

# Project Administration Manual

Project Number: 47047

Loan Number: LXXXX-PRC

June 2016

People's Republic of China: Shandong Groundwater  
Protection Project



## Contents

### ABBREVIATIONS

I.	PROJECT DESCRIPTION	1
	A. Rationale	1
	B. Impact and Outcome	2
	C. Outputs	3
II.	IMPLEMENTATION PLANS	5
	A. Project Readiness Activities	5
	B. Overall Project Implementation Plan	6
III.	PROJECT MANAGEMENT ARRANGEMENTS	7
	A. Project Implementation Organizations—Roles and Responsibilities	7
	B. Key Persons Involved in Implementation	9
	C. Project Organization Structure	11
IV.	COSTS AND FINANCING	11
	A. Cost Estimates Preparation and Revisions	11
	B. Key Assumptions	11
	C. Detailed Cost Estimates by Expenditure Category	13
	D. Allocation and Withdrawal of Loan Proceeds	14
	E. Detailed Cost Estimates by Financier	15
	F. Detailed Cost Estimates by Outputs	16
	G. Detailed Cost Estimates by Year	17
	H. Contract Awards and Disbursement S-curve	18
	I. Fund Flow Diagram	19
V.	FINANCIAL MANAGEMENT	20
	A. Financial Management Assessment	20
	B. Disbursement	20
	C. Accounting	21
	D. Auditing and Public Disclosure	21
VI.	PROCUREMENT AND CONSULTING SERVICES	22
	A. Advance Contracting and Retroactive Financing	22
	B. Procurement of Goods, Works and Consulting Services	23
	C. Procurement Plan	24
	D. Consultant's Terms of Reference	36
VII.	SAFEGUARDS	47
	A. Environment	47
	B. Ethnic Minorities	49
	C. Land Acquisition and Resettlement	49
VIII.	GENDER AND SOCIAL DIMENSIONS	54
	A. Social and Gender Action Plan	54
IX.	PERFORMANCE MONITORING, EVALUATION, REPORTING AND COMMUNICATION	61
	A. Project Design and Monitoring Framework	61
	B. Monitoring	64
	C. Evaluation	62
	D. Reporting	63
	E. Stakeholder Communication Strategy	63
X.	ANTICORRUPTION POLICY	63
XI.	ACCOUNTABILITY MECHANISM	63
XII.	RECORD OF PAM CHANGES	64

## **APPENDIX**

1. Draft Terms of Reference for Environmental Positions

### **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 of the People's Republic of China (government) and the Asian Development Bank (ADB) policies and procedures. The PAM includes references to all available templates and instructions either through linkages to relevant URLs or directly incorporated in the PAM.

The Shandong Provincial Government, represented by Shandong Water Resources Department (SWRD), the executing agency; and the county governments of Changle, Gaomi, Hantai, Qingzhou, and Shouguang, the implementing agencies are wholly responsible for the implementation of the project, as agreed jointly between the borrower and ADB; and in accordance with the government and ADB policies and procedures. ADB staff is responsible to support implementation including compliance by the SWRD of their obligations and responsibilities for project implementation in accordance with ADB policies and procedures.

At loan negotiations, the borrower and ADB agreed to the PAM and ensured consistency with the loan and project agreements. In the event of any discrepancy or contradiction between the PAM and the loan and project agreements, the provisions of the loan and project agreements shall prevail.

After 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
CSC	=	construction supervision companies
DMF	=	design and monitoring framework
EIA	=	environmental impact assessment
EMP	=	environmental management plan
EMS	=	environmental monitoring systems
FMA	=	financial management assessment
ICB	=	international competitive bidding
GRM	=	grievance redress mechanism
LAR	=	land acquisition and resettlement
LIEC	=	loan implementation environment consultant
MIS	=	management information systems
NCB	=	national competitive bidding
NCP	=	Northern China Plain
PCR	=	project completion report
PIO	=	project implementation office
PMO	=	project management office
PPMS	=	project performance monitoring systems
PPTA	=	project preparatory technical assistance
PRC	=	People's Republic of China
SFD	=	Shandong Finance Department
SGAP	=	social and gender action plan
SGE	=	some gender elements
SOE	=	statement of expenditure
SPG	=	Shandong Provincial Government
SPS	=	Safeguard Policy Statement
SSS	=	single-source selection
SWRD	=	Shandong Water Resources Department
TOR	=	terms of reference





## I. PROJECT DESCRIPTION

### A. Rationale

1. Falling groundwater tables as a result of over extraction of groundwater is a major concern in the People's Republic of China (PRC), particularly in the northern parts of the country. The PRC heavily depends on extraction of groundwater, with an estimated 20% of its annual water supply coming from groundwater, reportedly ranging from 110 billion cubic meters (m<sup>3</sup>) to 150 billion m<sup>3</sup> per year. The largest groundwater user is the agricultural sector (60%), with domestic and industrial usage sharing the remaining 40%. There are more than 100 large cones of groundwater depression with an estimated total area of 150,000 square kilometers in the PRC. In the North China Plain (NCP), the total area of the cone of groundwater depression already extends to 70,000 square kilometers.

2. Weifang and Zibo prefectures in Shandong Province also depend heavily on groundwater, especially for its intensive and high-value agricultural production. Domestic and industrial water use, although still less than agricultural water use, is also on the rise as a result of the rapid economic development in the area. The project area, covering Changle and Huantai counties, and Gaomi, Qingzhou, and Shouguang cities, is the main vegetable producer for Beijing and has a high concentration of greenhouses. The greenhouses that use drip irrigation require fresh and sediment-free water, which, in most cases, is provided from shallow groundwater sources. As a result of extensive groundwater abstraction, the project area has become the largest overexploited aquifer in Shandong Province, and the second largest in the PRC.<sup>1</sup> In some downstream areas, agricultural production stopped due to lack of suitable water sources. Some of the industrial or domestic water users that are still using groundwater are encouraged by the government to switch to surface water.<sup>2</sup>

3. Current groundwater recharge of both shallow and deep groundwater resources is insufficient to recover from the excessive pumping during the dry periods. Seasonal rainfall fluctuates widely, with an average of 70% of the rainfall occurring from June to September, followed by drought during the rest of the year. Flooding occurs during the summer months, but storm waters flow to the sea unutilized. The pattern of irregular rainfall is expected to worsen as a result of climate change, and rainfall is predicted to decrease. Excessive groundwater usage also occurs because of lack of pricing of the resource, a weak licensing and permitting system, and insufficient abstraction metering and groundwater level monitoring.

4. The consequences of the current unsustainable groundwater utilization are serious: (i) pumping costs have increased; (ii) groundwater quality is deteriorating due to seawater intrusion and environmental pollution; (iii) domestic water supplies and agricultural (particularly vegetable) production are at risk; and (iv) the project area is suffering from significant financial and economic damages caused by land subsidence. Seawater intrusion and upconing has extended 35 kilometers inland from the coast, and some areas have already experienced subsidence of more than 2 meters.<sup>3</sup> The process of land subsidence is irreversible, and urgent action is needed to avoid worsening.

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<sup>1</sup> The overexploited area of the Weifang–Zibo aquifer covers approximately 5,422 square kilometers.

<sup>2</sup> Usage of shallow (unconfined) groundwater causes overexploitation of groundwater sources that are used by many farmers. The use of deep (confined) groundwater causes land subsidence.

<sup>3</sup> Process by which saline water underlying freshwater in an aquifer rises upward into the freshwater zone as a result of pumping water from the freshwater zone.

5. Acknowledging the serious concerns, the PRC Government selected Shandong Province as a demonstration province for modernized water administration. The Shandong Provincial Government (SPG) has already taken multiple initiatives to address water scarcity in the NCP, including promoting water productivity and reuse, and introducing regulations on groundwater pumping. Several water-saving technologies, such as drip irrigation, are already widely used in the project area.<sup>4</sup> The results have been successful, but more efforts are needed to fully address the risk of further decline of groundwater levels in the NCP.<sup>5</sup> The national government has constructed the South–North Water Transfer Project, which started providing additional water for Shandong Province in 2014. The diverted water, which is mainly intended for domestic and industrial use, will not be sufficient to mitigate the current overexploitations of the groundwater resources in the NCP.

6. Lessons learned from past and ongoing support for the water sector, including the preparation of policy recommendations for the PRC's Thirteenth Five-Year Plan, 2016–2020, show that there is still lack of good examples of implementing integrated water management approaches and increasing water productivity in the PRC. Most counties in the project area lack (i) integration of good international practices to provide new alternatives for groundwater conservation, (ii) adequate implementation of water-saving strategies and regulatory stipulations, and (iii) introduction of up-to-date water environmental monitoring technologies. Existing government programs also lack the support to link efficient and reduced groundwater usage with the retention of surface and storm water to increase groundwater recharge and water availability for water-scarce areas.

7. The project will be the first Asian Development Bank (ADB) supported major investment in the PRC that specifically focus on groundwater resources protection, recognizing the strategic importance of these resources. Moreover, the project will support the development and introduction of economic policy instruments, critical to controlling groundwater usage. The project will contribute to the PRC's Thirteenth Five-Year Plan, 2016–2020, which pursues regionally balanced and environmentally sustainable growth; and the PRC's first National Plan to Protect the Safety of Groundwater Resources, 2011–2020.<sup>6</sup> The project will support the PRC in achieving the Sustainable Development Goals, in particular Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture and Goal 6: Ensure availability and sustainable management of water and sanitation for all. The project is in line with the country partnership strategy, 2016–2020 for the PRC of ADB in supporting the government's overarching strategic goal by focusing on environmentally sustainable growth.<sup>7</sup> The project will contribute to ADB's Water Operational Plan, 2011–2020 to (i) increase water productivity across the range of users; (ii) embed integrated water resources management, including improved risk management, to mitigate floods, droughts, and other water-related

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<sup>4</sup> In Shouguang City, which is among the worst affected in the project area, two-thirds of the farmers reportedly apply drip irrigation already.

<sup>5</sup> The amount of groundwater usage in Shandong Province declined from 13.4 billion m<sup>3</sup> in 2001 to 8.9 billion m<sup>3</sup> in 2012.

<sup>6</sup> On 10 October 2011, the PRC Government approved the National Plan to Protect the Safety of Groundwater Resources, 2011–2020. The adoption of the plan is an important step to mobilize additional financial resources to protect groundwater resources in the PRC. On 16 April 2015, the government also announced an associated action plan that includes a list of measures to tackle water pollution, with the aim of improving the quality of the water environment around the country by 2030. With regards to groundwater, the plan envisages that by 2020, groundwater overdraft will be reduced and the aggravated pollution of groundwater will be preliminarily controlled.

<sup>7</sup> ADB. 2016. *Transforming Partnership: People's Republic of China and Asian Development Bank, 2016–2020*. Manila.

disasters; and (iii) expand knowledge and capacity development that uses technology and innovation more directly.<sup>8</sup>

## B. Impact and Outcome

8. The impact will be a sustained groundwater supply for the agriculture sector in the Weifang–Zibo area. The outcome will be improved conservation and sustainable use of groundwater resources in Weifang and Zibo prefectures. The project will serve as a demonstration of different integrated approaches for environmental restoration and improved management of overexploited groundwater areas. The project will promote the integration of innovative demonstration activities like (i) groundwater recharge through water harvesting and storage in smart greenhouses; (ii) demonstration of comprehensive water management information systems; and (iii) capacity development in water resources management, including water resource policy and regulation, water pricing, and water markets.

## C. Outputs

9. The project will have three outputs: (i) groundwater recharged and conserved, (ii) surface water allocation improved and monitored, and (iii) capacity development for water resources management enhanced. Demonstration activities will be implemented in Changle and Huantai counties, and Gaomi, Qingzhou, and Shouguang cities in Weifang and Zibo, which are representative for critical water-scarce conditions in intensive agricultural production bases in the Weifang–Zibo area.

10. **Output 1: Groundwater recharged and conserved.** Output 1 will support the introduction of groundwater recharge technologies in the project area to increase shallow groundwater recharge and reduce usage of deep groundwater. Output 1 will have two components: (i) rehabilitation and construction of about 880 hectares of wetland areas, including canals, which will contribute to the recharge of shallow groundwater resources;<sup>9</sup> and (ii) technological innovation for monitoring shallow groundwater recharge in Huantai County. Under component 1, two wetland areas will be rehabilitated in Huantai County and Shouguang City to improve the reservoir and ecological functions of the wetlands, and increase shallow groundwater recharge through the canal network. These wetland areas currently suffer from water shortages and are not operational. Component 2 includes the development of a comprehensive management information system for water resources monitoring and management in Huantai County, including monitoring and dissemination of groundwater levels, quality, and abstraction. The management information system will be developed to complement an existing urban water supply management system. The existing system will be expanded to include monitoring of water resources, data analysis, optimizing the allocation of water resources, water regime forecasting, and decision-making support for flood control.

11. **Output 2: Surface water allocation improved and monitored.** Output 2 will improve water allocation and monitoring to increase water availability in water-scarce parts of the project area and indirectly reduce the pressure on groundwater resources. The output will have three components: (i) improvement of surface water allocation, (ii) retention of storm water, and (iii) establishment of hydrological facilities in Changle County. Through the improvement of surface

<sup>8</sup> ADB. 2011. *Water Operational Plan, 2011–2020*. Manila.

<sup>9</sup> The wetlands to be rehabilitated or constructed are all modified habitats, but may have important ecological values.

water resources allocations, the exploitation of groundwater can be reduced. Component 1 will support Gaomi and Qingzhou cities and Huantai County to rehabilitate surface water flow systems and construct connections between the wide network of small rivers, canals, and small-sized reservoirs that exist in the Weifang–Zibo area. The connections will enable the local governments to supply areas with additional surface water resources to reduce the pressure on groundwater resources. Similarly, component 2 will support Changle County and Gaomi City to increase their reservoir capacity for improved storage of surface water. It is envisaged that the total storage capacity of the Nanzhai and Juchenghe reservoirs will be increased from 3.7 million m<sup>3</sup> per year to 8.3 million m<sup>3</sup> per year. Output 3 will support Changle County to establish precipitation and flow monitoring capabilities in the Nanzhai Reservoir watershed.

**12. Output 3: Capacity development for water resources management enhanced.**

Output 3 will have two components: (i) institutional strengthening of ADB's project management procedures and policy development support, and (ii) project management. Component 1 will provide support for and training on groundwater policy and new approaches and techniques in water management, including wetland management, water-saving technologies for the agriculture sector such as smart greenhouses, the establishment of a groundwater trading system through pilot water user associations, and an integrated circuit card-controlled water usage system to be developed in Huantai County for monitoring and managing groundwater demand for agricultural and rural water users. Knowledge products will be prepared to document the experiences and achievements. Component 1 will also support capacity development and training of staff from the SPG and local governments in ADB project management procedures, technical design and implementation, and safeguard supervision and monitoring. Component 2 will provide overall project implementation support for staff from the SPG and cities and counties, including the implementation of land acquisition and resettlement.

## II. IMPLEMENTATION PLANS

### A. Project Readiness Activities

Indicative Activities	2015												2016												Responsible Agency(s)
	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12			
Advance contracting actions	■																								executing and implementing agencies
Retroactive financing actions													■												executing and implementing agencies
Submission and approval of FCUP													■												government
Establishment of project implementation arrangements	■																								executing and implementing agencies
ADB Board approval													■												ADB
Loan signing													■												government
Government legal opinion provided													■												ADB, government
Government budget inclusion	■																								executing agency
Loan effectiveness													■												ADB, executing agency, and government

ADB = Asian Development Bank, FCUP = foreign capital utilization plan.

