counties.
	(iii) Collection equipment	Total 60,516 equipment, 1,212 garbage bins, 59,036 sorted collecting bins, and 268 small garbage collection vehicles
	(iv) Transfer vehicles	162 garbage trucks of different types, including 10 enveloped vehicles, 149 garbage trucks, and 3 sludge sucking trucks
	(v) Public awareness facilities	425 bulletin boards, 910 plastic panels, 63,500 brochures
1.3	**Nonpoint Source Pollution Management**	
1.3.1	Site-specific formulated fertilizer	Total 3,406 hectares (ha), including sampling and testing 482 soil samples, applying recipe fertilizer in 1,803 ha area each year for 2 consecutive years, 3,246 tons of fertilizer in total; applying organic fertilizer in 1,603 ha area each year for 2 consecutive years, 14,430 tons of fertilizer in total.
1.3.2	Green pest control	Applying green pesticide control in 2,284-ha farmland: utilization of 487 solar insecticidal lamp, 2,714,100 sticky boards, 99 new frame type vaporizers, 118,741 tons of new biological pesticide
Output 2: Urban–Rural Water Supply System Established		
2.1	**Yangdongxia Water Supply Plant**	Water supply capacity of 20,000 m^3/day
2.1.1	Water treatment plant (WTP)	1 WTP: 2 tube settler, 1 v-filter, 2 clean water reservoirs, 1 water supply pump house, 1 chlorination room, 1 alum-dosing room, and other auxiliary production facilities
2.1.2	Conveyance and distribution pipelines	About 700.00 km of conveyance and distribution pipelines, including 13.80 km of conveyance pipelines (DN400 ductile iron pipe), 22.00 km of main distribution pipelines (DN500 ductile iron pipe), 78.45 km of main distribution pipelines (DN450 ductile iron pipe), 9.38 km of main distribution pipelines (DN400 ductile iron pipe), 17.10 km of main distribution pipelines (DN300 ductile iron pipe), 29.20 km of main distribution pipelines (DN200 ductile iron pipe), 1.68 km of main distribution pipelines (DN150 ductile iron pipe), 228.00 km of branch distribution pipelines (DN100 PE), 300 km of branch distribution pipelines below DN100.
2.1.3	Pressure regulation stations	Three pressure-reducing stations: Hejiashan pressure-reducing station (1,500 m^3), and two Xingning pressure-reducing stations (2,000 m^3)
2.2	**Chukou Water Supply Plant**	Water supply capacity of 620 m^3/day
2.2.1	WTP	1 packaged system, 60 m^2 of equipment room, 100 m^2 of office building
2.2.2	Conveyance and distribution pipelines	34.8 km of conveyance and distribution pipelines: 7.8 km of conveyance pipelines (DN160 PE), 4.0 km of distribution pipelines (DN100 PE), 23.0 km of distribution pipelines below DN100, and 500 m^3 of elevated water tank

No.	Output/Component	Major Contents
Output 3: River Course Rehabilitated		
3.1	**Dashazhou River (Xingning River) Rehabilitation**	
3.1.1	Embankment	1,315.20 m of masonry retain wall, 454.90-m reno lining, 392.29 m of planting brick, 594.18 m of new flood bank
3.1.2	Blockage clearance (excavation)	2,209 m^3 of blockage clearance in 4,098-m river course
3.1.3	Riverbank landscaping	3,400-m riparian green, waterside stairs at 18 locations
3.2	**Guangqiao River Rehabilitation**	
3.2.1	Embankment	805.43 m of masonry retain wall, 1,000.55-m reno lining, 1,253.27 m of planting brick, 516.06 m of new flood bank
3.2.2	Blockage clearance (excavation)	4,263 m^3 of blockage clearance in 4,098-m river course
3.2.3	Riverbank landscaping	6,000 m riparian green, waterside stairs at 22 locations
3.3	**Qingyao River Rehabilitation**	
3.3.1	Embankment	1,254.0 m of masonry retain wall, 1,366.0-m reno lining, 1,159.0 m of planting brick, 663.4 m of new flood bank
3.3.2	Blockage clearance (excavation)	158,144 m^3 of blockage clearance in 4,098.0-m river course
3.3.3	Riverbank landscaping	7,000.0 m riparian green, waterside stairs at 23 locations
3.4	**Lianping River Rehabilitation**	
3.4.1	Embankment	294.0 m of masonry retain wall, 512.5-m reno lining, 100.0 m of planting brick, 990.0 m of new flood bank
3.4.2	Blockage clearance	84,471 m^3 of obstacle clearing in 849.0-m river course
3.4.3	Riverbank landscaping	5,000.0 m riparian green, waterside stairs at 10 locations
3.5	**Tian'eshan River Rehabilitation**	
3.5.1	Embankment	279.8 m of masonry retain wall, 357.9-m reno lining, 322.6 m of planting brick, 100.0 m of new flood bank
3.5.2	Blockage clearance (excavation)	137,313 m^3 of obstacle clearing in 3,193.0-m river course
3.5.3	Riverbank landscaping	3,000.0-m riparian green, waterside stairs at 17 locations
Output 4: Integrated Ecosystem Rehabilitation and Management Established		
4.1	**Aquatic Ecosystem Management**	
4.1.1	Fish proliferation platform	
	(i) Fish proliferation platform base	3,000 m^2
	(ii) Supporting infrastructure	0.72 km of access road, 2,000 m^2 of parking ground, 1 power supply equipment, 1 water supply equipment
	(iii) Transporting, loading and uploading equipment	1 transport boat (20 m^3), 2 transport vehicles (10 m^3), 1 automatic loading and uploading system, 1 fish-counting system
4.1.2	Proliferation releasing	Proliferation releasing: 5,000 summer fingerlings, 205,000 kilograms of winter fingerlings, 180,000,000 fertilized eggs of *salangid*
4.1.3	Offspring breading base construction	
	(i) Reform the cultivating tank and spawning tank	6.7 ha of parent fish-breeding tank, 13.3 ha of fingerling-breeding tank, 4 parent fish-spawning tanks, 500 m^2 of breeding workshop
	(ii) Aquaculture technology training building	2,010 m^3
	(iii) Processing workshop and freezer	1,000 m^3

No.	Output/Component	Major Contents
	(iv) Auxiliary facilities	2 km of diversion canal, 3 km of plant road, 4 km of fence wall, 7,500 m^2 of green spaces, 20,000 m^2 of dam seepage control, 1 water supply and drainage system, 1 power supply system, 100 energy-saving lamps
	(v) Quarantine center, loading and uploading equipment, monitoring equipment	1 breeding quarantine center, 1 monitoring system, 1 automatic loading and uploading system
4.1.4	Fishing resource protection	
	(i) Procurement of monitoring vehicles and boats	1 fishing resource monitoring boat, 3 fishing resource protection inspection boats, 2 fishing resource monitoring vehicles
	(ii) Fishing resource protection facilities	400 signal boards, 80 releasing and monitoring signs, 200 boundary posts
4.2	**Dongjiang River Wetland Protection and Restoration**	
4.2.1	Xingning river estuary wetland construction	
	(i) Wetland embankment green pathway construction	4.5 km of pathway: 7.5-m width of subgrade, Grade III road, bitumen concrete pavement. 125.1 *mu* of land acquisition. Construction, including subgrade, pavement, bridge, culvert, and crossing; Green and environmental protection project: 87,600 m^3 of earthwork, 3.90 km of drainage and reinforcement, 0.45 km of special subgrade treatment, 33,200 m^2 of pavement, 25 culverts, and 5 crossings
	(ii) Wetland flora restoration	26.0 ha of wetland flora restoration: 6.0 ha of greenery isolation zone, 4.0 ha of arbor grass protection zone, 6.0 ha of shrub wetland zone restoration, 5.0 ha of emerging plant zone restoration, 5.0 ha of floating-leaved and submerged plant zone restoration
	(iii) Habitat creation	14.0 habitat construction: 7.0 ha of bird habitat construction, 3.5 ha of fish-feeding farm, 3.5 ha of macrobenthos bio-environment creation
	(iv) Artificial wetland	15,000 m^2 of artificial wetland wastewater treatment tank, 6,000 m^3 of filling material, 300,000 of wetland plants, 1 appurtenance structure, 1 supporting equipment, 2 km of roads and fence walls and landscaping
	(v) Wetland promotion work	800 m^2 of wetland promotion area, 1.2 km of wetland promotion hallway, 1.9 km of pathway for ecology education, 800 m^2 footprint of technical exhibit room, 10 ecological floating islands, 5 waterside terraces, 3 scenic lookout pavilion, 1 bird observation pavilion, 1 interpretation system
4.2.2	Huangcao lakeside wetland construction	26.70 ha of wetland construction: 3.15 ha of Reno + ecological planting bag, 2.59 ha of artificial greenery ecological embankment, 20.96 ha of Vetiver double reinforced flexible embankment
4.2.3	Hangxi River estuary wetland construction	
	(i) Wetland flora restoration	85 ha of wetland flora restoration: 20 ha of marshland wetland plant restoration, 65 ha of lakeside transition zone plant restoration
	(ii) Habitat creation	15 ha of habitat construction: 7 ha of bird habitat construction, 5 ha of fish-feeding farm, 3 ha of macrobenthos bio-environment creation
	(iii) Wetland protection management infrastructure	5 km of wetland patrol plank road, 10 pavilions
4.3	**Soil Erosion Control**	
4.3.1	Artificial reforestation	1,000 ha of artificial forest: conifer+general broad-leaved tree,

No.	Output/Component	Major Contents
		conifer+precious broad-leaved tree, mixed broad-leaved tree (big seedlings), mixed broad-leaved (seedlings), replanting density is 2,250–4,500/ha; the key measures of replanting: forest clearing, field settling, land reclamation, planting, fertilizing, nurturing (in 3 consecutive years), replanting and management, improvement of forest pest prevention and control, forest pathway construction, operation road construction, fire-fighting belt construction, etc.
4.3.2	Natural regeneration and management	13,666 ha: artificial support to promote natural regeneration, including broad-leaved tree such as *cornus wisoniana, sweetgum, koelreuteria paniculate*, etc.; replanting native hardwood species (600/ha), soil preparation, fertilization, replanting, cultivation (continuous 3 years), strengthen publicity and inspection
4.4	**Public Forest Management**	
4.4.1	Public forest protection project	
	(i) Fire fighting	
	a. Fire prevention professional troop barrack, warehouse, and observatory	1 city-level firefighting barracks (1,172 m^2 of decorated barracks, 2,000 m^2 of training field reform), 1 Tian'eshan fire-fighting barracks (800 m^2 of decorated barracks, 2,200 m^2 of training field reform), 1 Chukou fire-fighting barracks (1,000 m^2 of decorated barracks, 2,400 m^2 of training field reform), 120 m^2 of city-level fire-fighting barracks supplies agency, 200 m^2 of Tian'eshan fire-fighting barracks supplies agency, 180 m^2 of Chukou fire-fighting barracks supplies agency, 126 m^2 of observatory
	b. Firefighting equipment	85 office equipment, 56 wind-generated extinguishers, 56 chain saws, 56 back pulsing-pressure hydraulic giants, 6 relay pumps, 1 forest fire-fighting publicity vehicle, 1 forest fire-fighting command car, 3 transferring vehicles, 1 transferring boat, 1 indoor training equipment
	c. Biological fire prevention belt construction	590 km of fire prevention belt: 301 km expanded fire breaks, expanding an initial width of 10 m into 20 m; introducing fire tree species: *schima superba, tea, arbutus*, etc.; 289-km new fire breaks, a width of 20 m.
	(ii) Pesticide management	Prevention and cure for *monochamus alternatus, ceracris kiangsu, camellia oleifera anthracnose, batocera horsfieldis*; forest pest survey; purchase of control equipment and pharmaceutical products
	a. Pesticide survey	80,000 ha of forest resource pesticide survey, including external survey and internal arrangement
	b. Procurement of prevention equipment	13 back duster and sprayers, 13 back sprayers, 1 vehicle height sprayer, 1 truck, 2 pest-forecasting toolboxes
	c. Procurement of pesticide	10 tons of *beauveria bassiana*, 14,030 bottles of *folimat*, 10,550 bags of *carbendazim*; releasing *oophagous trichogrammae* in 1,337-*mu* area.
4.5	**Upgrade of Low-Efficient Bamboo Forest**	Upgrade 2,595 ha of low-efficient bamboo forest; guiding farmers to upgrade ecological condition of the low-efficient bamboo forest by splitting the grass, removing impurity, replanting woods, diching, scientific fertilization, keeping bamboo shoots, moderate treetop removing, rational cutting, etc.; replanting 389,399 nursery stocks, 3,892.5 tons of fertilizer; forest clearing, fertilizing, replanting measures for updating the low-efficient bamboo forest; auxiliary facilities: pathway, operation road, irrigation equipment
4.6	**Livelihood Training**	
4.6.1	Livelihood skills training for households surrounding Dongjiang Lake	Implementation of skill capacity training for 30,000 people in 5 years: providing teaching materials, skill identifying, etc.; key content of training: tea processing, aquatic fruit processing, ship

No.	Output/Component	Major Contents
		steering, new industry production for residents surrounding the lake; conduct training for 3,171 households in Bailang, Dongjiang, Qingjiang, and Xingning six times per year in 3 consecutive years; key content of the training: soil-testing technology, green prevention technology of crop disease and pests
4.7	**Eco-Compensation Pilot Scheme**	Increasing tourism prices and using the increased fund for operation and maintenance of the rural wastewater treatment facilities and solid waste collection facilities
Output 5: Environmental and Project Management Capacity Strengthened		
5.1	**Dongjiang Lake Environmental Monitoring and Research Capacity Building**	
5.1.1	Dongjiang Lake environmental monitoring center	6,600 m^2, including 3,000-m^2 environmental monitoring command center, 3,500-m^2 fishing monitoring station, 100-m^2 forest resource (fire-fighting) monitoring center, 123 monitoring equipment and office equipment
5.1.2	Water quality automatic monitoring stations	30 monitoring equipment, 400 m^2 of construction area
5.2	**Dongjiang Lake Ecological and Environmental Protection Research Center**	
5.2.1	Construction project	3,300 m^2, including 2,300-m^2 laboratory building of research center, 1,000-m^2 ancillary building for life
5.2.2	Equipment purchase	Purchase relevant equipment, including 21 analytical equipment, 1 pilot system, 1 speedboat for sampling and monitoring, 2 field monitoring vehicles, and 161 office equipment
5.2.3	Auxiliary project	1 power supply project, 1 water supply project, 1 landscaping project, 1 fence wall, and 1 other project
5.3	**Dongjiang Lake Environmental Monitoring and Management Information System**	Establishment of data base, software development, procurement of hardware, network configuration, etc.
5.4	**Provision of Project Implementation Consulting Services, Training, Workshops, and Study Tours**	
5.4.1	Environmental awareness publicity	Prepare and deliver 50,000 copies of publicity material and 20 issues of publicity video of the Dongjiang Lake environmental protection, 200 publicity signboards
5.4.2	Training	Trainings on management, financing, technology, and skill training for department- and township-level project-related personnel; organizing project management staff and business technology staff overseas training
5.4.3	Consulting services	Domestic and international consulting specialists for project implementation management support
5.5	**Dongjiang Lake Project Management Information System**	Establishment of the Dongjiang Lake Project Management Information System to provide a platform for project management
5.6	**Establishment of Public Forest Ecological Benefits and Management Information System**	
5.6.1	Public forest survey and ecological benefits evaluation	Establishment of Zixing City's public interest on forest ecological benefit monitoring schemes, 54,000 ha of public forest baseline survey, public forest changes survey and resources data update; public interest ecological benefits evaluation
5.6.2	Establishment of public forest management information system	Establishment of public forest information management system, disposition hardware networks, public interest on forest database construction, software development of public forest management information system

Source: Asian Development Bank estimates.

II. IMPLEMENTATION PLANS

A. Project Readiness Activities

Indicative Activities	2015							2016						Responsibility
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Procurement agent recruited														ZCG/PMO, ZIFC
Advance contracting actions														ZCG/PMO, ZIFC
Retroactive financing actions														ZCG/PMO, ZIFC
Approval of FSR														HPG
Approval of FCUP														NDRC
Engagement of technical design institutes for first batch of subprojects														ZCG/PMO, ZIFC
EIA and resettlement plan approved														
ADB management review														ADB
Loan negotiations														ADB, MOF, HPG, ZCG
ADB Board consideration														ADB
Loan signing														ADB, MOF, HPG, ZCG
Government legal opinion														MOF, HPG, ZCG
Government budget inclusion														ZCG
Loan effectiveness														ADB, MOF

ADB = Asian Development Bank, EIA = environmental impact assessment, FCUP = foreign capital utilization plan, FSR = feasibility study report, HPG = Hunan Provincial Government, MOF = Ministry of Finance, NDRC = National Development and Reform Commission, PMO = project management office, ZCG = Zixing City Government, ZIFC = Zixing City Urban and Rural Environmental Protection Investment and Financing Center.
Source: ADB estimates.

B. Overall Project Implementation Plan

Indicative Activities	2016				2017				2018				2019				2020				2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
A. Design and Monitoring Framework																								
1. Pollution control improved																								
1.1 Construct six WWTPs and 38.1 km of sewer pipes in six townships																								
1.2 Construct 2,856 rural wastewater treatment facilities and 330 km of sewer pipes in ten township																								
1.3 Construct seven solid waste transfer stations and procure associated 11 solid waste compressing equipment																								
1.4 Procure 60,516 units of solid waste collection equipment and transfer vehicles																								
1.5 Test soil and apply green fertilizers (site-specific formulated and organic fertilizers) in 3,406 ha of farmland in 13 pilot villages																								
1.6 Procure green pest control devices and biological pesticide, and apply these new technologies in 2,284 ha of farmland in 19 villages																								
2. Urban–rural water supply system established																								
2.1 Construct the Chukou WSP with capacity of 620 m^3/day																								
2.2 Construct 7.8 km of conveyance pipelines, 4.0 km of water main distribution pipelines, and 23.0 km of household connection distribution pipelines in Chukou Town																								
2.3 Construct the Yangdongxia WSP with capacity of 20,000 m^3/day																								
2.4 Construct 13.8 km of conveyance pipelines, 157.8 km of water main distribution pipelines, 228.0 km of water branch distribution pipelines, 300.0 km of household connection distribution pipelines in five townships																								
3. River course rehabilitated																								
3.1 Clear and/or dredge about 653,692 m^3 (14.7 km) of river blockages in the five major rivers of Guangqiao, Lianping, Qingyao, Tian'eshan, and Xingning																								
3.2 Construct 13.7 km of green embankment in needed sections of the five major rivers																								
3.3 Plant riverbank trees for greening																								
4. Integrated ecosystem rehabilitation and management established																								
4.1 Procure fish resource monitoring equipment																								
4.2 Build about 3,000 m^2 of fish proliferation platform with access road																								
4.3 Build and upgrade 20 ha of fish-breeding pond, and procure associated equipment																								
4.4 Construct the 40-ha Xingning River wetland with 7.5 km of access road, 1.5 ha of artificial wetland for river water quality improvement																								

Indicative Activities	2016				2017				2018				2019				2020				2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
4.5 Construct the 26.7-ha Huangcao lakeside wetland																								
4.6 Construct the 100-ha Hangxi River wetland with 5 km of internal plank road and 10 pavilions																								
4.7 Construct 590 km of fire-prevention forest belt																								
4.8 Conduct 1,000 ha of reforestation in rocky area																								
4.9 Enhance 13,666 ha of forest management to increase the forest density																								
4.10 Procure forest fire-fighting equipment and facilities, and pest control equipment and biological pesticide																								
4.11 Improve the production efficiency in 2,595 ha of low-efficient bamboo forest																								
4.12 Conduct alternative livelihood training for farmers																								
4.13 Carry out eco-compensation pilot																								
4.14 Conduct fish release																								
5. Environmental and project management capacity strengthened																								
5.1 Establish a project management and evaluation system																								
5.2 Establish environmental, fishery, and forest fire-fighting monitoring centers																								
5.3 Set up the Dongjiang Lake ecological and environmental protection research center																								
5.4 Establish the Dongjiang Lake environmental monitoring and management information system																								
5.5 Recruit and manage project implementation consulting services																								
5.6 Conduct training, workshops, and study tours																								
B. Project Management Activities																								
Technical design and procurement planning and management																								
Carry out key activities of the gender action plan and the social development action plan																								
Conduct and monitor activities of the resettlement plan (including land acquisition), ethnic minority development plan, and environmental management plan																								
Conduct midterm and annual project reviews																								
Project completion report																								

ha = hectare, km = kilometer, m^2 = square meter, m^3 = cubic meter, WSP = water supply plant, WWTP = wastewater treatment plant.

Source: Asian Development Bank estimates.

III. PROJECT MANAGEMENT ARRANGEMENTS

A. Project Implementation Organizations—Roles and Responsibilities

Project Implementation Organizations	Management Roles and Responsibilities
Hunan Provincial Finance Department (HPFD)	• Provide overall project guidance and supervision • Establish and manage the project imprest account • Submit withdrawal applications to the Asian Development Bank (ADB) • Manage and supervise loan repayment
Zixing City Government (ZCG), Executing agency	• Oversee and coordinate the project planning, management, and implementation • Coordinate project implementation activities among government agencies • Execute the loan agreement and sign the project agreement • Provide counterpart funds and repay the ADB loan
Project management office, ZCG	• On behalf of ZCG, manage all implementation works during preparation and implementation • Coordinate with all involved agencies, departments, and institutes for project implementation • Implement nonstructural and capacity development components of the project • Prepare and update the procurement plan and other project documents • Provide ADB with (i) quarterly project progress reports, (ii) semiannual environmental monitoring reports, (iii) a project completion report, and (iv) annual audit reports • Forward the external resettlement monitoring reports • Review withdrawal applications prepared by ZIFC, the implementing agency; and prepare and submit withdrawal applications to HPFD • Carry out project performance and compliance monitoring
Zixing City Urban and Rural Environmental Protection Investment and Financing Center (ZIFC), Implementing agency	• Responsible for day-to-day project implementation activities for all infrastructure subcomponents • Design and procure works and goods under all infrastructure components, and administer and monitor the contractors and suppliers • Undertake contract management, construction supervision, and quality control, with the support of supervision companies • Develop project management procedures, implementation plan, and financial management • Prepare withdrawal applications • Maintain separate project accounts for the project

Project Implementation Organizations	Management Roles and Responsibilities
	• Prepare and update the environmental management plan and other project documents • Organize project acceptance verification
ADB	• Provide guidance to ZCG and ZIFC to ensure compliance with loan and project covenants, and ADB policies and procedures • Monitor and review the project implementation progress and impact • Review and approve procurement actions and other reports • Approve withdrawal applications and disburse loan proceeds • Review annual audit reports and follow up on audit recommendations • Update regularly the project information documents for public disclosure in the ADB website • Monitor implementation of ADB's anticorruption policies

24. **Implementation of livelihood training.** It is estimated that about 6,000 rural residents will be trained each year for 5 years. The subjects proposed for the training will include tea processing, aquatic products and fruits processing, boat and vehicle driving, mechanical and electric equipment maintenance, hotel and household services, computer operation, cooking, secretarial and repair services, etc.

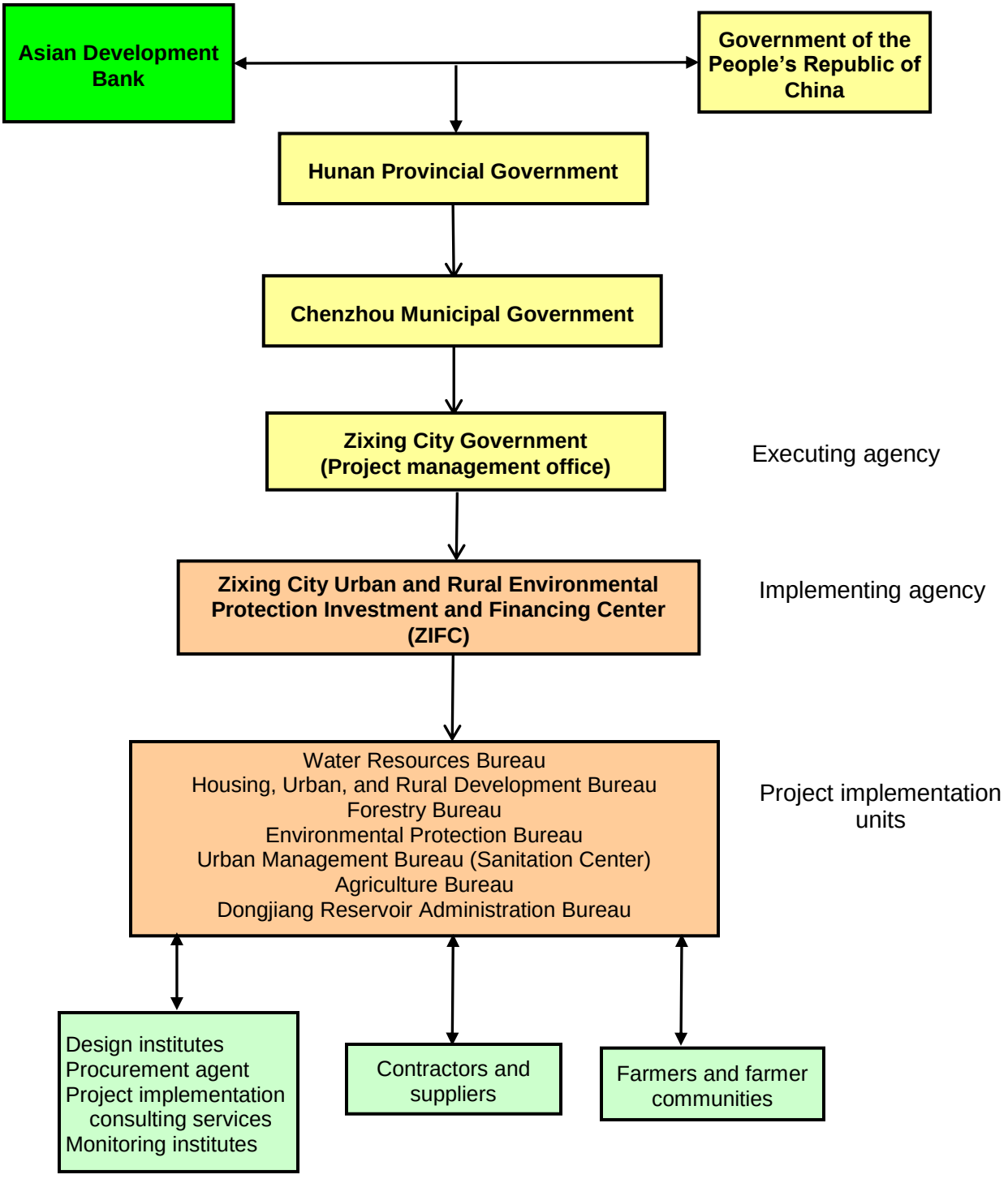
25. The Zixing Secondary Vocational School will be served as project implementation unit to conduct this activity. The school is a school dedicated to technical and vocational training. The school has established facilities and qualified instructors for vocational and technical training. The school is being strengthened under the ongoing ADB-financed Hunan Technical and Vocational Education and Training Demonstration Project.[6] The school is currently carrying out various vocational training programs in the area of mechanical and electrical technology application, computer application, tourism and service management, and agricultural cultivation. The school has the capacity and a clear advantage in providing the proposed livelihood training activities under the project. Detailed arrangement will be discussed and agreed during the loan inception mission, including the simple contract form, disbursement and liquidation, and monitoring mechanism to check how the training is provided and funds use.

[6] ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Hunan Technical and Vocational Education and Training Demonstration Project.* Manila.

B. Key Persons Involved in Implementation

Executing Agency	
Zixing City Government (ZCG)	Officer's Name: Mr. He Zunqing Position: Mayor Telephone No.: +86 18373533999
Project management office, ZCG	Officer's Name: Mr. Huang Bin Position: Executive Deputy Director Telephone No.: +86 735 7671116, +86 13975507897 Fax No: +86 735 7671116 Email address: yhdkxmb@163.com Office Address: Zixing City, Chenzhou, Hunan Province, People's Republic of China
Implementing Agency	
Zixing City Urban and Rural Environmental Protection Investment and Financing Center (ZIFC)	Officer's Name: Mr. Yang Shuming Position: Director Telephone No.: +86 13975708388 Office Address: Zixing City, Chenzhou, Hunan Province, People's Republic of China
Asian Development Bank	
East Asia Department Environment, Natural Resources, and Agriculture Division	Staff Name: Qingfeng Zhang Position: Director Telephone No.: +63 2 632 6769 Fax No.: +63 2 636 2534/2444 Email address: qingfengzhang@adb.org
Mission Leader	Staff Name: Yaozhou Zhou Position: Senior Water Resources Specialist, EARD Telephone No.: +63 2 632 5943 Email address: yaozhou@adb.org

C. Project Organization Structure



Source: Asian Development Bank.

IV. COSTS AND FINANCING

26. The government has requested a loan of $130 million from ADB's ordinary capital resources to help finance the project. The loan will have a 25-year term, including a grace period of 5 years, an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility,[7] a commitment charge of 0.15% per year (the interest and other charges during construction to be capitalized in the loan), and such other terms and conditions set forth in the draft loan and project agreements.