## B. Overall Project Implementation Plan

Indicative Activities	City	Year 1				Year 2				Year 3				Year 4				Year 5				Year 6			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Output 1: Groundwater recharged and conserved</b>																									
<b>1.1 Wetland construction and rehabilitation</b>																									
1.1.1 Judian Lake wetland rehabilitation (Q2 2015–Q2 2018)	Shouguang																								
1.1.2 Mata Lake wetland rehabilitation (Q3 2018–Q3 2020)	Huantai																								
<b>1.2 Technological innovation for recharge and water saving</b>																									
1.2.1 Management information system (Q4 2017–Q3 2019)	Huantai																								
<b>Output 2: Surface water allocation improved and monitored</b>																									
<b>2.1 Surface water allocation improvement</b>																									
2.1.1 River diversion works from Renhe Reservoir to Heihu Mountain and Qiyi reservoirs (Q1 2017–Q1 2019)	Qingzhou																								
2.1.2 River works for connection of Qiyi Reservoir to Yaowanghu Reservoir (Q2 2015–Q2 2017)	Qingzhou																								
2.1.3 River rehabilitation works for Beiyang River (Q2 2015–Q4 2017)	Qingzhou																								
2.1.4 Irrigation channel works for diversion of Mihe River to Bagouzi Reservoir (Q1 2015–Q1 2018)	Qingzhou																								
2.1.5 Other works (Q2 2016–Q3 2017)	Qingzhou																								
2.1.6 River ecological control engineering works (Q2 2016–Q1 2018)	Shouguang																								
2.1.7 Water diversion works (Q3 2016–Q2 2019)	Huantai																								
2.1.8 River rehabilitation works (Q3 2015–Q4 2018)	Huantai																								
2.1.9 River infrastructure (Q3 2015–Q4 2018)	Huantai																								
2.1.10 South route: Water works to connect Wangwu Reservoir, Jucheng River Reservoir and Chengnan Reservoir (Q3 2016–Q1 2018)	Gaomi																								
2.1.11 Other works (Q4 2015–Q1 2017)	Gaomi																								
<b>2.2 Storm water retention</b>																									
2.2.1 Capacity expansion of Nanzhai Reservoir (Q2 2015–Q2 2017)	Changle																								
2.2.2 West Route: Water transmission pipe from Xiashan Reservoir to Chengbei Reservoir (Q4 2015–Q2 2017)	Gaomi																								
<b>2.3 Water flow and quality monitoring</b>																									
2.3.1 Hydrological Monitoring Station construction (Q3 2016–Q3 2018)	Changle																								
<b>Output 3: Capacity development for water resources management enhanced</b>																									
<b>3.1 Institutional strengthening</b>																									
3.1.1 Recruit and mobilize consultants (Q1 2016–Q3 2016) <sup>a</sup>																									
3.1.2 Establish project management system (Q2 2016–Q4 2016)																									
3.1.3 Establish PPMS system (Q3 2016–Q2 2017)																									
3.1.4 Recruit and mobilize consultants (Q2 2016–Q4 2020)																									
<b>3.2 Project management</b>																									
3.2.1 Project design support (Q1 2016–Q4 2017)																									
3.2.2 Project management (Q1 2016–Q2 2020)																									
3.2.3 Project supervision (Q2 2016–Q4 2020)																									

PPMS = project performance monitoring system.

<sup>a</sup> Proposed for retroactive financing.

### III. PROJECT MANAGEMENT ARRANGEMENTS

#### A. Project Implementation Organizations—Roles and Responsibilities

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##### Executing agency:

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Shandong Water Resources Department (SWRD), including comprehensive project management office (PMO), representing the Shandong Provincial Government (SPG)</li> </ul> | <ul style="list-style-type: none"> <li>➤ Responsible for overall implementation of the project</li> <li>➤ Supervise the implementing agencies</li> <li>➤ Facilitate disbursement through Shandong Finance Department (SFD)</li> <li>➤ Facilitate auditing of project accounts</li> <li>➤ Responsible for ensuring timely counterpart funds by the implementing agencies</li> <li>➤ Provide oversight and daily management of the project preparation and implementation</li> <li>➤ Ensure coordination across sectors</li> <li>➤ Responsible for overall guidance, coordination, supervision, and management for implementation of the project, including recruitment of project consultants and all project plans [including procurement plan, environmental management plan (EMP), etc.]</li> <li>➤ Review withdrawal applications prepared by the implementing agencies and facilitate submission to the Asian Development Bank (ADB) through SFD</li> <li>➤ Update procurement plan</li> <li>➤ Provide ADB with (i) quarterly progress reports, (ii) semiannual environment progress reports, (iii) annual audit reports, and (iv) project completion report</li> <li>➤ Coordinate training and capacity development activities</li> <li>➤ Maintain separate accounting records for the project</li> <li>➤ Carry out project performance and compliance monitoring</li> <li>➤ Disclose project-related information and documents in accordance with ADB guidelines</li> </ul> |
| <ul style="list-style-type: none"> <li>• Shandong Finance Department</li> </ul>  | <ul style="list-style-type: none"> <li>➤ Provide overall project guidance and coordination</li> <li>➤ Establish and manage the project imprest account</li> <li>➤ Submit withdrawal applications to ADB</li> <li>➤ Manage and supervise loan repayment</li> </ul>   |
| <ul style="list-style-type: none"> <li>• Weifang and Zibo municipal and/or prefecture finance bureaus</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Coordinate between implementing agencies and SFD for financial transactions and payment</li> <li>➤ Review withdrawal applications prepared by the implementing agencies and facilitate submission to ADB through the PMO</li> </ul>  |
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**Implementing agencies:**

- Huantai County (through the county PIO)
  - Responsible for implementing Mata wetland areas and channel rehabilitation subproject
  - Responsible for implementing Management Information System Development subproject
  - Responsible for site-level implementation of the project EMP, in close coordination with PMO environment officer
  - Responsible for providing counterpart funds
  - Prepare withdrawal applications for relevant project expenses
  - Participate in training and capacity development activities
  - Maintain separate accounting records for the project
  
- Qingzhou City (through the city PIO)
  - Responsible for implementation and management of Renhe Reservoir and River Water Diversion subproject
  - Responsible for site-level implementation of the project EMP, in close coordination with PMO environment officer
  - Responsible for providing counterpart funds
  - Prepare withdrawal applications for relevant project expenses
  - Participate in training and capacity development activities
  - Maintain separate accounting records for the project
  - Responsible for providing counterpart funds
  
- Shouguang City (through the city PIO)
  - Responsible for implementation and management of Judian Lake Wetland System Construction subproject
  - Responsible for site-level implementation of the project EMP, in close coordination with PMO environment officer
  - Responsible for providing counterpart funds
  - Prepare withdrawal applications for relevant project expenses
  - Participate in training and capacity development activities
  - Maintain separate accounting records for the project
  
- Changle County (through the county PIO)
  - Responsible for implementation and management of Nanzai Reservoir Expansion subproject
  - Responsible for site-level implementation of the project EMP, in close coordination with PMO environment officer
  - Responsible for providing counterpart funds
  - Prepare withdrawal applications for relevant project expenses
  - Participate in training and capacity development activities



- Maintain separate accounting records for the project
    - Responsible for implementation and management of Surface Water Diversion and Allocation subproject
    - Responsible for site-level implementation of the project EMP, in close coordination with PMO environment officer
    - Responsible for providing counterpart funds
    - Prepare withdrawal applications for relevant project expenses
    - Participate in training and capacity development activities
    - Maintain separate accounting records for the project
- 
- Asian Development Bank**
- Provide the executing and implementing agencies with guidance to ensure smooth project implementation and achieve the desired development impacts and their sustainability
  - Conduct regular loan review, midterm review, and project completion review missions
  - Review and approve procurement actions
  - Approve withdrawal applications and disburse loan proceeds
- 

## **B. Key Persons Involved in Implementation**

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### **Executing Agency**

Shandong Water Resources  
Department on behalf of the Shandong  
Provincial Government

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Deputy Director General  
Shandong Water Resources Department  
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### **Implementing Agencies**

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    - Shouguang City
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- Changle County

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- Gaomi City

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**Asian Development Bank**

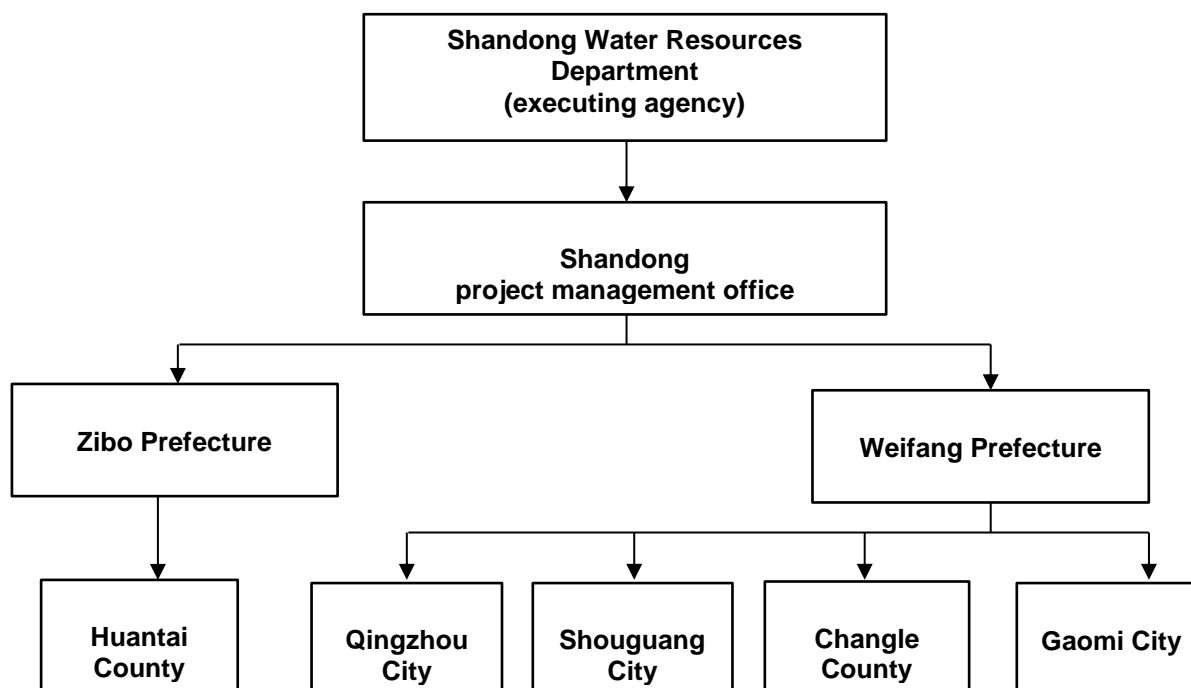
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### C. Project Organization Structure



## IV. COSTS AND FINANCING

13. The government has requested a loan of \$150 million from ADB's ordinary capital resources to finance the project. The loan will have a 25-year term, including a grace period of 5 years, will follow the straight-line method,<sup>10</sup> will have an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, a commitment charge of 0.15% per year on undisbursed funds (the interest and other charges during construction will be capitalized), and such other terms and conditions set forth in the draft loan and project agreements. The average maturity is 15.25 years, and the maturity premium payable to ADB is 0.10% per annum.

### A. Cost Estimates Preparation and Revisions

14. **Preparation.** The project management office (PMO) prepared the cost estimates in consultation with the implementing agencies and project preparatory technical assistance (PPTA) consultants, and under the guidance of ADB project officer. The file entitled "Shandong Project-Financial and Economic Model-V14" in MS Excel format was retained at the PMO and by ADB project officer.

15. **Revisions.** The PMO staff will revise the cost estimates when deemed necessary, under the guidance of ADB project officer during implementation based on the government's request for project cost reallocation and subsequent ADB's approval.

<sup>10</sup> This is based on the loan terms and the government's choice of repayment option and dates.



### C. Detailed Cost Estimates by Expenditure Category

Item	(CNY million)			(\$million)		
	Local Currency	Foreign Exchange	Total Cost <sup>a</sup>	Local Currency	Foreign Exchange	Total Cost <sup>a</sup>
<b>A. Base Costs<sup>b</sup></b>						
1 Civil Works	1,215.40	0.00	1,215.40	198.92	0.00	198.92
2 Machinery and Equipment	34.15	8.54	42.68	5.59	1.40	6.99
3 Land Acquisition, Compensation and Resettlement	294.06	0.00	294.06	48.13	0.00	48.13
4 Project Management	105.22	0.00	105.22	17.22	0.00	17.22
5 Survey and Design	97.13	0.00	97.13	15.90	0.00	15.90
6 Consulting Services	0.00	10.88	10.88	0.00	1.78	1.78
7 Training	0.00	2.44	2.44	0.00	0.40	0.40
Subtotal(A)	<b>1,745.96</b>	<b>21.86</b>	<b>1,767.82</b>	<b>285.75</b>	<b>3.58</b>	<b>289.33</b>
<b>B. Contingencies<sup>c</sup></b>						
1 Physical contingency	0.00	117.90	117.90	0.00	19.30	19.30
2 Price contingency	0.00	167.48	167.48	0.00	27.41	27.41
Subtotal(B)	<b>0.00</b>	<b>285.38</b>	<b>285.38</b>	<b>0.00</b>	<b>46.71</b>	<b>46.71</b>
<b>C. Interest and Commitment Charges<sup>d</sup></b>						
1 Interest during implementation	43.92	0.00	43.92	7.19	0.00	7.19
2 Commitment charge	4.88	0.00	4.88	0.80	0.00	0.80
Subtotal(C)	<b>48.80</b>	<b>0.00</b>	<b>48.80</b>	<b>7.99</b>	<b>0.00</b>	<b>7.99</b>
<b>Total Project Cost (A+B+C)</b>	<b>1,794.76</b>	<b>307.24</b>	<b>2,102.01</b>	<b>293.74</b>	<b>50.29</b>	<b>344.03</b>

ADB = Asian Development Bank.

Note: Numbers may not sum precisely because of rounding.

- a Includes taxes and duties of \$11.68 million to be financed from government resources and ADB loan resources. ADB loan will cover taxes and duties on items financed by ADB. Financing of taxes and duties is proposed because the due diligence showed that (i) the amount of taxes and duties is within the reasonable threshold identified in the country partnership strategy, (ii) the amount does not represent an excessive share of investment plan, (iii) taxes and duties apply only in respect to ADB-financed expenditures, and (iv) financing of the taxes and duties is relevant for the success of the project.
- b In 2015 prices.
- c Physical contingencies computed at 8% for all expenditure categories. Price contingencies computed based on cost escalation factors at 1.7% for 2016, 2.0% for 2017, and 2.1% for 2018–2022 on local currency costs; and 1.5% for 2016, 1.4% for 2017, and 1.5% for 2018–2022 on foreign exchange costs.
- d Includes interest and commitment charges. Interest during construction for OCR loan has been computed at the 5-year US dollar (USD) fixed swap rate plus an effective contractual spread of 0.5% and maturity premium of 0.1%. Commitment charges for an OCR loan are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

**D. Allocation and Withdrawal of Loan Proceeds**

CATEGORY			ADB FINANCING BASIS	
Number	Item	Total Amount Allocated for ADB Financing \$		Percentage and Basis for Withdrawal from the Loan Account
		Category	Subcategory	
1	Civil Works	137,279,561		
	Qingzhou		24,515,110	65% of total expenditure claimed
	Shouguang		45,889,121	71% of total expenditure claimed
	Changle		18,105,110	74% of total expenditure claimed
	Huantai		22,172,110	64% of total expenditure claimed
	Gaomi		25,998,110	62% of total expenditure claimed
	Greenhouse		600,000	100% of total expenditure claimed
2	Machinery and Equipment	2,653,089		100% of total expenditure claimed
3	Consulting Services	1,680,300		100% of total expenditure claimed
4	Training	400,000		100% of total expenditure claimed
5	Interest and Commitment Charges	7,987,050		100% of amounts due
	<b>Total</b>	<b>150,000,000</b>		

## E. Detailed Cost Estimates by Financier

Item	ADB		Qingzhou City Government		ShouGuang City		Changle County		Huantai County Government		Gaomi City Government		TOTAL	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount <sup>a</sup>	% of Total Cost
<b>A Base Costs<sup>b</sup></b>														—
1 Civil Works													198.92	
1.1 Qingzhou	24.5 <sup>e</sup>	64.6	13.3	35.4									37.6	10.9
1.2 ShouGuang	45.9 <sup>f</sup>	71.0			18.3	29.05							63.1	18.3
1.3 Changle	18.1 <sup>g</sup>	73.7					6.2	26.3					23.7	6.9
1.4 Huantia	22.2 <sup>h</sup>	63.6							12.3	36.4			33.7	9.8
1.5 MIS (Non-ADB financing)	0.0	0.0							0.3	100.0			0.3	0.1
1.6 Gaomi	26.0 <sup>i</sup>	61.5									15.4	38.5	39.9	11.6
1.7 Greenhouse	0.6	100.0											0.6	0.2
2 Machinery and Equipment														
ADB financing	2.7	100.0											6.8	2.0
Non-ADB financing							0.1	100.0					0.1	0.0
3 Land Acquisition, Compensation and Resettlement			1.6	3.3	7.7	15.92	28.5	59.1	6.9	14.3	3.5	7.3	48.1	14.0
4 Project Management			2.9	16.6	5.1	29.53	2.0	11.8	3.6	20.8	3.7	21.4	17.2	5.0
5 Survey and Design			4.0	25.3	5.1	31.77	1.8	11.2	2.3	14.3	2.8	17.5	15.9	4.6
6 Consulting Services														
ADB Financed	1.7	100.0											1.7	0.5
Government							0.1	1.0					0.1	0.0
7 Training	0.4	100.0											0.4	0.1
<b>Subtotal (A)</b>	<b>142.0</b>	<b>49.1</b>	<b>8.5</b>	<b>7.5</b>	<b>17.8</b>	<b>12.48</b>	<b>32.3</b>	<b>13.4</b>	<b>12.7</b>	<b>8.7</b>	<b>10.0</b>	<b>8.8</b>	<b>280.6</b>	<b>81.6</b>
<b>B Contingencies<sup>c</sup></b>														
Physical contingency			3.6	18.7	6.1	31.39	2.3	11.9	3.5	18.0	3.9	20.0	19.3	5.6
Price contingency			4.5	16.3	8.0	29.03	5.3	19.3	4.7	17.3	4.9	18.0	27.4	8.0
<b>Total Contingencies (B)</b>			<b>8.1</b>	<b>17.3</b>	<b>14.0</b>	<b>30.01</b>	<b>7.6</b>	<b>16.3</b>	<b>8.2</b>	<b>17.6</b>	<b>8.8</b>	<b>18.8</b>	<b>46.7</b>	<b>13.6</b>
<b>C Interest and Commitment Charges<sup>d</sup></b>														
Interest during implementation	7.2	100.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	7.2	2.1
Commitment charge	0.8	100.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.2
<b>Financial Charges (C)</b>	<b>8.0</b>	<b>100.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>8.0</b>	<b>2.3</b>
<b>TOTAL PROJECT COSTS (A+B+C)</b>	<b>150.0</b>	<b>43.6</b>	<b>29.9</b>	<b>8.7</b>	<b>50.1</b>	<b>14.57</b>	<b>46.3</b>	<b>644.6</b>	<b>33.5</b>	<b>9.7</b>	<b>34.1</b>	<b>9.9</b>	<b>344.0</b>	<b>100.0</b>

ADB = Asian Development Bank.

Note: Numbers may not sum precisely because of rounding.

- a Includes taxes and duties of \$11.68 million to be financed from government resources and ADB loan resources. ADB loan will cover taxes and duties on items financed by ADB. Financing of taxes and duties is proposed because the due diligence showed that (i) the amount of taxes and duties is within the reasonable threshold identified in the country partnership strategy, (ii) the amount does not represent an excessive share of investment plan, (iii) taxes and duties apply only in respect to ADB-financed expenditures, and (iv) financing of the taxes and duties is relevant for the success of the project.
- b In 2015 prices.
- c Physical contingencies computed at 8% for all expenditure categories. Price contingencies computed based on cost escalation factors at 1.7% for 2016, 2.0% for 2017, and 2.1% for 2018–2022 on local currency costs; and 1.5% for 2016, 1.4% for 2017, and 1.5% for 2018–2022 on foreign exchange costs.
- d Includes interest and commitment charges. Interest during construction for OCR loan has been computed at the 5-year US dollar (USD) fixed swap rate plus an effective contractual spread of 0.5% and maturity premium of 0.1%. Commitment charges for an OCR loan are 0.15% per year to be charged on the undisbursed loan amount.
- e The amount includes \$218,069 for associated equipment.
- f The amount includes \$1,127,741 for associated equipment.
- g The amount includes \$646,740 for associated equipment.
- h The amount includes \$728,082 for associated equipment.
- i The amount includes \$1,470,744 for associated equipment.

Source: Asian Development Bank estimates.

## F. Detailed Cost Estimates by Outputs

No.	Item	USD Million						
		Total Cost <sup>a</sup>	Groundwater recharged and conserved		Surface water allocation improved and monitored		Capacity development for water resources management enhanced	
			Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category
<b>A.</b>	<b>Base Cost<sup>b</sup></b>							
1	Civil Works	198.9	59.1	29.7	139.2	70.0	0.6	0.3
2	Machinery and Equipment	7.0	1.7	24.1	5.1	73.5	0.2	2.4
3	Land Acquisition, Compensation and Resettlement	48.1	6.8	14.1	41.3	85.9	0.0	0.0
4	Project Management	17.2	4.3	24.8	13.0	75.2	0.0	0.0
5	Survey and Design	15.9	3.9	24.4	12.0	75.6	0.0	0.0
6	Consulting Services	1.8	0.6	33.7	0.1	0.0	1.1	60.7
7	Training	0.4	0.0	0.0	0.0	0.0	0.4	100.0
	<b>Total Base Cost (A)</b>	<b>289.3</b>	<b>76.4</b>	<b>26.4</b>	<b>210.7</b>	<b>72.8</b>	<b>2.3</b>	<b>0.8</b>
<b>B.</b>	<b>Contingencies<sup>c</sup></b>							
<b>C.</b>	<b>Interest and Commitment Charges<sup>d</sup></b>							
	<b>Total Project Cost (A+B+C)</b>	<b>344.0</b>	<b>89.8</b>	<b>26.1</b>	<b>252.0</b>	<b>73.2</b>	<b>2.3</b>	<b>0.7</b>
	% of Total Project Cost	100.0	26.1		73.2		0.7	

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- a Includes taxes and duties of \$11.68 million to be financed from government resources and ADB loan resources. ADB loan will cover taxes and duties on items financed by ADB. Financing of taxes and duties is proposed because the due diligence showed that (i) the amount of taxes and duties is within the reasonable threshold identified in the country partnership strategy, (ii) the amount does not represent an excessive share of investment plan, (iii) taxes and duties apply only in respect to ADB-financed expenditures, and (iv) financing of the taxes and duties is relevant for the success of the project.
- b In 2015 prices.
- c Physical contingencies computed at 8% for all expenditure categories. Price contingencies computed based on cost escalation factors at 1.7% for 2016, 2.0% for 2017, and 2.1% for 2018–2022 on local currency costs; and 1.5% for 2016, 1.4% for 2017, and 1.5% for 2018–2022 on foreign exchange costs.
- d Includes interest and commitment charges. Interest during construction for OCR loan has been computed at the 5-year US dollar (USD) fixed swap rate plus an effective contractual spread of 0.5% and maturity premium of 0.1%. Commitment charges for an OCR loan are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.



## G. Detailed Cost Estimates by Year

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total <sup>a</sup>
<b>A Base Costs<sup>b</sup></b>							
1 Civil Works	9.9	19.9	29.8	59.7	49.7	29.8	198.9
2 Machinery and Equipment	0.3	0.7	1.0	2.1	1.7	1.0	7.0
3 Land Acquisition, Compensation and Resettlement	2.4	4.8	7.2	14.4	12.0	7.2	48.1
4 Project Management	0.9	1.7	2.6	5.2	4.3	2.6	17.2
5 Survey and Design	0.8	1.6	2.4	4.8	4.0	2.4	15.9
6 Consulting Services	0.1	0.2	0.3	0.5	0.4	0.3	1.8
7 Training	0.0	0.0	0.1	0.1	0.1	0.1	0.4
<b>Subtotal (A)</b>	<b>14.5</b>	<b>28.9</b>	<b>43.4</b>	<b>86.8</b>	<b>72.3</b>	<b>43.4</b>	<b>289.3</b>
<b>B Contingencies<sup>c</sup></b>							
Physical Contingency	1.0	1.9	2.9	5.8	4.8	2.9	19.3
Price Contingency	0.2	1.1	2.8	8.0	8.8	6.5	27.4
<b>Total Contingencies (B)</b>	<b>1.1</b>	<b>3.0</b>	<b>5.7</b>	<b>13.8</b>	<b>13.6</b>	<b>9.4</b>	<b>46.7</b>
<b>C Interest and Commitment Charges<sup>d</sup></b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Interest During Implementation	0.1	0.3	0.7	1.3	2.1	2.7	7.2
Commitment Charge	0.2	0.2	0.2	0.1	0.1	0.0	0.8
<b>Total Financial Charges (C)</b>	<b>0.3</b>	<b>0.5</b>	<b>0.8</b>	<b>1.4</b>	<b>2.2</b>	<b>2.7</b>	<b>8.0</b>
<b>TOTAL PROJECT COSTS (A+B+C)</b>	<b>15.9</b>	<b>32.4</b>	<b>49.9</b>	<b>102.1</b>	<b>88.1</b>	<b>55.6</b>	<b>344.0</b>
% of Total Project Cost	4.6	9.4	14.5	29.7	25.6	16.2	

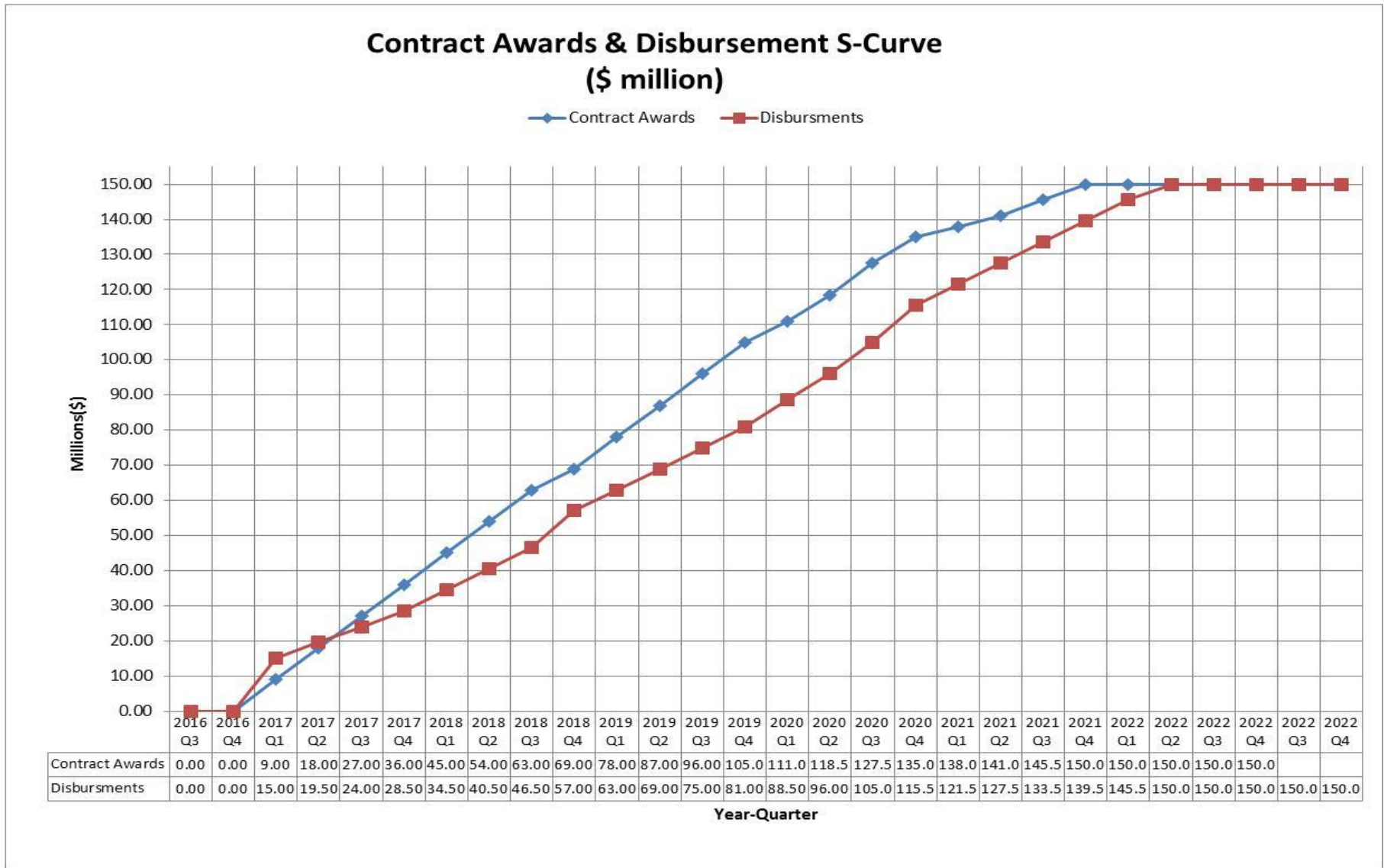
ADB = Asian Development Bank.

Note: Numbers may not sum precisely because of rounding.

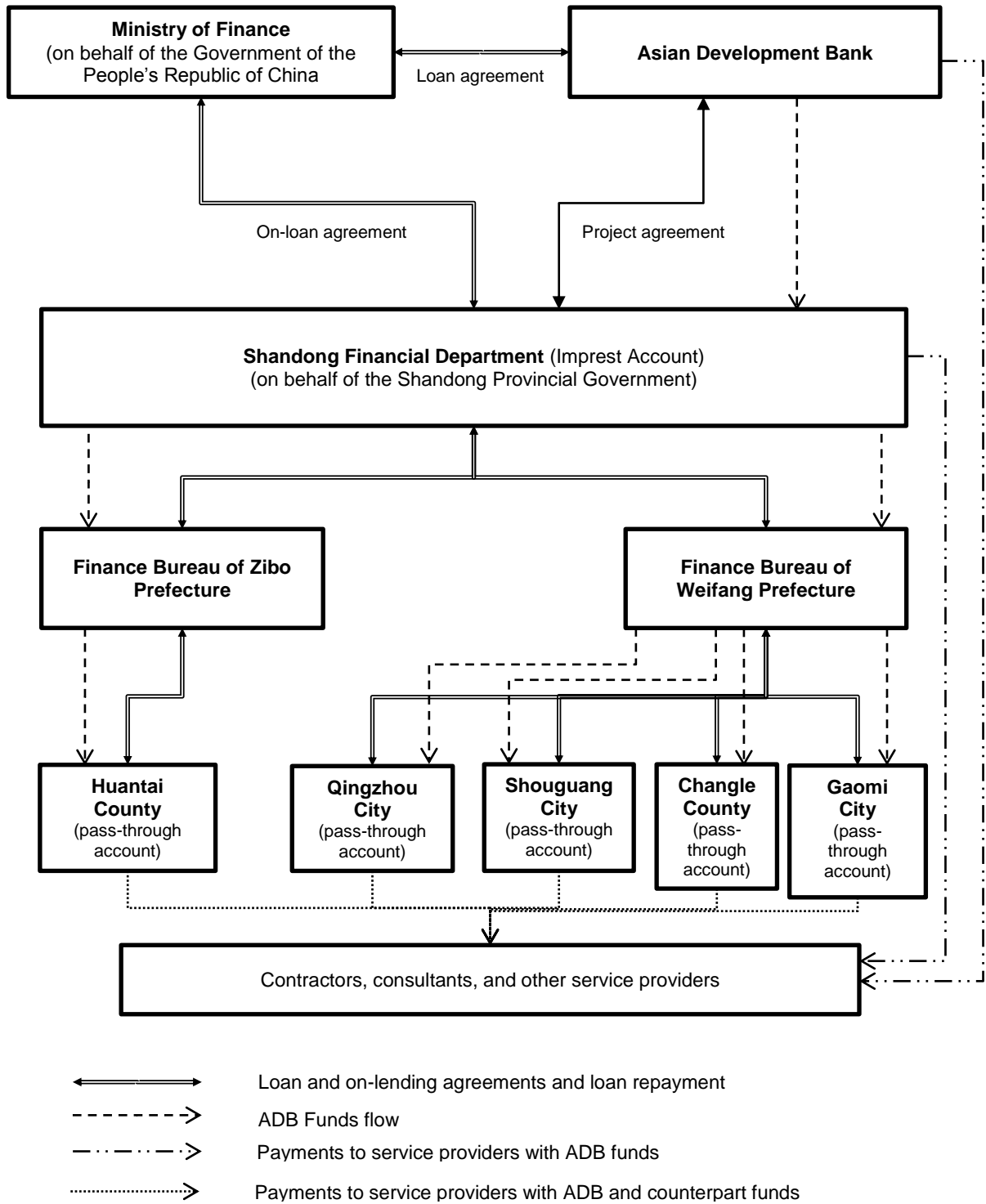
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- b In 2015 prices.
- c Physical contingencies computed at 8% for all expenditure categories. Price contingencies computed based on cost escalation factors at 1.7% for 2016, 2.0% for 2017, and 2.1% for 2018–2022 on local currency costs; and 1.5% for 2016, 1.4% for 2017, and 1.5% for 2018–2022 on foreign exchange costs.
- d Includes interest and commitment charges. Interest during construction for OCR loan has been computed at the 5-year US dollar (USD) fixed swap rate plus an effective contractual spread of 0.5% and maturity premium of 0.1%. Commitment charges for an OCR loan are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