27. The ADB loan will finance 49.6% of the project cost, including civil works, goods, consulting services, training, and taxes and duties for eligible ADB-financed expenditures.[8] ZCG will finance $109.6 million (41.8%); and the farmer beneficiaries will finance $22.5 million (8.6%) of the project cost, including civil works, land acquisition and resettlement (LAR) cost, environmental monitoring cost, design and supervision cost, and contingencies. The farmer beneficiaries' contributions refer to the farmers' share for subprojects relating to nonpoint source pollution, green and organic fertilizers and ecosystem management with community participation. Farmer beneficiaries will contribute their share of cash for buying materials from the suppliers for the nonpoint source pollution, and green and organic fertilizers components; and their share of labor for ecosystem management with community participation. The national government is the borrower of the loan and will relend the entire loan to HPG, which will onlend the loan proceeds to ZCG on the same terms and conditions as those for the ADB loan. ZCG will bear the foreign exchange and interest rate variation risks.

A. Cost Estimates Preparation and Revisions

28. **Preparation.** The project preparatory technical assistance (PPTA) consultants worked closely with the design institutes for preparing the cost estimates following the national government's guidelines on preparing the cost estimates and ADB's guide note on Preparing and Presenting Cost Estimates for Projects and Programs Financed by the Asian Development Bank. The electronic file in Microsoft excel format was retained at the project management office (PMO) under ZCG and by the ADB project officer.

29. **Revisions.** The PMO, with the assistance of the design institutes, will revise the cost estimates under the guidance of the ADB project officer during implementation based on the request for project cost reallocation and ADB's subsequent approval. During the midterm review, the project cost will be re-estimated and compared with the project cost at appraisal.

B. Cost Categories

30. Cost categories are as follows:

Category	Description
Civil works	Water supply plants and pipelines; wastewater treatment plants and sewers; solid waste collection facilities; river course rehabilitation (embankment, blockage cleaning, and riverbank greening); facilities for agricultural nonpoint source pollution control, and ecosystem improvement and management; and wetlands, buildings, and facilities for environmental monitoring
Equipment and	Green fertilizer and pest control materials for agricultural nonpoint source

[7] The interest includes a maturity premium of 20 basis points. This is based on the above loan terms and the government's choice of repayment option and dates.

[8] The amount of taxes and duties to be financed in the project has been determined based on the principles that (i) the amount is within the reasonable threshold, (ii) the amount does not represent an excessive share of the project, (iii) the taxes and duties apply only with respect to ADB-financed expenditures, and (iv) the financing of taxes and duties is material and relevant to the success of the project.

Category	Description
materials	pollution, vehicles and other equipment for solid waste collection and compressing, equipment for water supply plants, materials for river course rehabilitation, fertilizers and fire prevention equipment for ecology system management, and environmental monitoring and office equipment
Consulting services and training	Project implementation consultants; livelihood training; project monitoring and evaluation; and training, workshops, and study tours
Ecosystem rehabilitation and management	Including both civil works and seedlings for bamboo forest improvement, soil conservation forest, and public interest forest management and maintenance (to be carried out through community participation)
Land acquisition and resettlement	Cost for land acquisition and resettlement
Survey and engineering	Detailed technical surveys and designs, engineering supervision, and general project management

Source: Asian Development Bank.

C. Assumptions

31. The following key assumptions underpin the cost estimates and financing plan:
    (i) Exchange rate: CNY6.20 = $1.00 (as of 15 May 2015);
    (ii) Price contingencies based on expected cumulative inflation over the implementation period are as follows:

Item	2016	2017	2018	2019	2020	Average
Foreign rate of price inflation	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
Domestic rate of price inflation	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

D. Summary Cost Estimates and Financing Plan

Table 2: Project Investment Plan
($ million)

Item			Amount[a]
A.	**Base Cost**[b]		
	1.	Improved pollution control	47.47
	2.	Establishment of urban–rural water supply system	46.16
	3.	Rehabilitated river course	14.34
	4.	Establishment of integrated ecosystem rehabilitation and management	88.60
	5.	Strengthened environmental and project management capacity	24.83
		Subtotal (A)	**221.40**
B.	**Contingencies**[c]		**36.09**
C.	**Financial Charges During Implementation**[d]		**4.54**
		Total (A+B+C)	**262.03**

[a] Includes taxes and duties of $16.81 million to be financed from government resources and the Asian Development Bank (ADB) loan resources.
[b] In May 2015 prices.
[c] Physical contingencies computed at 10%. Price contingencies computed at 1.4% from 2016 and onwards on foreign exchange costs, and 3.0% for 2016 and onwards on local currency costs.
[d] Includes interest and commitment charges. Interest during construction for the ADB loan(s) has been computed at the 5-year US dollar fixed swap rate plus a spread of 0.5% and a maturity premium of 0.2%. Commitment charges for an ADB loan are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

Table 3: Financing Plan

Source	**Amount** ($ million)	**Share of Total** (%)
Asian Development Bank		
Ordinary capital resources (loan)	130.00	49.6
Zixing City Government (from its budgetary resources)	109.57	41.8
Farmer beneficiaries	22.46	8.6
Total	**262.03**	**100.0**

Source: Asian Development Bank estimates.

E. Detailed Cost Estimates by Expenditure Category

Item	(CNY Million) Foreign Currency	Local Currency	Total Cost	($ Million) Foreign Currency	Local Currency	Total Cost
A. Investment Cost						
1. Civil Works	71.75	645.75	**717.50**	11.57	104.15	**115.73**
Wastewater	14.03	126.31	**140.34**	2.26	20.37	**22.64**
Agricultural Nonpoint Source Pollution	-	-	**-**	-	-	**-**
Solid Waste Management	0.94	8.46	**9.40**	0.15	1.36	**1.52**
Water Supply	24.65	221.84	**246.49**	3.98	35.78	**39.76**
River Rehabilitation	8.07	72.67	**80.74**	1.30	11.72	**13.02**
Ecosystem Rehabilitation and Management	20.71	186.41	**207.13**	3.34	30.07	**33.41**
Environment Monitoring	3.34	30.06	**33.40**	0.54	4.85	**5.39**
2. Equipment	105.77	105.77	**211.55**	17.06	17.06	**34.12**
Wastewater	-	-	**-**	-	-	**-**
Agricultural Nonpoint Source Pollution	35.90	35.90	**71.81**	5.79	5.79	**11.58**
Solid Waste Management	21.81	21.81	**43.63**	3.52	3.52	**7.04**
Water Supply	6.68	6.68	**13.36**	1.08	1.08	**2.15**
River Rehabilitation	-	-	**-**	-	-	**-**
Ecosystem Rehabilitation and Management	27.00	27.00	**53.99**	4.35	4.35	**8.71**
Environment Monitoring	14.38	14.38	**28.76**	2.32	2.32	**4.64**
3. Ecosystem Management with Community Participation	114.07	114.07	**228.13**	18.40	18.40	**36.80**
4. Land Acquisition and Resettlement	-	21.50	**21.50**	-	3.47	**3.47**
5. Survey, Design, and Supervision	-	117.79	**117.79**	-	19.00	**19.00**
6. Consulting Services and Training	19.03	57.10	**76.14**	3.07	9.21	**12.28**
Subtotal (A)	**310.63**	**1,061.99**	**1,372.62**	**50.10**	**171.29**	**221.39**
B. Contingencies						**-**
1. Physical	31.06	106.20	**137.26**	5.01	17.13	**22.14**
2. Price	19.41	67.10	**86.51**	3.13	10.82	**13.95**
Subtotal (B)	**50.47**	**173.30**	**223.77**	**8.14**	**27.95**	**36.09**
C. Financing Charges During Implementation						**-**
1. Interest During Construction	26.02		**26.02**	4.20	-	**4.20**
2. Commitment Fees	2.14		**2.14**	0.35	-	**0.34**
Subtotal (C)	**28.17**	**-**	**28.17**	**4.54**	**-**	**4.54**
Total Project Cost (A+B+C)	**389.27**	**1,235.29**	**1,624.56**	**62.79**	**199.24**	**262.03**

Note: Numbers may not sum precisely because of rounding.
Source: Asian Development Bank estimates.

F. Allocation and Withdrawal of Loan Proceeds

CATEGORY				ADB FINANCING BASIS
No.	Item	Total Amount Allocated for ADB Financing ($)		Percentage and Basis for Withdrawal from the Loan Account
		Category	Subcategory	
1	Works	72,100,100		63% of total expenditure
2	Equipment and Materials	25,358,722		
2A	Green Fertilizers for Agricultural Nonpoint Source Pollution		2,185,722	35% of total expenditure
2B	Equipment and Materials other than Category 2A above*		23,173,000	100% of total expenditure
3	Consulting Services and Training	9,600,000		100% of total expenditure
4	Ecosystem Management with Community Participation	18,397,968		50% of total expenditure
5	Interest and Commitment Charges	4,543,210		100% of amount due
Total		**130,000,000**		

* This subcategory includes (a) green chemicals for pests and plants for agriculture non-point source pollution, (b) solid waste management, (c) water supply, (d) ecosystem rehabilitation and management (fishery resource protection and fire prevention), and (e) environmental monitoring.

G. Detailed Cost Estimates by Financier ($ Million)

Item	Total	Asian Development Bank		Zixing City Government		Farmer Beneficiaries	
		Amount	% Cost Category	Amount	% Cost Category	Amount	% Cost Category
A. Investment Cost							
1. Civil Works	**115.73**	72.10	63.0	43.63	37.0	-	-
Wastewater	**22.64**	14.10	63.0	8.53	37.0	-	-
Solid Waste Management	**1.52**	0.94	63.0	0.57	37.0	-	-
Water Supply	**39.76**	24.77	63.0	14.99	37.0	-	-
River Rehabilitation	**13.02**	8.11	63.0	4.91	37.0	-	-
Ecosystem Rehabilitation and Management	**33.41**	20.81	63.0	12.59	37.0	-	-
Environmental Monitoring	**5.39**	3.36	63.0	2.03	37.0	-	-
2. Equipment and Materials	**34.12**	25.36	74.3	4.70	13.8	4.06	11.9
Green and Organic Fertilizers for Agricultural Nonpoint Pollution	**6.25**	2.19	35.0	-	-	4.06	65.0
Green Chemicals for Plant Diseases and Pests for Agricultural Nonpoint Pollution	**5.34**	5.34	100.0	-	-	-	-
Solid Waste Management	**7.04**	7.04	100.0	-	-	-	-
Water Supply	**2.15**	2.15	100.0	-	-	-	-
Ecosystem Rehabilitation and Management	**8.71**	4.01	46.0	4.70	54.0	-	-
Pest Prevention and Fish Proliferation	**4.70**	-	-	4.70	100.0	-	-
Fishery Resource Protection and Fire Prevention	**4.01**	4.01	100.0	-	-	-	-
Environmental Monitoring	**4.64**	4.64	100.0	-	-	-	-
3. Ecosystem Management with Community Participation	**36.80**	18.40	50.0	-	-	18.40	50.0
4. Land Acquisition and Resettlement	**3.47**	-	-	3.47	100.0	-	-
5. Survey, Design, and Supervision	**19.00**	-	-	19.00	100.0	-	-
6. Consulting Services and Training	**12.28**	9.60	78.2	2.68	21.8	-	-
ADB-Financed Consulting Services and Training	**9.60**	9.60	100.0				
Project Implementation Management	**2.10**	2.10	100.0	-	-	-	-
Livelihood Training	**6.75**	6.75	100.0	-	-	-	-
Training/Workshops and Study Tours	**0.75**	0.75	100.0	-	-	-	-
Government-Financed Consulting Services	**2.68**	-	-	2.68	100.0	-	-
Subtotal (A)	**221.39**	**125.46**	**56.7**	**73.48**	**33.2**	**22.46**	**10.1**
B. Contingencies			**-**		**-**		**-**
1. Physical	**22.14**	-	-	22.14	100.0	-	-
2. Price	**13.95**	-	-	13.95	100.0	-	-
Subtotal (B)	**36.09**	**-**	**-**	**36.09**	**100.0**	**-**	**-**
C. Financing Charges During Implementation							
1. Interest During Construction	**4.20**	4.20	100.0	-	-	-	-
2. Commitment Fees	**0.35**	0.35	100.0	-	-	-	-
Subtotal (C)	**4.54**	**4.54**	**100.0**	**-**	**-**	**-**	**-**
Total Project Cost (A+B+C)	**262.03**	**130.00**	**49.6**	**109.57**	**41.8**	**22.46**	**8.6**

Note: Numbers may not sum precisely because of rounding.
Source: Asian Development Bank estimates.

H. Detailed Cost Estimates by Outputs/Components ($ Million)

Item	Total[a]	Pollution Control Improved		Urban–Rural Water Supply System Established		River Course Rehabilitated		Integrated Ecosystem Rehabilitation and Management Established		Environmental and Project Management Capacity Strengthened	
		Amount	% Cost Category	Amount	% Cost Category	Amount	% Cost Category	Amount	% Cost Category	Amount	% Cost Category
A. Investment Cost[b]											
1. Civil Works	**115.73**	24.15	20.9	39.76	34.4	13.02	11.3	33.41	28.9	5.39	4.7
Wastewater	**22.64**	22.64	100.0		-		-		-		-
Agricultural Nonpoint Source Pollution	**-**	-	-		-		-		-		-
Solid Waste Management	**1.52**	1.52	100.0		-		-		-		-
Water Supply	**39.76**		-	39.76	100.0		-		-		-
River Rehabilitation	**13.02**		-		-	13.02	100.0		-		-
Ecosystem Rehabilitation and Management	**33.41**		-		-		-	33.41	100.0		-
Environmental Monitoring	**5.39**		-		-		-		-	5.39	100.0
2. Equipment	**34.12**	18.62	54.6	2.15	6.3	-	-	8.71	25.5	4.64	13.6
Wastewater	**-**	-	-		-		-		-		-
Agricultural Nonpoint Source Pollution	**11.58**	11.58	100.0		-		-		-		-
Solid Waste Management	**7.04**	7.04	100.0		-		-		-		-
Water Supply	**2.15**		-	2.15	100.0		-		-		-
River Rehabilitation	**-**		-		-	-	-		-		-
Ecosystem Rehabilitation and Management	**8.71**		-		-		-	8.71	100.0		-
Environmental Monitoring	**4.64**		-		-		-		-	4.64	100.0
3. Ecosystem Management with Community Participation	**36.80**		-		-		-	36.80	100.0		-
4. Land Acquisition and Resettlement	**3.47**	0.22	6.4	0.28	8.2	0.07	2.0	2.18	62.7	0.72	20.7
5. Survey, Design, and Supervision	**19.00**	4.48	23.6	3.96	20.8	1.25	6.6	7.33	38.6	1.99	10.5
6. Consulting Services and Training	**12.28**	-	-	-	-	-	-	0.18	1.5	12.10	98.5
Subtotal (A)	**221.39**	**47.47**	**21.4**	**46.16**	**20.8**	**14.34**	**6.5**	**88.60**	**40.0**	**24.83**	**11.2**
B. Contingencies[c]											
1. Physical	**22.14**	4.75	21.4	4.62	20.8	1.43	6.5	8.86	40.0	2.48	11.2
2. Price	**13.95**	3.98	28.5	3.90	28.0	1.21	8.7	3.92	28.1	0.93	6.7
Subtotal (B)	**36.09**	**8.73**	**24.2**	**8.52**	**23.6**	**2.65**	**7.3**	**12.78**	**35.4**	**3.42**	**9.5**
C. Financing Charges During Implementation[d]											
1. Interest During Construction	**4.20**	1.20	28.5	1.17	28.0	0.36	8.7	1.18	28.1	0.28	6.7
2. Commitment Fees	**0.35**	0.10	28.5	0.10	28.0	0.03	8.7	0.10	28.1	0.02	6.7
Subtotal (C)	**4.54**	**1.30**	**28.5**	**1.27**	**28.0**	**0.39**	**8.7**	**1.28**	**28.1**	**0.30**	**6.7**
Total Project Cost (A+B+C)	**262.03**	**57.50**	**21.9**	**55.94**	**21.4**	**17.38**	**6.6**	**102.65**	**39.2**	**28.55**	**10.9**

Note: Numbers may not sum precisely because of rounding.

[a] Includes taxes and duties of $16.81 million to be financed from government resources and the Asian Development Bank (ADB) loan resources.

[b] In May 2015 prices.

[c] Physical contingencies computed at 10%. Price contingencies computed at 1.4% from 2016 and onwards on foreign exchange costs, and 3.0% for 2016 and onwards on local currency costs.

[d] Includes interest and commitment charges. Interest during construction for the ADB loan has been computed at the 5-year US dollar fixed swap rate plus a spread of 0.50% and a maturity premium of 0.20%. Commitment charges for an ADB loan are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

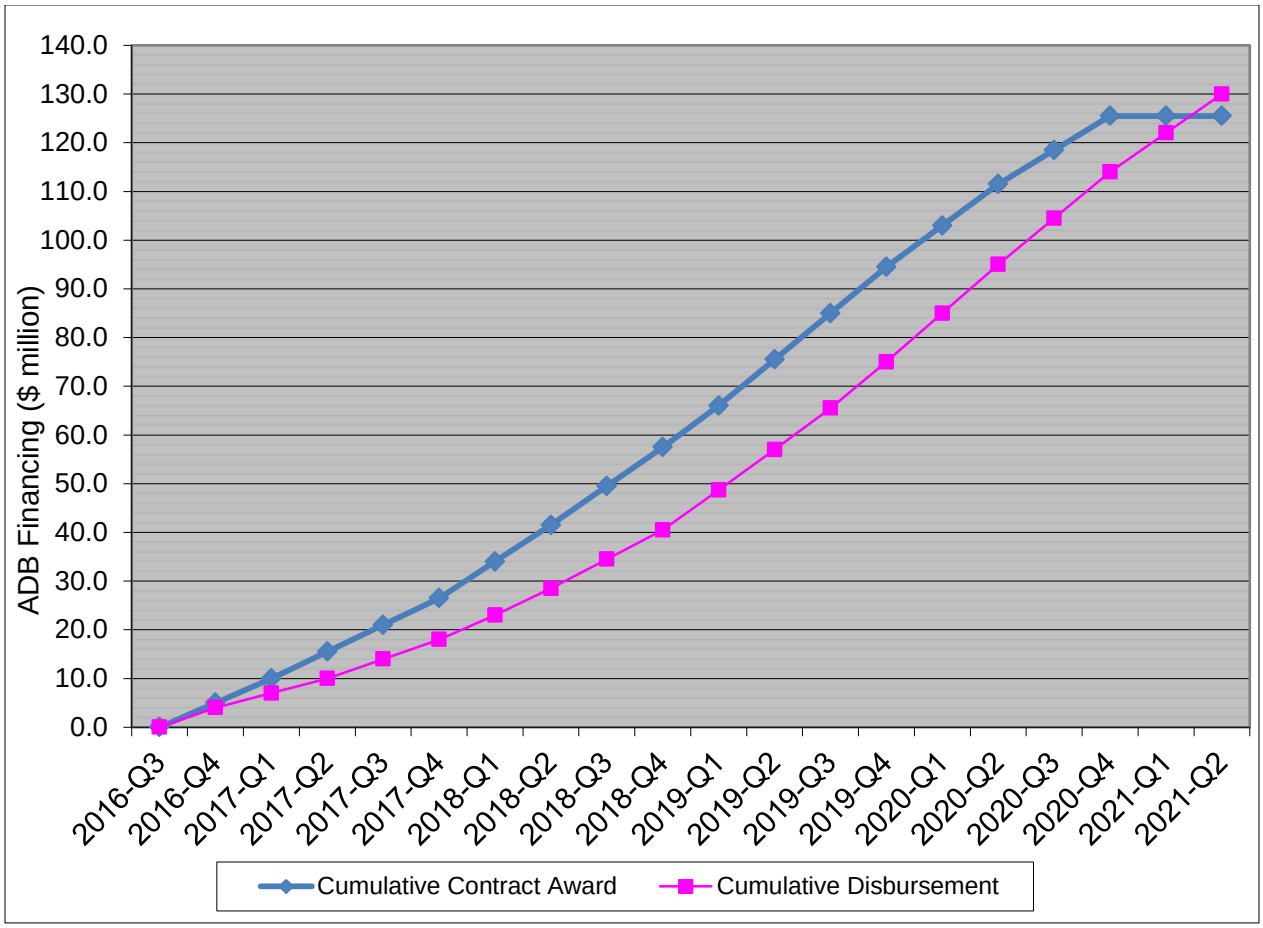
I. Detailed Cost Estimates by Year ($ Million)

Item	Total	2016	2017	2018	2019	2020
A. Investment Cost						
1. Civil Works	**115.73**	17.36	28.93	28.93	28.93	11.57
Wastewater	**22.64**	3.40	5.66	5.66	5.66	2.26
Agricultural Nonpoint Source Pollution	**-**	-	-	-	-	-
Solid Waste Management	**1.52**	0.23	0.38	0.38	0.38	0.15
Water Supply	**39.76**	5.96	9.94	9.94	9.94	3.98
River Rehabilitation	**13.02**	1.95	3.26	3.26	3.26	1.30
Ecosystem Rehabilitation and Management	**33.41**	5.01	8.35	8.35	8.35	3.34
Environmental Monitoring	**5.39**	0.81	1.35	1.35	1.35	0.54
2. Equipment	**34.12**	8.53	8.53	8.53	6.82	1.71
Wastewater	**-**	-	-	-	-	-
Agricultural Nonpoint Source Pollution	**11.58**	2.90	2.90	2.90	2.32	0.58
Solid Waste Management	**7.04**	1.76	1.76	1.76	1.41	0.35
Water Supply	**2.15**	0.54	0.54	0.54	0.43	0.11
River Rehabilitation	**-**	-	-	-	-	-
Ecosystem Rehabilitation and Management	**8.71**	2.18	2.18	2.18	1.74	0.44
Environmental Monitoring	**4.64**	1.16	1.16	1.16	0.93	0.23
3. Ecosystem Management with Community Participation	**36.80**	5.52	9.20	9.20	9.20	3.68
4. Land Acquisition and Resettlement	**3.47**	3.47	-	-	-	-
5. Survey, Design, and Supervision	**19.00**	5.70	7.60	1.90	1.90	1.90
6. Consulting Services and Training	**12.28**	2.46	2.46	2.46	2.46	2.46
Subtotal (A)	**221.39**	**43.03**	**56.72**	**51.02**	**49.31**	**21.31**
B. Contingencies						
1. Physical	**22.14**	4.30	5.67	5.10	4.93	2.13
2. Price	**13.95**	1.37	2.79	3.41	4.18	2.20
Subtotal (B)	**36.09**	**5.67**	**8.46**	**8.51**	**9.11**	**4.33**
C. Financing Charges During Implementation						
1. Interest During Construction	**4.20**	0.23	0.55	0.88	1.20	1.34
2. Commitment Fees	**0.34**	0.16	0.11	0.06	0.02	-
Subtotal (C)	**4.54**	**0.38**	**0.66**	**0.94**	**1.22**	**1.34**
Total Project Cost (A+B+C)	**262.03**	**49.09**	**65.84**	**60.47**	**59.64**	**26.98**
Annual % Disbursement	**100%**	**19%**	**25%**	**23%**	**23%**	**10%**

Note: Numbers may not sum precisely because of rounding.
Source: Asian Development Bank estimates.

J. Contract and Disbursement S-Curve

32. The graphs show quarterly contract awards and disbursement projections over the life of the project. The S-Curve is only for the ADB financing and the ADB-administered cofinancing which will be recorded in ADB's systems and reported through the eOperations system.

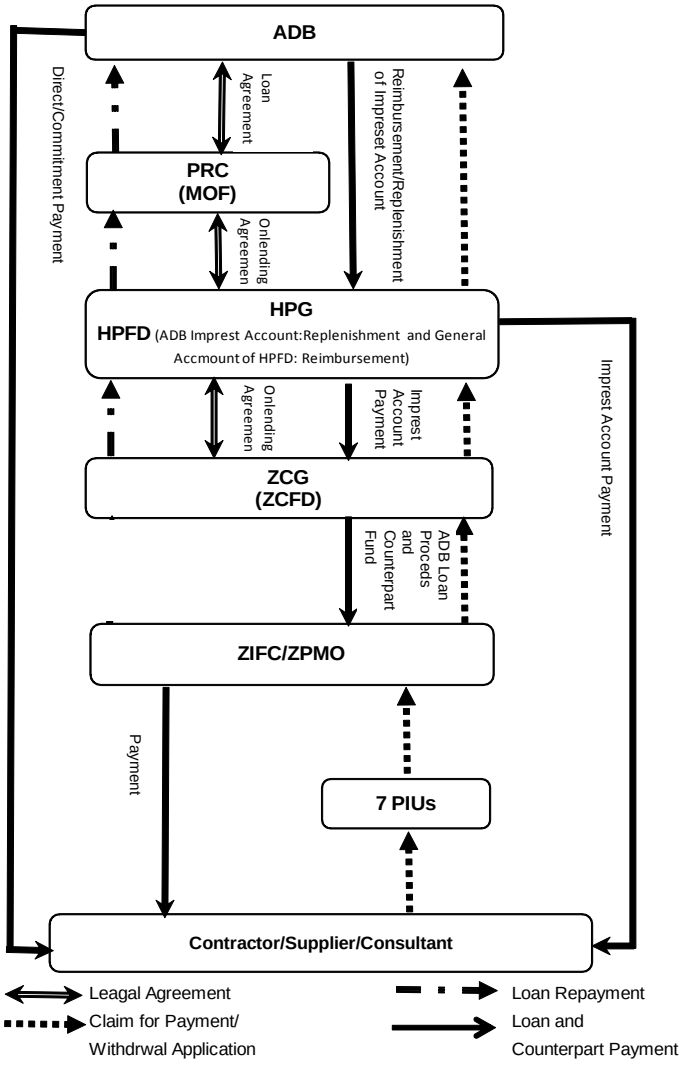


($ Million)

	Contract Awards					Disbursement				
Year	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
2016	0.0	0.0	0.0	5.0	5.0	0.0	0.0	0.0	4.0	4.0
2017	5.0	5.5	5.5	5.5	21.5	3.0	3.0	4.0	4.0	12.0
2018	7.5	7.5	8.0	8.0	31.0	5.0	5.5	6.0	6.0	22.5
2019	8.5	9.5	9.5	9.5	37.0	8.2	8.3	8.5	9.5	34.5
2020	8.5	8.5	7.0	7.0	31.0	10.0	10.0	9.5	9.5	39.0
2021						8.0	8.0			16.0
Total					**125.5**					**130.0**

ADB = Asian Development Bank.
Note: Cumulative contract award does not include $4.54 million financial charges.
Source: ADB estimates.

K. Fund Flow Diagram



ADB: Asian Development Bank
PRC: People's Republic of China
MOF:Minstry of Finance
HPG:Hunan Provincial Government
HPFD:Hunan Provincial Finance Department
ZCG: Zixing City Government
ZCFD: Zixing City Finance Department
ZIFC:Zixing Urban and Rural Environmental Protection Investment and Financing Center
ZPMO: Zixing Project Mangement Office
PIUs: Project Implementation Units
- Zixing Housing, Urban & Rural Development Bureau
- Zixing Environmental Protection Bureau
- Zixing Sanitation Department (Urban Management Bureau)
- Zixing Agriculture Bureau
- Zixing Water Resource Bureau
- Dongjiang Reservior Management Bureau
- Zixing Forestry Bureau

Notes: (i) ADB loan funds will be paid from the HPFD imprest account to ZCG and ZIFC through pass-through accounts; and
(ii) Farmer beneficiaries under agriculture nonpoint source pollution, green and organic fertilizers, and ecosystem management with community participation will contribute cash for buying materials from suppliers for the first two components and their share of labor for ecosystem management with community participation; while farmers will also receive payment for their labors paid by the ADB loan proceeds. Farmers will buy materials from the implementing agency's selected qualified suppliers in their locality and pay their shares to the suppliers. For the labor payment, the project implementation unit (Zixing City Forestry Bureau) will verify the areas of the tree or bamboo planting by each farmer household with the assistance from the village committees concerned; and each farmer household will be paid (loan share) through bank card transfer based on the areas, multiplying the unit cost after verification. This will be done through community participation procurement (via community participation agreement), and the ADB loan proceeds will be paid to the farmers from the imprest account based on provisions of the community participation agreement.

Source: Asian Development Bank.

V. FINANCIAL MANAGEMENT

A. Financial Management Assessment

33. The financial management assessment (FMA)[9] was conducted in January 2015 in accordance with ADB's *Guidelines for the Financial Management and Analysis of Projects*[10] and the Financial Due Diligence—A Methodology Note.[11] The FMA considered the capacity of ZCG, the executing agency; and the Zixing City Urban and Rural Environmental Protection Investment and Financing Center (ZIFC), the implementing agency, on funds flow arrangements, staffing, accounting and financial reporting systems, financial information systems, and internal and external auditing arrangements (footnote 9). The FMA found that (i) ZCG and ZIFC has adequate and qualified staff for operating and administering the project account, and (ii) its internal control and audit will be mitigated through capacity building and close monitoring during project implementation (footnote 9). ZIFC is relatively new entity established in 2014 with no internal audit unit, and staff increase may be required to meet project implementation needs. Based on the FMA, the financial management risks identified are ZCG's and ZIFC's unfamiliarity with ADB's financial management policies and procedures (footnote 9). It is concluded that the overall pre-mitigation financial management risk of ZCG and ZIFC is moderate. Both ZCG and ZIFC have agreed to implement an action plan as key measure to address the deficiencies. With mitigating measures, these financial management arrangements are deemed adequate.