H. Contract Awards and Disbursement S-curve



I. Fund Flow Diagram



## V. FINANCIAL MANAGEMENT

### A. Financial Management Assessment

17. The financial management assessment (FMA) was conducted in January 2015 in accordance with ADB's Guidelines for the Financial Management and Analysis of Projects and the Financial Due Diligence: a Methodology Note to assess the financial management capacity of the executing and implementing agencies. The FMA includes fund flow arrangements, staffing, accounting policies and procedures, internal and external auditing arrangements, reporting and monitoring, and financial information system. The FMA concluded that the pre-mitigation financial management risk of the executing and implementing agencies is "low". Based on the assessment, the key financial management risks identified are limited to the implementing agencies and include a lack of experience of ADB project management, lack of accounting staff for review procedure, and insufficient internal auditing. Agreed mitigation measures include to (i) conduct training on ADB's disbursement procedures and project accounting requirements; and (ii) engage consultant services support to the PMO, implementing agencies, and other project agencies on project management and supervision. The identified risks in financial management will be closely monitored during project implementation. The overall financial management risk of the executing and implementing agencies with the mitigation measures is considered is "low".

### B. Disbursement

#### 1. Disbursement Arrangements for ADB

18. The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2015, as amended from time to time),<sup>11</sup> and detailed arrangements agreed upon between the government and ADB. Online training for project staff on disbursement policies and procedures is available at [http://wpqr4.adb.org/disbursement\\_elearning](http://wpqr4.adb.org/disbursement_elearning). Project staffs are encouraged to avail of this training to help ensure efficient disbursement and fiduciary control.

19. To facilitate project implementation through timely release of loan proceeds, the SPG, through Shandong Finance Department (SFD) will establish an imprest account promptly after loan effectiveness at a commercial bank acceptable to ADB.<sup>12</sup> The SFD, who will establish the imprest account in its name, is accountable and responsible for proper use of advances made to the imprest account. The government may request for initial and additional advances to the imprest account based on 6 months estimated expenditures to be financed through the imprest account. The imprest account will be established, managed, and liquidated in accordance with ADB's *Loan Disbursement Handbook* (2015, as amended from time to time) and detailed arrangements agreed by the government and ADB. The handbook describes which (i) supporting documents should be submitted to ADB, and (ii) should be retained by the government for liquidation and replenishment of an imprest account.

20. The PMO will submit project level disbursement projections to ADB based on projections prepared by the implementing agencies. The implementing agencies will be responsible for arranging counterpart financing or requesting budgetary allocations for counterpart funding, as appropriate. The implementing agencies will prepare disbursement claims and collect

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<sup>11</sup> Loan Disbursement Handbook: <http://www.adb.org/Documents/loan-disbursement-handbook>.

<sup>12</sup> The bank charges incurred in the operation of the imprest account may be financed from the loan proceeds.

supporting documents, which will then be passed to the PMO for review and endorsement before onward transmission to their prefecture finance bureaus. Cities and counties are responsible for initiating payments by the SFD and the SFD is responsible for sending loan withdrawal applications to ADB.

21. The minimum value per withdrawal application is \$100,000 equivalent. Individual payments below this amount should be paid from the imprest account or by the executing agency and subsequently claimed to ADB through reimbursement, unless otherwise accepted by ADB.

22. The statement of expenditure (SOE) procedure may be used for reimbursement of eligible expenditures or liquidation of advances to the imprest account(s).<sup>13</sup> Supporting documents and records for the expenditures claimed under the SOE 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. Before the submission of the first withdrawal application, the SPG, through SFD, 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.

## **2. Disbursement Arrangements for Counterpart Fund**

23. The SPG will ensure that (i) all local and foreign currency counterpart funds, including cash advances, necessary for the smooth and successful completion of the project are provided in a timely manner; and (ii) additional funds, as and when needed, will be provided to meet any project shortfall or cost overruns. The SPG will also ensure that operation and maintenance of all project facilities is fully funded from the government budget.

### **C. Accounting**

24. The Shandong Water Resources Department (SWRD), on behalf of the executing agency, will maintain, or cause to be maintained, separate books and records by funding source for all expenditures incurred on the project. The SWRD will prepare consolidated project financial statements annually following international accounting principles and practices or those prescribed by the government's accounting laws and regulations.

### **D. Auditing and Public Disclosure**

25. The SWRD, on behalf of the executing agency, will cause the detailed consolidated project financial statements to be audited in accordance with International Standards on Auditing and the Government Auditing Standards of the PRC (where these are consistent with International Standards on Auditing), by an auditor acceptable to ADB. The audited project financial statements will be submitted in English language to ADB within 6 months of the end of the fiscal year by the executing agency.

26. The annual audit report for the project financial statements will include a management letter and auditor's opinions which cover (i) whether the project financial statements present a

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<sup>13</sup> The relevant forms are available in Appendix 9B and 9C of ADB's *Loan Disbursement Handbook* (2015, as amended from time to time).

true and fair view or are presented fairly, in all material respects, in accordance with the applicable financial reporting standards; (ii) whether the proceeds of the loan were used only for the purpose(s) of the project; (iii) whether the borrower or executing agency was in compliance with the financial covenants contained in the legal agreements (where applicable); (iv) use of the imprest fund procedure; and (v) use of the SOE procedure certifying the eligibility of those expenditures claimed under SOE procedure, and proper use of the SOE and imprest procedures in accordance with ADB's *Loan Disbursement Handbook* (2015, as amended from time to time), and project documents.

27. 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.

28. The government, SWRD, and the five implementing agencies 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.<sup>14</sup> 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 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's policies and procedures.

29. 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).<sup>15</sup> After review, ADB will disclose the audited project financial statements and the opinion of the auditors on the project financial statements no later than 30 days of ADB's confirmation of their acceptability by posting them on ADB's website. The management letter, additional auditor's opinions, and audited entity financial statements will not be disclosed.<sup>16</sup>

## VI. PROCUREMENT AND CONSULTING SERVICES

### A. Advance Contracting and Retroactive Financing

30. To expedite project implementation, the government requested ADB to approve advance contracting and retroactive financing of consultant services and works packages. Use of retroactive financing of eligible expenditures will be restricted to 20% of the loan amount. When

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<sup>14</sup> 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 disbursements, 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 disbursements, 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.

<sup>15</sup> Public Communications Policy: <http://www.adb.org/documents/pcp-2011>

<sup>16</sup> This type of information would generally fall under public communications policy exceptions to disclosure. ADB. 2011. *Public Communications Policy*. Paras. 97(iv) and/or 97(v).

undertaking implementation activities under ADB retroactive financing facility, it is the responsibility of the SPG to ensure that all relevant aspects of ADB's Safeguard Policy Statement (2009) and project specific safeguard plans are fully adhered to.

31. Advance contracting will include (i) tendering and bid evaluation for civil works packages, (ii) preparation of tendering documents for procurement of materials and equipment, and (iii) recruitment of consultants. The issuance of invitations to bid under advance contracting will be subject to ADB's approval. According to the preliminary procurement plan, 10 civil works contracts, 1 equipment contract, and 3 individual consultant contracts will be procured through advance contracting. In preparing the bidding documents under the advance contracting arrangement, the SPG, through the PMO, must ensure that the provisions of all loan assurances agreed at loan fact-finding (or as modified at loan negotiations) are incorporated in their latest form. These assurances include monitoring and reporting requirements placed on contractors, compliance with labor laws and regulations, specific measures in the environmental management plan (EMP), and social and gender action plan (SGAP).

## **B. Procurement of Goods, Works and Consulting Services**

32. All procurement of goods and works will be undertaken in accordance with ADB's Procurement Guidelines (2015, as amended from time to time).<sup>17</sup> Except as ADB may otherwise agree, the following process thresholds shall apply to procurement of goods and works.

33. Civil works contracts estimated to cost \$25 million and above, and contracts for goods estimated to cost \$3 million and above will be procured using international competitive bidding (ICB) procedures. Contracts for works and goods estimated to cost less than the ICB values but equal to \$100,001 and above will be procured through national competitive bidding (NCB). NCB will be conducted in accordance with the PRC Tendering and Bidding Law (2000), subject to modifications agreed with ADB. Contracts for goods and works estimated to cost less than the above NCB values will be procured using shopping procedures. The relevant sections of ADB's Anticorruption Policy (1998, as amended from time to time) will be included in all procurement documents and contracts.

34. For NCB, the first draft English language of the procurement documents (prequalification, bidding documents, and draft contract) should be submitted for ADB's approval regardless of the estimated contract amount. Subsequent procurements are subject to post review. All ICB contracts are subject to prior review and ADB's approval of the procurement documents (bidding and contract) is required.

35. A procurement plan over the life of the project including the first 18-month procurement contract packages starting from July 2015 has been prepared and agreed with the PMO and the implementing agencies, which indicates procurement method, estimated costs of contracts, threshold and review procedures, goods, works, and consulting service contract packages, and NCB guidelines. The details are in section C.

36. Consulting services will be required for (i) project management support, (ii) capacity development for water policy and conservation demonstration activities, and (iii) software development for the MIS in Huantai County. The outline terms of reference (TOR) for each of the three consulting services packages are described in section D.

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<sup>17</sup> <http://www.adb.org/documents/procurement-guidelines>

37. The PMO will be responsible for engaging consultants. All consultants financed by ADB will be recruited according to ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).<sup>18</sup>

### C. Procurement Plan

38. The procurement plan for the project as agreed with the executing and implementing agencies is provided below:

<b>Basic Data</b>	
<b>Project Name:</b> Shandong Groundwater Protection Project	
<b>Project Number:</b> 47047-002	<b>Approval Number:</b>
<b>Country:</b> China, People's Republic of	<b>Executing Agency:</b> Shandong Provincial Government
<b>Project Procurement Classification:</b>	<b>Implementing Agency:</b> N/A
<b>Project Procurement Risk:</b>	
<b>Project Financing Amount:</b> US\$ 342,610,000 <b>ADB Financing:</b> US\$ 150,000,000 <b>Cofinancing (ADB Administered):</b> <b>Non-ADB Financing:</b> US\$ 192,610,000	<b>Project Closing Date:</b> 30 June 2022
<b>Date of First Procurement Plan:</b> 19 April 2016	<b>Date of this Procurement Plan:</b> 19 April 2016

### A. Methods, Thresholds, Review and 18-Month Procurement Plan

#### 1. Procurement and Consulting Methods and Thresholds

39. Except as the Asian Development Bank (ADB) may otherwise agree, the following process thresholds shall apply to procurement of goods and works.

Procurement of Goods and Works		
Method	Threshold	Comments
International Competitive Bidding for Goods	US\$ 3,000,000 and Above	
National Competitive Bidding for Goods	Between US\$ 100,001 and US\$ 2,999,999	The first NCB is subject to prior review, thereafter post review.
Shopping for Goods	Up to US\$ 100,000	
International Competitive Bidding for Works	US\$ 25,000,000 and Above	
National Competitive Bidding for Works	Between US\$ 100,001 and US\$ 24,999,999	The first NCB is subject to prior review, thereafter post review.
Shopping for Works	Up to US\$ 100,000	
Consulting Services		
Method	Comments	
Quality- and Cost-Based Selection for Consulting Firm	A consulting firm to provide a team of experts for software development for MIS in Huantai County (\$600,300).	
Single Source Selection for Consulting Firm	A local research institute to provide a team of national experts for the capacity development on water policy and conservation demonstration activities (\$589,500).	

<sup>18</sup> <http://www.adb.org/documents/guidelines-use-consultants-asian-development-bank-and-its-borrowers>



Individual Consultants Selection for Individual Consultant	Three national individual consultants for project management support (\$346,500), and two international individual consultants for the water policy and conservation demonstration activities (\$144,000).
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## 2. Goods and Works Contracts Estimated to Cost \$1 Million or More

40. 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	Procurement Method	Review (Prior/ Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
CW-CL-01	Dam construction of Nanzhai Reservoir (Main dam, auxiliary dam, spillway, water discharge tunnel) (Change)	5,889,700	NCB	Prior	1S1E	Q3 / 2015	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works  Comments: First NCB. Advance contracting
CW-CL-02	Water intake pumping station and production bridges (Change)	2,554,200	NCB	Post	1S1E	Q4 / 2015	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works  Comments: Advance contracting
CW-CL-03	Dam seepage proofing (Change)	1,183,600	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works

Package Number	General Description	Estimated Value	Procurement Method	Review (Prior/ Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
CW-CL-04	Administration area construction (Administration building, fences, and etc.) (Change)	1,894,300	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
CW-CL-05	Dam slope and crest construction (roads, wave wall, slope protection) (Change)	3,593,300	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
CW-CL-06	Earthworks excavation and sediments removal in reservoir area (Change)	9,230,200	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
CW-GM-01	Water transmission pipe from Xiashan Reservoir to Chengbei Reservoir (Gaomi)	21,478,100	NCB	Post	1S1E	Q1 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Large Works  Comments: Advance contracting
	Lot 1: Water transmission pipe from Xiashan Reservoir to Chengbei Reservoir	11,407,300					
	Lot 2: Water transmission pipe from Xiashan Reservoir to Chengbei Reservoir	10,070,800					

Package Number	General Description	Estimated Value	Procurement Method	Review (Prior/ Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
CW-GM-02	Jucheng River Reservoir Capacity Expansion (Reservoir sediments dredging, dam slope protection, spillway, protection wall, dam crest transport, etc.) (Gaomi)	13,887,100	NCB	Post	1S1E	Q3 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Large Works
CW-GM-03	Water works to connect Wangwu Reservoir and Jucheng River Reservoir (two main sections) (Gaomi)	6,017,900	NCB	Post	1S1E	Q1 / 2017	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
CW-HT-01	Xiaofu River rehabilitation (phase 1) (Huantai)	2,112,200	NCB	Post	1S1E	Q4 / 2015	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works  Comments: Advance contracting
CW-HT-02	Wu River rehabilitation (phase 1) (Huantai)	3,947,500	NCB	Post	1S1E	Q4 / 2015	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works  Comments: Advance contracting
CW-HT-03	Wu River rehabilitation (phase 2) (Huantai)	3,531,800	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works

Package Number	General Description	Estimated Value	Procurement Method	Review (Prior/ Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
CW-HT-05	Dazhai Canal extended section rehabilitation (Huantai)	1,262,300	NCB	Post	1S1E	Q2 / 2017	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
CW-HT-06	Water diversion channel rehabilitation (South Trunk Channel) (Huantai)	2,612,700	NCB	Post	1S1E	Q2 / 2017	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
CW-HT-07	Water diversion channel rehabilitation (North Trunk Channel) (Huantai)	3,667,300	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
CW-HT-09	Dongzhulong River rehabilitation (Huantai)	3,894,100	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
CW-HT-10	Mata Lake wetland water replenishment (Huantai)	10,418,000	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Large Works