34. The financial management action plan is summarized below:

(i) To conduct regular training on ADB's disbursement procedures, and project accounting and financial reporting requirements. The training budget has been included in the project cost. During the PPTA implementation, on-the-job training was provided by the PPTA consultant.
(ii) To provide implementation consulting services to the ZCG and ZIFC staff on financial management. The financial management specialist with 6 person-months of inputs has been included in the implementation consulting services package.
(iii) Separate accounts to be maintained for all project outputs financed by ADB and the national government, and to be audited by an independent external auditor;
(iv) Annual project accounts and underlying working papers timely prepared for the annual financial statement audit;
(v) Prompt reporting to project stakeholders after the end of each accounting period;
(vi) Compliance with loan covenants monitored, including submission of audited project accounts; and
(vii) Regular back-up of all accounting systems and appropriate security measures over back-up data to be put in place.

B. Disbursement

1. Disbursement Arrangements for ADB

35. The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2015, as amended from time to time),[12] and detailed arrangements agreed upon between ADB and the national government. Online training for project staff on disbursement

[9] Financial Management Assessment (accessible from the list of linked documents in Appendix 2 of the report and recommendations of the President [RRP]).
[10] ADB. 2005. *Financial Management and Analysis of Projects*. Manila.
[11] ADB. 2009. *Financial Due Diligence A Methodology Note*. Manila.

policies and procedures is available at http://wpqr4.adb.org/disbursement_ elearning. Project staff will be encouraged to avail of this training to help ensure efficient disbursement and fiduciary control.

36. Direct payment, reimbursement, commitment, and imprest fund procedures may be used to withdraw funds from the loan account. To expedite the flow of funds and simplify document processing, the statement of expenditure (SOE) procedure may be used to reimburse, replenish, and liquidate eligible expenditures for any individual payment not exceeding $500,000.

37. An imprest account in US dollar will be set up for the project by the Hunan Provincial Finance Department (HPFD) in a commercial bank acceptable to ADB. HPFD will be responsible for management, monitoring, and reconciliation of the imprest account. The total outstanding advance to the imprest account should not exceed the estimate of ADB's share of expenditures to be paid through the imprest account for the forthcoming 6 months. The executing agency may request for initial and additional advances to the imprest account based on an estimate of expenditure sheet available in Appendixes 9B and 9C of ADB's *Loan Disbursement Handbook* (2015, as amended from time to time), setting out the estimated expenditures to be financed through the account for the forthcoming 6 months; and submission of evidence satisfactory to ADB that the imprest account has been duly opened (footnote 12). Supporting documents should be submitted to ADB or retained by the executing and implementing agencies in accordance with ADB's *Loan Disbursement Handbook* (2015, as amended from time to time) when liquidating or replenishing the imprest account (footnote 12).

38. **Statement of expenditure procedure.** [13] The SOE procedure may be used for reimbursement of eligible expenditures or liquidation of advances to the imprest account. The ceiling of the SOE procedure is the equivalent of $500,000 per individual payment. Supporting documents and records for the expenditures claimed under the SOE procedure should be maintained and made readily available for review by ADB's disbursement and review missions, upon ADB's request for submission of supporting documents on a sampling basis, and for independent audit. Reimbursement and liquidation of individual payments in excess of the SOE ceiling should be supported by full documentation when submitting the withdrawal application to ADB.

39. Before the submission of the first withdrawal application, HPFD through the Ministry of Finance should submit to ADB sufficient evidence of the authority of the person(s) who will sign the withdrawal applications on behalf of the borrower, together with the authenticated specimen signatures of each authorized person. The minimum value per withdrawal application is $100,000 equivalent. Individual payments below this amount should be paid (i) by the borrower and subsequently claimed from ADB through reimbursement, or (ii) through the imprest fund procedure, unless otherwise accepted by ADB.

2. Disbursement Arrangements for Counterpart Fund

40. The PMO, in coordination with ZIFC, will prepare disbursement projections and request budget allocations from ZCG for counterpart funds. ZCG will allocate the counterpart from its budget resources in line with its budget regulations and procedures. ZCG may also obtain

[12] Available at: http://www.adb.org/documents/loan-disbursement-handbook.
[13] SOE forms are available in Appendixes 9B and 9C of ADB's *Loan Disbursement Handbook* (2015, as amended from time to time; footnote 12).

financial support from the provincial and national governments through various environmental and water resources improvement programs.

3. Accounting

41. HPG and ZCG, as the case may be, will cause ZIFC to, (i) maintain separate accounts and records by funding source for all expenditures incurred on the project following the equivalent national accounting standards; and (ii) prepare annual financial statements for the project in accordance with the national government's accounting laws and regulations which are consistent with international accounting principles and practices.

4. Auditing and Public Disclosure

42. HPG and ZCG, as the case may be, will cause ZIFC to, have the detailed consolidated project financial statements audited in accordance with the International Standards on Auditing and with the national government's audit regulations, by an independent auditor whose qualification, experience and terms of references are acceptable to ADB, in accordance with international standards for auditing or the national equivalent acceptable to ADB. The audited project financial statements together with the auditor's opinion will be presented to ADB by ZCG in the English language within 6 months from the end of the fiscal year.

43. The audit report for the project accounts will include an audit management letter and auditor's opinions which cover (i) whether the project financial statements present a true and fair view or are presented fairly, in all material respects, in accordance with the applicable financial reporting framework; (ii) whether the proceeds of the loan were used only for the purposes of the project; (iii) the level of compliance for each financial covenant contained in the legal agreements for the project; (iv) use of the imprest fund procedure; and (v) the use of the SOE procedure certifying to the eligibility of those expenditures claimed under SOE procedures, and proper use of the SOE and imprest procedures in accordance with ADB's *Loan Disbursement Handbook* and the project documents (footnote 12).

44. Compliance with financial reporting and auditing requirements will be monitored by review missions and during normal program supervision; and followed up regularly with all concerned, including the external auditor.

45. The national government, HPG, ZCG, and ZIFC have been made aware of ADB's approach to delayed submission, and the requirements for satisfactory and acceptable quality of the audited project financial statements.[14] ADB reserves the right to require a change in the auditor (in a manner consistent with the constitution of the borrower), or for additional support to be provided to the auditor, if the audits required are not conducted in a manner satisfactory to

[14] ADB's approach and procedures regarding delayed submission of audited project financial statements:

- When audited project financial statements are not received by the due date, ADB will write to the executing agency advising that (i) the audit documents are overdue; and (ii) if they are not received within the next 6 months, requests for new contract awards and disbursement such as new replenishment of imprest accounts, processing of new reimbursement, and issuance of new commitment letters will not be processed.
- When audited project financial statements are not received within 6 months after the due date, ADB will withhold processing of requests for new contract awards and disbursement such as new replenishment of imprest accounts, processing of new reimbursement, and issuance of new commitment letters. ADB will (i) inform the executing agency of ADB's actions; and (ii) advise that the loan may be suspended if the audit documents are not received within the next 6 months.
- When audited project financial statements are not received within 12 months after the due date, ADB may suspend the loan.

ADB, or if the audits are substantially delayed. ADB reserves the right to verify the project's financial accounts to confirm that the share of ADB's financing is used in accordance with ADB policies and procedures.

46. Public disclosure of the audited project financial statements, including the auditor's opinion on the project financial statements, will be guided by ADB's Public Communications Policy (2011).[15] After review, ADB will disclose the annual audited financial statements for the project and the opinion of the auditors on the financial statements within 30 days of the date of their receipt by posting them on the ADB website. The management letter, additional auditor's opinions, and audited entity financial statements will not be disclosed.[16]

[15] Available at: http://www.adb.org/documents/pcp-2011?ref=site/disclosure/publications
[16] ADB. 2011. *Public Communications Policy*. Paragraphs 97(iv) and/or 97(v). Manila. This type of information would generally fall under public communications policy exceptions to disclosure.

VI. PROCUREMENT AND CONSULTING SERVICES

A. Advance Contracting and Retroactive Financing

47. All advance contracting and retroactive financing will be undertaken in conformity with ADB's Procurement Guidelines (2015, as amended from time to time)[17] and the Guidelines on the Use of Consultants (2013, as amended from time to time).[18] The issuance of invitations to bid under advance contracting and retroactive financing will be subject to ADB's approval. The borrower, ZCG, and ZIFC have been advised that approval of advance contracting and retroactive financing does not commit ADB to finance the project.

48. **Advance contracting.** The contracts to be included under advance contracting and retroactive financing were tentatively identified and indicated in the procurement plan, which will be finalized during loan negotiations. Contracts for retroactive financing are listed as (i) six WWTPs and sewer networks; (ii) village wastewater treatment facilities and sewer pipes in Chukou, Dongping, Lianping, Longxi, Qingjiang, and Qingyao towns; and (iii) seven solid waste transfer stations and associated facilities. As cited in the previous paragraph, approval of advance contracting does not commit ADB to finance the project.

49. **Retroactive financing.** The national government and ZCG have been advised that retroactive financing may only apply to up to 20% of the amount of the ADB loan in respect for expenditures incurred before loan effectiveness, but not earlier than 12 months before the date of the loan and project agreements.

B. Procurement of Goods, Works, and Consulting Services

50. All procurement to be financed under the ADB loan will be carried out following ADB's Procurement Guidelines. Contracts for civil works valued at $20 million or above and contracts for goods and related services valued at $5 million or above will be procured through international competitive bidding procedures. Contracts for civil works valued at below $20 million but at $200,000 or over, and contracts for goods and related services valued below $5 million but at $100,000 or over will be procured through national competitive bidding (NCB) procedures. NCB will be undertaken following the PRC's Tendering and Bidding Law (1999), subject to modifications agreed with ADB.[19] Contract packages for civil works valued at $200, 000 or less and goods valued at $100,000 or less will be awarded through shopping procedure. Community participation will be applied for the afforestation and bamboo subprojects under integrated ecosystem rehabilitation and management output.

51. An 18-month procurement plan, indicating threshold and review procedures, goods, works, and consulting service contract packages and NCB guidelines, is in Section C.

52. All consultants financed by ADB will be recruited according to ADB's Guidelines on the Use of Consultants.[20] An estimated 162 person-months (26 international, 136 national) of consulting services are required to (i) facilitate project management and institutional

[17] Available at: http://www.adb.org/documents/ procurement-guidelines

[18] Available at: http://www.adb.org/documents/ guidelines-use-consultants-asian-development-bank-and-its-borrowers

[19] For NCB for works and goods, Chinese Model Bidding Documents: Procurement of Civil Works/Goods under National Competitive Bidding (NCB) issued by the Ministry of Finance in January 2012 and enforced on 1 June 2012 will be used as model NCB documents.

[20] Checklists for actions required to contract consultants by method available in e-Handbook on project implementation available at: http://www.adb.org/documents/handbooks/project-implementation

strengthening; (ii) conduct external resettlement and social monitoring; (iii) advise on initial project implementation support, including project management and procurement; (iv) conduct public environmental protection campaign; (v) implement project management and monitoring information system; and (vi) conduct livelihood training. A consulting firm will be engaged using the quality- and cost-based selection method with a standard quality–cost ratio of 80:20 for project implementation consulting service package.

C. Procurement Plan

Basic Data

Project Name: Hunan Dongjiang Lake Integrated Environmental Protection and Management Project	
Country: People's Republic of China	**Executing Agency:** Zixing City Government (ZCG)
Project Procurement Classification: B	**Implementing Agency :** Zixing City Urban and Rural Environmental Protection Investment and Financing Center (ZIFC)
Procurement Risk: Moderate	
Project Financing Amount: **ADB Financing:** $130.00 million **Non-ADB Financing:** $132.03 million	**Project Closing Date: 30 June 2021**
Date of First Procurement Plan:	**Date of this Procurement Plan:** 9 October 2015

1. Methods, Thresholds, Review, and 18-Month Procurement Plan

a. Procurement, Consulting Methods, and Thresholds

53. Except as ADB may otherwise agree, the following thresholds shall apply to procurement of goods and works. Community participation in procurement is proposed to carry out the afforestation and bamboo subprojects under Output 4: Establishment of integrated ecosystem rehabilitation and management. The current nine packages were based on the nature of works and/or activities, such as tree planting for rocky desert rehabilitation; forest upgrading and protection; fire-prevention forest belt; forest pest prevention; and bamboo forest upgrading (further broken down into five packages, each in 5 years). The subprojects will involve a total of 65,699 households; and the farmers will be organized by the Zixing City Forestry Bureau, with assistance of village committees, to carry out the works, including seedlings, land preparation, planting, watering, fertilizer application, and maintenance for initial 3 years. The Zixing Forest Bureau will then verify the areas planted or improved; and then, ZIFC will pay the farmers (cost per unit of area planted) through bank transfers.

Procurement of Goods and Works

Method	Threshold	Comments
International Competitive Bidding (ICB) for Works	>= $20,000,000	Invitation for bids, bidding documents, and bid evaluation and recommendation for contract awards will be subject to the Asian Development Bank's (ADB) prior review.
ICB for Goods	>= $5,000,000	
National Competitive Bidding (NCB) for Works	>= $ 200,000 and < $20,000,000	The first NCB procurement documents for works should be submitted for ADB's prior review and approval. Subsequent NCB procurement documents will be subject to post review.
NCB for Goods	>= $ 100,000 and < $5,000,000	
Shopping for Civil Works	< $200,000	
Shopping for Goods	< $100,000	
Community Participation (CP)		CP applies to the afforestation and bamboo subprojects under output 4: integrated ecosystem rehabilitation and management established. First CP agreement should be submitted for ADB's prior review and approval.

Consulting Service Method	
Method	**Comments**
Quality- and Cost-Based Selection (QCBS)	Five submissions: (i) advertisement, (ii) shortlist and request for proposals, (iii) technical evaluation, (iv) financial evaluation and overall ranking, and (v) draft negotiated contract
Service delivery assignment (SDA)	SDA will be applied for the livelihood training of about 30,000 farmers by using the services of the Zixing Secondary Vocational School supported under the ADB-financed Hunan Technical and Vocational Education and Training Demonstration Project.

b. Goods and Works Contracts Estimated to Cost $1 Million or More

54. The following table lists goods and works contracts for which the procurement activity is either ongoing or expected to commence within the next 18 months:

Package Number	General Description	Estimated Value (US$)	Procure-ment Method	Review (Prior/Post)	Bidding Procedure	Advertise-ment Date (Quarter/ Year)	Comments
Equipment and Materials							
G1-SW1	Solid Waste Compressing Equipment	1,083,900	NCB	Prior	Single-stage: one-envelope	Q1/2016	First NCB documents for prior review and approval.
G1-SW2	Solid Waste Collection Facilities	2,715,000	NCB	Post	Single-stage: one-envelope	Q1/2016	
G1-SW3	Solid Waste Transport Vehicle	2,941,900	NCB	Post	Single-stage: one-envelope	Q1/2016	
G1-AG1	Green Fertilizer (2016–2017)	1,590,100	NCB	Post	Single-stage: one-envelope	Q2/2016	

Package Number	General Description	Estimated Value (US$)	Procure-ment Method	Review (Prior/Post)	Bidding Procedure	Advertise-ment Date (Quarter/ Year)	Comments
G1-AG2	Organic Fertilizer (2018–2020)	4,654,800	NCB	Post	Single-stage: one-envelope	Q2/2018	
G1-AG3	New and Green Chemicals for Plant Disease and Insect Pest Prevention	3,830,400	NCB	Post	Single-stage: one-envelope	Q2/2016	
G1-AG4	Other Apparatus for Plant Disease and Insect Pest Prevention	1,506,800	NCB	Post	Single-stage: one-envelope	Q2/2016	
G4-ER5	Fire Prevention and Monitoring Equipment for Public Interest Forest	3,023,300	NCB	Post	Single-stage: one-envelope	Q2/2016	
G5-EM1	Environmental Monitoring Equipment (two monitoring stations, one monitoring center, and one ecological research center)	4,085,700	NCB	Post	Single-stage: one-envelope	Q3/2016	
Civil Works							
W1-WW1	WWTPs and Sewer Networks for Six Towns, and Solid Waste Transfer Station for Qingjiang	5,060,000	NCB	Prior	Single-stage: one-envelope	Q4/2015	First NCB documents for prior review and approval.
W1-WW2	Village WWTPs and Sewer Networks for Bailang and Dongping Towns	1,926,400	NCB	Prior	Single-stage: one-envelope	Q4/2015	For retroactive financing
W1-WW3	Village WWTPs and Sewer Networks for Lianping, Longxi, and Qingyao Towns	6,049,500	NCB	Prior	Single-stage: one-envelope	Q4/2015	For retroactive financing
W1-WW4	Village WWTPs and Sewer Networks for Chukou, Huangcao, and Qingjiang Towns	4,540,000	NCB	Post	Single-stage: one-envelope	Q2/2016	
W1-WW5	Village WWTPs and Sewer Networks for Dongjiang and Zhoumensi Towns	5,060,400	NCB	Post	Single-stage: one-envelope	Q2/2016	
W1-SW1	Six Solid Waste Transfer Stations and Affiliated Facilities (excluding Qingjiang)	1,516,500	NCB	Prior	Single-stage: one-envelope	Q4/2015	For retroactive financing
W3-RR1	Rehabilitation for Tian'eshan and Xingning Rivers	4,634,100	NCB	Post	Single-stage: one-envelope	Q1/2016	
W3-RR2	Rehabilitation for Guangqiao River	3,004,200	NCB	Post	Single-stage: one-envelope	Q1/2016	

Package Number	**General Description**	**Estimated Value** (US$)	**Procure-ment Method**	**Review** (Prior/Post)	**Bidding Procedure**	**Advertise-ment Date** (Quarter/ Year)	**Comments**
W3-RR3	Rehabilitation for Lianping and Qingyao Rivers	5,384,700	NCB	Post	Single-stage: one-envelope	Q1/2016	
W4-ER1	Fish Proliferation Platform	2,203,200	NCB	Post	Single-stage: one-envelope	Q3/2016	
W4-ER2	Fish-Breeding Base	6,987,900	NCB	Post	Single-stage: one-envelope	Q3/2016	
W4-ER3	Riverbank Greening and Passway in Wetland	3,751,600	NCB	Prior	Single-stage: one-envelope	Q4/2015	For retroactive financing
W4-ER4	Xingning River Wetland	7,997,800	NCB	Prior	Single-stage: one-envelope	Q4/2015	For retroactive financing
W4-ER5	Hangxi River Wetland	5,403,200	NCB	Prior	Single-stage: one-envelope	Q4/2015	For retroactive financing
W4-ER6	Huangcao Lake Wetland	5,823,100	NCB	Post	Single-stage: one-envelope	Q3/2016	
W4-ER7	Public Interest Forest Protection Warehouse Renovation	1,240,600	NCB	Post	Single-stage: one-envelope	Q3/2016	
W5-EM1	Environmental Monitoring Stations (2), Environmental Monitoring Center, Fishing Monitoring Center, Forest Resources (Fire Prevention) Monitoring Center	3,781,700	NCB	Post	Single-stage: one-envelope	Q3/2016	
W5-EM3	Dongjiang Lake Ecological and Environmental Protection Research Center	1,604,800	NCB	Post	Single-stage: one-envelope	Q4/2016	
CP4-ER1	Tree Planting for Rocky Desert Rehabilitation	7,968,800	CP			Q1/2016	various
CP4-ER2	Tree Natural Upgrade and Protection for Rocky Desert Rehabilitation	15,726,000	CP			Q1/2016	various
CP4-ER3	Biological Fire Prevention Belt for Public Interest Forest	1,701,300	CP			Q1/2016	various
CP4-ER4	Pest Biological Prevention for Public Interest Forest	1,606,000	CP			Q1/2016	various
CP4-ER5	Bamboo Forest Upgrade Package A	1,958,800	CP			Q1/2016	various

Package Number	General Description	Estimated Value (US$)	Procure-ment Method	Review (Prior/Post)	Bidding Procedure	Advertise-ment Date (Quarter/Year)	Comments
CP4-ER6	Bamboo Forest Upgrade Package B	1,958,800	CP			Q1/2017	various

CP = community participation, NCB = national competitive bidding, WWTP = wastewater treatment plant.

c. Consulting Services Contracts Estimated to Cost $100,000 or More

55. The following table lists consulting services contracts for which the recruitment activity is either ongoing or expected to commence within the next 18 months:

Package Number	General Description	Estimated Value (US$)	Recruit-ment Method	Review (Prior/Post)	Advertisement (Quarter/Year)	Type of Proposal	Comments
CS1	Project Implementation Management Support	2,100,000	QCBS	Prior	Q1/2016	FTP	

FTP = full technical proposal, QCBS = quality- and cost-based selection.

d. Goods and Works Contracts Estimated to Cost Less than $1 million and Consulting Services Contracts Less than $100,000

56. The following table groups smaller-value goods, works, and consulting services contracts for which the activity is either ongoing or expected to commence within the next 18 months:

Goods and Works							
Package Number	**General Description**	**Estimated Value** (US$)	**Number of Contracts**	**Procure-ment Method**	**Review** (Prior/Post)	**Bidding Procedure**	**Advertisement Date** (Quarter/Year)
G1-SW4	Environmental Sanitation Promotion Facilities	296,000		NCB	Post	Single-stage, one-envelope	Q2/2016
G4-ER4	Fishery Resources Protection Facilities and Equipment	982,800		NCB	Post	Single-stage, one-envelope	Q1/2016
G5-EM2	Office Equipment (two monitoring stations, one monitoring center, and one ecological research center)	552,900		NCB	Post	Single-stage, one-envelope	Q3/2016
W2-WS8	Chukou WTP and Distribution Pipelines	722,600		NCB	Post	Single-stage, one-envelope	Q4/2016

NCB = national competitive bidding, WTP = water treatment plant.

2. Indicative List of Packages Required under the Project

57. The following table provides an indicative list of goods, works, and consulting services contracts over the life of the project, other than those mentioned in previous sections (i.e., those expected beyond the 18 months period):

Goods and Works							
Package Number	**General Description**	**Estimated Value** (US$)	**Number of Contracts**	**Procure-ment Method**	**Review** (Prior/ Post)	**Bidding Procedure**	**Comments**
G2-WS1	Equipment for Yangdongxia WTP	2,154,400		NCB	Post	Single-stage, one-envelope	Advertise-ment date: Q3/2018
W2-WS1	Civil Works for Yangdongxia WTP	3,862,800		NCB	Post	Single-stage, one-envelope	Advertise-ment date: Q3/2018
W2-WS2	Main Water Transmission and Distribution Pipelines for Yangdongxia WTP and Pressure-Reducing Stations	2,708,600		NCB	Post	Single-stage, one-envelope	Advertise-ment date: Q3/2018
W2-WS3	Transmission and Distribution Pipelines in Zhoumensi Town for Yangdongxia WTP	6,491,000		NCB	Post	Single-stage, one-envelope	Advertise-ment date: Q3/2018
W2-WS4	Transmission and Distribution Pipelines in Lanshi Town for Yangdongxia WTP	4,915,300		NCB	Post	Single-stage, one-envelope	Advertise-ment date: Q3/2018
W2-WS5	Transmission and Distribution Pipelines in Boshui Town for Yangdongxia WTP	2,401,600		NCB	Post	Single-stage, one-envelope	Advertise-ment date: Q3/2018
W2-WS6	Transmission and Distribution Pipelines in Xingning Town for Yangdongxia WTP	13,345,600		NCB	Post	Single-stage, one-envelope	Advertise-ment date: Q3/2018
W2-WS7	Transmission and Distribution Pipelines in Bailang Town for Yangdongxia WTP	5,308,800		NCB	Post	Single-stage, one-envelope	Advertise-ment date: Q3/2018
CP4-ER7	Bamboo Forest Upgrade Package C	1,958,800	various	CP			Advertise-ment date: Q4/2017
CP4-ER8	Bamboo Forest Upgrade Package D	1,958,800	various	CP			Advertise-ment date: Q4/2018
CP4-ER9	Bamboo Forest Upgrade Package E	1,958,700	various	CP			Advertise-ment date: Q4/2019

CP = community participation, NCB = national competitive bidding, WTP = water treatment plant.

3. Non-ADB Financing

Goods and Works				
General Description	**Estimated Value** (US$)	**Estimated Number of Contracts**	**Procurement Method**	**Comments**
Pest Prevention and Chemicals Purchases for Public Interest Forest	202,700		NBF	G1-ER1 Advertisement date: Q4/2015
Fish Proliferation Package A and B	1,800,000		NBF	G4-ER1Advertisement date: Q4/2015
Fish Proliferation Package C, D, and E	2,700,000		NBF	G4-ER2 Advertisement date: Q4/2017
Public Environmental Protection Promotion	850,000		NBF	CS6 Advertisement date: Q4/2016
Public Interest Forest Ecological Benefits and Information Management System	650,000		NBF	CS7 Advertisement date: Q4/2016
Dongjiang Lake Environmental Monitoring Information System	320,000		NBF	CS8 Advertisement date: Q4/2017
Forest Harmful Ecological Survey	180,000		NBF	CS9 Advertisement date: Q4/2016
External Resettlement and Social Monitoring	100,000		NBF	Advertisement date: Q2/2016
Start-up Consultant	100,000		NBF	Advertisement date: Q3/2015
Project Monitoring and Management Information System	480,000		NBF	Advertisement date: Q2/2016

ADB = Asian Development Bank, NBF = non-ADB financing.

4. National Competitive Bidding

58. The borrower's Law of Tendering and Bidding of the People's Republic of China, promulgated by Order No. 21 of the President of the People's Republic of China on 30 August 1999, are subject to the following clarifications required for compliance with the guidelines:

(i) All invitations to prequalify or to bid shall be advertised in the national press, official gazette, or a free and open access website in the borrower's country. Such advertisement shall be made in sufficient time for prospective bidders to obtain prequalification or bidding documents, and prepare and submit their responses. In any event, a minimum preparation period of thirty (30) days shall be given. The preparation period shall count (a) from the date of advertisement; or (b) when the documents are available for issue, whichever date is later. The advertisement and the prequalification and bidding documents shall specify the deadline for such submission.

(ii) Qualification requirements of bidders and the method of evaluating the qualification of each bidder shall be specified in detail in the bidding documents; and in the prequalification documents, if the bidding is preceded by a prequalification process.

(iii) If bidding is preceded by a prequalification process, all bidders that meet the qualification criteria set out in the prequalification document shall be allowed to bid; and there shall be no limit on the number of pre-qualified bidders.

(iv) All bidders shall be required to provide a performance security in an amount sufficient to protect the borrower and/or project executing agency in case of breach of contract by the contractor, and the bidding documents shall specify the required form and amount of such performance security.

(v) Bidders shall be allowed to submit bids by mail or by hand.

(vi) All bids shall be opened in public; all bidders shall be afforded an opportunity to be present (either in person or through their representatives) at the time of bid opening, but bidders shall not be required to be present at the bid opening.

(vii) All bid evaluation criteria shall be disclosed in the bidding documents and quantified in monetary terns or expressed in the form of pass or fail requirements.

(viii) No bid may be rejected solely on the basis that the bid price falls outside any standard contract estimate, or margin or bracket of average bids established by the borrower and/or project executing agency.

(ix) Each contract shall be awarded to the lowest evaluated responsive bidder, that is, the bidder who meets the appropriate standards of capability and resources; and whose bid has been determined (a) to be substantially responsive to the bidding documents, and (b) to offer the lowest evaluated cost. The winning bidder shall not be required, as a condition of award, to undertake responsibilities for work not stipulated in the bidding documents or otherwise to modify the bid as originally submitted.

(x) Each contract financed with the proceeds of the loan shall provide that the suppliers and contractors shall permit ADB, at its request, to inspect their accounts and records relating to the performance of the contract and to have said accounts and records audited by auditors appointed by ADB.

(xi) Government-owned enterprises in the borrower's country may be permitted to bid if they can establish that they (a) are legally and financially autonomous, (b) operate under commercial law, and (c) are not a dependent agency of the borrower and/or project executing agency.

(xii) Re-bidding shall not be allowed solely because the number of bids is less than three.

D. Consultant's Terms of Reference

1. Package CS1: Project Implementation and Institutional Strengthening Support

59. The project implementation and institutional strengthening consulting services estimated at 26 person-months of international and 136 person-months of national consultants will be

engaged using the quality- and cost-based selection method, with a standard quality–cost ratio of 80:20 and full technical proposal procedure.