Package Number	General Description	Estimated Value	Procurement Method	Review (Prior/ Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
CW-QZ-03	Irrigation channel works for diversion of Mihe River to Bagouzi Reservoir (Qingzhou)	13,077,400	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Large Works
CW-QZ-04	River diversion works from Renhe Reservoir to Heihu Mountain and Qiyi reservoirs-Channel reinforcement and tunnel lining (Qingzhou)  Lot 1: River diversion works from Renhe Reservoir to Heihu Mountain and Qiyi reservoirs-Channel reinforcement and tunnel lining  Lot 2: River diversion works from Renhe Reservoir to Heihu Mountain and Qiyi reservoirs-Channel reinforcement and tunnel lining	15,270,700  9,142,000  6,128,700	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Large Works
CW-SG-01	Aquatic life cultivation and plants planting of the Judian Lake wetland (Shouguang)	8,976,800	NCB	Post	1S1E	Q1 / 2017	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works  Comments: Advance contracting

Package Number	General Description	Estimated Value	Procurement Method	Review (Prior/ Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
CW-SG-02	Water environment improvement of the Judian Lake wetland (Shouguang)	21,596,900	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Large Works  Comments: Advance contracting
CW-SG-03	Ta River rehabilitation and buildings (dredging, embankment upgrade, rubber dams, traffic bridges, and other buildings) (Shouguang)	18,392,500	NCB	Post	1S1E	Q3 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Large Works  Comments: Advance contracting
CW-SG-04	Construction of Judian Lake wetland dam, roads, and buildings (Shouguang)	6,822,900	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
CW-SG-05	River ecological rehabilitation works (Ta River, Zhinv River, New Zhinv River, Yang River, and Wuyan River) (Shouguang)	8,423,200	NCB	Post	1S1E	Q4 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works

Package Number	General Description	Estimated Value	Procurement Method	Review (Prior/ Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
ES-HT-02	MIS (Huantai)	1,633,300	NCB	Post	1S1E	Q3 / 2017	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Goods

### 3. Consulting Services Contracts Estimated to Cost \$100,000 or More

J. 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	Recruitment Method	Review (Prior/ Post)	Advertisement Date (quarter/year)	Type of Proposal	Comments
CS-01	Project Implementation Support-Project Management Specialist	204,000	ICS	Prior	Q2 / 2016		Assignment: National  Expertise: Project Management Specialist  Comments: National 24 PM, Advance Contracting
CS-02	Capacity development on water policy and conservation demonstration activities	589,500	SSS	Prior	Q3 / 2016	BTP	Assignment: National  Comments: National 84PM
CS-HT-01	Software development for MIS (Huantai)	570,300	QCBS	Prior	Q1 / 2017	STP	Assignment: International  Quality-Cost Ratio: 90:10  Comments: Lumpsum output based contract.

### 4. Goods and Works Contracts Estimated to Cost Less than \$1 Million and Consulting Services Contracts Less than \$100,000 (Smaller Value Contracts)

41. The following table lists 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	Number of Contracts	Procurement Method	Review (Prior/ Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
CW-SG-06	High efficient water conservation demonstration (water storage tanks, water collection facilities)	600,000	1	NCB	Post	1S1E	Q1 / 2017	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
ES-CL-02	Office equipment (Changle)	27,300	1	Shopping	Post		Q3 / 2016	
ES-CL-03	Office vehicles (Changle)	76,900	1	Shopping	Post		Q3 / 2016	
ES-GM-01	Office equipment (Gaomi)	22,700	1	Shopping	Post		Q4 / 2017	Comments: Advance Contracting
ES-HT-01	High efficient water conservancy facilities (Huantai)	150,000	1	NCB	Prior	1S1E	Q1 / 2017	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Goods  Comments: First NCB
ES-SG-01	Office equipment (Shouguang)	264,200	1	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Goods
ES-SG-03	Water quality monitoring equipment (Shouguang)	192,300	1	NCB	Post	1S1E	Q2 / 2016	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Goods
ES-PMO-01	Office equipment	20,000	1	Shopping	Post		Q4 / 2016	
ES-QZ-01	Office equipment (Qingzhou)	85,000	1	Shopping	Post		Q2 / 2016	

Consulting Services								
Package Number	General Description	Estimated Value	Number of Contracts	Recruitment Method	Review (Prior/ Post)	Advertisement Date (quarter/year)	Type of Proposal	Comments



Consulting Services								
Package Number	General Description	Estimated Value	Number of Contracts	Recruitment Method	Review (Prior/ Post)	Advertisement Date (quarter/year)	Type of Proposal	Comments
CS-03	Project Implementation Support-Resettlement Specialist	52,500	1	ICS	Prior	Q2 / 2016		Assignment: National  Expertise: Resettlement Specialist  Comments: National 7PM; Advance Contracting
CS-04	Project Implementation Support-Environment Specialist	90,000	1	ICS	Prior	Q2 / 2016		Assignment: National  Expertise: Environment Specialist  Comments: National 12PM; Advance Contracting
CS-05	Water Right Policy Specialist	96,000	1	ICS	Prior	Q3 / 2016		Assignment: International  Expertise: Water Right Policy Specialist  Comments: International 4PM
CS-06	Smart Greenhouse Advisor	48,000	1	ICS	Prior	Q3 / 2016		Assignment: International  Expertise: Smart Greenhouse Advisor  Comments: International 2PM
CS-07	Software Development Specialist	30,000	1	ICS	Prior	Q3 / 2016		Assignment: National  Expertise: Software development  Comments: National 5 PM

### B. Indicative List of Packages Required Under the Project

42. 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 current period).

Goods and Works							
Package Number	General Description	Estimated Value (cumulative)	Estimated Number of Contracts	Procurement Method	Review (Prior/ Post)	Bidding Procedure	Comments
CW-HT-04	Xiaofu River rehabilitation (phase 2) (Huantai)	2,794,800	1	NCB	Post	1S1E	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
CW-HT-08	Laozi River rehabilitation (Huantai)	498,600	1	NCB	Post	1S1E	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Small Works
ES-SG-02	Water quality monitoring equipment (Shouguang)	192,300	1	NCB	Post	1S1E	Prequalification of Bidders: N  Domestic Preference Applicable: N  Bidding Document: Goods

Consulting Services							
Package Number	General Description	Estimated Value (cumulative)	Estimated Number of Contracts	Recruitment Method	Review (Prior/ Post)	Type of Proposal	Comments
None							

## C. National Competitive Bidding

### I. Regulation and Reference Documents

43. The procedures to be followed for national competitive bidding shall be those set forth in *The Government Procurement Law of People's Republic of China* approved on 29 June 2002 and *Law of the People's Republic of China on Bid Invitation and Bidding of the People's Republic of China* promulgated on August 30, 1999 with the clarifications and modifications described in the following paragraphs required for compliance with the provisions of the ADB Procurement Guidelines.

### II. Procurement Procedures

1. **Competitive Bidding Procedure** (Procurement Law Art. 26 and Law on Bidding Art. 10).

44. Public tendering is the acceptable method of government procurement, and public invitation is the accepted bid invitation mode.

## **2. Eligibility**

45. The eligibility of bidders shall be as defined under section I of the Procurement Guidelines; accordingly, no bidder or potential bidder should be declared ineligible for reasons other than those provided in section I of the Guidelines, as amended from time to time.

## **3. Advertising**

46. All invitations to prequalify or to bid shall be advertised in the national press (China Daily Newspaper) or a free and open access website ([www.chinabidding.com](http://www.chinabidding.com)). 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 twenty-eight (28) 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.

## **4. Bidding Period**

47. The minimum bidding period is 28 days prior to the deadline for the submission of bids.

## **5. Participation by Government-Owned Enterprises**

48. 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/Project Executing Agency.

## **6. Rebidding**

49. Re-bidding shall not be allowed solely because the number of bids is less than three (3).

# **III. Bidding Documents**

## **7. Qualification Requirements**

50. 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.

## **8. Bid Submission and Opening**

51. Bidders shall be allowed to submit bids by mail or by hand.

52. 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.

## **9. Bid Evaluation and Award**

53. 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/Project Executing Agency.

54. 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.

## **10. ADB Policy Clauses**

55. 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.

56. A provision shall be included in all bidding documents for NCB works and goods contracts financed by ADB stating that the Borrower shall reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for the contract in question.

57. A provision shall be included in all bidding documents for NCB works and goods contracts financed by ADB stating that ADB will declare a firm or individual ineligible, either indefinitely or for a stated period, to be awarded a contract financed by ADB, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices or any integrity violation in competing for, or in executing, ADB-financed contract.

## **D. Consultant's Terms of Reference<sup>19</sup>**

### **1. Project Management Support**

58. The objective of the consulting services for project management support is to assist the executing and implementing agencies in implementing the project by providing assistance in (i) project management; (ii) project performance monitoring systems (PPMS) development; (iii) disbursement and contract management; (iv) construction planning, supervision, and monitoring; (v) report preparation to meet ADB's reporting requirements; (vi) safeguard management and monitoring; (vii) corporate planning and financial management; and (viii) training provision.

59. Three national individual consultants for a total of 43 person-months (pm) will be engaged to provide the following inputs:

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<sup>19</sup> The TOR was prepared by ADB and the executing agency. The PPTA consultants were not involved in the preparation of the TOR.

**Table 3: Inputs for Project Management Support Consulting Services**

<b>No.</b>	<b>Specialist Position</b>	<b>Person-month Inputs</b>
1	Project management specialist	24
2	Environment specialist	12
3	Resettlement specialist	7
	<b>Total</b>	<b>43</b>

60. The outline TOR for the individual experts to be engaged through individual consultant selection are described below:

61. **Project management specialist** (national, 24 pm). The project management specialist shall have a minimum of 10 years of experience in related project management. The specialist will be responsible for providing technical and management support to the PMO and the implementing agencies in project management, bidding document review, procurement assistance, contract bid review and evaluation, and other project management related tasks. The specialist must have a good English proficiency to communicate with ADB and to fulfill all the requirements on reporting in English. Specific work tasks include:

- (i) Provide support for the PMO and the implementing agencies to coordinate procurement on civil works, equipment, and installation, consulting services, and other contracts in accordance with the PRC and ADB policies and requirements.
- (ii) Provide technical support as required in design review, bill of quantities preparation, bidding document preparation, and technical specification review. Provide assistance in bid review, bid evaluation report preparation, and other bidding related tasks.
- (iii) Assist the PMO and the implementing agencies in setting up PPMS in accordance with the PRC and ADB policies and requirements.
- (iv) Assist the PMO and the implementing agencies in supervising and guiding the project implementation.
- (v) Monitor the implementation of the contractual agreements and procedures.
- (vi) Develop a contract management system and provide assistance in updating the procurement plan, contract award and disbursement monitoring, procurement planning, and other contract management tasks.
- (vii) Review bidding documents, bidding evaluation reports, contracts, and other related documents on bidding procedures and contract management.
- (viii) Assist the PMO and the implementing agencies in project management, project monitoring, procurement, disbursement, and training.
- (ix) Assist the PMO and the implementing agencies in implementing the social and gender action plan (SGAP), and the consultation and participation plan prepared during project preparation.
- (x) Monitor the compliance with the SGAP and assist in taking follow-up actions to address the key issues.
- (xi) Assist the PMO in preparing quarterly progress reports and the PCR for chapters related to social dimensions.
- (xii) Assist in reporting relevant social and gender indicators in the design and monitoring framework (DMF) and PPMS.
- (xiii) Prepare quarterly progress reports, project performance monitoring and evaluation reports, project completion report (PCR), and other project required reports in both Chinese and English.

- (xiv) Undertake site visits as required.

62. **Environment specialist** (national, 12 pm). The specialist will have: (i) a university 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 has good health to regularly visit the subproject sites; and (vii) proficiency in spoken and written English. Specific tasks include:

- (i) Assist the PMO in establishing an environmental management system, which will include various arrangements and activities such as staffing, inspection, monitoring, grievance redress mechanism (GRM), reporting, and corrective actions or measures.
- (ii) Assess the status of environmental readiness of each project component prior to the project implementation based on the readiness indicators defined in the environmental management plan (EMP).
- (iii) Assist the PMO and the implementing agencies in updating the EMP, including updating mitigation measures and environmental monitoring programs, based on the detailed engineering design, for submission to the executing agency and ADB for approval.
- (iv) Assist the implementing agencies in contracting environment monitoring agencies and coordinate with the agencies to ensure that all the environmental monitoring activities meet both domestic and ADB requirements.
- (v) Conduct regular EMP compliance assessments, undertake site visits as required, identify any environmental-related implementation issues, propose necessary corrective measures, and include such corrective measures in a corrective action plan.
- (vi) Assist in setting up a GRM, provide trainings to the PMO and the implementing agencies staffs on environmental laws, regulations and policies, ADB's Safeguard Policy Statement (2009), EMP implementation, and GRM in accordance with the training plan defined in the EMP.
- (vii) Prepare semiannual environmental monitoring and progress reports to ADB and provide input on environmental aspects to progress reports, midterm reports, PCR, and other required documents.
- (viii) Prior to the midterm review mission, provide support to the PMO and the implementing agencies in organizing public meetings in the project cities and/or counties to present and discuss the EMP implementation progress, collect public opinions and concerns, and develop necessary corrective measures.
- (ix) Prior to the project completion, organize surveys on public opinions in the project cities and/or counties to evaluate the community satisfaction with the project implementation, project output, and EMP implementation, and then document the results in the PCR.

63. **Resettlement specialist** (national, 7 pm). The resettlement specialist shall have a minimum of 8 years of experience in ADB loan projects. The resettlement specialist will be responsible for providing support in updating and implementing the resettlement plans for compliance to ADB's safeguard policies and procedures, and assist the PMO and project implementation offices (PIO) with internal monitoring and reporting. The specialist must have a

good English proficiency to communicate with ADB and to fulfill all English reporting requirements. The specific tasks may include:

- (i) Assist the PMO, the implementing agencies, and design institutes in updating the five resettlement plans based on the detailed design and census of affected persons, and ensuring disclosure of the resettlement plans to the affected persons prior to ADB's approval.
- (ii) Assist the county and city PIOs in implementing the activities on land acquisition and resettlement in accordance with the resettlement plans.
- (iii) Assist the PMO and the county and city PIOs in supervising construction contractors to ensure the compliance to the resettlement plans).
- (iv) Assist the PMO and the county and city PIOs in monitoring the implementation of the resettlement plans by collecting and updating data, and closely coordinating with the external resettlement monitors.
- (v) Review external monitoring and evaluation reports prepared by the external resettlement monitors, respond to ADB's comments on the external monitoring reports, monitor the compliance to the resettlement plans, and evaluate whether adequate results have been achieved. Also report to the PMO and the county and city PIOs on key implementation issues, and provide assistance in follow-up.
- (vi) Assist the PMO in preparing quarterly progress reports and the PCR for an annex related to resettlement.
- (vii) Undertake site visits and other work activities as needed.

64. The consultants will deliver the following reports in addition to the daily advisory assistance: (i) an inception study report, (ii) quarterly progress reports during the project implementation period, (iii) design review reports, (iv) semi-annual environmental monitoring reports, and (v) a PCR.

## **2. Capacity Development for Water Policy and Conservation Demonstration Activities**

65. The objective of the consulting services package is to help the executing and implementing agencies to strengthen the institutional capacities in water policy and conservation demonstration activities. It is focused on three key areas: water resources policy and regulation, water information management, and rainwater harvesting and reuse.

66. The PMO proposes to engage the Water Resources Research Institute of Shandong Province (WRRRI)<sup>20</sup> through single-source selection (SSS) to provide 84 pm of national consulting services for the implementation of the policy and demonstration activities under the project. The assignment will provide support to strengthen institutional capacity in three key areas: water resources policy and regulation, water information management, and rainwater harvesting and reuse.

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<sup>20</sup> The Water Research Institute of Shandong Province, founded in 1957, is a social non-profit research institution mainly focusing on irrigation technology and application. All together, the institution has about 230 staff members, including over 100 senior professional staff. Its main specialized scopes include: water assessment and utilization, water ecology and water environment; irrigation, drainage and soil & water conservation; measurement and control of project quality; and construction and management of hydraulic engineering. The institute is not affiliated with the Shandong Water Resources Department.