60. The proposed consulting service inputs for Package CS1 are summarized in Table 4:

Table 4: Proposed Consulting Service Inputs for Package CS1

	International (person-month)	**National** (person-month)
Project Implementation and Institutional Strengthening Support		
Project Manager and Water Resource Expert	20	
Deputy Project Manager and Construction Management Expert		48
Procurement and Contract Management Expert	6	16
Ecology and Wetland Specialist		6
Wastewater Specialist		8
Forest Expert		8
Water Supply Specialist		4
Solid Waste Management Specialist		5
Nonpoint Source Pollution Expert		4
River Specialist		5
Financial Management Specialist		6
Environmental Specialist		6
Social Development Specialist		7
Gender Specialist		7
Environmental Monitoring and Geographic Information System Specialist		6
Total	**26**	**136**

61. The outline terms of reference are as follows:

(i) Assist the PMO in setting up the institutional framework, operational procedure, document control, design supervision, and contract management systems for the project; and the work plan to guide and facilitate the project implementation. This should utilize and adapt, as necessary, the arrangements set up for the earlier ADB projects in Hunan Province;

(ii) Establish a project performance management system (PPMS) in accordance with ADB requirements, including establishing baseline and operation mechanism for data collection, analysis, and reporting;[21]

(iii) Develop comprehensive project implementation plans and procedures for monitoring and controlling overall project activities;

(iv) Conduct technical review, and provide expert comments on detailed engineering design in accordance with the design codes and standards;

(v) Reviewing designs, drawings, and the bidding documents, including the identification of potential technical problems and suggestions for their means of resolution; and incorporation of environmental mitigation measures, where appropriate;

(vi) Ensure that the bidding documents include for contractors to provide equipment O&M manuals in Chinese, and that training in equipment and maintenance is adequately provided for;

(vii) Conduct technical, financial, and procedural review of bid evaluation; and hold contract negotiations;

[21] ADB's project performance management system is available at: http://www.adb.org/countries/prc/project-learning-resources

(viii) Conduct routine site visits; and provide technical inputs to construction planning, supervision, and monitoring for quality control of the project construction;
(ix) Conduct contract management, including monitoring construction progress, preparing semiannual progress reports, reviewing the contractors' claims for payments, coordinating project implementation among contractors and various stakeholders, and coordinating daily operational tasks;
(x) Conduct technical review for construction supervision and management, including (a) approval of construction methods; (b) ensuring work is undertaken according to the intent of contract specifications; (c) control over construction quality; (d) adherence to contract work programs and recovery of slippage; (e) site health and safety procedures; (f) record keeping systems to protect client interests in event of claims; and (g) claims assessment and determination;
(xi) Provide expert inputs, review, and justification for contract variation; and prepare necessary documentations in accordance with the requirements of ADB and the national government, if necessary;
(xii) Providing expert inputs on asset commissioning and handover, including a review of documentation provided by the contractors; and that they have fully discharged their training obligations;
(xiii) Establish an efficient and effective financial management system for the project implementation in accordance with ADB's policy and procedural requirements, and implement such financial management system;
(xiv) Assess financial management by (a) reviewing current accounting and administrative capacities of the project operation units for the built facilities; (b) verifying if internal control system is employed; (c) checking current internal audit, external, or government audit; and (d) recommending any changes, as appropriate;
(xv) Assess the financial performance of the project operation units for the past 5 years; and evaluate its financial capacity regarding cost recovery, borrowing capacity, debt servicing, tariff collection, accounts receivable, and subsidies, as appropriate;
(xvi) Identify areas for improvement and training needed with respect to the quality of financial statements, disclosure, and notes to the financial statements; and develop templates for the annual financial statements;
(xvii) Review disbursement applications and supporting documents;
(xviii) Collect all necessary information, edit, draft, and submit the reports required under the loan and project covenants on a timely manner;
(xix) Review and update the environmental management plan (EMP, Annex 1) and assist in conducting internal monitoring of the EMP implementation;
(xx) Review the ethnic minority development plan (EMDP),[22] the gender action plan (GAP),[23] the resettlement plan,[24] and the social development action plan (SDAP); and conduct internal monitoring of the implementation of the EMDP, GAP, SDAP, and the resettlement plan on a semiannual basis;
(xxi) Provide expert opinions to ensure effectiveness of the project components' environmental mitigation measures and enhancement package implementation;
(xxii) Collect periodic information for PPMS update;
(xxiii) Prepare necessary information for ADB's loan administration missions, including the loan midterm, annual, and completion review missions;

[22] Ethnic Minority Development Plan (accessible from the list of linked documents in Appendix 2 of the RRP).
[23] Gender Action Plan (accessible from the list of linked documents in Appendix 2 of the RRP).
[24] Resettlement Plan (accessible from the list of linked documents in Appendix 2 of the RRP).

(xxiv) Update the project financial status, project cost tables and financing plan, economic and financial analyses, and safeguard implementation;
(xxv) Organize and provide semiannual training on effective project financial management, procurement, disbursement, safeguards, and anticorruption measures;
(xxvi) Organize and provide semiannual training on the skills necessary for construction supervision, project management, and implementation of social and environmental safeguards for the ADB requirements;
(xxvii) Undertake annual tariff reviews for wastewater tariff, and assess the impact and affordability for the poor of the tariff increase;
(xxviii) Consult with concerned stakeholders, particularly the poor; and ensure the poor's participation in the public hearing process for tariff increase in accordance with the national government's policies and regulations;
(xxix) Provide training on prevention and control of transmissible diseases and HIV/AIDS, and community disturbance to contractors;
(xxx) Advise and train contractors, and supervise companies on ADB's policy and procedural requirements to ensure their full compliance;
(xxxi) Sample and monitor environmental data related to the project, and contract out the official environmental monitoring services to an accredited environmental monitoring station;
(xxxii) Recommend resolutions to any issues or problems on implementing the EMP and resettlement plan;
(xxxiii) Develop and submit the semiannual progress reports, including the internal social, resettlement, and environmental monitoring reports, with quality acceptable to ADB; and
(xxxiv) Prepare a project completion report within 3 months of project completion.[25]

E. Procurement Guidelines and Resources

Procurement Guidelines (in Chinese)
http://www.adb.org/Documents/Guidelines/Procurement/default.asp
http://www.adb.org/Documents/Translations/Chinese/Guidelines-Procurement-CN.pdf

Guidelines on Use of Consultants by ADB and Its Borrowers
http://www.adb.org/Documents/Guidelines/Consulting/default.asp

Consulting Services Recruitment Notice:
http://csrn.adb.org

Templates for engagement of consultants: (including submission templates)
http://www.adb.org/Consulting/loan-rfp.asp

Harmonized RFP (Loans)
http://www.adb.org/Consulting/all-methods-loan.asp

[25] Project completion report format is available at: http://www.adb.org/Consulting/consultants-toolkits/PCR-Public-Sector-Landscape.rar

Consulting Services Operations Manual
http://www.adb.org/Documents/Manuals/Consulting-Services-Operations-Manual/CSOM.pdf

Procurement Documents:
http://www.adb.org/Procurement/prequalification-bid-documents.asp

Guide on Bid Evaluation
www.adb.org/Procurement/guide-bid-apr06.pdf

Procurement Plans
http://www.adb.org/Projects/reports.asp?key=reps&val=PP

Electronic Procurement
http://www.mdbegp.org/www/eGPInteractiveus/tabid/69/language/en-US/Default.aspx

Project Administration Instructions
http://www.adb.org/Documents/Manuals/PAI/default.asp

E-Handbook on Project Implementation
http://www.adb.org/Documents/handbooks/project-implementation/default.asp?p=proj

Anticorruption and Integrity
http://www.adb.org/Integrity/default.asp

How to report fraud and corruption
http://www.adb.org/Integrity/howto.asp

VII. SAFEGUARDS

A. Environment

62. **Due diligence.** The project is classified as category A for environment. An environmental impact assessment (EIA) and an EMP has been prepared and disclosed on the ADB website on 27 April 2015. [26] The EIA incorporates the results of the domestic environmental, soil, and water assessments approved by the Hunan Provincial Department of Environmental Protection in May 2015. The EIA complies with the ADB policies and requirements, including ADB's Safeguard Policy Statement (SPS, 2009).[27] The EIA concludes that the project's anticipated environmental impacts can be mitigated through full and effective implementation of the EMP.

63. **Environmental management plan.** The project EIA and EMP, not the domestic environmental assessments, forms the basis of the official loan agreement between ADB and ZCG. The EMP is the key document to be used by ZCG and the contractors to manage and report on the environmental impacts of project construction and operation. The EMP defines the mitigation measures, monitoring program, grievance redress mechanism (GRM), public consultation plan, and roles and responsibilities for the project agencies. ZCG, through the PMO, holds final responsibility for implementation and compliance with the EMP. ZCG and ZIFC, the implementing agency, will be responsible for ensuring the project is designed, constructed, decommissioned, and operated in accordance with (i) the national and local government environmental, health, and safety laws, regulations, procedures, and guidelines; (ii) ADB's SPS; and (iii) the EMP. A full-time environmental officer has been assigned in the PMO to coordinate implementation of the EMP. The effectiveness of the mitigation measures will be evaluated through environmental inspections and monitoring. The loan implementation environment consultants (LIECs) will support the PMO and contractors in implementing the EMP.

64. **Environmental management plan update and the bidding documents.** In the design stage, ZCG will forward the EMP to (i) the design institutes for incorporating mitigation measures into the detailed technical designs; and (ii) the wetland specialist who will design the fauna habitat features for the embankments and constructed wetlands. The EMP will be updated at the end of the detailed design, as needed; reviewed by ADB; and re-posted on the ADB website. To ensure that contractors comply with the EMP, the PMO will prepare and provide the following for incorporation into the bidding documents: (i) a list of environmental management requirements to be budgeted by bidders in their proposals, (ii) environmental clauses for contractual terms and conditions, and (iii) the updated EMP. The contractors and the construction supervision companies (CSCs) will incorporate the EMP mitigation measures in their construction plans and will also be responsible for internal environmental monitoring during construction. Environmental impact monitoring will be conducted by the local environmental monitoring stations contracted by ZCG. Assurances for environmental safeguards have been prepared and are included in the loan and project agreements.

65. **Potential impacts.** Key construction-related risks during construction relate to dredging and embankment along the sections of the five major rivers, the six wastewater treatment stations, the two water treatment plants, and the water transmission pipelines. Potential impacts and measures to avoid, minimize, and mitigate these are described in the EMP. All planned

[26] Environmental Impact Assessment (accessible from the list of linked documents in Appendix 2 of the RRP).
[27] ADB. 2009. *Safeguard Policy Statement*. Manila. Available at: http://www.adb.org/documents/safeguard-policy-statement

project activities are compatible with the zoning and regulations of local reserves, and the relevant provincial and local master plans and regulations for Dongjiang Lake. All relevant provincial and local agencies, including the environment, water resources, and forestry agencies, were involved in the development of the project activities.

66. **Dredging and embankment.** About 14.62 km of dredging and 13.72 km of embankments will be implemented along the sections of five major rivers. Some of these river sections retain relatively natural habitats, steep-sided forested slopes, and/or levels of heavy metals in the soil or sediments which exceed the PRC standards. One of the rivers, Tian'eshan River, is located in a forest park. Construction risks include loss and damage of channel habitats, temporary elevated turbidity, and release of heavy metals. Mitigation measures include seasonal timing (dredging will only be conducted from September to February, the time of lowest water levels), on-site sediment sampling prior to any works, closely controlled dredging and sediment removal (in short, staged sections of river), on-site support by a wetland specialist who will also design the embankment habitat features, and disposal of dredge material at sites close to the river (i.e., within the same area to avoid contaminating other regions). With these measures, net impacts are anticipated to be minimal. Aquatic communities are anticipated to recolonize the river sections from intact sections upstream. No in-channel structures will be constructed (such structures might impede the movement of fish or other aquatic fauna along the channels).

67. **Construction of new facilities.** Construction activities will involve noise, dust, vibration, vegetation removal, protection of water quality, and considerations for occupational and community health and safety, and physical cultural values. These issues have been assessed. Mitigation measures are in the EMP.

68. Key operation-related risks include (i) cumulative nutrient loading in rivers and Dongjiang Lake from the treated effluent discharged by the six WWTPs, (ii) air and noise emissions from plant operation, and (iii) lack of maintenance of project facilities. For nutrient loading, modeling was conducted to assess the risk that the combined effluent loads from the six WWTPs might affect water quality and exceed the required standards. Results confirm that pollutants will be diluted to levels which are considerably lower than the required standard—within 100 meters downstream of the WWTPs—under conditions of low flow in the dry season. The four rivers are permanent (limiting the risk of stagnation and eutrophication), and none are used for drinking water supply. Risks to communities and aquatic ecology are concluded to be low. Air and noise emissions were also modeled and confirmed to meet the required standards at the plant boundaries. For project O&M, to avoid the risk of new project structures and facilities being poorly operated or falling into disrepair, (i) the project includes capacity building for maintenance of all project facilities; and (ii) operational plans will be developed as part of the project for all facilities, which will include roles and responsibilities, schedules, and facility maintenance.

69. **Cumulative and indirect impacts.** The Dongjiang Lake basin is experiencing slow but steady population growth and incremental rising pressures to water quality. In addition to the current project, ZCG is undertaking a range of other domestically funded programs to manage the lake resources as well as promote development. In conjunction with these, the project will help achieve 100% of the targets in the Dongjiang Lake Ecological Implementation Plan, 2012–2015. Dongjiang Lake is also a pilot lake under the PRC's "One Lake, One Strategy" program. Under the program, the national government will address remaining water pollution sources which are not being addressed under the current project (e.g., mining in upstream counties). These activities, combined with the project, aim to improve the water quality throughout the lake to Grade II of the PRC's surface water quality standard or better compared to current Grade III.

70. **Public consultation and grievance redress mechanism.** Information disclosure and two rounds of public consultations were conducted during the EIA in accordance with the PRC's Guideline on Public Consultation in EIA (2006) and ADB's SPS. Public concerns about air and water pollution were documented and have been addressed in the project design. During construction, the project will continue to seek public consultation and raise awareness of project activities, especially those which may impact the public such as noise or dust. The project implementation units (PIUs) are responsible for public participation during project implementation. They will be supported by the PMO's environment and social safeguards officers.

71. A project-specific GRM has been established to receive and manage any community concerns which may arise due to the project. The PMO is the lead agency that will have final responsibility for management, implementation, and reporting of the GRM. The PMO's environment and social safeguards officers will (i) coordinate the GRM; and instruct local EPBs, and contractors on their responsibilities in the GRM; (ii) establish a simple registry system to document and track grievances received (including forms to record complaints and how they have been resolved); (iii) report on progress of the GRM in the quarterly project progress reports and the semiannual environmental and resettlement monitoring and progress reports to ADB; and (iv) arrange future public consultations for the project. The GRM procedures, reporting timelines, roles and responsibilities of all agencies, and the GRM contact persons in each project participating enterprise are described in Section G of the EMP.

72. **Capacity building.** The project agencies are without previous experience with ADB-funded projects or safeguard requirements. To ensure effective implementation of the EMP, a capacity building program will be implemented on (i) the EMP, including the mitigation measures, monitoring, and reporting; and (ii) sustainable integrated watershed management. Training will be provided by the Hunan Provincial Department of Environmental Protection, the Chenzhou Municipal and Zixing City EPBs, and the LIECs. Trainees will include the CSCs, the PIUs, the PMO, the implementing agencies, the contractors, and the water resources bureaus. The PMO will arrange and coordinate the training programs supported by the LIECs. The training program is in Table EMP-6 of the EMP (Annex 1).

73. **Budget.** ZCG shall make available, and cause ZIFC, the implementing agency, to make available the necessary budget and human resources to fully implement the EMP. If any unanticipated environmental risks and impacts arise during construction or operation of the project that were not considered in the EIA and/or EMP, ZCG, through the ZIFC or the implementing agency, should promptly inform ADB in writing of the occurrence of such risks or impacts, with detailed description of the event and the proposed action plan for incorporation in the updated EMP. The total estimated cost for EMP implementation is about CNY15.943 million ($2,571,452) for 5-year construction (Table EMP-8 in the EMP, Annex 1). The estimated cost for the PMO is CNY754,000 (4.7%), and for the contractors is about CNY14,594,000 (91.5%). About CNY595,000 (3.7%) will be paid from the ADB loan for consulting services. Remaining costs will be paid by ZCG. Overall, the cost of EMP implementation is small given the large scale of the project and when spread over 5 years.

74. **Climate change.** A climate risk vulnerability assessment was conducted to identify the threat that climate change presents to project viability, assuming a design life of 30-40 years. The assessment found that mean annual temperature will increase, annual precipitation will remain the same or slightly decrease, and evapotranspiration will increase. Projected in-flows to Dongjiang Lake for 2015–2030 remain similar to the baseline period of 1971–2000. Declining seasonal flows could reduce the efficiency of the constructed water pipelines and treatment

rates of the wastewater and water treatment plants, while altered storm intensity could impact the rivers. Initial climate risk during project concept stage was medium, while the climate risk vulnerability assessment found the risk to be low and adaptation measures were included in the project design.

75. Pursuant to ADB's SPS, ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the SPS.

B. Resettlement

76. The project is classified as category A for involuntary resettlement due to significant LAR impacts. ZCG, with the support of a local institute, prepared the resettlement plan according to ADB's SPS. The resettlement planning and implementation is designed to ensure that the affected persons will be better off or at least not worst off as a result of the project, and support to the displaced poor and other vulnerable groups, including women to at least national minimum standards.

77. **Land acquisition and resettlement.** The table below summarizes the LAR impacts. A total of 189.06 ha (2,835.84 mu) of land will be occupied permanently for the project, including 12.28 ha (184.22 mu) of collective land and 176.77 ha (2,651.62 mu) of state-owned land. In addition, some 65.29 ha (979.40 mu) of land will be occupied temporarily. The project will demolish 1,539.1 square meters (m^2) of housing. It will affect 573 people, 284 of them will lose more than 10% of their productive assets and/or be physically displaced. Seven households need to be relocated. ZCG, with the assistance of consultants engaged under the PPTA, prepared a resettlement plan in line with ADB's SPS and related laws and regulations of HPG, the Chenzhou Municipal Government, and the national government. ZCG has endorsed the resettlement plan and disclosed the relevant information to the affected people. The resettlement plan was also disclosed on the ADB website on 2 July 2015. ZCG will fully finance CNY23.1448 million (including resettlement contingency) of LAR costs. ZCG has experience in conducting LAR for foreign-funded projects and has the capacity to implement the resettlement plan for this project

78. The LAR compensation standards will follow the Land Administration Law of the People's Republic of China (2004); the Decision of the State Council on Deepening the Reform and Rigidly Enforcing Land Administration (SC [2004] No.28), (21 October 2004); and other applicable guidelines. They will also be based on local policies regarding LAR in Hunan Province, Chenzhou Municipality, Zixing City, and ADB's SPS. HPG and ZCG will provide necessary assistance for house construction and relocation during resettlement implementation.

79. **Resettlement and income restoration.** To minimize project impacts and promote income restoration, detailed livelihood restoration and resettlement programs have been developed; and included in the draft resettlement plan based on the results of the socioeconomic survey for resettlement, and by reference to successful resettlement experience from local similar projects. The income restoration measures for the households affected by land acquisition include cash compensation, agricultural development, nonagricultural employment, skills training, social security, etc. The resettlement modes for the households affected by house demolishing include self-demolition and self-reconstruction, and resettlement in centrally built apartments. Only seven households affected by house demolition will need resettlement housing. Six households have chosen self-demolition and self-reconstruction based on affordability, where housing land compensation is paid to the village group, new housing land is provided by the village group to each affected households for free, and township government is responsible for the three supplies and one leveling. The other affected household

has chosen resettlement in centrally built apartments, where two housing sizes (108 m^2 and 81 m^2) and two structures (two or three households per building) are available, to be constructed by the government, and purchased at the cost price of CNY638/m^2. The LAR impacts are summarized in Table 6.

80. **Institutional arrangements.** ZCG is the executing agency of the project, and the Zixing City PMO is the management and coordinating agency. ZIFC is the implementing agency; and the Zixing Land Acquisition and House Demolition Affairs Center is responsible for the LAR implementation, including impact verification; consultation with the affected persons; raising funds and payment of compensation fees; and implementation of resettlement measures. The township and/or subdistrict resettlement offices, and the village committees will actively participate in the implementation of the resettlement plan. The PMO and ZIFC will organize training or capacity building on the compensation and resettlement. The resettlement plan also includes a training program to strengthen the capacity of the staff of resettlement offices at all levels. The resettlement implementation schedule has been prepared based on the preparation and construction timetable. The resettlement plans will be updated based on the final design and detailed measurement survey, disclosed to affected persons, and submitted to ADB for review and approval prior to awarding of civil works contract.

81. **Cost.** The total estimated resettlement cost is CNY23.1448 million (accounting for 1.4% of the total project cost), including basic land acquisition and house demolition costs of CNY10.9502 million or 47.31% of the budget; and other costs (including resettlement planning costs, staff training costs, land acquisition taxes, supporting fund for vulnerable groups, etc.) of CNY10.5522 million or 45.59% of total costs; and contingencies of CNY1.6424 million or 7.1% of total costs. The estimation of resettlement cost is shown in Table 7.

Table 6: Summary of Land Acquisition and Resettlement Impacts

Component				Pollution Control Improved		Urban–Rural Water Supply System Established		River Course Rehabilitated	Integrated Ecosystem Rehabilitation and Management Established		Environmental and Project Management Capacity Strengthened[a]	Total
				Domestic Wastewater Treatment	MSW Transfer and Treatment	Yangdongxia Water Supply	Chukou Water Supply	Integrated Lake-going River Management	Lake Ecosystem Rehabilitation	Wetland Conservation and Rehabilitation		
Permanently occupied land (*mu*)		Subtotal		8.01	13.43	31.84	3	80.29	13.12	2,669.27	16.88	2,835.84
		Collective land		4.72	12.20	31.84[b]	3		7.32	123.94	1.20	184.22
		State-owned land		3.29	1.23			80.29	5.80	2,545.33	15.68	2,651.62
Temporarily occupied land (*mu*)		Subtotal		79.00	32.80	614.10	36	102.20	29.00	69.20	17.10	979.40
		State-owned land		54.00	10.00	524.10	34	78.80	26.40	48.40	7.90	783.60
		Collective land		25.00	22.80	90.00	2	23.40	2.60	20.80	9.20	195.80
HD (m^2)		Subtotal			480.00					1,059.10		1,539.10
		Government-owned houses			480.00[c]							480.00
		Rural residential houses								1,059.10[d]		1,059.10
Affected population	Permanently affected	LA	AHs	1	3				1	117	1	123
			APs	6	17				5	371	4	403
		HD	AHs							20		20
			APs							64		64
		Both LA and HD	AHs							20		20
			APs							64		64
		Subtotal	AHs	1	3				1	117	1	123
			APs	6	17				5	371	4	403
	Temporarily affected	Temporary land occupation	AHs	18	3	15				15		51
			APs	58	12	52				48		170
	Total		**AHs**	**19**	**6**	**15**			**1**	**132**	**1**	**174**
			APs	64	29	52			5	419	4	573

HD = house demolition, LA = land acquisition, m^2 = square meter, MSW = solid waste management, *mu* = a Chinese unit of land measurement (1 mu = 666.67 m^2).

[a] Land will be utilized by the construction of the research center, the environmental monitoring and supervision center, and the two water monitoring stations.

[b] Collective non-contracted forest land without any affected persons.

[c] Old factory buildings belongs to the township government and are unused for a long time.

[d] Most of the structures are not the main houses and partially affected; and only seven households need to be relocated.

Source: Asian Development Bank estimates.

Table 7: Estimation of Resettlement Investment

(CNY '000)

No.	Item	Pollution Control Improved	Urban–Rural Water Supply System Established	River Course Rehabilitated	Integrated Ecosystem Rehabilitation and Management Established	Environmental and Project Management Capacity Strengthened	Total	Percent (%)
1	Basic resettlement costs	934.9	819.9	365.1	5,146.5	3,683.8	10,950.2	47.31
1.1	Compensation fees for permanent LA	380.2	702.5	0.0	3,331.4	28.6	4,442.7	19.20
1.2	Compensation fees for state-owned land transfer	528.0	0.0	0.0	0.0	3,571.5	4,099.5	17.71
1.3	Compensation fees for temporary land occupation	5.4	2.2	0.0	6.5	0.0	14.1	0.06
1.4	HD compensation fees	0.0	0.0	0.0	1,108.9	0.0	1,108.9	4.79
1.5	Compensation fees for ground attachments	21.3	115.2	365.1	699.7	83.7	1,285.0	5.55
2	Resettlement planning and design costs (3% of basic costs)	28.0	24.6	11.0	154.4	110.5	328.5	1.42
3	Staff training costs (5% of basic costs)	46.7	41.0	18.3	257.3	184.2	547.5	2.37
4	Taxes and fees on LAR	344.9	854.1	14.6	7,779.1	354.8	9,347.5	40.39
5	Supporting fund for vulnerable groups (3% of basic costs)	28.0	24.6	11.0	154.4	110.6	328.6	1.42
6	Contingencies (15% of basic costs)	140.2	123.0	54.8	771.9	552.5	1,642.4	7.10
7	**Total**	**1,522.8**	**1,887.2**	**474.8**	**14,263.6**	**4,996.4**	**23,144.8**	
8	Percent (%)	6.58	8.15	2.05	61.63	21.59	100.00	

HD = house demolition, LA = land acquisition, LAR = land acquisition and resettlement.
Note: Numbers may not sum precisely because of rounding.
Source: Asian Development Bank estimates.

82. **Grievance redress mechanism.** A GRM has been developed in compliance with ADB's SPS requirement to address the LAR issues raised by the affected persons. The details of the GRM, including a time-bound flow chart of procedures, are included in the resettlement plan.

83. **Resettlement implementation schedules.** The implementation, supervision, monitoring, and reporting milestones for the resettlement plan are shown in Table 8.

Table 8: Milestones for Resettlement Activities

No.	Task	Target	Agencies Responsible	Time Frame	Remark
1	**Information Disclosure**				
1.1	RIB	8 villages	Zixing PMO	2015-5-30	
1.2	Disclosure of the RP on ADB website		Zixing PMO, ADB	2015-5-30	
2	**Updating of the RP and Approval of the Resettlement Budget**				
2.1	DMS	8 villages	Zixing PMO, ZIFC	2015-9-30	
2.2	Updating the RP based on detailed design	8 villages	Zixing PMO	2015-11-30	
2.3	Approval of the RP and resettlement budget (including compensation rates)	CNY23.1448 million	ZMG	2015-12-30	
3	**LA Announcement**				
3.1	Disclosure of the final RP	8 villages	Zixing PMO, ZIFC	2016-1	
3.2	Release of the LA announcement	8 villages	ZMG	2016-2	
4	**Compensation agreements**				
4.1	Entering into LA compensation agreements and paying compensation	AHs in 8 villages	ZIFC, village committees	2016-5	
4.2	Entering into HD compensation agreements and paying compensation	20 AHs	Bailang Xiang government	2016-5	
4.3	HD	20 AHs	Bailang Xiang government	2016-6	
5	**Resettlement Housing Construction**				
5.1	Completion of resettlement housing	7 AHs	ZIFC, affected villages, and APs	2016-12-31	
5.2	Moving into new housing	7 AHs	ZIFC, affected villages, and APs	2017-1	
6	**Implementation of Livelihood Restoration Measures**				
6.1	Suggestions on livelihood restoration and employment	AHs in 8 villages	Zixing PMO, Zixing Industrial Worker Training Office, affected villages, and APs	2016-5-2018-12	
6.2	Implementation of training program	AHs in 8 villages			
6.3	Employment of APs during construction	AHs in 8 villages	Zixing Industrial Worker Training Office, employers	2016-5-2018-12	
6.4	Assistance for vulnerable groups	Vulnerable groups	Zixing Industrial Worker Training Office, village committees	2016-5-2018-12	
7	**Institutional Capacity Building**				
7.1	Training of staff of ZIFC, and land and resources bureau	50 persons	Zixing PMO	2016-1	
7.2	Training of county, township, and village	200 persons	Zixing PMO	2016-2	

No.	Task	Target	Agencies Responsible	Time Frame	Remark
	staff				
8	**M&E**				
8.1	Establishment of internal M&E mechanism	As per the RP	Zixing PMO, ZIFC	2016-3	
8.2	Appointment of external M&E agency	One	Zixing PMO, ZIFC	2016-3	
8.3	Baseline survey	AHs in 8 villages	External M&E agency	2016-4	
8.4	Internal monitoring reports	Quarterly report	Zixing PMO, ZIFC	2016-6-2018-12	
8.5	External monitoring reports	Semiannual report	External M&E agency	2016-6-30	1# Report
				2016-12-30	2# Report
				2017-6-30	3# Report
				2017-12-30	4# Report
8.6	External evaluation reports	Annual report	External M&E agency	2018-6-30	5# Report
				2019-6-30	6# Report
8.7	Resettlement completion report	One report	Zixing PMO, ZIFC	2019-12-30	
9	**Public Participation and Consultation**		ZIFC	2016-5-1-2019-12-30	
10	**Grievance Redress**				
11	**Payment of Compensation Fees**				
11.1	Payment to ZIFC	Compensation	CMG	2016-3	
11.2	Payment to the affected townships	Compensation	ZIFC	2016-4	
11.3	Payment to AHs	Compensation	Township governments	2016-5	
12	**Civil Works Schedule**				
12.1	Domestic wastewater treatment		ZIFC, ZMG	2016-7	
12.2	MSW transfer and treatment		ZIFC, ZMG	2016-7	
12.3	Urban-rural water supply		ZIFC, ZMG	2018-10	
12.4	River course rehabilitation		ZIFC, ZMG	2016-7	
12.5	Lake ecosystem rehabilitation		ZIFC, ZMG	2016-7	
12.6	Wetland conservation and rehabilitation		ZIFC, ZMG	2016-7	
12.7	Lake environmental monitoring and research capacity building		ZIFC, ZMG	2016-10	

ADB = Asian Development Bank, AH = affected household, AP = affected person, CMG = Chenzhou Municipal Government, DMS = detailed measurement survey, ha = hectare, HD = house demolition, LA = land acquisition, M&E = monitoring and evaluation, MSW = solid waste management, PMO = project management office, RP = resettlement plan, RIB = resettlement information booklet, ZIFC = Zixing City Urban and Rural Environmental Protection Investment and Financing Center.
Source: ADB estimates.