67. Founded in 1957, the WRRRI of Shandong Province is a social non-profit research institution that specializes on water assessment and utilization, water ecology and water environment; irrigation, drainage and soil & water conservation; and construction and management of hydraulic engineering. As one of the leading research institutions in the area of water assessment, management and conservation, it has conducted several national and provincial water resources studies, including for the Shandong Science and Technology Department and Shandong Water Resources Department, which are relevant for the proposed project interventions. The WRRRI is proposed to be engaged through SSS method because (i) it is considered to have unique knowledge of and access to ongoing discussions on national and provincial water policy development, amongst others through its previous assignments for the Ministry of Water Resources and SWRD; (ii) it has an extensive network of professional contacts that will be required to be an effective stakeholder to discuss and promote water related policy changes; and (iii) it has accumulated and possesses relevant water assessment data that is needed for this assignment. The WRRRI is not affiliated with the SWRD.

68. The detailed scope of consulting service on capacity development is summarized in the following:

- (i) **Water resources policy and regulation.** Assist the executing agency and implementing agencies in conducting a pilot study on water right and policy development to introduce innovative water management practices, and a trial regional market for water right trading in the project area. The pilot study is to establish a most strict pilot water resources management system for implementation over the project area. The scope will include policy studies on water quota setting, water right determination, water right trading, water tariff improvement, water resources allocation, law enforcement, farming user association and administration, etc. with an emphasis on agricultural water uses and savings. The policy research will create new policies for the comprehensive improvement to the area and sustainable management of the water resources.
- (ii) **Support and preparation of IC-card enabled demand management systems.** An upgraded IC Card system will be developed to introduce controlled demand management for agricultural water management in a selected pilot location in Huantai County. The IC controlled demand system will consist of IC card operated wells, a data transmission system and a central data unit. The central data unit will be integrated with the MIS systems that will be put in place for the Huantai County and that will among others have groundwater level recorders that can measure the impact. The central data unit will also be used to analyze and discuss water uses by different farmers. The physical systems are complemented by a set of rules that deal with registering water users, determining user quota and tariff for the use of groundwater. The well users will be united in a water users association, which will facilitate the introduction and co-manage the system to promote water trading and improved water management among members.
- (iii) **Innovative greenhouse roof top water harvesting.** The smart greenhouse pilot activity will introduce water harvesting in green house areas in Shouguang County, as a future strategy to secure good quality water for the horticultural industry. In water harvesting from greenhouses there are several options with respect to collection and particular storage: open surface storage, closed surface storage and aquifer storage. The Design Institute as part of the Feasibility Report prepared a



preliminary design for water harvesting from greenhouses, based on closed surface storage.

69. The required consultancy inputs for the capacity development are detailed below.

**Table 4: Inputs for Capacity Development Consulting Services**

No.	Specialist Position	Person-months Input (national)
1	Water resources management specialist and team leader	18
2	Water economist	7
3	Water tariff specialist	6
4	Water conservancy engineering specialist	5
5	Agricultural irrigation specialist	6
6	Agricultural water-saving specialist	10
7	Groundwater resources management specialist	6
8	Social development specialist	5
9	Water information management specialist	12
10	Association management specialist	9
<b>Subtotal</b>		<b>84</b>

70. The outline TOR for the individual experts to be engaged for the capacity development consulting services are described below:

71. **Water resources management specialist and team leader** (national, 18 pm). The specialist shall have a university degree or above in water resources management, and have over 10 years of experience in water resources management with focus on policy and regulation. Specific tasks include:

- (i) Set a framework for developing a strict pilot water resources management system to be implemented over the project area.
- (ii) Design a framework for developing a trial regional market for water right trading in the project area.
- (iii) Provide support for the implementation of the smart greenhouse demonstration activity, in close cooperation with the international individual consultant.
- (iv) Carry out overall management and progress assurance.
- (v) Ensure an optimum communication with all experts, key stakeholders at the provincial and county levels, the PMO, and ADB.
- (vi) Develop work plans and coordinate the work among the specialist consultant team, including expert mobilization, site visits, and report preparation.
- (vii) Ensure the completion of high quality outputs on different components of study.
- (viii) Organize research on water quota, water right determination, water right trade, water tariff improvement, water resource distribution and management, and committee management.
- (ix) Coordinate with the international consultant specialists to facilitate their work input in the project.
- (x) Organize, review, and complete all reports (in both Chinese and English with good quality).

72. **Water economist** (national, 7 pm). The water economist shall have a minimum of 10 years of experience in economic management. The specialist shall have a bachelor degree or above in economic management or in a similar major. Specific work tasks include:

- (i) Collect relevant economic data and information with the help from the PMO and the implementing agencies.
- (ii) Investigate the tariff status for different sectors, determine a reasonable tariff structure for the agricultural sector, study the option of tiered tariff systems for agricultural water use, and propose a tariff system that will be suitable for the project area.
- (iii) Study the water compensation mechanisms for the agricultural sector, and reward systems for enhancing water saving incentives.
- (iv) Study the policies for attracting social investment to the subject water sector.
- (v) Prepare the economic sections of progress reports.
- (vi) Provide training on economic analysis and management in accordance to ADB policies.

73. **Water tariff specialist** (national, 6 pm). The water tariff specialist shall have a minimum of 10 years of experience in financial management. The specialist must have a bachelor degree in financial management or similar major. Specific work tasks include:

- (i) Collect related financial data and information.
- (ii) Work with the water economist to investigate the tariff status for different sectors, determine a reasonable tariff structure for the agricultural sector, study the option of tiered tariff systems for agricultural water use, and propose a tariff system that will be suitable for the project area.
- (iii) Research on financial management systems for agricultural water management project and engineering works.
- (iv) Complete the financial sections of progress reports.
- (v) Provide training on financial analysis and management.

74. **Water conservancy engineering specialist** (national, 5 pm). The water conservancy engineering specialist shall have a minimum of 10 years of experience in water conservancy engineering and management. The specialist must have a bachelor degree or above in water conservancy engineering or in a similar major. Specific work tasks include:

- (i) Complete an analysis and study on water conservancy policies and management.
- (ii) Provide suggestions on water right trading and market regulations for water conservancy management.
- (iii) Study the relevant policies and regulations on water supply and water rights.
- (iv) Provide support for the implementation of the smart greenhouse demonstration activity, in close cooperation with the international individual consultant.
- (v) Complete the water facilities management sections of all progress reports.
- (vi) Provide training on water facility management.

75. **Agricultural irrigation specialist** (national, 6 pm). The agricultural irrigation specialist shall have a minimum of 10 years of experience in agricultural water conservancy and management. The specialist must have a bachelor degree or above in agricultural water management or in a similar major. Specific work tasks include:

- (i) Investigate the irrigation practices and drainage conditions in the project area, including the origin of agricultural water supply, the method of water supply, the methods of irrigation, and the current use of engineering facilities.
- (ii) Carry out a policy analysis on farming land irrigation.
- (iii) Provide advice on water right policy development from the irrigation perspective.
- (iv) Complete the water facilities engineering management sections of all progress reports.
- (v) Provide training on agricultural water facilities management.

76. **Agricultural water-saving specialist** (national, 10 pm). The agricultural water-saving specialist shall have a minimum of 10 years of experience in agricultural water-savings management. The specialist must have a bachelor degree in irrigation engineering or in a similar major. The specific tasks include:

- (i) Analyze the current status of water-saving practices in agriculture in the PRC and in the project area.
- (ii) Review the successful domestic and international experiences and project cases in agricultural water savings.
- (iii) Complete the analysis on agricultural water-saving policies and regulations.
- (iv) Provide suggestions on water right trading and market regulations from the water-savings aspect.
- (v) Introduce agricultural water-saving techniques and a reward mechanism.
- (vi) Complete the agricultural water-saving sections of all progress reports
- (vii) Provide training on water-savings in the agricultural sector.

77. **Groundwater resources management specialist** (national, 6 pm). The groundwater resources management specialist shall have a minimum of 10 years of experience in hydrogeological assessments and groundwater resources management. The specialist must have a bachelor degree in groundwater resources management or in a similar major. Specific work tasks include:

- (i) Investigate the current status of groundwater resources management in the PRC and in the project area.
- (ii) Complete an analysis on agricultural water saving policies and regulations.
- (iii) Provide suggestions on water right trading and market regulations from the groundwater resources management perspective.
- (iv) Provide advice on technical aspects of water right trading, market setting, and regulation development from the groundwater resources management aspect.
- (v) Study the feasibility of applying proper groundwater management techniques and technologies into the project area.
- (vi) Complete the groundwater resource management sections of all progress reports.
- (vii) Provide training on groundwater resources management.

78. **Social development specialist** (national, 5 pm). The social development specialist shall have a minimum of 10 years of experience in social development. The specialist must have a bachelor degree in water facilities or social development or in a similar major. The specific tasks may include:

- (i) Complete a policies analysis on water resource and social development, and provide suggestions on water rights and market policies to enhance the social development.
- (ii) Study how water resources management should adapt to the sustainable socio-economic development.
- (iii) Provide suggestions on the role and functions of water user association from the social development perspective.
- (iv) Complete social coordination development sections of all progress reports.
- (v) Provide training on integration of water resources management and social development.

79. **Water information management specialist** (national, 12 pm). The water information management specialist shall have a minimum of 10 years of experience in water facilities information system. The specialist must have a bachelor degree in information engineering or in a similar major. The specific tasks include:

- (i) Introduce water information management techniques and successful cases from both domestic and international experiences.
- (ii) Analyze techniques and experiences in water information management that can be applied to the proposed MIS subproject in Huantai County.
- (iii) Provide advice on how to implement and monitor the Huantai County's MIS and integrated circuit card subprojects.
- (iv) Provide advice on water right trading and market mechanisms from the water information management perspective.
- (v) Analyze the functions and roles of water information systems in the development of a water right trading system.
- (vi) Advice on applications of scientifically advanced water information management methods to the project area.
- (vii) Complete water information management sections of all progress reports.
- (viii) Provide training on water facilities and information management systems.

80. **Association management specialist** (national, 9 pm). The association management specialist shall have a minimum of 10 years of experience in association management. The specialist must have a bachelor degree in water resources management or in a similar major. Specific tasks will include:

- (i) Develop the framework and systems for establishment of water user associations, including setup of documentation, registration, governance, staffing, organizational structures, etc.
- (ii) Research on management practices and modality for sustainable operation of water user associations.
- (iii) Analyze the role of water user associations in socio-economic development.
- (iv) Provide guidance and monitoring of the pilot development of rural water user associations in the project area.
- (v) Complete the association management sections of all progress reports.
- (vi) Provide training on development and management of water user associations.

81. The consultants will deliver the following reports in addition to the daily advisory assistance: (i) an inception study report within the first month after mobilization, (ii) quarterly progress reports during the project implementation period, (iii) design review reports, (iv) semiannual environmental monitoring reports, and (v) a project completion report.

### 3. Individual International Consultants for Policy Support

82. The PMO will also engage two international individual consultants for a total of 6 pm to provide support for the implementation of the policy and demonstration activities under the project. The consultants will be engaged through individual consultant selection method. The outline TOR are below.

83. **Water policy advisor** (international, 4 pm). The water policy advisor shall have 10 years of experience in water policy management, including groundwater management and water pricing issues; and contributor to national or international policy documents. Specific tasks include:

- (i) Develop the report outlays and study plans for the different studies—including inputs of experts, survey methods, and report outlays.
- (ii) Support the policy research team and provide guidance on:
  - a) groundwater quota and trading study
  - b) water pricing study
  - c) institutional study
- (iii) Suggest international experience in groundwater management to be used in the policy research studies: introduce advanced and successful cases and policies on water rights, use of market mechanism, and establishment of committees of aquifer users.
- (iv) Quality control and review of the reports in English version, ensuring clear and actionable recommendations come out on water quota, water right determination, water right trade, water tariff improvement, water resource configuration, and supervision and committee.
- (v) Maintain contact with ADB and main team.

84. **Smart greenhouse water specialist** (international, 2 pm). The greenhouse water specialist shall have at least 10 years of proven experience in greenhouse water management and water harvesting from green houses. Specific work tasks include:

- (i) Guide and supervise the smart greenhouse component.
- (ii) Assess overall water management in greenhouses.
- (iii) Assess hydrogeological conditions for recharge and subsurface storage of harvested water.
- (iv) Prepare and give training on rooftop water harvesting and local recharge to member of project counties and interested institutes.
- (v) Guide the scoping and mapping of opportunities under different design options in Shouguang County.
- (vi) Prepare the design criteria layout including dimension of the different components, based on water requirements and rainfall patterns.
- (vii) Check and supervise site investigation.
- (viii) Check and approve the detailed design and cost estimate.
- (ix) Prepare a monitoring plan for the pilot—including costs and/or benefits, and technical robustness.

#### 4. Software Development for the Management Information System in Huantai County

85. The MIS subproject in Huantai County includes the development of the following modules: (i) groundwater monitoring, (ii) optimal allocation of water resources, (iii) electronic administration, (iv) storm water and flood data monitoring, and (v) water conservancy infrastructure patrol system. The scope of consulting service on the MIS software development is to create the software operating system for linkage, operation, data collection, data monitoring, data transfer, and facility patrolling among different modules of the MIS.

86. A corporate software development company that specializes in information technology and software development will be commissioned to carry out the required consulting services. The firm will be engaged using quality- and cost based selection (QCBS) at a quality-cost ratio of 90:10. The contract will be a lump-sum output based contract. The company shall possess the following qualifications:

- (i) Qualified for Certificate of Class 3 or above on in computer system integration.
- (ii) Certified for ISO 9000 quality management system.
- (iii) Certified for software development.
- (iv) Certified for CIMM3.

87. The detailed TOR and required expertise will be developed during the project, as the scope of the MIS infrastructure to be developed under Output 1, is still uncertain. The TOR will be developed with support of a national individual software development expert (see below). It is anticipated that the software development consultants will deliver the following reports in addition to the daily advisory assistance: (i) an inception study report within the 2 months after mobilization, (ii) an interim report during the project implementation period, (iii) a good quality operational software system for linking and operating the overall MIS system as well as individual modules, (iv) pass the review and acceptance check approved by a panel of experts in software development, and (v) a software operating user manual.

88. An individual national individual consultant for a total of 5 person-months (pm) will be engaged to support the preparation of the TOR and supervision of software development consultants. The outline TOR for the individual expert to be engaged through individual consultant selection is described below:

89. **Software Specialist** (national, 5 pm). The software development specialist shall have a minimum of 10 years of experience in related software development, including development of Terms of References. The specialist will be responsible for preparing the TOR for the development of the software system in Huantai county. The specialist must have a good English proficiency to communicate with ADB and to fulfill all the requirements on reporting in English. Specific work tasks include:

- (i) Discuss and assess the anticipated requirements for the automated monitoring system;
- (ii) Undertake field visits to determine the scope of the anticipated system;
- (iii) Provide support for the PMO and the implementing agency to prepare the outline for the TOR of the software development consultants;
- (iv) Advise the executing and implementing agencies on suitable contract arrangements for the software development;
- (v) Prepared the detailed TOR and budget for the software development;

- (vi) Support the PMO and implementing agency with the bidding process to engage the software development company;
- (vii) Provide support for the PMO and implementing agency with the supervision and commission of the software;
- (viii) Prepare a final report on the completed assignment.

## VII. SAFEGUARDS

90. **Prohibited investment activities.** Pursuant to ADB's Safeguard Policy Statement (SPS) (2009), ADB funds may not be applied to the activities described on ADB Prohibited Investment Activities List set forth at Appendix 5 of the SPS.