C. Ethnic Minorities

84. The project is categorized as B for the indigenous peoples according to ADB's SPS (and safeguard requirement 2). The Yao people are the major ethnic minority group inhabiting in few villages within four townships in the project's service areas: (i) Huangcao, (ii) Lianping, (iii) Longxi, and (iv) Qingjiang. The household survey reveals that the Yao people consider themselves as Chinese. Consultations with the Yao villagers show that the Yao people are well integrated in the villages; speak the same language; and practice the same cultural practices as that of the Han, and have assimilated the culture of the Han. However, they affirm that most of their children no longer speak the unique dialect of the Yao people, especially if they migrate out of the villages to work in other parts of the country. The majority of the Yao people also no longer practice the culture that is distinct in their own ethnic group. The children of the Yao people attend the same school with other Chinese children.

85. The project will not have any significant, direct, and adverse impact on the Yao villagers (i.e., some construction disturbance but without LAR impacts. The project will provide them direct and indirect benefits, such as livelihood opportunities in bamboo upgrade, wetland protection, improved sanitation, flood prevention, livelihood training, and tourism activities. The upgrading of bamboo forests in Lianping Township will benefit the Yao people, but they will face increasing competition for other locations that have lower transport costs. Also, tourism activities should be culturally appropriate, such as the eco-tourism in Huangcao Town, Longxing Village, and adjacent villages. The Yao households should be supported to develop such tourism services and avoid being exploited by outsiders.

86. The Yao culture in village around Dongjiang Lake faces threats due to the (i) small size of scattered Yao communities in a Han dominated area, (ii) limited resources that they are permitted to develop for their livelihood, (iii) high transport due to their remoteness; (iv) lower levels of education also due to their remoteness; and (v) lack of education in the Yao language.

87. A draft EMDP has been prepared to ensure that the Yao minority people are able to participate and benefit directly from the project, and that any negative impacts that might affect them are either avoided or mitigated. Adequate provisions to enhance economic conditions of the Yao villagers have been integrated into the project design. An action plan is given in Table 9 of the EMDP. The EMDP fully complies with the requirements of relevant laws, regulations, and policies of the national government, HPG, ZCG, and ADB's SPS. The EMDP was also disclosed on the ADB website on 2 July 2015 (footnote 22).

88. **Institutional arrangements.** The PMO will be responsible for implementing the EMDP with the assistance from the social development and gender consultant, who will be hired by ZCG or the executing agency during project implementation. The consultant shall also ensure that the EMDP and other plans (i.e., SDAP, GAP, and the communication plan) are implemented in a timely manner. The PMO has appointed a social safeguards officer who was already trained or given orientation on the important functions to be performed, and ADB's SPS. During the training conducted on 18 March 2015, the Zixing City Ethnic Minority and Religious Affairs Office and its township offices will provide support to coordinate, advise, and review the EMDP implementation progress. Implementation arrangements for the EMDP are integrated into the specific project activities. Other key agencies for implementation include the Zixing City Forestry Bureau, the Industrial Workers Training Office, the All China Women's Federation, and other concerned agencies, in coordination with the township heads and the Yao village leaders or cadres who shall be the focal persons to facilitate linkages at the village level. In Lianping Township, the concerned agencies, including the Zixing City Ethnic Minority and Religious Affairs Office, will review progress of the bamboo upgrading component at the four Yao villages.

The actions to be implemented are either included as (i) part of the project budget, or (ii) part of routine administrative expenses of respective authorities. An awareness training program will be conducted by the social development consultant in the later part of 2015 or as soon as the project commences in 2016.

89. **Grievance redress mechanism.** A GRM has been developed in compliance with ADB's SPS requirement to address safeguard issues raised by affected Yao people. The details of the GRM, including a time-bound flow chart of procedures, are included in the EMDP.

90. **Prohibited investment activities.** Pursuant to ADB's SPS, ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the SPS.

VIII. GENDER AND SOCIAL DIMENSIONS

91. This section describes the required actions for gender and social dimensions, other than social safeguards. A social, poverty, and gender analysis was undertaken in accordance with ADB's policies on Gender and Development in ADB Operations (Operations Manual Section C2) and on Incorporation of Social Dimensions into ADB Operations (Operations Manual Section C3). The analysis collected relevant information to assist in the design of the project by identifying the poor, examining causes of poverty, and recommending poverty reduction measures within the project scope.

A. Summary Poverty Reduction and Social Strategy

92. Poverty and social analysis was undertaken in accordance with the ADB guidelines. Rising inequality is a major concern for the national government. The main determinant of widening inequality has been the growing income gap between rural and urban areas as well as within cities. According to the Zixing City Poverty Alleviation Office, the poverty rate in the project area is 9.8%. The project areas cover a total of 13 townships and 183 villages. The project will directly benefit 78,325 households from improved pollution control, enhanced water supply, reduced flood risk, integrated management of ecosystem and strengthened environmental and project management capacity. The major impact of the project will be sustainable economic development among the households who will be benefited by the project. The implementation of the project components and activities are expected to reduce pollution of the Dongjiang Lake and surrounding watershed by improving solid waste and wastewater management. Providing adequate water and safe drinking water to households will improve the health conditions and prevent spread of water-borne diseases and related illnesses. Other project components will also increase agricultural production; improve the environment or ecosystem; and increase public awareness on improved health, sanitation, and environmental protection. Eco-compensation and livelihood training activities under the project are essential to increase household income. The survey also shows that 49% of the households get water from springs and only 36% have piped water. More than 50% of households, especially in the rural areas, are still using the traditional type of toilets without septic tanks.

93. About 3,410 jobs will be needed during construction or civil works, of which 852 jobs (25% of labor) will be given to women. A total of about 1,360 permanent jobs will be needed during operation, of which 544 jobs (40%) will be given to women. Employment targets for vulnerable groups and women are included in the design and monitoring framework (DMF) and loan assurances. This will provide the local people, including women, ethnic minority, and affected persons a fair opportunity to have jobs generated by the project.

94. The local people, including women, will also have the opportunity to participate in capacity building and/or public awareness campaign on improved health and sanitation, environmental protection, and livelihood training that will be conducted during project implementation, of which 40% of the total participants are women. The livelihood training will provide the local people, including women, ethnic minority, and affected persons, the opportunity to increase income; and have sustainable or long-term livelihood. During the baseline survey and stakeholders consultations, the local people suggested livelihood training for both agricultural- and nonagricultural-related jobs such as bamboo planting, bamboo crafts, food processing (bamboo shoots, fish, fruits, tea, vegetables, etc.), livestock raising, poultry raising, cultural tourism or eco-tourism services, restaurant services, and boat repair. A total of 30,000 local people will be benefited by the livelihood training.

B. Gender Development and Gender Action Plan

95. The project has been designed as effective gender mainstreaming. Women in focus group discussions found that environmental improvements are anticipated to have a significant gender impact, with reduced time burdens and costs for healthcare, preparation for floods, and clean-up after floods; and with overall improvement of surroundings. The project will also create women's employment opportunities. A GAP has been prepared to ensure that women are kept fully informed; engaged throughout the project cycle; and participate in activities, such as training, public awareness, public hearings on setting tariffs for improved water system, and solid waste and wastewater treatment, employment during construction (civil works) and project operations, public consultations, and other activities. Gender-specific indicators have also been included in the project's DMF. The GAP includes measures addressing gender concerns in all project components and capacity development, such as (i) ensuring that there will be sufficient project management support consultants with appropriate awareness of gender issues to effectively oversee the implementation and monitoring of the GAP; (ii) ensuring the effective inclusion of women in all project activities; and (iii) ensuring, as far as possible, that the targets set for the employment of women are met; and that the work conditions of and pay for men and women are equitable. Resettlement plan measures will mitigate any possible negative impacts of the project on women due to the LAR impacts. Table 9 shows the GAP.

96. The GAP includes provisions to ensure that the staff of the PMO and ZIFC are fully briefed on gender and development, and the GAP at the commencement of project implementation. The staff responsible for social safeguards and gender will (i) work with women's federations, contractors, and community office staff to facilitate the participation of women in opportunities for physical works; and (ii) ensure that all PRC labor laws and standards are respected. The staff will also ensure that (i) the gender-disaggregated baseline and survey data will be collected; (ii) the GAP is implemented, monitored, and reported to ADB through quarterly project progress reports. The social development and gender specialists engaged for project management support will mentor the staff, as necessary; and facilitate achievement of the project's gender and development objectives. The GAP will be monitored during ADB review missions, and supervision will be supported by ADB's social development specialists.

C. Social Development Action Plan

97. A SDAP has been prepared to facilitate continued consultation and participation (C&P) of communities in the project, and ensure that the local people in the affected villages are mobilized and engaged in the entire project cycle. The SDAP also includes specific activities and target indicators to ensure that (i) the local people, including women, will be benefited by the project in terms of training, public awareness, employment during construction in some project components, and participation in public hearings to set the tariff for improved water supply system, and the solid waste and/or wastewater treatment system; and (ii) labor rights and entitlements are observed, and the needs of poor households are considered. Table 10 shows the SDAP.

98. Core labor standard in accordance with the PRC laws will need to be followed for works contracts under the projects, including community labor. The SDAP also indicates that civil works contracts will stipulate that (i) the local people will receive priority with respect to employment; (ii) equal wages will be paid for work of equal value, and that women's wages will be paid directly to them; (iii) no child or forced labor will be employed; and (iv) all employees will be provided with a written contract in accordance with the format prescribed by the PRC's national law. The implementation of the GAP and SDAP will be supported by the community C&P plan (Section IX.E).

Table 9: Gender Action Plan

Objective and/or Activity	Target and Monitoring Indicator	Time Frame	Budget and Sources	Responsible Organization	Key Stakeholder
Output 1: Pollution Control Improved					
1.1 Conduct public awareness through information dissemination and consultation: (i) Conduct training on improved wastewater management (ii) Conduct training on solid waste separation and/or management	• Number and percentage of people consulted during the detailed design phase (disaggregated by sex and ethnicity), of which 40% are women • 40% of training participants are women.	Jan 2016–Dec 2019	Budget included in the project	PMO Consultants Other agencies	Local people Women Yao EM Local government agencies Farmers Other stakeholders
1.2 Involve women in public hearings on solid waste/ wastewater tariff setting	• At least 40% of beneficiaries of solid waste/wastewater tariff public hearings are women.	2018–2020 or after project completion	No budget required	PMO Consultants Other agencies	Affected local people (all sectors, including women and EM)
On civil works and operations:					
1.3 Provide skilled and unskilled project construction jobs 1.4 Provide permanent jobs during operation, and target women 1.5 Ensure timely advertisement of employment opportunities; and ensure that employment preference will be given to the affected people, including women and Yao villagers 1.6 Protect labor rights and interests of employees	• At least 25% of temporary employment opportunities are to be filled by women. • Relevant gender-specific clauses on core labor standards are included in the bidding documents of all contracts. • Records of the number of labor force hired to particular positions disaggregated by sex.	2016–2020	Contractor's budget No additional cost to the project	PMO Consultants Contractors ACWF Zixing City labor/ employment bureau Other agencies	Local people, including women, Yao EM, etc.
Output 2: Urban–Rural Water Supply System Established					
2.1 Ensure project beneficiaries are informed about the project	• The proportion of women to all participants during project consultations in the detailed design is at least 40%.	2016–2020	Budget included in the project	PMO Consultants Other agencies	ACWF Local people, including women. Yao EM, etc.
2.2 Involve women in public hearings on tariff setting for improved water supply system	• At least 40% of the participants of tariff setting for improved water supply system are women.	After project completion			Local government units

Objective and/or Activity	Target and Monitoring Indicator	Time Frame	Budget and Sources	Responsible Organization	Key Stakeholder
2.3 Conduct public awareness through training or seminar on improved health and sanitation, water conservation, and other relevant topics	• Number and percentage of people included in awareness programs (disaggregated by sex and ethnicity), of which 40% are women • About 80% of the participants including women report increased awareness	2016–2020			
On civil works and operations: 2.4 Provide skilled and unskilled project construction jobs 2.5 Provide permanent jobs during operations 2.6 Ensure timely advertisement of employment opportunities; and that employment preference will be given to the affected people, including women and Yao villagers	• At least 25% of the unskilled construction jobs are to be held by women. • At least 30% of permanent jobs during operations are occupied by women. • Relevant gender-specific clauses on core labor standards are included in the bidding documents of all contracts.	2016–2020	Contractor's budget No additional cost to the project	PMO Consultants Contractors ACWF Zixing City labor/employment bureau	Local people, including women, Yao EM, etc. Other stakeholders
2.7 Protect labor rights and interests of employees	• Records of the number of labor force hired to particular positions disaggregated by sex				
2.8 Ensure individual household access or connection to improved water supply system for the low-income households and other vulnerable groups	• Target 100% coverage of low-income households, female-headed households, and other vulnerable groups (list of individuals are available at the village head office)	2016–2020	No extra costs required in the project (subsidy and/or assistance could be provided by the village)	PMO Contractors Consultants ACWF Zixing City labor/employment bureau Village head Other agencies	ACWF Local people, including women Other sectors
Output 3: River Course Rehabilitated					
3.1 Ensure project beneficiaries are informed about the project	• The proportion of women to all participants during project consultations in the detailed design and awareness activities is at least (40%).	Years 1–2	Budget included in the project	PMO Contractors Consultants ACWF Zixing City labor/employment bureau Village head	Local people, including women Other sectors
3.2 Conduct public awareness through training or seminar on flood control, environmental protection (to keep rivers clean), and water management and practices	• Number and percentage of people included in awareness programs (disaggregated by sex and ethnicity), of which (40%) are women				

Objective and/or Activity	Target and Monitoring Indicator	Time Frame	Budget and Sources	Responsible Organization	Key Stakeholder
3.3 Provide skilled and unskilled jobs in river course rehabilitation component which include embankment masonry, grass planting, landscaping, blockage clearing, construction of stairs, and other structures and/or facilities	• 500 temporary jobs will be created, and women will have the opportunity to work; at least 25% of unskilled construction jobs shall be assigned to women (i.e., grass planting, landscaping, and other civil works)	PMO Zixing City environ-mental protection bureau Other agencies	Jan 2016–Dec 2019	Project company/ agency operating budgets	Local people, including women Yao EM Other sectors/ stakeholders
Output 4: Integrated Ecosystem Rehabilitation and Management Established					
4.1 Ensure project beneficiaries are informed about the project. 4.2 Conduct public awareness through training or seminar on environmental management and protection, and related topics	• The proportion of women to all participants during project consultations in the detailed design is at least (40%). • At least (40%) of the participants in community awareness on ecosystem rehabilitation and management are women.	2016–2020	Included in the budget for the project	PMO Consultants Zixing City environmental protection and forestry bureaus Other agencies	Local people, including women, Yao EM, etc. Farmers, fishermen Other sectors
4.3 Livelihood skills training for the local people, including women: (i) Bamboo planting (ii) Bamboo crafts (iii) Food processing (tea, fruits, bamboo shoots, fish, vegetables, etc.) (iv) Livestock raising (v) Chicken and duck raising (vi) Cultural tourism services (vii) Restaurant services (viii) Others	• Training provided to about 30,000 rural residents around the Dongjiang Lake areas, including 40% women supported to find alternative livelihood and/or nonfarm jobs • Target low-income households, female-headed households, Yao EM, and other vulnerable persons as priority for livelihood skills training and eco-compensation • At least 50% of the livelihood training participants have applied the knowledge and skills learned through jobs (including self-employment) and agricultural production.	PMO Zixing City agriculture, employment, forestry, and tourism bureaus ACWF Industrial Workers Training Office and relevant agencies to deliver training	Jan 2016–Dec 2019	Project budget	Local people, including women, Yao EM, etc. Other stakeholders
Output 5: Environmental and Project Management Capacity Strengthened					
5.1 Gender awareness training for the PMO staff on (a) ADB's gender policies, (b) GAP implementation and monitoring, and (c) benefits from gender mainstreaming	• Ensure that 100% of the PMO staff who will be involved in project implementation are to be trained on gender awareness, ADB's gender policies, GAP implementation and monitoring, and benefits from gender mainstreaming	2015 (prior to project implement-ation)	No additional cost on the project	PMO with the gender specialist/ consultant	PMO Women's Bureau/ ACWF Concerned agencies

Objective and/or Activity	Target and Monitoring Indicator	Time Frame	Budget and Sources	Responsible Organization	Key Stakeholder
	• At least 40% of participants in all capacity building training activities are women.				
5.2 Hiring of consultants (national social development, gender, and EM specialist) to assist the PMO in implementing, monitoring, and reporting on GAP, EM development plan, social development action plan, etc.	• Hire one national social development, gender, and EM specialist to support the PMO on the implementation, monitoring, and reporting on GAP, EM development plan, social development action plan, etc.	2015–2020	Included in the project	PMO with the national social development, gender, and EM specialist/ consultant	PMO Women's Bureau/ ACWF Concerned agencies
5.3 Ensure monitoring and evaluation for the GAP, design and monitoring framework, etc. includes collection of appropriate gender indicators	• Collect sex-disaggregated data in project performance and monitoring indicators, and provide quarterly progress reports • The PMO will ensure that GAP progress updates are included in the quarterly and annual reports.	Year 1 Years 1–5	No cost to the project	PMO with the gender specialist/consultant	PMO Women's Bureau/ ACWF Concerned agencies

ACWF = All China Women's Federation, ADB = Asian Development Bank, EM = ethnic minority, GAP = gender action plan, PMO = project management office.
Source: ADB.

Table 10: Social Development Action Plan

Proposed Actions	Target Indicators	Agencies Responsible	Time Frame	Funding Source	Monitoring Tools/ Indicators
1. Community mobilization and participation[a]			Jan 2016–Dec 2019	Project company/ agency operating budgets	Quarterly progress monitoring reports Daily attendance sheet (will compile sex disaggregated data monthly)
1.1 Conduct consultations with the farmers, fishermen, women, and other sectors; and engage them to participate in various activities as follows:		PMO Zixing City environmental protection, forestry, and water resources bureaus Local governments Other agencies			Will be included in the GAP quarterly progress monitoring reports
A. Integrated Ecosystem Rehabilitation and Management: (i) Tree planting and/or upgrading for rocky desertification rehabilitation	• Number of participants during community participation in integrated ecosystem rehabilitation and management.				Semiannual and annual reports
(ii) Bamboo forest upgrade	• Bamboo production output increases.				
B. Wetland Restoration and Management: (i) Pathway and/or road connecting to Bailang Village	• Number of participants during community participation in wetland restoration and management.				
(ii) Wetland planting (aquatic vegetation, etc.) (iii) Estuary wetland restoration (planting trees, shrubs, submerged aquatic vegetation, and others)	• Number and percentage of project beneficiaries consulted during public hearings.				
1.2 Affected beneficiaries. including women, participate in public hearings on tariff setting for solid waste/wastewater management and/or improved water supply system		PMO Zixing City environmental protection and water resources bureaus Local governments			

Proposed Actions	Target Indicators	Agencies Responsible	Time Frame	Funding Source	Monitoring Tools/ Indicators
2. Employment and participation in river course rehabilitation			Jan 2016–Dec 2019	Project company/ agency operating budgets	Monthly monitoring form for labor force (sex disaggregated) will be collated and included in the GAP Quarterly progress monitoring reports Semiannual and annual reports
2.1 Provide skilled and unskilled jobs in river course rehabilitation component which include embankment masonry, grass planting, landscaping, blockage clearing, construction of stairs, and other structures and/or facilities	• 500 temporary jobs will be created for local villagers • Target poor and/or low-income households, female-headed households, Yao EM, and other vulnerable persons	PMO Zixing City environmental protection bureau Contractors Other agencies Local governments			
2.2 Local people participate in flood control seminars and/or training conducted in affected villages	• 33,900 project beneficiaries will be benefited from flood control. • The number of participants in flood control seminar/training	PMO Zixing City environmental protection bureau Local governments			
3. Job hiring in construction (civil works) operations[b]	• 3,410 jobs will be needed during construction or civil works.	PMO Contractors Project companies	Jan 2016–Dec 2019	Project company/ agency operating budgets	Daily attendance sheet for the labor force in construction works (sex-disaggregated data will be complied in monthly report) Will be included in the GAP quarterly progress monitoring report Semiannual and annual reports
3.1 Labor and employment in project components and/or subcomponents with construction (civil works) and operations, environmental protection, and other project subcomponents (i) Provide skilled and unskilled project construction jobs (ii) Provide permanent jobs during operations (iii) Ensure timely advertisement of employment opportunities; and that employment preference will be given to the local people, including the affected persons, women, Yao EM, and low-income households (iv) Protect labor rights and interests of employees	• 1,360 permanent jobs will be needed during operation. • Mass media advertisements to the villages with construction works through television, newspapers, and posters) and monthly announcements on the bulletin boards of village offices • Core labor standards (such as equal pay for equal work and no child labor) will be applied to local labor. • 100% of employees with signed contract with welfare provisions • Target poor and/or low-income households, female-headed households, Yao EM, and other vulnerable persons	Zixing City labor/employment bureau ACWF Local government Other agencies			

Proposed Actions	Target Indicators	Agencies Responsible	Time Frame	Funding Source	Monitoring Tools/ Indicators
4. Conduct livelihood training for the local people in the project areas: 4.1 Participation of the local people, including women and Yao EM in livelihood training for agricultural skills: (i) Bamboo planting (ii) Bamboo crafts (iii) Food processing (tea, fruits, bamboo shoots, fish, vegetables, etc.) (iv) Livestock raising (v) Chicken and duck raising (vi) Others 4.2 Participation of the local people, including women, in livelihood training for non-agricultural skills: (i) Cultural tourism or eco-tourism services (ii) Restaurant services (iii) Boat repair (iv) Others	• Training provided to about 30,000 rural residents around the Dongjiang Lake areas to find alternative livelihood and/or nonfarm jobs • Target poor and/or low-income households, female-headed households, Yao EM, and other vulnerable persons as priority for livelihood skills training and eco-compensation • At least 50% of the livelihood training participants have applied the knowledge and skills learned through jobs (including self-employment) and agricultural production	PMO Zixing City agriculture, employment, forestry, and tourism bureaus ACWF Industrial Workers Training Office Local governments Relevant agencies to deliver training	Jan 2016–Dec 2019	Project budget	Attendance sheet for the livelihood training participants Evaluation or feedback form after the training Survey after project completion Semiannual and annual reports
5. Conduct public awareness on environmental management and sanitation 5.1 Local people, including women and Yao EM, participate in environmental management and sanitation awareness 5.2 Conduct training program on the following areas: (i) Fire prevention belt for public interest forest	• Public awareness conducted to 166,385 people in the project area • Organized at least one training program or seminar for each topic identified per village and/or township with improved pollution control project • Target women, Yao EM, farmers, low-income households, and other vulnerable persons as priority for the public awareness program	PMO Zixing City agriculture and environmental protection bureaus Local governments Other agencies	Jan 2016–Dec 2019	Project budget	Attendance sheet (sex disaggregated monitoring tool) Evaluation form after the training Survey after project completion Semiannual and annual reports

Proposed Actions	Target Indicators	Agencies Responsible	Time Frame	Funding Source	Monitoring Tools/ Indicators
(ii) Pest prevention to reduce agricultural pollution (iii) Soil testing and application of formulated fertilizers in three townships (Bailang, Qinjiang, and Xingning) (iv)Solid waste separation and collection (v) Proper hygiene (vi) Water conservation (vi) Other topics related to environmental protection and/or management					
6. Conduct public awareness on wetland protection program 6.1 Local people, including women and Yao EM, participate in training and other public awareness on wetland protection program in Bailang, Huangcao, and other subproject areas	• Number of local people participating in the wetland and biodiversity protection awareness programs (disaggregated by sex). • Target women, Yao EM, fishermen, farmers, poor and/or low-income households, and other vulnerable persons as priority for the public awareness program • Number of education programs (in school or village meetings) on wetland protection awareness program	PMO Zixing City forestry bureau Local government in affected areas Other agencies	Jan 2016–Dec 2019	Project budget	Attendance sheet (sex disaggregated monitoring tool) Evaluation form after the training Survey after project completion Semiannual and annual reports

ACWF = All China Women's Federation, AP = affected person, EM = ethnic minority, GAP = gender action plan, PMO = project management office.

[a] Community participation includes information dissemination (informing the people) about the project; consultation with the people to be able to formulate better action and ensure that they are engaged in decision making; involvement of the people during project implementation; and empowering them (or engaging them to act and/or be a part of project operation and/or management).

[b] Labor and employment in project components and/or subcomponents with construction (civil works), such as construction of pathway (road) connecting to Bailang Village, Bailang Township; river course rehabilitation (with embankment masonry retaining walls, construction of dikes, stairs, etc.); wastewater treatment plants, improved water supply project, including employment in project operations.

Source: Asian Development Bank.