### A. Environment

#### 1. Objectives

91. The project is classified as category A for environment. An environmental impact assessment (EIA) and EMP have been prepared and were disclosed on ADB website on 9 March 2015. The project EIA and EMP (not the domestic EIAs) form the basis of the official loan agreement between ADB and the SPG. The SPG, through the PMO, holds final responsibility for implementation and compliance with the EMP. The EMP will be implemented in all phases of the project—design, pre-construction, construction, and operation. The EMP complies with the PRC's environmental laws and ADB's SPS (2009). The EMP contains: (i) objectives; (ii) roles and responsibilities; (iii) mitigation measures; (iv) inspection, monitoring, and reporting arrangements; (v) training and institutional strengthening; (vi) GRM; (vii) future public consultation; and (viii) a feedback and adjustment mechanism.

92. A full time environmental officer has been assigned in the PMO to coordinate EMP implementation. The loan implementation environment consultants will support the PMO and contractors to implement the EMP. In the design stage, the PMO will pass the 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 offices (PIOs) 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 project EIA including updated EMP for compliance.

93. **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 project area may be subject to increasing frequency and duration of winter drought, variability in precipitation, and flood severity in summer. Flood volumes and higher flows could exceed the capacity of embankments, channels, pipelines, and the two project pump stations. To accommodate these: (i) all structures will be constructed to a flood protection standard of one in 20 years or one in 50 years, and (ii) embankments will be designed to be porous for infiltration. The project is oriented to strengthen resilience to climate risks: (i) increased storm water retention and improved water monitoring and allocation will strengthen water security, (ii) channel rehabilitation will improve water flows and reduce flood risk, and (iii) training in water conservation and wetland management will help secure the freshwater resources of two large project wetlands.

## 2. Organizations and their Responsibilities for EMP Implementation

94. The SPG, represented by the SWRD, is the executing agency of the project. At the provincial level, the SPG has established the comprehensive project management office (PMO) to provide policy guidance and coordinate overall project implementation. The PMO comprises representatives from the SFD, Shandong Development and Reform Commission, SWRD, and other relevant agencies. The five project city and county governments will be the implementing agencies. Each city and county has established a city or county PIO to implement their project components and subprojects. The EMP implementation arrangements and responsibilities of governmental organizations are summarized below.

**Table 5: Institutional Responsibilities for EMP implementation**

Agency	Environmental Management Roles and Responsibilities
Executing Agency: SPG, represented by the SWRD and the comprehensive PMO	<ul style="list-style-type: none"> <li>• Coordination with city and county governments</li> <li>• Coordinate project preparation and implementation</li> <li>• Facilitate inter-agency coordination</li> <li>• Liaison with ADB</li> <li>• Supervise and manage project implementation</li> <li>• Daily management work in project preparation and implementation</li> <li>• Assign PMO environment officer and PMO social officer</li> <li>• Coordinate with ADB on project progress and monitoring reports</li> <li>• Submit bidding documents, bid evaluation reports, and other necessary documentations to ADB for necessary approval</li> </ul>
	<ul style="list-style-type: none"> <li>• Procure project implementation consulting services, including a LIEC</li> <li>• Consolidate environmental monitoring reports prepared by county PMOs and EMS and submit them to ADB for disclosure</li> <li>• Engage a procurement agency which supports the implementation agencies and five PIOs</li> </ul>
Implementing Agencies: Five project cities and counties (through the city and county PIOs)	<ul style="list-style-type: none"> <li>• Implement project components in their jurisdiction, including finance and administration, technical and procurement matters, monitoring and evaluation, and safeguard compliance</li> <li>• Coordinate with the PMO for project management and implementation</li> <li>• Establish environment management unit and appoint environment specialist as EMP coordinator</li> <li>• Incorporate EMP into bidding documents</li> <li>• Establish GRM</li> <li>• Supervise and monitor EMP implementation and annual reporting to the PMO (with support of LIEC)</li> <li>• Participate in capacity development and training programs</li> <li>• Construction supervision and quality control</li> <li>• Contract local EMS to conduct environmental monitoring</li> <li>• Commission the constructed facilities</li> </ul>
Project Facility Operators: Local WRBs	<ul style="list-style-type: none"> <li>• With the implementing agencies, commission the constructed facilities</li> <li>• Operate and maintain completed facilities, including environmental management, monitoring, and reporting responsibilities</li> </ul>

ADB = Asian Development Bank, EMP = environmental management plan, EMS = environmental monitoring stations, GRM = grievance redress mechanism, LIEC = loan implementation environment consultant, PIO = project implantation office, PMO = project management office, SFD = Shandong Finance Department, SPG = Shandong Provincial Government, SPPLG = Shandong Provincial Project Leading Group.

95. **Environment staff within PMO and the implementing agencies.** The PMO will have main EMP coordination responsibility. The PMO has designated two full time PMO



environmental officers responsible for EMP implementation. The officers will: (i) coordinate the implementation of mitigation measures during project design, construction, and operation; (ii) ensure that environmental management, monitoring, and mitigation measures are incorporated into bidding documents, construction contracts, and operation management plans; (iii) submit semiannual EMP monitoring and progress reports to ADB; (iv) implement the GRM; and (v) respond to any unforeseen adverse impacts beyond those mentioned in the EMP. The officers will be technically supported by the national individual loan implementation environment consultant (LIEC). At the county level, the PIO of each implementing agency will include one environment officer. This officer will be responsible for daily implementation of the EMP, working closely with the PMO environment officer, and LIEC. TORs for PMO and PIO environment officers are in Appendix 1.

**96. Loan implementation environment consultant.** A LIEC will be hired as national individual consultant under the loan implementation consultant services. The LIEC will advise the PMO, PIOs, contractors, and construction supervision companies (CSC) 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) supervise the implementation of the mitigation measures specified in the EMP; (iii) on behalf of the PIOs and PMO, prepare the annual EMP monitoring and progress reports in English and Chinese and submit it to ADB; (iv) provide training to the PMO, local PIOs, and CSCs on the PRC's environmental laws, regulations and policies, ADB's SPS (2009), EMP implementation, and GRM in accordance with the training plan; (v) identify any environment-related implementation issues, and propose necessary corrective actions; and (vi) undertake site visits for EMP inspection as required. TOR for the LIEC are in Appendix 1.

**97. 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 PIOs. Contractors will develop site-specific EMPs on the basis of this project EMP. The CSCs will be selected through the PRC bidding procedure by the PIOs. The CSCs will be responsible for supervising construction progress and quality, and 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 PIOs and PMO.

**98. Environmental monitoring station (EMS).** The PIOs will appoint the EMS of each project county to conduct periodic environmental impact monitoring during construction and operation in accordance with the monitoring plan.

## **B. Ethnic Minorities**

99. The project does not involve any distinct ethnic minority and thus does not trigger ADB's SPS (2009) indigenous peoples requirements. Therefore, an ethnic minority development plan is not required.

## **C. Land Acquisition and Resettlement**

### **1. Land Acquisition and Resettlement Impacts**

100. There are five project components that have involuntary resettlement impacts, so resettlement plans have been prepared by county and city PIOs for each. The project will affect

a total of five villages and/or urban communities, and two townships and/or sub-districts by permanent land acquisition in Changle County and Shouguang City, respectively. The Changle component will involve both permanent land acquisition and house demolition, while the Shouguang component will involve permanent acquisition of collective land without contracted to villagers but no house demolition. The Gaomi, Huantai, and Qingzhou components will be constructed within existing river channels, and involve temporary land occupation only, but no permanent land acquisition and house demolition. Detailed impacts are presented in Table 6.

101. The total area of permanent land acquisition is 2,147.19 mu, of which 740.75 is state-owned and 1,408 mu is collective-owned land. The collective land included farmland, forestry land, house plot, and wetland or waste land accounting for 38.8%, 18.1%, 4.5%, and 38.6%, respectively. About 9,422 mu of temporary land occupation is involved, most of which is collective land. The building demolition area is 47,781 m<sup>2</sup>, including residential houses of 44,924 m<sup>2</sup>, and rural shanties of 2,857 m<sup>2</sup>. No houses on state-owned land will be demolished.

102. It is estimated that a total of 1,697 persons from 446 households are affected by permanent land acquisition and resettlement, including 136 households (530 persons) affected by land acquisition only, 191 households (668 persons) by house demolition only, and 119 households (499 persons) by both. In addition, about 3,390 households will be affected by temporary land occupation.

## **2. Resettlement Principles and Entitlements**

103. The resettlement plans are prepared in compliance with the Land Administration Law of the PRC (2004), Decisions on Deepening Reform and Strengthening Land Administration by the State Council of the PRC (GuoFa [2004] No. 28), Notices on Formulation of Land Acquisition Uniform Annual Yield Value Standard and Land Acquisition District Comprehensive Land Price by Ministry of Land and Resources (GuoTuZiFa [2005] No.144), and other applicable guidelines. They are also based on local policies regarding land acquisition and resettlement (LAR) in Shandong Province and the project cities and/or counties, and ADB's SPS (2009). Based on consultations with the local governments and affected persons and general practices in the project area, the implementing agencies have adopted a set of resettlement principles and an entitlement matrix has been prepared for each resettlement plan.

104. Compensation for land acquisition, residential housing, and non-residential buildings (shops and enterprises) are paid to the affected owners or users. For land acquisition, compensation fees include land compensation, resettlement subsidy, and compensation for young crops and/or trees. The land acquisition compensation rates are based on comprehensive district prices of different areas in Shandong Province. The compensation rate for both land compensation and resettlement subsidies in a comprehensive land price is CNY49,000/mu for the Changle component, CNY38,000/mu (irrigated farmland) and CNY30,400/mu (swamp land) for the Shouguang component, and CNY42,000/mu for the Gaomi component, respectively. Temporary land occupation involved in the five project cities and/or counties will be taken for 1–1.5 years, and the compensation in CNY1,800/mu per year will be paid to affected peoples directly.

105. For affected rural households suffering house demolition of the Changle component, both an apartment in new resettlement community and cash compensation can be provided. The standards for housing replacement cost of main houses are as follows: CNY750/m<sup>2</sup> for brick-concrete structure, CNY600/m<sup>2</sup> for brick-wood structure, CNY200/m<sup>2</sup> for earth-wood structure, and CNY200/m<sup>2</sup> for simple structure. A moving subsidy of CNY350 per person will be

paid for. The Changle County Government will provide unified transition housing for affected persons. In addition, households will also receive compensation at replacement costs for the loss of ground attachment and utilities. The components of Gaomi, Huantai, Qingzhou, and Shouguang will not involve house demolition.

106. A fund of CNY50,000 in total of the components is set up to provide assistance to the vulnerable groups. Every relocated household that lives below local poverty lines will get the living subsidy. The subsidy will be delivered as following procedures: (i) individual application, (ii) community verification, and (iii) city and/or county PMO confirmation.

### **3. Public Participation and Grievance**

107. Public consultation has been the key for the preparation of the five resettlement plans. From July 2011 to January 2015, a series of consultation activities were carried out with the affected persons, resettlement communities, institutions and enterprises, and other project stakeholders. The physical object survey on land and building asset inventory, and socio-economic survey of sample households, enterprises, and institutions have performed. The affected persons have participated in the preparation of the resettlement plans through the initial measurement and socio-economic surveys, and community meetings. Their concerns and comments have been integrated into the resettlement plans. Further consultations will be held during the implementation of the resettlement plans. 31 March 2015 is set as the cut-off date of existing physical status in the affected areas for all five components. A GRM has been established for the affected persons to redress their LAR issues, including three steps: (i) townships resettlement offices, (ii) resettlement offices of subprojects of the project cities and/or counties, and (iii) Shandong PMO. The resettlement information booklets have been disclosed to the affected persons in local language (Chinese) and resettlement plans will be distributed to affected households, village and/or community committees, and town and/or street offices before the resettlement implementation. In addition, the resettlement plans will be uploaded on ADB website in both English and Chinese. The PMO and PIOs will be assisted by a national resettlement specialist (7 pm).

### **4. Resettlement and Livelihood Rehabilitation**

108. To minimize the resettlement impacts to affected persons and restore their income and living standards, detailed programs of restoration and relocation have been arranged in the resettlement plans. The affected persons can choose the available programs according to their requirements. Based on the socioeconomic survey and analysis of the affected households, and local experiences in relocation and resettlement of similar projects, measures for resettlement and income restoration have been prepared. These measures include unified resettlement housing, distribution of temporary living expenses to the affected persons, employment creation by the local labor bureaus, skill training for the affected persons, employment related to the project, non-monetary support, etc.

109. About 11,407.86 mu of collective land acquired will be compensated in cash based on the type of land loss. About 9,398 mu of land will be occupied temporarily for channel dredging, dam rehabilitation, and facility pipe installation, for which there will be temporary income losses and the compensation will be paid in cash. In terms of house relocation of the Changle component, 310 rural households will be provided unified apartment units in a new resettlement community based on “get same construction area to the area of houses to be demolished”. Local governments will build the unified resettlement houses. In addition, affected households will be compensated by cash in standards of different housing structures. About 13 small stores

and/or shops operating with their houses will suffer demolition impacts. They will be compensated for their lost assets, and relocation and transitional allowances will be paid to them.

## **5. Institutional Arrangement**

110. The Shandong Province PMO will assume the overall responsibility for supervision of the implementation of LAR, including the planning, implementation, financing, and reporting of LAR. The implementing agencies: Changle, Gaomi, Huantai, Qingzhou, and Shouguang PIOs, respectively, will take the primary responsibility for the resettlement consultation, implementation, and timely delivery of entitlements. To ensure smooth implementation, the staff in charge of LAR will undertake training on resettlement implementation organized by the Shandong Province PMO. 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 in local language, and submitted to ADB for review and approval prior to award of civil works contracts.

## **6. Cost and Schedule**

111. The total estimate budget is CNY291.51 million, including: (i) costs for permanent land acquisition of CNY56.786 million (accounting for 19.32% in the total budget); (ii) compensation for temporary land occupation of CNY57.927 million (19.71%); (iii) compensation for houses demolition of CNY36.120 million (12.29%); (iv) compensation for ground affiliated facilities of CNY48.299 million (16.43%); (v) taxes of CNY36.491 million (12.42%); (vi) contingency of CNY26.0 million (9.19%); and (vii) other costs of CNY31.294 million (10.65%).

## **7. Monitoring and Reporting**

112. Each PIO will be responsible for monitoring and reporting progress on LAR implementation to the Shandong PMO, which will be summarized in the quarterly progress reports to be submitted to ADB. Each PIO will also engage an external monitor to assess progress, evaluate results, and submit report semiannually. These will be submitted to ADB and disclosed to affected persons.

**Table 6: Impact of Land Acquisition and Resettlement**

Item	Unit	Changle Component	Shouguang Component	Huantai Component	Qingzhou Component	Gaomi Component	Total	
Affected town/urban sub-district	No	1	-	-	-	-	1	
Affected village/community	No	9	-	-	-	-	9	
Permanent land acquisition	Total	mu	1,767.46	379.73	0	0	1.42	2,147.19
	Collective land	mu	1,026.71	379.73	0	0	1.42	1,407.86
	Farmland	mu	530.29	14.1	0	0	1.42	545.81
	Forestry land		254.45	0	0	0	0	254.45
	House plot and construction land	mu	63.85	0	0	0	0	63.85
	Enterprise land	mu	0	0	0	0	0	0
	Other land	mu	178.12	365.63	0	0	0	543.75
	State land	mu	740.75	0	0	0	0	740.75
Temporary land occupation	Collective land	mu	674.87	2,754	2,004	1,258.85	2,730.18	9,421.91
Acquisition of residential houses and structures	Rural house	m <sup>2</sup>	44,923.62	0	0	0	0	44,923.62
	Rural shanty	m <sup>2</sup>	2,857	0	0	0	0	2,857
	Urban house	m <sup>2</sup>	0	0	0	0	0	0
	Urban shanty	m <sup>2</sup>	0	0	0	0	0	0
	Urban enterprise/shop	m <sup>2</sup>	0	0	0	0	0	0
Affected rural households and persons	By land acquisition only	HH	136	0	0	0	0	136
		person	530	0	0	0	0	530
	By house demolition only	HH	191	0	0	0	0	191
		person	668	0	0	0	0	668
	Both land and house acquisition	HH	119	0	0	0	0	119
		person	499	0	0	0	0	499
Affected urban households and persons	Acquisition of residential houses	HH	0	0	0	0	0	0
		person	0	0	0	0	0	0
Total of affected households and persons	HH	446	0	0	0	0	446	
	person	1,697	0	0	0	0	1,697	

## VIII. GENDER AND SOCIAL DIMENSIONS

### A. Social and Gender Action Plan

#### 1. Introduction

113. A social and gender action plan (SGAP) was prepared jointly by the Shandong Province PMO; and participating local governments of Changle and Huantai counties, Gaomi, Qingzhou, and Shouguang cities, with the assistance of the PPTA social experts.