IX. PERFORMANCE MONITORING, EVALUATION, REPORTING AND COMMUNICATION

A. Project Design and Monitoring Framework

Impact the Project is Aligned with: Sustainable economic development of the Xiang River basin in Hunan Province achieved. (Xiang River Basin Scientific Development Master, Plan 2011–2020) [a]			
Results Chain	**Performance Indicators with Targets and Baselines**	**Data Sources and Reporting**	**Risks**
Outcome Integrated environmental protection in Dongjiang Lake basin achieved	By end 2021, a. Public satisfaction with environmental and municipal services (water supply, sanitation, and waste) in the project area increased to 80% (2014 baseline: 72%) b. Wastewater collection and treatment in the project area increased to 80% (2014 baseline: 5%) c. Pollution loads to Dongjiang Lake reduced by Chemical oxygen deman: 1,389 tons Total phosphorus: 100 tons Total nitrogen: 227 tons Garbage: 80,000 tons (2014 baseline: not applicable) d. About 131,888 people serviced with new or improved water supply (2014 baseline: not applicable) e. About 24,600 *mu* of farmland protected by improved flood capacity (2014 baseline: not applicable)	a. Project management office's survey b. ZCG statistic yearbook c. ZCG environmental protection bureau's monitoring report d. Project progress and completion reports e. ZCG water resources bureau's monitoring reports	The local government fails to adopt integrated and coordinated approach to the Dongjiang Lake's environmental protection.
Outputs 1. Pollution control improved	By early 2021 (2014 baseline: 0), 1a. Six township WWTPs with capacity of 2,000 m^3/day and 330 km of associated sewer pipes, and 2,856 small rural wastewater treatment facilities operational 1b. Sewer connection to households in project area increased from 850 to 33,573 1c. Collection and treatment of solid waste increased from 130 tons/day to 212 tons/day 1d. Green fertilizers and pest control measures applied in 5,690 ha of farmland 1e. 40% of 327 permanent operation jobs and 25% of 450 construction jobs allocated for women	1a–e. Project progress and completion reports, and loan review missions	Infrastructure assets are poorly operated and maintained as a result of lack of capacity and/or budget. Rural village communities failed to connect to wastewater treatment facilities, and incentives are lacking for solid waste collection.
2. Urban–rural water supply system established	2a. Yangdongxia WSP with the capacity of 20,000 m^3/day operational 2b. About 700 km of water delivery and supply pipelines installed 2c. Chukou WSP with the capacity of 620 m^3/day operational 2d. About 35 km of water delivery and supply pipelines installed	2a–e. Project progress and completion reports, and loan review missions	

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
	2e. 40% of 327 permanent operation jobs and 25% of 450 construction jobs allocated for women		
3. River course rehabilitated	3a. About 653,692 m^3 (14.7 km) of river blockage cleared and/or dredged in the five major rivers 3b. 13.7 km green embankment constructed in the needed sections of the five major rivers 3c. Flood control capacity in the five major rivers increased from once in 5 years to once in 10 years 3d. 25% of 300 temporary construction jobs allocated for women	3a–d. Project progress and completion reports, and loan review missions	
4. Integrated ecosystem rehabilitation and management established	4a. Fish stocking and releasing facilities constructed 4b. About 167 ha of three new wetland areas established 4c. 1,000 ha of reforestation and revegetation conducted for reduced soil erosion, and 590 km of fire-break forest belt constructed 4d. Production efficiency in about 2,595 ha of bamboo forest improved through community participation, of which 40% are women 4e. Alternative livelihood training conducted for 30,000 rural residents, of which 40% are women 4f. 40% of 960 permanent operation jobs and 25% of 2,010 construction jobs allocated for women	4a–f. Project progress and completion reports, and loan review missions	
5. Environmental and project management capacity strengthened	5a. An environmental monitoring center established and operational for effective environmental monitoring 5b. An ecological and environmental protection research center set up 5c. About 5,400 staff-days training provided for project staff, of which 40% are women; and their capacity improved 5d. A project monitoring and evaluation system operational	5a–d. Project progress and completion reports, and loan review missions	

Key Activities with Milestones

1. Pollution control improved

1.1 Construct six WWTPs and 38.1 km of sewer pipes in six townships (Q1 2016–Q4 2017)
1.2 Construct 2,856 rural wastewater treatment facilities and 330 km of sewer pipes in 10 townships (Q1 2016–Q4 2017)
1.3 Construct seven solid waste transfer stations and procure associated solid waste compressing equipment (Q1 2016–Q4 2017)
1.4 Procure 60,516 units of solid waste collection equipment, and transfer vehicles (Q1 2016–Q4 2017)
1.5 Test soil and apply green fertilizers (site-specific formulated and organic fertilizers) in 3,406 ha of farmland in 13 pilot villages (Q1 2016–Q4 2019)
1.6 Procure green pest control devices and biological pesticide, and apply these new technologies in 2,284 ha of farmland in 19 villages (Q1 2016–Q4 2019)

2. Urban-rural water supply system established

2.1 Construct the Chukou WSP with capacity of 620 m^3/day (Q1 2016–Q4 2017)

Key Activities with Milestones

2.2 Construct 7.8 km of conveyance pipelines, 4.0 km of water main distribution pipelines, and 23.0 km of household connection distribution pipelines in Chukou Town (Q1 2016–Q4 2017)
2.3 Construct the Yangdongxia WSP with capacity of 20,000 m^3/day (Q1 2016–Q4 2019)
2.4 Construct 13.8 km of conveyance pipelines, 157.8 km of water main distribution pipelines, 228.0 km of water branch distribution pipelines, and 300.0 km of household connection distribution pipelines in five townships (Q1 2016–Q4 2019)

3. River course rehabilitated

3.1 Clear and/or dredge about 653,692 m^3 (14.7 km) of river blockages in the five major rivers of Guangqiao, Lianping, Qingyao, Tian'eshan, and Xingning (Q1 2016–Q4 2017)
3.2 Construct 13.7 km of green embankment in needed sections of the five major rivers (Q1 2016–Q4 2017)
3.3 Plant riverbank trees for greening (Q1 2016–Q4 2018)

4. Integrated ecosystem rehabilitation and management established

4.1 Procure fish resource monitoring equipment (Q1 2016–Q4 2016)
4.2 Build about 3,000 square meters of fish proliferation platform with access road (Q1 2016–Q4 2017)
4.3 Build and upgrade 20 ha of fish-breeding pond, and procure associated equipment (Q1 2016–Q4 2017)
4.4 Construct the 40 ha Xingning River wetland with 7.5 km of access road, 1.5 ha of artificial wetland for river water quality improvement (Q1 2016–Q4 2017)
4.5 Construct the 26.7 ha Huangcao lakeside wetland (Q1 2016–Q4 2017)
4.6 Construct the 100 ha Hangxi River wetland with 5 km of internal plank road and 10 pavilions (Q1 2016–Q4 2017)
4.7 Construct 590 km of fire-prevention forest belt (Q1 2016–Q4 2018)
4.8 Conduct 1,000 ha of reforestation in rocky area (Q1 2016–Q4 2020)
4.9 Enhance 13,666 ha of forest management to increase the forest density (Q1 2016–Q4 2020)
4.10 Procure forest fire-fighting equipment and facilities, and pest control equipment and biological pesticide (Q1 2016–Q4 2020)
4.11 Improve the production efficiency in 2,595 ha of low-efficient bamboo forest (Q1 2016–Q4 2020)
4.12 Conduct alternative livelihood training for farmers (Q1 2016–Q4 2020)
4.13 Carry out eco-compensation pilot scheme (Q1 2017–Q4 2020)
4.14 Conduct fish release (Q1 2017–Q4 2020)

5. Environmental and project management capacity strengthened

5.1 Establish a project monitoring and evaluation system (Q1 2016–Q4 2016)
5.2 Establish environmental, fishery, and forest fire-fighting monitoring centers (Q1 2016–Q4 2017)
5.3 Set up the Dongjiang Lake ecological and environmental protection research center (Q1 2016–Q4 2017)
5.4 Establish the Dongjiang Lake environmental monitoring and management information system (Q1 2016–Q4 2018)
5.5 Recruit and manage project implementation consulting services (Q1 2016–Q4 2020)
5.6 Conduct training, workshops, and study tours (Q1 2016–Q4 2020)

Project Management Activities

Technical design and procurement planning and management (Q3 2015–Q4 2019)
Carry out key activities of the gender action plan and the social development action plan (Q1 2016–Q4 2020)
Conduct and monitor activities of the resettlement plan (including land acquisition), ethnic minority development plan, and environmental management plan (Q1 2016–Q2 2021)
Conduct midterm and annual project reviews (Q3 2016–Q4 2020)

Inputs

Asian Development Bank loan:	$130,000,000
Zixing City Government:	$109,570,000
Farmer beneficiaries:	$ 22,460,000

Assumptions for Partner Financing

Not applicable.

ha = hectare, km = kilometer, m^2 = square meter, m^3 = cubic meter, *mu* = a Chinese unit of land measurement (1 *mu* = 1/15 ha), Q = quarter, WSP = water supply plant, WWTP = wastewater treatment plant, ZCG = Zixing City Government.

[a] Hunan Provincial Government. 2013. *Xiang River Basin Scientific Development Master Plan (2011–2020)*. Changsha.

Source: Asian Development Bank.

B. Monitoring

99. **Project performance monitoring.** To monitor the progress of the project in achieving the planned outcome and outputs, the PMO will establish and maintain the PPMS which will be designed to permit adequate flexibility to adopt remedial action regarding project design, schedules, activities, and development impacts. At the start of project implementation, the PMO and ZIFC will develop integrated PPMS procedures to generate data systematically on the inputs and outputs of the components, as well as the indicators to be used to measure the project's impact and outcome taking into account the components' scope. The PMO will be responsible for monitoring and reporting on project performance. The basis for performance monitoring will be the DMF, which identifies performance targets for the impact, outcome, and outputs of the project.

100. Disaggregated baseline data for output and outcome indicators gathered during project processing will be updated and reported quarterly through the PMO's semiannual progress reports and after each ADB review mission. These quarterly progress reports will provide information necessary to update ADB's PPMS (footnote 21). The PMO will collect the data, calculate the indicators, analyze the results, and prepare a brief report describing the extent to which the project is generating the intended outputs and outcome, as well as the overall impact on Dongjiang Lake's environment and water quality. The relevance and practicability of data collection for indicators was confirmed with the PMO and ZIFC. The agreed socioeconomic and environmental indicators to be used will be further enhanced to measure project impacts. The PMO and ZIFC agreed and confirmed that they will (i) refine and integrate the PPMS framework at the start of project implementation; (ii) confirm that targets are achievable; (iii) develop recording, monitoring, and reporting arrangements; and (iv) establish systems and procedures no later than 6 months after project inception.

101. **Compliance monitoring.** During project implementation, ADB and the PMO will closely monitor the compliance of all the covenants under the project and will take necessary remedy actions for any noncompliance. The compliance status will be reported in the quarterly progress report by the PMO and will be reviewed during project review missions. Compliance monitoring will also be undertaken by (i) the environment officer, supported by the PMO and the Zixing City EPB to ensure overall compliance of all relevant agencies with the EMP, and (ii) the PMO's social safeguards officer to ensure overall compliance with the relevant social, gender, and resettlement plans. Semiannual environmental monitoring reports will be prepared by the PMO's environment officer; and after review by the implementing agencies, the municipal and city EPBs, and the PMO, the report will then be submitted by the PMO to ADB.

102. **Environmental monitoring.** The project will undertake two types of environmental monitoring: internal and external. Internal monitoring will comprise monitoring and inspection by the CSCs, the PIUs, the PMO, ZIFC, and the contractors. The PMO's environment officer, supported by the LIEC, will be responsible for internal inspection and overall compliance with the EMP throughout the project until project completion. The PMO's environment officer, the LIEC, and the Zixing City EPB will advise and supervise the CSCs, the PIUs, and the contractors to ensure that the environmental mitigation measures defined in the EMP are properly implemented. The LIEC will be responsible for verifying the EMP implementation and the environmental monitoring information prepared by the PMO and the implementing agencies. In verifying, the LIEC may conduct their own investigation by visiting the project sites, taking samples, and/or conducting site inspections. The LIEC will discuss the verification results with the PMO and the implementing agencies, suggest corrective actions, and reflect findings in their EMP implementation and environmental monitoring verification reports.

103. The results of environmental inspection and monitoring will be used to assess (i) the extent and severity of actual environmental impacts against predicted impacts; (ii) the effectiveness of the EMP mitigation measures; (iii) compliance with environmental standards and regulations; (iv) trends in impacts; (v) overall effectiveness of the EMP implementation; and (vi) the need for additional mitigation measures and corrective actions, if noncompliance is observed.

104. Within 3 months after each subproject completion, or no later than 1 year with permission of the local EPBs, environmental acceptance monitoring and audit reports of each subproject completion shall be (i) prepared by a licensed environmental monitoring institute in accordance with the PRC's Guideline on Project Completion Environmental Audit (2001), (ii) reviewed for approval of the official commencement of individual subproject operation by environmental authorities, and (iii) finally reported to ADB through the annual EMP monitoring and progress reporting process.

105. **Resettlement monitoring.** Internal and external monitoring of the resettlement plan implementation will be conducted. The PMO and ZIFC will carry out internal supervision and monitoring to ensure compliance with the provisions of the resettlement plan, and submit internal resettlement monitoring reports semiannually during project implementation, to be submitted together with the regular project monitoring report (footnote 24). The PMO and ZIFC will also employ an external monitoring institute or firm to conduct external monitoring. The external monitoring agency will prepare a baseline study, and implement external monitoring and evaluation of the resettlement plan implementation. Semiannual external monitoring reports will be prepared and submitted to ADB during resettlement implementation; and annual evaluation reports will be forwarded to the PMO and ADB for 2 years after conclusion of the resettlement implementation.

106. **Ethnic minority development plan monitoring.** The implementation of the EMDP will be monitored and reported semiannually to ADB. The social development and gender specialists, to be recruited under the loan financing, will work with the PMO and ZIFC to set up an appropriate monitoring system and assist with the preparation of reports. The PMO's social safeguards officer, with the assistance of the specialists, will coordinate and monitor the implementation of the EMDP (footnote 22).

107. **Gender action plan monitoring.** This will be incorporated into the overall M&E plan for the project. The PMO and ZIFC will be responsible for establishing and coordinating M&E. An ADB staff with expertise in gender issues will participate in the midterm review. The social and

gender development specialists will work with the PMO and ZIFC staff to create a detailed implementation and monitoring plan for each of the tasks outlined, help to complete the first GAP implementation report, and review the second report prepared by the implementing agencies.

C. Evaluation

108. In addition to regular monitoring, project performance will be reviewed at least once a year jointly by ADB, HPFD, and the national government. The review will assess implementation performance and achievement of project outcomes and outputs, assess financial progress, identify issues and constraints affecting implementation, and work out a time-bound action plan for their resolution. ADB, HPFD, and the national government will undertake a midterm review to assess implementation status and take appropriate measures—including modification of scope and implementation arrangements, and reallocation of loan proceeds, as appropriate—to achieve the project impact and outcome. Feedback from the PPMS activities will be analyzed. Within 3 months of physical completion of the project, the PMO will submit a project completion report to ADB (footnote 25). During the midterm review, a procurement review for effective implementation shall also be conducted to identify risks in procurement and measures for improved procurement performance.

D. Reporting

109. The PMO will provide ADB with (i) quarterly project progress reports in a format consistent with ADB's PPMS (footnote 21); (ii) semiannual environmental monitoring report; (iii) semiannual resettlement monitoring report; (iv) audited accounts within 6 months of the end of each fiscal year; and (iv) a project completion report within 3 months of physical completion of the project (footnote 25). The PMO will also forward external resettlement M&E reports to ADB. The PMO will report to ADB the implementation progress of the GAP and SDAP through the project progress reports. To ensure projects continue to be both viable and sustainable, project accounts and the executing agency audited financial statements, together with the associated auditor's report, should be adequately reviewed.

110. Table 11 summarizes the reporting requirements.

Table 11: Reporting Requirements

Report	Due Time	Reference
Project Performance Management System ➢ Develop comprehensive PPMS procedures ➢ Reporting of baseline and progress data, including the EMP	 No later than 6 months after loan effectiveness Quarterly	Project Agreement, Schedule
Quarterly Project Progress Reports	Quarterly, within 1 month after the end of each quarter	Project Agreement, Schedule
Audited Financial Statements	Not later than 6 months after the closure of fiscal year	Project Agreement, Schedule
Land Acquisition and Resettlement: ➢ Internal monitoring reports to ADB ➢ External monitoring report to ADB,	 Semiannually Semiannually during	Project Agreement, Schedule

Report	Due Time	Reference
PMO, and ZCG ➢ Resettlement completion report to ADB	implementation and annual evaluation for 2 years Within 3 months after completion of land acquisition and resettlement	
EMDP: ➢ Reporting on EMDP implementation	Semiannually	Project Agreement, Schedule
GAP and SDAP: ➢ Reporting on GAP implementation ➢ Reporting on SDAP implementation	Semiannually	Project Agreement, Schedule
Environmental Report ➢ Internal and external environmental monitoring reports to ADB ➢ Environmental acceptance monitoring report	Semiannually Within 3 months after project completion	Project Agreement, Schedule
Project Completion Report	Not later than 3 months after the physical completion of the project	Project Agreement, Schedule

ADB = Asian Development Bank, EMDP = ethnic minority development plan, EMP = environmental management plan, GAP = gender action plan, PMO = project management office, PPMS = project performance management system, SDAP = social development action plan, ZCG = Zixing City Government.
Source: ADB.

E. Stakeholder Communication Strategy

111. Project information will be communicated through public consultation, information disclosure mechanism in the website of the national government and ADB website, meetings, interviews, focus group discussions, and community consultation meetings, in accordance with ADB's requirements of information disclosure policy. Extensive consultation will take place on aspects of infrastructure design and design of nonstructural measures, such as awareness raising campaigns with institutional stakeholders, beneficiaries, and affected persons. In the consultative meetings, participants—including male, female, and poor and vulnerable residents, and other significant stakeholders—will be consulted about concerns or complaints raising mechanisms, information needs, and further consultation expectations.

112. **Environment.** Extensive consultation was carried out with affected people and other concerned stakeholders during project preparation. Direct public participation was conducted as an ongoing element in the development of the suboutputs. These activities were carried out by the implementing agencies in their preparation of the feasibility study reports and EIAs and by the PPTA consultants following the PRC's National Environmental Impact Assessments Technical Guidelines and ADB's SPS. Future consultation will include involvement of affected people in monitoring impacts and mitigation measures during construction and operation; evaluating environmental and economic benefits and social impacts; and interviewing the public after the project is completed. During construction, the affected people will be consulted through formal questionnaire surveys and informal interviews by the on-site environmental engineers of the construction contractors, the CSCs, and voluntary monitors of the local residents living in the

project areas, especially those around the construction sites. A project public complaints unit will be established in the PMO to coordinate the project GRM.

113. **Resettlement.** All affected villages and the directly affected households will be involved throughout the project cycle, starting from planning, implementation, and M&E. Through meetings, interviews, socioeconomic surveys, focus group discussions, public consultation workshops, and community consultation meetings, local representatives have participated in the planning, and concerns have been integrated into the resettlement plan. Before implementation, the PMO and the implementing agencies will further discuss and consult with the affected persons' representatives on potential impacts and the detailed compensation plan to ensure interests are protected and to provide employment opportunities for the affected persons' livelihoods as a result of project implementation. The PMO and ZIFC will disclose the final resettlement plan in relevant government offices and to affected people in local language. The draft resettlement plan has been posted on the ADB website and disclosed to the affected households. The respective implementing agency will establish project resettlement units for supervision of implementation, particularly of the temporary land acquisition, continued public consultation, monitoring of progress, and response to grievances. The grievance redress procedures have been established and explanations have been included in the resettlement plan. The resettlement plans also contain a public consultation schedule and detailed description of the progress.

114. **Other social safeguard and dimensions.** Consultations with communities have taken place at different points in the preparation of the EMDP, GAP, and SDAP within the components. They have been designed not only to inform people about the component or specific activities related to its preparation and implementation, but also to enable people in the community to ask questions, make suggestions, state preferences, and express concerns. Further consultation will be conducted during EMDP, GAP, and SDAP implementation. Special attention will be paid to the participation of women and any other vulnerable groups, such as the poor.

115. Specifically, the purpose of the community C&P plan is to engage the project beneficiaries and other affected stakeholders in meaningful consultation and decision-making process. Informing them about the proposed project, and consulting them on various issues related prior to and/or during project implementation is essential to achieve proactive and meaningful people's participation. The stakeholders identified involved the following: local government authorities, including the district, city, township, and village leaders; concerned government agencies; local people, including women, ethnic minorities, households affected by resettlement, private sector, and/or nongovernment organizations, and farmers collectives and/or associations; and other stakeholders who will be affected or may have interest on the proposed projects. The following table summarizes the community C&P plan.

Table 12: Community Consultation and Participation Plan

Stakeholder Group	Objective of their Intervention Why They are Included	Type of Participation and Depth	Participation Methods Method	 Who will be Responsible	Time Line Start Date	 End Date	Cost Estimate
Zixing City Government (ZCG); government agencies and/or bureaus	To be informed about the project, responsible for project implementation in accordance with the term of reference (TOR), decision makers at the national level, and could influence the local government units and/or agencies in policy making and decision making	Information sharing, regular meetings, consultation, shared decision making, and shared responsibility Participation (high)	Meeting Workshop	Project management office (PMO) Consultants	2016	2017	Budget for hiring one national gender specialist
Local government officials and/or leaders (provincial, district, city, townships, villages, and village groups)	Representatives of the government's executing agencies need to be informed and consulted about the project, those responsible for policy making and engage the township, city, and/or village heads to support and/or participate actively during project implementation	Information generation and/or sharing, consultation, and shared decision making and/or responsibility Participation (high)	Meeting Workshop Public consultation	PMO Consultants Local government unit (LGU) and/or agency heads, Village heads	2016	2017	Budget for snacks and transportation of the PMO and/or gender specialist
Representative assemblies, bureaus, and/or agencies responsible for implementing the project components and/or subcomponents (i.e., the PMO; bureaus of agriculture, fisheries, forestry, tourism, etc.)	Representatives of government bodies in the province, cities, townships, and villages responsible for decision making and assist during project implementation. To share their expertise during capacity building, and participate in sharing information during project implementation. To define the roles of each agency during project implementation, elicit their support, and harmonize the projects with the existing programs and/or plans of the government agencies and/or bureaus.	Regular meetings, consultation, and shared decision making and/or responsibility Participation (high)	Meeting Workshop Public consultation	PMO Consultants LGU and/or agency heads	2016	2017	Budget for snacks and transportation of the PMO and/or gender specialist
Existing and potential new consumers, households (HHs), including the low-income, FHH, ethnic minority (EM), project beneficiaries	Beneficiaries and/or households are interested on how they could access project benefits, and share inputs and/or decision making in all project cycles (design, implementation, and monitoring) To provide information to households and/or individuals that could potentially	Information generation and/or sharing, cconsultation and shared decision making and/or responsibility Participation (medium)	Meeting, Focus group discussion (FGD), Public consultation	PMO, Consultants, LGU and/or agency heads, Townships and/or village heads, Women	2016	2017	Budget for snacks and transportation of the PMO and/or gender specialist; and resettlement

Stakeholder Group	Objective of their Intervention Why They are Included	Type of Participation and Depth	Participation Methods Method	 Who will be Responsible	Time Line Start Date	 End Date	Cost Estimate
and resettlement, affected persons (APs), and/or affected households (AHs), etc.)	experience potential negative impacts or face the risk of being marginalized by the project impact. They are the project beneficiaries, and are the direct stakeholders of the project. They need to be informed, participate in decision making, implementation, monitoring, and control.			association, AP/HHs (due to resettle-ment), EM groups			information brochure
Community-based organizations, such as farmers groups and/or collectives (bamboo farmers collectives, orchard farmers collectives, women associations, etc.)	Representatives of the various community-based organizations responsible on issues and/or matters concerning solid pollution control, solid waste and wastewater disposal and/or management system, drinking water, flood protection, soil erosion, forestry, etc. They need to be informed, participate in decision making, project implementation, monitoring, and control. The associations will oversee the operation and maintenance of the irrigation, drinking water, and/or flood control systems. The farmers, women, and other sectors are direct stakeholders; and at the same time, they are represented in the associations.	Information sharing, consultation, and shared decision making, and shared responsibility, and control Participation (medium)	Meeting FGD Public consultation	PMO, Gender specialist Township and village heads EM village (Yao) leaders Women associations Farmers and farmer collectives, etc. Nongovern-ment organizations (NGOs) and/or community-based organizations (CBOs)	2016	2020	Budget for capacity building, transportation cost for the PMO and/or gender specialist
Women	Women are the primary beneficiaries and users of water in the households. Lack of access to reliable and safe water, and poor health and sanitation result to increase in diseases adding to their domestic burden (i.e., fetching water, taking care of sick HH members, and other traditional roles). Women will have more time to attend to productive tasks, including economic activities.	Information sharing and/or generation Consultation, and shared decision making, and shared responsibility, and control Participation (medium)	Meeting FGD Workshop Public consultation	PMO Gender specialist Women associations and/or leaders Women federation Labor and employment bureau	2016	2020	Budget for capacity building, transportation cost for the PMO and/or gender specialist

Stakeholder Group	Objective of their Intervention Why They are Included	Type of Participation and Depth	Participation Methods Method	 Who will be Responsible	Time Line Start Date	 End Date	Cost Estimate
	To ensure inclusiveness of women and that they are able to benefit from the project in livelihood capacity building, public awareness, capacity building, and employment that would be created during project implementation.			Farmers and farmer collectives, etc. NGOs and/or CBOs			
Private sector and/or businesses	Businesses are affected directly affected by problems caused by lack of access to safe and reliable water source; poor sanitation could cause diseases; pollution problems in the environment and Dongjiang Lake affect the economic activities. These cause impediments to private sector business and investment.	Information sharing and/or generation shared responsibility and control Participation (low)	Meeting Workshop Public consultation	Business associations and/or organizations Other private sectors	2016	2020	Transportation cost for the PMO and/or gender specialist
Consultancy firms and/or agencies and organizations that will be selected by ZCG through the PMO to implement various project components as approved in the ADB loan and/or project	The consultancy firm and/or consultants that will be selected by the PMO will ensure that the project outputs and activities, key indicators, etc. will be implemented as planned; inform and engage the people to participate in the decision making, ensure that social safeguard and/or gender mainstreaming plans and/or activities are implemented; conduct capacity building, monitoring and evaluation. To assist the PMO in coordinating and/or working with various government agencies and/or bureaus; oversee and monitor compliance implementation (as stated in the TOR; reports submitted to ADB, etc.)	Regular meetings Information sharing Consultation, and shared decision making, and shared responsibility and control Collaboration (high)	Meeting Workshop	Team leader/ project director of the consultancy firm, the PMO, individual consultants who will be hired by the consultancy firm or by the PMO to assist in project implementation	2016	2020	No budget required
NGOs and/or CBOs (with mandate relevant to the project outputs or components)	Will be mobilized to participate in public information and dissemination, could help in organizing fora, seminars on climate change, environmental protection, pollution control, livelihood skills training, gender mainstreaming, health and sanitation, etc.	Information sharing Consultation Collaboration (medium)	Meeting Workshop Consultation	Project director and/or project coordinators at the local level, PMO in coordination with the	2016	2020	Budget for workshops

Stakeholder Group	Objective of their Intervention Why They are Included	Type of Participation and Depth	Participation Methods Method	 Who will be Responsible	Time Line Start Date	 End Date	Cost Estimate
	NGOs and/or CBOs have the resources and expertise that could be tapped to complement and/or support project implementation.			township and/or village leaders			
International development partners (ADB, etc.)				ADB project officer, executing agency and/or PMO, Consultants	2016	2020	Budget for the consultants who were mobilized

Source: Asian Development Bank.

X. ANTICORRUPTION POLICY

116. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy relating to the project.[28] All contracts financed by ADB shall include provisions specifying the right of ADB to audit and examine the records and accounts of the executing agency and all project contractors, suppliers, consultants, and other service providers. Individuals and/or entities on ADB's anticorruption debarment list are ineligible to participate in an ADB-financed activity and may not be awarded any contracts under the project.[29]

117. To support these efforts, relevant provisions are included in the draft loan and project agreements, and the bidding documents for the project. The project design and implementation arrangements provide for mitigating corruption risks. Risks associated with project management will be mitigated by (i) training the executing and implementing agencies' staff in the procurement of civil works, goods, and services under the project; (ii) setting up a supervisory body in place to prevent undue interference in business practices, and making adequate resources available for its effective operation; and (iii) conducting periodic inspections of contractors' activities relating to fund withdrawals and settlements by the executing agency's staff. The executing and implementing agencies shall also initiate liaison meetings with the Prosecutor's Office, as needed, to discuss any warnings about, or information on, alleged corrupt, fraudulent, collusive, or coercive practices relating to the investment program.

XI. ACCOUNTABILITY MECHANISM

118. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make a good faith effort to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.[30]

[28] Available at: http://www.adb.org/Documents/Policies/Anticorruption-Integrity/Policies-Strategies.pdf
[29] ADB's Integrity Office web site: http://www.adb.org/integrity/unit.asp
[30] For further information see: http://www.adb.org/Accountability-Mechanism/default.asp.

XII. RECORD OF PAM CHANGES

119. The project administration manual is a living document subject to change after ADB Board's approval of the project's report and recommendation of the President.[31] It is concise yet informative, providing checklists of all activities related to project implementation along with the necessary procedures for the ZCG, PMO, and ZIFC to effectively implement and monitor the project.

Date	Project Administration Manual Changes
March 2015	Discussed during the PPTA final review and loan fact-finding mission.
October 2015	Discussed and agreed during loan negotiations.

PPTA = project preparatory technical assistance.
Source: Asian Development Bank.

[31] Project Administration Manual (accessible from the list of linked documents in Appendix 2 of the RRP).

ANNEX 1: ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL MANAGEMENT PLAN FOR THE HUNAN DONGJIANG LAKE INTEGRATED ENVIRONMENTAL PROTECTION AND MANAGEMENT PROJECT

People's Republic of China

Prepared by the Zixing City Government for the Asian Development Bank

A. Objectives

1. This environmental management plan (EMP) is for the Hunan Dongjiang Lake Integrated Environmental Protection and Management Project in Zixing City of Hunan Province, People's Republic of China (PRC). The EMP complies with the Safeguard Policy Statement (SPS, 2009) of the Asian Development Bank (ADB);[1] and is based on the domestic environmental impact assessments (EIAs) prepared by the Guangdong Environmental Protection Engineering Design Institute (pollution control component), the Zhongnan Engineering Corporation Limited (urban–rural water supply and river course rehabilitation components), and the Chenzhou Municipal Environmental Protection Research Institute (ecosystem rehabilitation component) and the project EIA.[2]

2. The EMP describes the roles and responsibilities of all project agencies to implement this plan; mitigation measures; inspection, monitoring, and reporting arrangements; training and institutional strengthening; grievance redress mechanism (GRM); and future public consultation.

3. In the design stage, the project management office (PMO) will pass this EMP to the design institutes for incorporating mitigation measures into the detailed designs. The EMP will be updated at the end of the detailed design, as needed. To ensure that bidders will respond to the EMP's provisions, the PMO and local project implementation units (PIUs) will prepare and provide the following specification clauses for incorporation into the bidding documents: (i) a list of environmental management requirements to be budgeted by the bidders in their proposals; (ii) environmental clauses for contractual terms and conditions; and (iii) component domestic EIAs and the project EIA, including the updated EMP for compliance (footnote 2).

B. Organizations and their Responsibilities for Implementation of the Environmental Management Plan

4. The EMP implementation arrangements and responsibilities of government organizations are summarized in Table EMP-1. The Zixing City Government (ZCG) is the project executing agency (EA). The EA is responsible for communication with ADB, loan onlending and repayment, as well as supervision and guidance of the Zixing City PMO and implementing agencies (IAs) during the project implementation. A project leading group (PLG) has been established, chaired by the mayor and comprises senior officials from relevant government agencies, to facilitate inter-agency coordination, and resolve any institutional problems affecting project implementation at municipal level.

5. The PMO will conduct daily management and coordination during project implementation on behalf of the PLG.

6. The Zixing City Urban and Rural Environmental Protection Financing Center (ZIFC) is the IA. Within the ZIFC, there are four functional departments: administration, finance, technical engineering, and contract management. ZIFC will (i) engage and supervise engineering design institutes, tendering company, and the project management consulting service during project implementation; and (ii) report on progress.

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[1] ADB. 2009. *Safeguard Policy Statement*. Manila. Available at: http://www.adb.org/documents/safeguard-policy-statement

[2] Environmental Impact Assessment (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).

Table EMP-1: Project Operation and Maintenance Arrangements in Zixing City

	Component/Subcomponent	Activity	Implementing Unit	Operation and Maintenance Unit
A	**Improved Pollution Control**			
A.1	Domestic wastewater treatment	WWTP-urban area	HURB	Towns where facility is located
		WWTP-rural area	ZEPB	Villages
A.2	Solid waste collection, compaction, transfer, disposal	Collection, transfer	SD	Township government, sanitation department, and/or outsourced operation
		Landfill		
		Incineration		
A.3	Agricultural nonpoint source pollution management	Soil testing, fertilizer	AB	Farmers
		Crop pest control	AB	
		Training		
B	**Establishment of Urban–Rural Water Supply System**			
B.1	Yangdong WTP and distribution project		WRB	Water Supply Company
B.2	Chukou water supply project		WRB	Chukou Town Government
C	**Establishment of Integrated Ecosystem Rehabilitation and Management**			
C.1	River modification	Xingning River	WRB	TWMS
		Guangqiao River	WRB	TWMS
		Qingyao River	WRB	TWMS
		Lianping River	WRB	TWMS
		Tian'e Mountain River	WRB	National Forestry Park
D	**Integrated Ecosystem Rehabilitation and Management**			
D.1	Dongjiang Lake aquatic ecosystem rehabilitation	Fish release structures	DRMB	Aquatic Product Seeding Plant
		Fish release	DRMB	DRMB
		Breeding facility	DRMB	Zixing Aquatic Product Seeding Plant
		Fish monitoring station	DRMB	Fishery Administration Group
D.2	Wetland restoration and management facilities	Embankment	FB	FB
		Restoration	FB	FB
		Research	FB	FB
		Education	FB	
D.3	Karst area desertification rehabilitation project	Reforestation	FB	Will supervise; provide technical support; priority given to the forestry owner
		Regeneration	FB	
D.4	Ecological forest protection		FB	
D.5	Bamboo forest improvement		FB	
E	**Environmental Monitoring and Capacity Building for Ecological System Protection**			
E.1	Capacity building for environmental monitoring		ZEPB	EPB
E.2	Deep water research center		ZEPB	EPB
E.3	Training on livelihood skills		HRSS	HRSS
E.4	Project management and capacity building	Studies	PMO	
		Workshops		
		Training		
E.5	Project monitoring and evaluation system		PMO	

AB = agriculture bureau; DRMB = Dongjing Reservoir Management Bureau; EPB = environment protection bureau; FB = forestry bureau; HRSS = Human Resource and Social Security Bureau; HURB = Housing, Urban and Rural Development Bureau; PMO = project management office; SD = sanitation department; TWMS = Town Water Management Station; WRB = water resource bureau; WTP = water treatment plant; WWTP = wastewater treatment plant, ZEPB = Zixing City environment protection bureau;.

7. **Environment staff within the project management office and the project implementation units.** The PMO will have main EMP coordination responsibility. The PMO has appointed a PMO environment officer to be responsible for the environmental issues during project implementation. These officers will take charge of (i) coordinating the implementation of the EMP and developing implementation details; (ii) supervising the implementation of mitigation

measures during project design, construction, and operation; (iii) ensuring that environmental management, monitoring, and mitigation measures are incorporated into the bidding documents, construction contracts, and operation management plans; (iv) submitting annual EMP monitoring and progress reports to ADB; (v) coordinating the GRM; and (vi) responding to any unforeseen adverse impacts beyond those mentioned in this EMP. The PMO environment officer will be technically supported by the loan implementation environment consultant (LIEC).

8. **Project implementation units.** The PIUs are set in the agriculture; Donjiang Lake reservoir management, environmental protection; forestry; housing, urban, and rural development; and water resources bureaus and the sanitation department of Zixing City to implement relevant subprojects. Each PIU has assigned an environmental coordinator to assist the PMO environment officer.

9. **Loan implementation environment consultant.** The LIEC will be hired for 9 person-months under the loan implementation consultant services. The LIEC will advise the PMO, PIUs, contractors, and construction supervision companies (CSCs) on all aspects of environmental management and monitoring for the project. The LIEC will (i) assist in updating the EMP and environmental monitoring program, as needed; (ii) support the implementation of the EMP; (iii) support the PMO in preparing semiannual progress reports in English and Chinese for submission to ADB; (iv) provide training to the PMO, PIUs, and CSCs on EMP implementation, GRM, relevant laws and policies, and ADB's SPS (Table EMP-6 and footnote 1); (v) identify any environment-related implementation issues, and propose necessary corrective actions; (vi) undertake site visits for the EMP inspection, as required.

10. Terms of reference for key personnel are in Appendix 1.

11. **Construction contractors and construction supervision companies.** Construction contractors will be responsible for implementing relevant EMP mitigation measures during construction under the supervision of the CSCs and PIUs. Contractors will develop site-specific EMPs on the basis of this project EMP. The CSCs will be selected through the PRC's bidding procedure by the PIUs. The CSCs will be responsible for supervising construction progress and quality, and the EMP implementation on construction sites. Each CSC shall have at least one environmental engineer on each construction site to (i) supervise the contractor's EMP implementation performance; and (ii) prepare the contractor's environmental management performance section in monthly project progress reports submitted to the PIUs and PMO.

12. **Environmental monitoring station.** ZIFC will contract the environmental monitoring station (EMS) under the local environmental protection bureau (EPB) to implement the external monitoring program defined in this EMP (Table EMP-4).

C. Potential Impacts and Mitigation Measures

13. Prior to construction, the PMO will assess the project environmental readiness using Table EMP-2 and review with ADB. If necessary, corrective actions will be identified to ensure that all requirements are met.

Table EMP-2: Project Readiness Assessment Indicators

Indicator	Criteria	Assessment	
		Yes	No
EMP update	The EMP was updated after technical detail design, and approved by ADB	☐	☐

Indicator	Criteria	Assessment	
		Yes	No
Compliance with loan covenants	The borrower complies with loan covenants related to project design and environmental management planning	☐	☐
Public involvement effectiveness	• Meaningful consultation completed • GRM established with entry points	☐ ☐	☐ ☐
Environmental supervision in place	• LIEC is in place • Environment Officer appointed by ZIFC • EMS and CSCs contracted by ZIFC • EMC appointed by each PIUs	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
Bidding documents and contracts with environmental safeguards	• Bidding documents and contracts incorporating the impact mitigation and environmental management provisions of the EMP.	☐	☐
Site construction planning (Environmental)	Site environmental management and supervision plan prepared for each work site by the ZIFC, PIUs and contractors.		
EMP financial support	The required funds have been set aside by contractors, ZIFC and PIUs to support the EMP implementation	☐	☐

ADB = Asian Development Bank; EMS = environmental monitoring station, IA = implementing agency, LIEC = loan implementation environmental consultant, PIU = project implementing unit, ZIFC = Zixing City Urban and Rural Environmental Protection Investment and Financing Center.

14. Table EMP-3 lists the potential project impacts, and mitigation measures. The mitigation measures will be incorporated into the detailed design, bidding documents, construction contracts, and operational management manuals by the design institutes (during detailed design) and contractors (during construction) under the supervision of the CSCs and PIUs, with technical support from the LIECs. The effectiveness of these measures will be evaluated based on environmental inspections and monitoring to determine whether they should be continued, improved, or adjusted.

Table EMP-3: Potential Impacts and Mitigation Measures during Pre-Construction and Construction Phases

Item	Potential Issues	Mitigation Measures	Imple- ment	Super- vise
A. DURING DESIGN AND CONSTRUCTION				
Detail Design Stage	Detailed design (WWTPs, rural WWTP, WTPs, buildings, embankments, dredging, landscaping, and wetlands)	• Plan the dredging and embankment for September to December; allow 1 month (February) for settling of sediment. • Include habitat features for aquatic flora, turtles, frogs, in design of embankments. • Confirm final designs and layout for all project infrastructure. • Locate odor-generating and noise-producing facilities furthest from residences.	IAs, DI, wetland specialist	PMO
	Institutional strengthening for EMP Implementation and supervision	• At least 6 months before construction: (i) appoint PMO environment officer, PIU environment officer, LIEC, and wetland specialist. See TOR in Appendix 1. • At least 6 months before construction, train staff for EMP implementation and supervision. • PIUs have contractual agreements with EMS to conduct environmental monitoring in this EMP. • All EMS are qualified centers which are part of county-level or higher EPBs • Conduct training on this EMP for the PMO, IAs, PIUs, contractors, and CSCs.	PMO, PIUs	EA, ADB

Item	Potential Issues	Mitigation Measures	Imple- ment	Super- vise
	Update EMP	• Update mitigation measures defined in this EMP based on final detailed design. • Submit the updated EMP to ADB for review. • In case of major changes of project location and/or components, conduct EIA and public consultation. Submit to EPD and ADB for approval and disclosure.	PMO, LIEC	EPB, ADB
Construct- ion Prepara- tion	Sediment quality	• Conduct second-round sediment sampling at sites for borrow pits, dredging, spoil disposal.	EMS	EPB
	Bidding and contract documents	• Incorporate mitigation measures in this EMP to bidding documents. • Bidding documents are sent to ADB for review. • Prepare environmental contract clauses for contractors.	DIs, PMO, PIUs	LIEC, EPB, ADB
	Dredging	• Bid documents for dredging will include all specific mitigation measures in this EMP. • Bid documents will require contractor to have sufficient dredge experience in sensitive areas.	DIs, PMO, PIUs	LIEC, EPB, ADB
	EMP training	• LIEC, EPD, and EPBs provide training on EMP implementation.	LIEC, PMO	EPD, ADB
	Establish GRM	• PMO and PIU environment officers and PMO social officer establish GRM with LIEC. • All PMO and PIU personnel trained in GRM. • Distribute contact details for GRM on PMO and EPB public websites and construction sites.	PIUs	PMO, LIEC, ADB
B. DURING CONSTRUCTION				
Topo- graphy and Soils	Earthwork, soil erosion, soil contamination	• Define spoil disposal sites and borrow pit locations in the construction tender documents. • Construct intercepting channels to prevent construction run-off entering waterways. • Divert runoff from sites to sedimentation ponds or existing drainage. • Limit construction and material handling during periods of rains and high winds. • Stabilize cut slopes, embankments, and other erosion-prone areas during works. • Minimize open excavation areas and use compaction techniques for pipe trenches. • Properly store petroleum products, hazardous materials, and wastes on impermeable surfaces in secured and covered areas. • Rehabilitate all spoil disposal sites and construction sites. • All landscaping will only use native plant species. • Situate construction camps and storage areas to minimize land area required. • Remove construction wastes from the site to the approved disposal sites. • Establish emergency preparedness and response plan for spills including cleanup equipment at each construction site and training in emergency spill response procedures. • Stabilize earthwork areas within 30 days after earthworks have ceased at the sites.	Contractor CSCs	PIUs, EPBs, WRB, LIEC
Ambient Air	Dust generated by construction activities, gaseous air pollution (SO_2, CO, NOx) from	• Equip material stockpiles and concrete mixing equipment with dust shrouds. • Spray water on construction sites and earth/material handling routes.	Contractor CSCs	PIUs, LIEC

Item	Potential Issues	Mitigation Measures	Imple- ment	Super- vise
	construction machinery and asphalt pavement after pipeline laying	• For odor impacts during sediment dredging, immediately transport spoil to disposal site after de-watering in sealed containers. • Cover materials during truck transport. • Purchase pre-mixed asphalt for road surface paving after water diversion pipeline laying; if asphalt is heated and mixed onsite, asphalt mixers must be located ≥200 m from villages and other sensitive receptors. • Store petroleum or other harmful materials in appropriate places. • Ensure emissions from vehicle and machinery comply with the PRC standards of GB18352-2005, GB17691-2005, GB11340-2005, GB2847-2005, and GB18285-2005. • Equipment and machinery is maintained to a high standard to ensure efficient running and fuel burning. High-horsepower equipment will be installed with tail gas purifiers to ensure emissions be in compliance with the PRC standadrd of GB16297-1996. • Provide high-horsepower equipment with tail gas purifiers.		
Noise	Noise generated from construction activities	• Ensure construction machinery conform to the PRC standard of GB12523-90. • Properly maintain vehicles and machineries to minimize noise. • Apply noise reduction devices or methods where piling equipment is operating, such as construction of bridges and other hydraulic structures, within 300 m of sensitive sites. • Locate sites for rock crushing and concrete-mixing ≥500 m from sensitive areas. • Prohibit operation of machinery generating high levels of noise, such as piling, and movement of heavy vehicles along urban and village roads between 20:00 and 06:00. • Place temporary hoardings or noise barriers around noise sources during construction. • Monitor noise at sensitive areas and consult residents at regular intervals (see monitoring plan in this EMP). If noise standards are exceeded, equipment and construction conditions shall be checked; and mitigation measures shall be implemented to rectify the situation. • Conduct interviews with residents adjacent to construction sites to identify and resolve issues, including adjustment of work hours of noise-generating machinery.	Contractor CSCs	PIUs, LIEC
Surface Water Pollution and Dredging	Impact of embankment and dredging construction	• Extract channel material with small excavators or manual labor to minimize disturbance. • Access sites through existing roads or at points where minimum clearing is required. • If not possible, enter the river bed upstream from silt protection barriers. • Place all disposal sites in low permeable material (permeability <10-6 cm/sec). Cover site with a clay and topsoil cap. Reseed using local species of grasses. • Conduct dredging in <800 m sections to minimize the extent of disturbance at any one time. • Only conduct works in dry season between September and January, time of lowest water depth and flow. Complete 1 month before rainy season. • Install silt fences or other appropriate method downstream from excavated areas.	Contractor, CSCs, EMS	PIUs, LIEC, EPBs, WRB, reservoir authorities

Item	Potential Issues	Mitigation Measures	Imple- ment	Super- vise
		• Avoid any known fish breeding sites, especially in Guangqiao and Lianping rivers. • Remove all dredged material at suitable sites within 75 m of the disturbed areas, to avoid unnecessary transport minimizing the release of contaminated dust and sediment. • Prior to disposal, drain off excess water. Dry the dredge material in sludge drying areas.		
	Impact of wastewater pollution	• Construction wastewater collected in retention ponds and filter tanks to remove silts, oil. • Machine wash-down sites are equipped with water collection basins and sediment traps. • Locate storage and/or cleaning areas for fuel, machinery, and vehicles ≥500 m from waterways. • Storage facilities for fuels, oil, and other hazardous materials will be within secured areas on impermeable surfaces and provided with bunds and clean-up installations. • Contractors' fuel suppliers must be properly licensed. They shall follow proper protocol for transferring fuel and the PRC standard of JT3145-88 (Transportation, Loading and Unloading of Dangerous or Harmful Goods). • All earthworks along waterways will be accompanied by measures to minimize sediment run-off, including sediment traps. • Labor camps will be located ≥300 m from waterways. • Portable toilets and on-site wastewater pre-treatment systems will be installed at construction camps along with proper maintenance protocols. • Water quality (for pollutants such as SS, COD_{cr}, NH_3-N, and petroleum) in the project waterways will be monitored by local EMS during construction (see monitoring table in this EMP).	Contractor	IA, PMO
Solid Waste	Solid waste generated by construction activities and from workers' camps	• Provide appropriate waste collection and storage containers at locations away from surface water or sensitive receivers. • Arrange with municipal waste collection services for regular collection of waste. • Properly remove and dispose residual materials, wastes, and contaminated soils. Paving or vegetating shall be done as soon as the materials are removed to stabilize the soil. • Burning of waste is strictly prohibited. • Provide sufficient garbage bins at strategic locations and ensure that they are protected from birds and vermin, and emptied regularly by the municipal waste collection systems.	Contractor CSCs	PIUs, LIEC
Biological Resources	Protection of flora and fauna around construction sites	• Prior to construction, demarcate existing vegetation and fauna habitats, e.g., vegetated roadsides, trees, riverbanks. • As far as possible, avoid clearance of any vegetation. • After construction, immediately replant vegetation in any sites subject to clearance. • In compliance with the PRC's Forestry Law, the compensatory planting must be the same as, or larger than, the area cleared. • Use only native plant species of local provenance for all re-vegetation. • Any fauna found during construction, especially turtles, will be immediately reported to the EPBs and PMO environment officer, photographed, and released on the same day in the nearest suitable habitat.	Contractor, CSCs	PIUs, LIEC

Item	Potential Issues	Mitigation Measures	Imple- ment	Super- vise
Socio economic resources	Impact on physical cultural resources	• Establish chance-find procedures for physical cultural resources. • If a new site is unearthed, work shall be stopped immediately and local BCR and the PIU promptly notified.	Contractor, CSCs	PIUs LIEC, cultural bureau
	Temporary interruption to water supply from pipeline or embankment construction	• Use coffer dams and temporary diversion channels to maintain continued water flow while works are conducted. • Prior to works, re-confirm the planned construction schedule and site EMP actions. • Inform residents at least 2 days before any planned water interruptions. • Assist residents if requested with community water storage during the interruption period. • Interruptions to water supply should not be longer than 1 day. • In case of accidental interruption (e.g., unintended damage of an existing pipeline), immediately inform affected communities and assist with water supply until the issue is resolved.	Contractor, CSCs,	PIU, EPB
	Community health and safety	• Prepare and implement a traffic control plan for approval by the county traffic management administration. To schedule or divert construction traffic to avoid peak hours, regulate traffic at road crossings; select routes to reduce disturbance; reinstate roads; and open them to traffic when construction is completed. • Underground facilities survey and protection. Pipeline construction activities will be planned to minimize disturbances to utility services. Three-dimensional detection of underground facilities will be conducted before construction where appropriate. • Residents and businesses will be informed in advance through media and information boards of the construction activities, dates, and duration of expected disruption. • Signs will be placed at construction sites informing people of the project GRM, potential dangers (e.g., moving vehicles, hazardous materials, excavation) and safety issues. • Heavy machinery will not be used at night. • All sites will be secured from unauthorized public access.	Contractor, CSCs	PIUs LIEC, labor bureau
	Occupational health and safety	• Prepare environmental, health, and safety plan which complies with the PRC's State Administration of Worker Safety Laws and Regulations, including • Clean and sufficient supply of fresh water for construction sites, camps, offices. • Sufficient latrines and other sanitary arrangements at construction sites and work camps. • Garbage receptacles and regular emptying. • Provide protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed boots) for construction workers and enforce their use. • Place signs around the construction areas to provide safety advice and warnings. • Ensure sites and machinery are off-limits to the general public. • For residential areas next to construction (especially loud noise), ensure residents are aware of the duration and nature of works, potential hazards, and offer to provide ear plugs/dust masks/other basic safety equipment. • Emergency response plan for accidents prepared and approved by PIUs and EPB. Establish emergency phone	Contractors	CSCs, PIUs, EPB, LIEC

Item	Potential Issues	Mitigation Measures	Imple- ment	Super- vise
		links with township hospitals and maintain a first-aid base in each construction camp. • Establish a records management system for occupational accidents, diseases, incidents. The records will be reviewed during compliance monitoring and audits. • Safety communication. Ensure that occupational health and safety matters are given a high degree of publicity to all persons on-site. Display posters prominently. • Training, awareness and competence. Train all workers in basic sanitation, health, and safety matters; and work hazards. Implement awareness and prevention program for HIV/AIDS and other diseases; and target the local community and construction workers.		
C. DURING OPERATION				
Water	Performance testing of WWTP processes, water source protection	• Prior to commissioning, test the ability to achieve the required treatment standard. • Install wastewater quality monitoring devices for real-time monitoring at WWTPs. • Establish real-time monitoring framework. • Close all direct wastewater discharge outlets and re-direct to WWTPs. • No riverside loading or unloading facilities which include the handling of garbage, manure or fecal waste or toxic or hazardous substances. • Monitor Yangdong Reservoir levels and flows at the Chukou WTP intake and inform other users when limited access to water resources may occur. • Place monitoring wells around SWM facilities and annually monitoring groundwater quality.	WWTP O&M Units, SWM O&M Units	PMO
Air	Odor from WWTPs and SWMs	• Equip odor generating facilities with ventilation or odor containment. • Implement regular sludge removal and avoid stockpiling. • Institute regular check, repair and maintenance of all treatment facilities and equipment.	WWTP and SWM O&M Units	PMO
Noise	Noise produced plant operation and SWM mechanical equipment	• Implement noise and vibration reduction measures. Adopt low noise level equipment. • Create green buffer zone/noise absorption zone along WWTP and WTP boundaries using native trees and shrub planting.	WWTP and WTP O&M Units	PMO
Solid waste	Separate and manage solid waste	• Develop and implement a solid waste handling process covering packaging, transportation, and disposal at a SWM facility.	As above	PMO
Flora and fauna	Manage the built habitats—landscaped embankments and constructed wetlands	• Maintain the landscaping – watering, weeding, stabilizing, survival and growth of planted trees, shrubs and herbs, with replacement and corrective action, as necessary. • Provide security and surveillance to guard against misuse, theft and littering. • Regularly remove litter and transport to landfill.	WRB	PMO
Emergen-cy prepared-ness and response	WWTP maintenance, and health and safety of surrounding residents	• Prepare emergency preparedness and response plan before each WWTP, WTP, and SWM facility is operational. The plan will include staff training, resources, responsibilities, communication, procedures, and other aspects required to respond effectively to emergencies.	WWTP O&M Units	PMO

Item	Potential Issues	Mitigation Measures	Imple- ment	Super- vise
Health and safety	Health and safety of WWTP, WTP, and SWM facilities' operation staff	• Compulsory use of safety equipment and clothing as necessary (e.g., non-slip boots, chemical resistant clothing, safety goggles, respiratory mask). • Safety instructions for storage, transport, handling or pouring of chemicals	WWTP O&M Units	PMO
	Handling of agricultural chemicals—bamboo plantations	• Worker training and strict safety procedures for storage, transport, and handling of pesticides. • Provide safety clothing and equipment for chemical preparation, pesticide application, equipment cleaning, or spill cleanups.	Community plantation units	PMO

ADB = Asian Development Bank, EIA = environmental impact assessment, EMS = environmental monitoring station, EPB = environmental protection bureau, IA = implementing agency, DI = design institute, LIEC = loan implementation environment consultant, O&M = operation and maintenance, PMO = project management office, SEMSP = site environmental management and supervision plan, SWM = solid waste management, SRT = sludge retention time, WTP = water treatment plant, WWTP = wastewater treatment plant.
Source: Asian Development Bank.

D. Monitoring and Reporting

15. Three types of project monitoring will be conducted under the EMP: (i) internal monitoring—to be conducted by the CSCs and PIUs; (ii) external monitoring—of air, noise, soil, and water standards—to be conducted by the local EMS; and (iii) compliance monitoring—to be conducted by the LIEC to ensure that the EMP is being implemented. The project monitoring program is in Table EMP-4. Monitoring shall comply with the PRC standards for environmental monitoring and quality.

16. **Internal monitoring.** During construction, the CSCs and PIUs will be responsible for conducting internal environmental monitoring in accordance with the monitoring plan.

17. **External monitoring.** The PIUs will contract the Zixing EMS to conduct environmental monitoring in accordance with the monitoring program. A detailed cost breakdown will be provided by the local EMS when the environmental monitoring program is updated at the start of each component implementation. Monitoring will be conducted during construction and operation until a project completion report (PCR) is issued. Semiannual monitoring reports will be prepared by the EMS and submitted to the PMO and PIUs.

18. **Compliance monitoring for environmental management plan and progress reporting.** The LIEC will review project progress and compliance with the EMP based on field visits, and the review of the environmental monitoring conducted by the EMS. The findings of the LIECs will be reported to ADB through the annual EMP monitoring and progress reports. The reports will include (i) progress made in the EMP implementation; (ii) overall effectiveness of the EMP implementation (including public and occupational health and safety); (iii) environmental monitoring and compliance; (iv) institutional strengthening and training; (v) public consultation (including GRM); and (vi) any problems encountered during construction and operation, and the relevant corrective actions undertaken. The LIECs will help the PMO prepare the reports, and submit the English report to ADB for appraisal and disclosure.

19. **Project completion environmental audits.** Within 3 months after each subproject completion, or no later than 1 year with permission of the local EPBs, environmental acceptance monitoring and audit reports of each subproject completion shall be (i) prepared by a licensed environmental monitoring institute in accordance with the PRC's Guideline on Project

Completion Environmental Audit (2001), (ii) reviewed for approval of the official commencement of individual subproject operation by environmental authorities, and (iii) finally reported to ADB through the annual EMP monitoring and progress reporting process.

20. **Quality assurance and/or quality control for compliance monitoring.** To ensure accuracy of the monitoring, quality assurance (QA) and/or quality control (QC) procedures will be conducted in accordance with the following regulations:

(i) Regulations of QA/QC Management for Environmental Monitoring issued by the State Environmental Protection Administration in July 2006;
(ii) QA/QC Manual for Environmental Water Monitoring (Second edition), published by the State Environmental Monitoring Centre in 2001; and
(iii) QA/QC Manual for Environmental Air Monitoring published by the State Environmental Monitoring Centre in 2001.

Table EMP-4: Environmental Monitoring Program

Subject	Parameter	Location	Frequency	Implement	Supervise
1. Pre-construction					
Heavy metal contents	As, Cd	Spoil disposal sites and borrow pits for river rehabilitation component	Once before construction	PIU	ZIFC
2. Construction					
Internal monitoring (contractors, CSCs, ZIFC environmental officer, PIU)					
Ambient air quality	Dust mitigation measures in EMP; equipment maintenance	Visual inspection at all construction sites	1 time/week	Contractor, CSC	PIU, LIEC, ZIFC, EPB
Solid waste	Garbage and construction waste	Visual inspection at all construction sites and work-camps	Daily	Contractor, CSC	PIU, EPB, ZIFC, sanitation bureau
Wastewater	Provision and operation of domestic and construction wastewater	Visual inspection at all construction sites and work-camps	Daily	Contractor, CSC	PIU, ZIFC, EPB
Soil erosion and re-vegetation	Soil erosion intensity	Visual inspection at spoil sites and all construction sites, especially roadsides, water pipelines, banks of rivers, wetland	1 time/week; and immediately after heavy rainfall	Contractor, CSC	PIU, LIEC, ZIFC, WRB
	Re-vegetation of embankments, spoil disposal sites, construction sites	Visual inspection at all sites	At least 4 times/year	Contractor, CSC	PIU, WRB
Occupational health and safety	Camp hygiene, safety, availability of clean water, emergency response plans	Inspection at all construction sites and work-camps	1 time/month	Contractor, CSC	PIU, ZIFC,
External monitoring (Local environment monitoring station)					
Quality of sewage and discharge channels at work camps	pH, SS, NH_3-N, COD_{Cr}, BOD_5 oil, fecal coliforms	Domestic wastewater discharge at work-camps	4 times/year during construction	EMS	EPB, PIU, ZIFC
Construction wastewater	SS, oil, pH	at wastewater discharge points of all construction sites	4 times/year during construction	EMS	EPB, PIU, ZIFC

Subject	Parameter	Location	Frequency	Implement	Supervise
Surface water quality	pH, SS, NH_3-N, COD_{Cr}, oil, As, Cd	200 m upstream and 500 m downstream of the construction site of fiver selected rivers;	2 times/year during construction	EMS	EPB, PIU, ZIFC
Ambient air quality	TSP, PM_{10}, NO_x	All construction sites (at least 1 point upwind, 1 point downwind) and nearby sensitive receivers (described in Section IV of EIA)	4 times/year during construction	EMS	EPB, PIU , ZIC, LIEC
Noise	LAeq	Boundaries of all construction sites and sensitive receivers (described in Section IV of EIA)	2 times/year (twice a day: once in day time and once at night time, for 2 consecutive days)	EMS	EPB, PIU, ZIFC, LIEC
Solid Waste (garbage, construction waste)	Work camps and construction waste at construction sites	Visual inspection at all construction sites and work-camps	Once a year	LIEC	EPB, PIU, ZIFC
Soil erosion and re-vegetation	Soil erosion intensity	Visual inspection at spoil sites and construction sites, especially water pipeline route and embankments of rivers, wetlands	Twice a year, and 1 after completion of construction	LIEC	EPB, PIU, ZIFC
	Re-vegetation of embankments, spoil disposal sites and construction sites	Visual inspection at sites, and temporary occupied lands	Compliance Monitoring: Twice a year, and 1 after completion of construction	LIEC	EPB, PIU, ZIFC
Occupational health and safety	Work camp hygiene, safety, availability of clean water, emergency response plans	Inspection at all construction sites and work-camps	Twice a year, and once after completion of construction	LIEC	Sanitation, labor bureaus, PIU, ZIFC
3. Operation Phase					
Wastewater discharge	pH, SS, NH_3-N, oil, COD_{cr}, BOD_5, TN, TP, fecal coliforms	(i) Inflow and outflow of 6 WWTPs and Xingning Wetland; (ii) leachate of SWTSs; (iii) outlet of wastewater discharge of Yangdong WWTP;	4 times during the first year of operation	EMS	EPB, PIU, ZIFC
Surface water quality	COD, dissolved oxygen, TN, TP	(i) At Dongjiang Lake near Xingning, Hangxihe and Huangcao wetlands; (ii) wastewater receiving water bodies of Yangdong WTP (Yongle River) and WWTPs (Changhuo River, Qingyao River, Lianping River	4 times during the first year of operation	EMS	EPB, PIU, ZIFC
	As, Cd	Five selected rivers	Once after construction	EMS	EPB, PIU, ZIFC
Noise	LAeq	(i) boundary of pump stations (Xingning distribution pump station, Xindong distribution pump station and Yangdong WTP; (ii) nearby sensitive receivers along access road to Xingning wetland and pumps;	4 times during the first year of operation	EMS	EPB, PIU, ZIFC

Subject	Parameter	Location	Frequency	Implement	Supervise
		(iii) boundary of SWTS			
Odor	H_2S, NH_3	Boundary of WWTP and SWTS	4 times during the first year of operation	EMS	EPB, PIU, ZIFC
Soil and Vegetation	Plant survival and coverage	All re-vegetated sites	Spot check, twice a year	PIU	PIU, ZIFC, WRB

BOD_5 = 5-day biochemical oxygen demand; COD_{cr} = chemical oxygen demand; CSC = construction supervision company; EMS = environmental monitoring station; EPB = environmental protection bureau; FB = county forestry bureau, IA = implementation agency; LAeq = equivalent continuous A-weighted sound pressure level; LSMI = licensed soil erosion institute; NH_3-N = ammonia nitrogen; NO_x = nitrogen oxides; OPF = operators of project facilities; PM_{10} = particles measuring ≤10μm; PMO = Project Management Office; SO_2 = sulfur dioxide; SS = suspended solids; TSP = total suspended particle.

21. Environmental reporting for the project will follow the program in Table EMP-5.

Table EMP-5: EMP Reporting Plan

Reports		From	To	Reporting Frequency
During Construction				
Internal progress reports by contractors	Internal project progress report by construction contractors, including monitoring results by CSCs	Contractors, CSCs	PIUs, ZIFC	Monthly (during construction season)
Environmental impact monitoring reports	Environmental impact monitoring report	EMS	PIUs, ZIFC	Quarterly (during construction season)
Reports to ADB	Project progress report (including section on EMP implementation and monitoring)	ZIFC with support of LIEC	ADB	Semi-annually
	Environment progress and monitoring reports	ZIFC with support of LIEC	ADB	Semi-annually
Acceptance reports	Environmental acceptance monitoring and audit report	Licensed institute	Chenzhou EPB	Once for each engineering subcomponent, not later than one year after completion of physical works
During Operation				
Environmental impact monitoring	Environmental impact monitoring report (during first year of operation)	EMS	PIUs, ZIFC	Quarterly
Reports to ADB	Project progress report (including section on EMP implementation and monitoring)	ZIFC with support of LIEC	ADB	Semi-annually
	Environment progress and monitoring report	EMS	PIUs, ZIFC	Quarterly
		ZIFC with support of LIEC	ADB	Once (after first year of operation)

ADB=Asian Development Bank; EMS = Environment Monitoring Station, LIEC = Loan Implementation Environmental Consultant, PIU=Project Implementing Unit, ZIFC=Zixing City Urban and Rural Environmental Protection Financing Center.

E. Training

22. The project agencies have no previous experience with ADB-funded projects or safeguard requirements. To ensure effective implementation of the EMP, a capacity building program will be implemented on (i) the EMP, including the mitigation measures, monitoring, and

reporting; and (ii) sustainable integrated watershed management. Training will be provided by the Hunan EPD, Chenzhou and Zixing EPBs, and LIEC. Trainees will include the PMO, IAs, PIUs, contractors, CSCs, and water resource bureaus. The PMO will arrange and support the training programs supported by the LIECs. The training program is in Table EMP-6.

Table EMP-6: Training Program

Training	Attendees	Contents	Times	Period (days)	No. of persons
EMP adjustment and implementation	ZIFC, PIUs, contractors, CSCs, local EPB	Development and adjustment of the EMP, roles and responsibilities, monitoring, supervision and reporting procedures, review of experience (after 12 months)	Twice - Once prior to, and once after one year of project implementation	2x0.5	40
Grievance Redress Mechanism	ZIFC, PIUs, contractors, CSCs, local EPB	Roles and responsibilities, Procedures, review of experience (after 12 months)	Twice - Once prior to, and once after one year of project implementation	2x0.5	40
Wetland management	As above	Management and rehabilitation of (i) the riverbanks, (ii) the constructed wetlands	Twice – Once prior to construction and once during operation	2x1	40
Environmental aspects of facilities operation	ZIFC, O&M unit	Environmental housekeeping; Sludge treatment and disposal process; Safety operation regulations Emergency preparedness and breakdown response procedures	Once during project operation	1	50

O&M = operations and maintenance.

F. Public Consultation

23. Two rounds of public consultation were conducted during project preparation (Section VIII of the EIA). During construction, the project will continue to seek public consultation and raise awareness of project activities, especially those which may impact the public, such as noise or dust. The project public consultation plan is in Table EMP-7, and includes public participation in evaluating environmental benefits and impacts. The PIUs are responsible for public participation during project implementation. They will be supported by the PMO environment and social officers and the loan implementation consultants.

Table EMP-7: Public Consultation and Participation Plan

Organizer	Approach	Times/Frequency	Subjects	Participants
Construction				
PMO, PIUs, LIEC	Questionnaire survey, site visits, informal interviews	Once a year during peak construction	Construction impacts; adjusting mitigation measures if necessary; feedback	Workers, residents in construction areas
	Public workshops	At least once during peak construction	EMP implementation progress; construction impacts; adjusting mitigation measures if necessary; feedback	Residents, affected persons, social sectors
Operation				
PMO, PIU, operators of project facilities	Public consultation and site visits	At least once in first year of operation	Effects of mitigation measures, impacts of operation, feedback	Residents, affected persons adjacent to project facilities
	Public workshop	As needed based on public consultation	Effects of mitigation measures, impacts of	Residents, affected persons, social

Organizer	Approach	Times/Frequency	Subjects	Participants
			operation, feedback	sectors
	Public satisfaction survey	At least once after one year of operation	Comments and suggestions	Project beneficiaries

EIA = environmental impact assessment, OPF = operator of project facilities, PIU = project implementing unit, LIEC = loan implementation environmental consultant.

G. Grievance Redress Mechanism

24. The GRM has been established to receive and manage any public environmental and/or social issues which may arise due to the project. The PMO environment and social officers will coordinate the GRM. However, all project agencies and staff will be trained in the GRM and will take an active role in supporting these staff as and when necessary.

25. At the PMO level, the PMO environment and social officers will establish a GRM tracking and documentation system, conduct daily coordination with the PIU officers, arrange meetings and conduct site visits as necessary, maintain the overall project GRM database, and prepare the reporting inputs for progress reports to ADB. At the PIU level, the environment and social officers will instruct contractors and CSCs on the GRM procedures, and coordinate with the county EPBs and other government divisions, as necessary. The PMO and PIU staff will be trained and supported by the LIEC and the loan implementation social consultant (LISC).

26. The contact persons for different GRM entry points, such as the PMO and PIU environment and social officers, contractors, operators of project facilities (OPFs), and county EPBs, will be identified prior to construction. The contact details for the entry points (phone numbers, addresses, e-mail addresses) will be publicly disclosed on information boards at construction sites and on the websites of the PMO and county EPBs.

27. Once a complaint is received and filed, the PMO and PIU officers will identify if complaints are eligible. Eligible complaints include those where (i) the complaint pertains to the project; and (ii) the issues arising in the complaint fall within the scope of environmental issues that the GRM is authorized to address. Ineligible complaints include those where (i) the complaint is clearly not project-related; (ii) the nature of the issue is outside the mandate of the environmental GRM (such as issues related to resettlement, allegations of fraud, or corruption); and (iii) other procedures are more appropriate to address the issue. Ineligible complaints will be recorded and passed to the relevant authorities, and the complainant will be informed of the decision and reasons for rejection. The procedure and timeframe for the GRM is as follows and also summarized in Figure EMP-1.

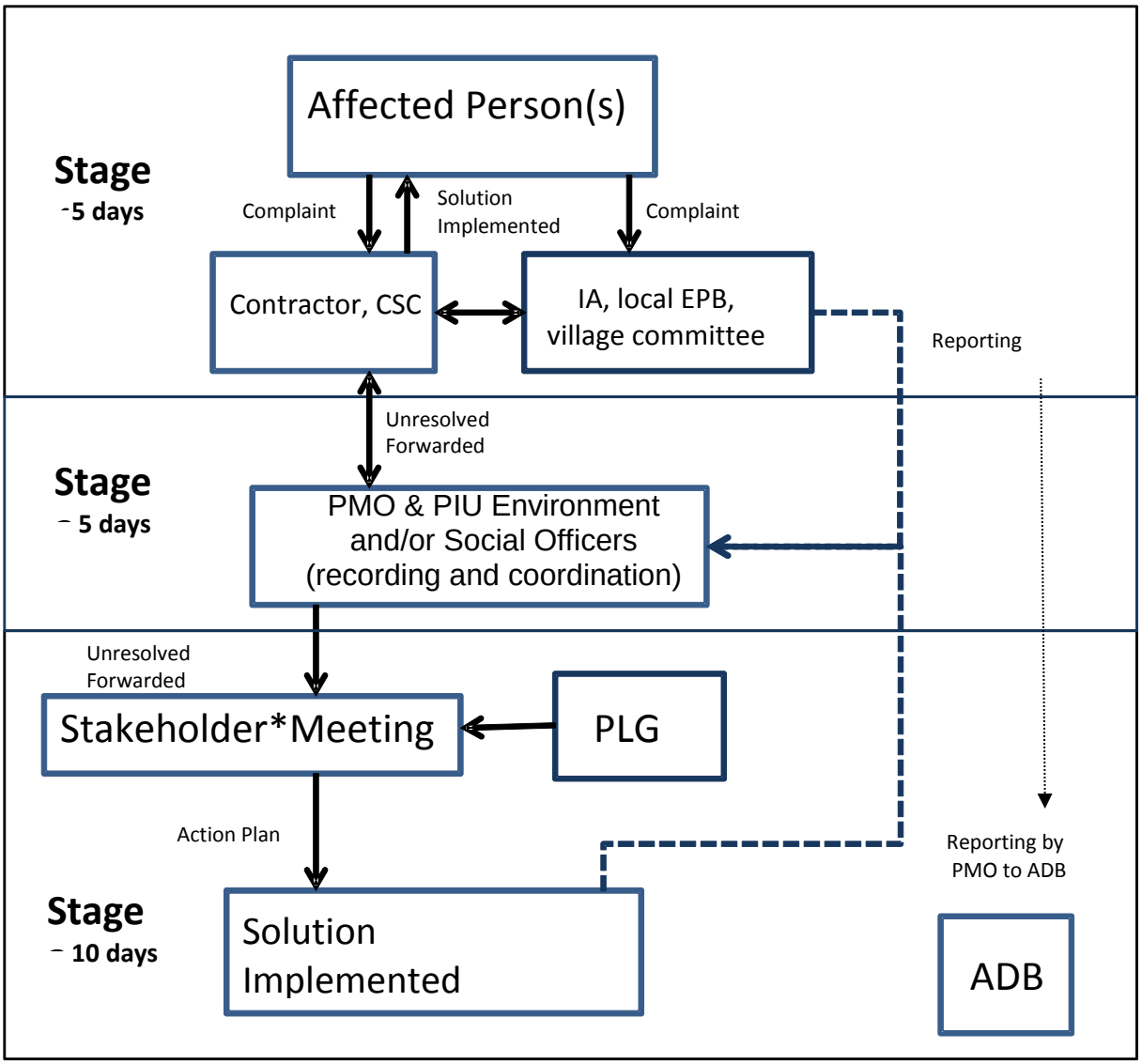

Figure EMP-1: Grievance Redress Mechanism

(i) **Stage 1 (5 days).** If a concern arises during construction, the affected person may submit a written or oral complaint to the contractor. Whenever possible, the contractor will resolve the issue directly with the affected person. The contractor shall give a clear reply within 5 working days. The contractor will keep the PIU fully informed at all stages.

(ii) **Stage 2 (5 days).** If the issue cannot be resolved in Stage 1 after 5 days, the PIU and/or PMO will take over responsibility. Eligibility of the complaint will be assessed and a recommended solution given to the complainant and contractors within 5 working days. If the solution is agreed by the complainant, the contractors and/or facility operators will implement the solution within 7 days. Written records will be made of all stages and outcomes.

(iii) **Stage 3 (10 days).** If no solution can be identified by the PMO and/or PIU; and/or the complainant is not satisfied with the proposed solution, the PMO and/or PIU

will organize within 10 days a stakeholder meeting (including the complainant, contractor and/or operator of the facility, county EPB, PIU, PMO). A solution acceptable to all shall be identified, including clear steps. The contractors (during construction) and facility operators (during operation) will immediately implement the agreed solution. Written records will be made of all stages and outcomes.

28. The GRM does not affect the right of an affected person to submit their complaints to any agency they wish to, for example, the local village committee, community leaders, courts, the PMO, PIU, and/or ADB.

29. The PMO and PIUs shall bear any and all costs of implementing the GRM, including meeting, travel, and/or accommodation costs of the project staff or affected person. The GRM will be implemented throughout project construction and at least the first year of operation for each project facility.

H. Cost Estimates

30. This section provides an estimate of the cost of EMP implementation. The cost comprises three categories: mitigation measures (Table EMP-3); monitoring (Table EMP-4); and training (Table EMP-6). Costs are presented for the construction phase of 5 years; and the first year of operation, i.e., a total of 6 years. The costs do not include (i) detailed design revisions and adjustments; (ii) internal monitoring and/or inspection of solid wastes disposal, soil erosion and re-vegetation, and occupational health and safety during construction, as this will be included in the construction supervision contracts; and (iii) salaries of the PMO and PIU staff. Costs for mitigation measures and training are based on estimates in the domestic EIAs and/or the experience of the project preparatory technical assistance (PPTA) team from other projects. All costs were discussed with the the EIA institute, the PMO, and IAs.

31. The total estimated cost for EMP implementation is CNY15.943 million (US$2,571,452) for 5-year construction (Table EMP-8). The estimated cost for the PMO is CNY 754,000 (4.7%) and for contractors is about CNY14,594,000 (91.5%). About CNY595,000 (3.7%) will be paid from the ADB loan consulting services and remaining costs by the IAs. Total costs are small given the large scale of the project and when spread over 5 years.

Table EMP-8. Estimated Cost for Environmental Management Plan Implementation for 5-Year Construction and First Year Operation *(xCNY10,000).*

Item	**Unit Cost** (CNY)	**No. of Unit**	**5-Year Cost** (CNY)
MITIGATION (Table EMP-3)			
PRE-CONSTRUCTION			
1.1 Public consultations	5,000	2	10,000
1.2 LIEC	45,000	6 person-months	270,000
1.3 Wetland Specialist	45,000	6 person-months	270,000
1.4 GRM	5,000	1	5,000
Subtotal			**555,000**
CONSTRUCTION			
2.1 Domestic wastewater	5,000	8	40,000
2.2 Construction wastewater	5,000	32	160,000
2.3 Dust management	5,000	32	160,000
2.4 Vehicle emissions	2,000	32	64,000
2.5 Odor	2,000	32	64,000
2.6 Noise and vibration	3,000	32	96,000
2.7 Domestic waste	2,000	32	64,000
2.8 Construction waste	12,500	20	250,000
2.9 Soil erosion	400,000	32	12,800,000

Item	**Unit Cost** (CNY)	**No. of Unit**	**5-Year Cost** (CNY)
2.10 Site hygiene	1,000	32	32,000
2.11 Community safety	1,000	32	32,000
2.12 Site safety	1,000	32	32,000
2.13 Public consultation	5,000	1	5,000
Subtotal			**13,799,000**
3. MONITORING (Table EMP-4)			
CONSTRUCTION			
3.2 Internal monitoring	250,000	32	**800,000**
Ambient air quality	5,000	32	
Solid waste	5,000	32	
Wastewater	5,000	32	
Soil erosion and re-vegetation	5,000	32	
Occupational health and safety	5,000	32	
3.3 External monitoring			
3.3.1 PRE-CONSTRUCTION			
Spoil site heavy metals testing	5,000	13	65,000
3.3.2 During construction			
Water Quality	10,000	8	80000
Noise	5,000	32	160000
Ambient air quality	10,000	32	320000
3.3.3 During operation			
Water Quality	3,000	23	69000
Noise	1,000	15	15000
Ambient air quality	3,000	15	45000
Subtotal			**754,000**
4. TRAINING (Table EMP-6)			
EMP Implementation	10,000	2	20,000
GRM	5,000	2	10,000
Environmental operation of facilities	5,000	1	5,000
Subtotal			**35,000**
GRAND TOTAL *(CNY)*			**15,943,000**
Total (US$, US$1=CNY6.2)			**2,571,452**

EMS = environmental monitoring station; GRM = grievance redress mechanism; LIEC = loan implementation environment consultant; PM = person-month; WWTP = wastewater treatment plant.
Note: Construction-phase costs will be paid by the contractors (as part of their contracts). Operational-phase costs will be paid by each project implementing agency.

I. Mechanisms for Feedback and Adjustment

32. Based on environmental inspection and monitoring reports, the PMO and PIUs shall decide, in consultation with the LIEC, whether (i) further mitigation measures are required as corrective actions, or (ii) some improvements are required for environmental management practices. The effectiveness of mitigation measures and monitoring plans will be evaluated by a feedback reporting system. Adjustment to the EMP will be made, if necessary. The PMO environment officers will play a critical role in the feedback and adjustment mechanism.

33. If during inspection, substantial deviation from the EMP is observed or any changes are made to the project that may cause substantial adverse environmental impacts or increase the number of affected people, then the PMO and PIUs will immediately consult with ADB and form an environmental assessment team to conduct additional environmental assessment. If necessary, further public consultation will be undertaken. The revised domestic EIAs and project EIA, including this EMP, will be submitted to ADB for review, appraisal, and public disclosure. The revised EMP will be passed to the contractors, CSCs, and OPFs for implementation.

APPENDIX 1: DRAFT TERMS OF REFERENCE FOR ENVIRONMENTAL POSITIONS

I. PROJECT MANAGEMENT OFFICE ENVIRONMENT OFFICER

A. Background

1. Development projects supported by the Asian Development Bank (ADB) routinely include a project management office (PMO). The PMO is responsible for project implementation and comprises the provincial and/or municipal agencies involved in the project. Compliance with the loan and project agreements includes implementation of an environmental management plan (EMP), which is prepared as part of the project environmental impact assessment (EIA). The EMP is the critical guiding document to manage, monitor, and report upon potential project environmental impacts. Implementation of the EMP is a full-time task. For this reason, the PMO assigns at least one full-time officer for this role. These terms of reference describe the requirements for this officer.

B. SCOPE AND DURATION OF WORK

2. The officer will work on behalf of the PMO to implement the project EMP. The officer will report directly to the PMO. The position is for the entire project duration.

C. QUALIFICATIONS

3. The officer will have (i) an undergraduate degree or higher in environmental management or related field; (ii) at least 5 years of experience in environmental management, monitoring, and/or impact assessment; (iii) ability to communicate and work effectively with local communities, contractors, and government agencies; (iv) ability to analyze data and prepare technical reports; (v) willingness and health to regularly visit the project construction sites and in different seasons; and (vi) ideally, proficiency in spoken and written English.

D. DETAILED TASKS

4. The PMO environment officer will have a detailed understanding of the project EMP and supporting documents, including the domestic environmental reports, the project EIA, and project environmental assurances. The officer will have the following tasks:

(i) Assess whether the EMP requires updating due to any changes in project design which may have occurred after the EMP was prepared;
(ii) Distribute the Chinese language version of the EMP to all relevant agencies, including the implementing agencies, provincial, and municipal agencies for environmental protection. This should occur at least 3 months before construction begins;
(iii) Conduct meetings with agencies, as necessary, to ensure they understand their specific responsibilities described in the EMP;
(iv) Ensure that relevant mitigation, monitoring, and reporting measures in the EMP are included in the bidding documents, contracts, and relevant construction plans;
(v) Confirm that the implementing agencies (IAs) responsible for the internal environmental monitoring described in the EMP understand their tasks and will implement timely monitoring;
(vi) At least 2 months before construction begins, establish and implement the project grievance redress mechanism (GRM) described in the EMP. This will

include (a) prepare a simple table and budget identifying the type, number, and cost of materials needed to inform local communities about the GRM and starting dates and scope of construction; (b) design, prepare, and distribute these materials, and plan and conduct the community meetings; (c) prepare a form to record any public complaints; (d) prepare a summary table to record all complaints, including dates, issues, and how they were resolved; and (e) ensure that all relevant agencies, including contractors, understand their role in the GRM;

(vii) Prior to construction, ensure that IAs and their contractors have informed their personnel, including all construction workers, of the EMP requirements. This will include all mitigation measures relating to impacts to air, water, noise, soil, sensitive sites, ecological values, cultural values, worker and community health and safety, respectful behavior when communicating with local communities, and responding to and reporting any complaints;

(viii) During project construction, make regular site visits with the loan implementation environment consultant (LIEC) to assess progress, meet with contractors and/or local communities, and assess compliance with the EMP;

(ix) Ensure that all relevant agencies submit required progress reports and information, including environmental monitoring and reports of any issues or grievances;

(x) Compile, review, and store environmental progress reports from the IAs, records of any grievances, and any other relevant issues; maintain digital copies of all information; when necessary, enter data into summary tables in digital format (e.g., to transfer records of grievances from hard copy forms); and ensure that all information is stored in the PMO filing system, backed up, and can be easily retrieved;

(xi) Prepare semiannual environment progress reports; and

(xii) Work closely with the PMO, IAs, loan implementation consultants, and other agencies and personnel, as necessary, to conduct these tasks.

E. REPORTING REQUIREMENTS

5. Semiannual environment monitoring reports using the template provided by ADB or a domestic format reviewed and approved by ADB.

F. LOGISTICAL SUPPORT PROVIDED BY PMO TO THE ENVIRONMENT OFFICER

(i) Provision of hard and soft copies of the project EMP, domestic and project environmental reports, feasibility study reports, loan and project agreements, maps, and other supporting materials, as necessary, to ensure the officer can implement the tasks;

(ii) Vehicle transport, office materials, and other logistical support, as necessary, for the officer to visit the project construction sites and local communities; arrange and conduct meetings; and prepare and distribute consultation materials; and

(iii) Overall coordination, including review of the draft semiannual monitoring reports; and final responsibility for submission of the monitoring reports to ADB.

II. PROJECT IMPLEMENTATION UNIT ENVIRONMENT OFFICER

A. BACKGROUND

6. The project will be coordinated by a project management office (PMO). Overall coordination of the project environmental management plan (EMP) is the responsibility of the PMO environment officer. At the field level, implementation of the EMP will be undertaken by the project implementation unit (PIU). For this purpose, the PIU requires a PIU environment officer.

B. SCOPE AND DURATION OF WORK

7. The officer will work on behalf of the PIU to implement the project EMP. The officer will report directly to the PIU manager and work closely with the county environmental protection bureau (EPB), the environmental monitoring station (EMS), and the PMO environment officer. The position is for the entire project duration (5 years).

C. QUALIFICATIONS

8. The officer will have (i) an undergraduate degree or higher in environmental management or related field; (ii) at least 5 years of experience in environmental management, monitoring, and/or impact assessment; (iii) ability to communicate and work effectively with local communities, contractors, and government agencies; (iv) ability to analyze data and prepare technical reports; (v) willingness and health to regularly visit the project construction sites and in different seasons; and (vi) ideally, proficiency in spoken and written English.

D. DETAILED TASKS

9. The PIU environment officer will have a detailed understanding of the project EMP and supporting documents, including the domestic environmental reports, project environmental impact assessment (EIA), and project environmental assurances. The officer will have the following tasks:

(i) Work closely with the PMO environment officer, EPB, EMS, contractors, construction supervision companies (CSCs), and all other relevant agencies to implement the EMP;
(ii) Distribute the Chinese language version of the EMP to all relevant agencies, including the implementing agencies, provincial, and municipal agencies, for environmental protection. This should occur at least 3 months before construction begins;
(iii) Conduct meetings with agencies, as necessary, to ensure they understand their specific responsibilities described in the EMP;
(iv) Ensure that contractors implement the relevant mitigation measures in the EMP;
(v) Implement the monitoring and reporting requirements in the EMP, including timely submission of progress reports to the PIU and PMO environment officers;
(vi) Implement the project grievance redress mechanism (GRM);
(vii) Make regular inspections of construction sites to assess progress, meet with contractors and/or local communities, and assess compliance with the EMP;
(viii) Maintain digital records of all progress and information; and
(ix) Support the PMO environment officer in all of their tasks.

E. REPORTING REQUIREMENTS

10. Monthly reports to the PIU and PMO environment officers.

III. LOAN IMPLEMENTATION ENVIRONMENT CONSULTANT

A. BACKGROUND

11. The project will be coordinated by a project management office (PMO), whose overall responsibility includes implementation of the project environmental management plan (EMP). At the field level, the project will be implemented by a project implementation unit (PIU). The PMO and PIUs will be assisted by a loan implementation consultant team. The loan implementation environment consultant (LIEC) will be a part of this team and will support the PMO and PIUs to implement the project EMP.

B. SCOPE AND DURATION OF WORK

12. This is an independent position (recruited as part of a consultant team or individually) which is not part of the PMO in-house environmental team. The specialist will report to the PMO. The position is for the entire project duration. The LIEC should be recruited as soon as possible after loan effectiveness, as the first task is to confirm project environmental readiness.

C. QUALIFICATIONS

13. The specialist will have (i) an undergraduate degree or higher in environmental management or related field; (ii) at least 8 years of experience in environmental management, monitoring, and/or impact assessment; (iii) familiarity with ADB project management requirements and national environmental management procedures; (iv) ability to communicate and work effectively with local communities, contractors, and government agencies; (v) ability to analyze data and prepare technical reports; (vi) willingness and health to regularly visit the subproject sites; and (vii) proficiency in spoken and written English.

D. TASKS

14. Working closely with the PMO and PIU environmental officers, the LIEC will do the following:

1. Before Construction

(i) Ensure project environmental readiness, including (i) all contractor contracts include, and will comply with, the EMP; and (iii) relevant sections of the EMP are incorporated in construction plans and contracts;
(ii) Assist the PMO and PIUs to implement the GRM, including (i) establishing and publicizing the GRM; and (ii) collating and evaluating grievances received;
(iii) Develop procedures to (i) monitor EMP implementation progress, (ii) collate and evaluate data collected in the EMP environmental monitoring program, and (iii) prepare and submit the semiannual environmental monitoring reports to ADB (to continue until project completion report);
(iv) Train project agencies in on-site ecological management and rehabilitation for the river dredging component, and operation of the constructed wetlands; and
(v) Provide hands-on support and on-the-job training to the PMO, IAs, and contractors on the specific requirements of the EMP, as required.

2. During Project Implementation

(i) Undertake site visits to all IAs during subproject construction and operation;
(ii) Assist in the ongoing public consultation process as described in the project EIA;

(iii) Conduct EMP compliance assessments, identify any environment-related implementation issues, and propose necessary responses in corrective action plans;
(iv) Undertake training of project agencies as required by the EMP training plan; and
(v) Assist the PMO in preparing semiannual environmental monitoring progress reports for submission to ADB.

IV. WETLAND AND ECOLOGICAL CONSULTANT

A. BACKGROUND

15. The project will be coordinated by a project management office (PMO), whose overall responsibility includes implementation of the project environmental management plan (EMP). At the field level, the project will be implemented by a project implementation unit (PIU). The PMO and PIUs will be assisted by a loan implementation consultant team. The wetland and ecological consultant will be a part of this team and will support the PMO and PIUs to implement the project EMP. The specialist will focus on providing ecological management support during the planned dredging and embankment of five rivers in the Dongjiang Lake project area.

B. SCOPE AND DURATION OF WORK

16. This is an independent position (recruited as part of a consultant team or individually) which is not part of the PMO in-house environmental team. The specialist will report to the PMO. The position is for 6 person-months. The timing of the position will be planned to coincide with the project dredging and embankment, between years 1 and 3 of the five-year project (see below).

C. QUALIFICATIONS

17. The specialist will have (i) an undergraduate degree or higher in wetland ecology or related field; (ii) at least 10 years of experience in the applied management of natural wetlands, rivers and lakes, and ecological survey, research and management of aquatic fauna, especially fish biodiversity conservation; (iii) preferably, management experience with embankment and dredging; (iv) ability to communicate and work effectively with local communities, contractors, and government agencies; (v) ability to analyze data and prepare technical reports; (vi) willingness and health to regularly visit the project sites; and (vii) ideally, proficiency in spoken and written English.

D. TASKS

18. Working closely with the PMO and PIU environment officers, the specialist will do the following tasks:

1. Before Construction

(i) Design the habitat features for the planned embankments along the five project rivers, tailoring the features specifically to the native fauna and flora of the Dongjiang Lake area;
(ii) Conduct regular field visits to the five project rivers—especially the target sections for dredging and embankment—to gain a detailed familiarity with these sites and the key aquatic ecological values which need to be protected;
(iii) Through site surveys, desktop review, and interviews with experts and residents, as far as possible identify any specific sites of ecological significance in the planned dredge sections, especially any fish and/or turtle breeding sites;

(iv) Assist with integration of these habitat features into the final detailed engineering designs of the embankments;
(v) Review and if necessary, strengthen the planned mitigation measures in the project EMP for dredging; and
(vi) Develop simple on-site procedures to be implemented together with the construction team during the dredging and embankment, e.g., checking of the channel by the specialist immediately before dredging commences.

2. During Project Implementation

(i) On-site support throughout the dredging and embankment to check the channel, remove and release any fauna found trapped or injured by the construction, and ensure implementation of the EMP ecological protection measures;
(ii) Conduct post-construction site inspection to assess the effectiveness of, and compliance with, the EMP and habitat designs; and
(iii) Prepare a progress report after each major trip to the project site, and a final report. The PMO will include these reports in the government's semiannual environment progress reports to the Asian Development Bank.