#### 2. Purpose

114. The purpose of the SGAP is to ensure that important social, poverty, and gender issues are addressed during project implementation to enhance project benefits and mitigate any likely negative impacts. Any adverse impacts need to be avoided or mitigated, and project benefits should be inclusive of vulnerable groups (e.g., poor, women, and others). The SGAP emphasizes social inclusion and equitable access to project benefits.

#### 3. Basis for the Social and Gender Action Plan

115. The SGAP has focused on issues related to directly affected people, vulnerable people, gender, and local social and agricultural development. Measures to address these issues have been formulated based on the poverty and social assessment report and adopted based on extensive stakeholder consultation. The main actions can be grouped into three types: (i) for structure components in outputs 1 and 2, the project benefits enhancement measures such as employment promotion and social risks mitigation measures such as pro-poor activities will be within the direct control of the implementing agencies; (ii) for non-structure components in outputs 1 and 2, public awareness activities and campaigns on water saving technology, irrigation water quota, water rights trading, ascending water pricing, etc. will be organized in the subproject areas each year, being the responsibility of the Shandong Province PMO and country PIOs.<sup>21</sup> In the case of Huantai subproject, public hearings on water quota, water rights trading, and ascending water pricing will be arranged in case of any changes in water price; and (iii) for two capacity development components in output 3, training, meetings, consultations, case studies, workshops and seminars on decision making, ADB project management procedures, technical design and implementation, public awareness, and consultation capacity enhancement will be arranged by the Shandong Province PMO and exchange opportunities for the five subproject counties/cities to learn local good practices from each other will be provided. Examples of good practices may include but are not limited to precise agriculture, sophisticated greenhouse cultivation, agricultural water saving technologies, rain water and dew water collection, groundwater and surface water monitoring, farmers' training experiment base, and farmers' water user association. Table 9 presents the SGAP, including the proposed actions, target groups, implementing agencies, timing, funding source, and monitoring indicators.

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<sup>21</sup> For example, local school's regular classes and activities on water saving, water resource protection, and pollution control will continue to play a fundamental role in youth education and students are invited to involve in the promotion of the project's new concepts.

#### 4. Gender Aspects

116. The project is classified by ADB as “some gender elements”. The Shandong Province PMO and the participating local governments have agreed to take following actions to enhance project benefits for women: (i) contractors hire women for project implementation with a target of 30% of newly created civil work positions; (ii) hire women for facilities’ operation with a target of 30% of newly created positions in reservoirs, river courses, open canals, etc.; (iii) conduct workshops and seminars on capacity development and public awareness enhancement and rotation show cases by the five subprojects with a target of 30% of female participants; and (iv) hold public hearings for irrigation water quota, ascending pricing, and trading with a target of 40% of female residents of the Huantai component.

117. The gender actions stress inclusion of all the society through:

- (i) Public participation and awareness enhancement. During the four-year project implementation phase, campaigns each year on agricultural water saving technology application; and promotion of agricultural water quota, water right trade, and ascending water pricing will require participation by women all over the project area. Local school’s regular classes and activities on water saving, water resource protection, and pollution control will continue to play a fundamental role in education, and school girls are invited to involve in the promotion of the project’s new concepts. In the case of Huantai, public hearings on water quota, water right trade, and ascending water pricing will require participation by 40% female representatives. Results will be regularly reported on the project performance monitoring system.
- (ii) Employment enhancement. Employment enhancement measures will include consultation and participation of women during project design and implementation, and preferential employment of women as unskilled laborers during and after project implementation. The employment plan includes a target of 30% for women in civil work during project implementation and in operation of reservoirs, river coarse and open canals, etc.
- (iii) Capacity development. Measures will include training, meetings, consultations, case studies, and workshops on topics including decision making, project management, safeguard supervision and monitoring, implementation of land acquisition and resettlement, public awareness, and consultation on capability enhancement. The training plan for capacity development has a target of 30% for women’s participation. The project will also organize subproject cities and/or counties to learn good practices from each other with a target of 30% for female participants.

#### 5. Poverty Reduction Aspects

118. The Shandong Province PMO and county and city PIOs have agreed to take following actions to enhance project benefits for the poor: (i) coordinating with contractors and local street offices or the affected villages to hire laborers from poverty villagers and/or households with a target of 15% of newly created positions for project construction; (ii) hiring laborers from poverty villagers/households with a target of 15% of newly created positions for project operation; (iii) public hearings for irrigation water quota, ascending pricing and trading with a target of 15% of representatives from low-income households; (iv) supporting local governments in technical

training programs or providing training for new workers before taking positions; and (v) promoting non-farm employment opportunities.

## **6. Implementation Arrangements**

119. The SGAP will be implemented by the county and city PIOs of the five subprojects in coordination with local governments as indicated in Table 9. Each PIO will appoint at least one staff to manage the SGAP implementation. The Shandong Province PMO will be responsible for overseeing the PIOs implementing those actions within their direct control, as well as supervision of related activities that involve the construction contractors. For actions outside the direct mandates of the PMO and PIOs, the assigned staff will be responsible to liaise with the relevant local government agencies, township governments, or village committees. This will ensure that appropriate measures are taken in a timely and satisfactory manner. The SPMO will also be responsible for monitoring and reporting progress, issues, and results. The Shandong Province PMO will provide ADB with SGAP monitoring reports for review semiannually and follow-up during loan supervision missions. If necessary, ADB and the executing agency may agree to revise the SGAP to improve the effectiveness of the proposed measures.

## **7. Funding Sources**

120. There are no specific funding sources for the SGAP other than: (i) the project cost (e.g., civil works, environmental management plan, or resettlement plan costs); (ii) support from the project implementation consultants; and (iii) local government funding for poverty reduction, etc. In this manner, some activities in the SGAP will be part of the project implementation and others will be integrated with ongoing government programs. The Shandong Province PMO will monitor implementation to ensure that sufficient funding is made available in a timely manner.



**Table 9: Social and Gender Action Plan**

<b>Output/ Component</b>	<b>Proposed Actions</b>	<b>Target Group(s)</b>	<b>Agencies Involved</b>	<b>Timing</b>	<b>Funding Needs and Source</b>	<b>Monitoring Indicators</b>
<b>Output 1: (I)</b>  <b>Output 2: (I) (II)</b>	<b>1. Employment Priority to Local People During Project Implementation</b> <ul style="list-style-type: none"> <li>• Priority to local labor in general.</li> <li>• Use of local construction materials, e.g., rock, gravel, clay, cement</li> <li>• Training on work safety, health and skills to be provided by contractors</li> </ul>	About 1,680 full time positions during project construction Targets: <ul style="list-style-type: none"> <li>➢ 15% women for labors in civil work</li> <li>➢ 15% poor for unskilled labor in civil work</li> <li>➢ 100% workers receive the training</li> </ul>	SPMO, subproject PMOs and IAs, contractors, local street offices, township governments, village committees	2016–2019	Included in project civil works cost and paid by contractors	<ul style="list-style-type: none"> <li>• No. of local people employed (disaggregated by sex, skilled/unskilled and poverty status)</li> <li>• Wages (disaggregated) paid to local people</li> <li>• Value of construction materials supplied locally</li> <li>• Training of local workers</li> </ul>
	<b>2. Protect local communities from construction disturbances and ensure safe construction practices</b> <ul style="list-style-type: none"> <li>• Prohibit nighttime construction and adhere to proposed noise standards</li> <li>• Reconstruct public facility systems such as road, poles and transformers recovery due to water pipe installation</li> <li>• Construction safety enhancement, including temporary road traffic (e.g., safe road conditions and proper warning signage)</li> </ul>	Residents close to project sites	Subproject PMOs, IAs, contractors, local governments, and residence communities	2016–2020	Included in project cost (refer to EMP)	<ul style="list-style-type: none"> <li>• No. and resolution of complaints (sex disaggregated)</li> <li>• Number of public facilities (% recovery)</li> <li>• Accidents on temporary construction roads</li> <li>• Accidents on project site</li> </ul>
	<b>3. Control and Prevention of the of HIV/AIDS/STIs</b> <ul style="list-style-type: none"> <li>• Centre for Disease</li> </ul>	All project construction workers	Subproject PMOs, IAs, Contractors, local CDPCs, and	2016–2020	Awareness training costs for workers are included in	<ul style="list-style-type: none"> <li>• No. of manuals, posters and drawing</li> </ul>

Output/ Component	Proposed Actions	Target Group(s)	Agencies Involved	Timing	Funding Needs and Source	Monitoring Indicators
	Prevention and Control (CDPC) provides training to worksite health promoters <ul style="list-style-type: none"> <li>Health promoters provide training to all workers and managers and subcontractors</li> <li>HIV/AIDS and STI counseling program and voluntary testing by health agencies for workers</li> <li>Provide manuals, posters and drawings</li> </ul>	Targets: <ul style="list-style-type: none"> <li>100% of worksite health promoters</li> <li>100% of workers managers and sub-constructors</li> <li>100% of communities and villages near the project sites</li> <li>100% of workplaces and project sites</li> </ul>	local governments		contract costs. Local CDPCs costs included in Department of Health budget	distributed <ul style="list-style-type: none"> <li>No. of training sessions and trainees (sex disaggregated)</li> <li>No. of tests and HIV/AIDS/STI cases (disaggregated) if have</li> </ul>
	<b>4. Employment Priority to Local People During Project Operation</b> <ul style="list-style-type: none"> <li>Priority to local labor in general</li> <li>Training on work safety, health and skills to be provided by operation units</li> </ul>	170 full time positions in reservoir, river course and open canals operation  Targets: <ul style="list-style-type: none"> <li>30% women of the positions</li> <li>15% poor of the positions</li> <li>100% workers receive the training</li> </ul>	SPMO, subproject PMOs, IAs, HRB, WRB, local street offices, township governments, village committees	2018 onwards	Included in project operation cost and paid by operation units	<ul style="list-style-type: none"> <li>No. of local people employed (disaggregated by sex, skilled/unskilled and poverty status)</li> <li>Wages (disaggregated) paid to local people</li> <li>Training of local workers</li> </ul>
	<b>5. Pro- poor program</b> <ul style="list-style-type: none"> <li>Inclusion of rural poor affected by land acquisition and resettlement under the minimum living standard security program based on</li> </ul>	Rural poor affected by the resettlement  Targets: <ul style="list-style-type: none"> <li>100% of rural poor</li> </ul>	Subproject city/county governments, CAB, HRB, township governments,	2016 onwards	Subproject government budget	<ul style="list-style-type: none"> <li>No. of poor designated from the affected villagers</li> </ul>

Output/ Component	Proposed Actions	Target Group(s)	Agencies Involved	Timing	Funding Needs and Source	Monitoring Indicators
	<p>careful assessment of their economic status</p> <ul style="list-style-type: none"> <li>• Inclusion of the poor and vulnerable households under project benefits</li> <li>• Inclusion of skill and job training for affected poor households for livelihood restoration</li> </ul>		village committees			
<b>Output 1: (II)</b>	<ol style="list-style-type: none"> <li>1. Organize water conservation awareness campaigns each year on water law, irrigation water saving knowledge, technologies and sustainable usage.</li> <li>2. Each year school activities, such as class discussion, papers writing, public outreaches, on water law, irrigation water saving knowledge, technologies and sustainable usage.</li> </ol>	<p>Subproject areas: Targets:</p> <ul style="list-style-type: none"> <li>➢ All the people</li> <li>➢ All the students</li> </ul>	SPMO, subproject PMOs, implementing agencies, WRS, FWUA, sub-districts, village committees, schools	2016–2020	Local government budget	<ul style="list-style-type: none"> <li>• No. of communities</li> <li>• No. of villages</li> <li>• No. of schools</li> <li>• No. of events</li> <li>• No. of participants (disaggregated by sex)</li> <li>• Types of means (TV, radio, newspaper, mobile vehicle broadcasting, village loudspeaker, flyers, advertisements, LED messages, movies, etc.)</li> </ul>
<b>Output 1: (III)</b>	<ol style="list-style-type: none"> <li>1. Organize water conservation awareness campaigns each year on irrigation water quota, water right trade, and ascending water pricing</li> <li>2. Each year school activities, such as class discussion, papers writing, public outreaches, on irrigation water quota, water right trade, and ascending water pricing</li> </ol>					
<b>Output 1: (III)</b>	<p><b>Public Hearings for Huantai Subproject on :</b></p> <ul style="list-style-type: none"> <li>• Agriculture Water Quota</li> </ul>	Residents in Huantai County	SPMO, Huantai County Government,	Before 2020	No budget needed	<ul style="list-style-type: none"> <li>• No. of public hearings</li> <li>• No. of participants</li> </ul>

Output/ Component	Proposed Actions	Target Group(s)	Agencies Involved	Timing	Funding Needs and Source	Monitoring Indicators
<b>Output 2: (III)</b>	<ul style="list-style-type: none"> <li>• Agriculture Water Right Trade</li> <li>• Agriculture Water Ascending Pricing</li> </ul>	Target: <ul style="list-style-type: none"> <li>➢ At least 15% of representatives from low-income households</li> <li>➢ At least 40% female representatives</li> </ul>	Huantai PMO (WRB), IAs, local FB, PB, sub-districts, township governments and village committees			<ul style="list-style-type: none"> <li>• (sex disaggregated, poor households)</li> </ul>
<b>Output 3: (I) (II)</b>	<ol style="list-style-type: none"> <li>1. Capacity development and training of SPG and county staff in ADB project management procedures, technical design and implementation, and safeguard supervision and monitoring.</li> <li>2. Provide overall project implementation support for the SPG and counties staff, including implementation of land acquisition and resettlement.</li> <li>3. Show cases on local good practices by Subproject Counties/Cities:               <ul style="list-style-type: none"> <li>• 2016 Huantai (integrated circuit card)</li> <li>• 2017 Shouguang (Smart Greenhouse) and Qingzhou</li> <li>• 2018 Changle and Gaomi</li> </ul> </li> </ol>	Project implementation staff Target: <ul style="list-style-type: none"> <li>➢ 30% female participants</li> <li>➢ 1 female staff in each PMO</li> <li>➢ 1 assigned staff in charge of SGAP and GAP implementation</li> </ul>	SPMO, Subproject PMOs, local governments, implementing agencies	2016–2020	Budgets included in Output 3 Project Implementation Supported	<ul style="list-style-type: none"> <li>• No. of workshops and seminars, etc.</li> <li>• No. of participants (sex disaggregated)</li> <li>• No. of female decision-makers</li> </ul>

AP = affected persons, CAB = Civil Affairs Bureau, CC = community committee, CDPC = centers for disease prevention and control, DI = design institute, DPA = Direct Project Area, EA = executing agency, FB = Finance Bureau, HH = household, GAP = gender action plan, IA = implementing agency, LAR = land acquisition and resettlement, SPMO = Shandong Project Management Office, PADO = Poverty Alleviation and Development Office, PB = Price Bureau, RIB = resettlement information booklet, RP = resettlement plan, Subproject PMO = subproject management offices, STI = sexually transmitted infection.

## IX. PERFORMANCE MONITORING, EVALUATION, REPORTING AND COMMUNICATION

121. A draft DMF for the project has been prepared during the PPTA work in accordance with ADB's guidelines. The DMF was developed following a set of principles, including:

- (i) Maintain the integrity of the DMF as a monitoring tool;
- (ii) Select indicators that can be supported with readily available data; and
- (iii) Choose benefit indicators that are appropriately matched to the anticipated benefits.

122. For each design category (impact, outcome, and outputs), performance indicators, data sources and reporting mechanisms, assumptions and risks were selected and specified during the PPTA. Activities with milestones for each of the three outputs were also identified and specified in the DMF.

### A. Project Design and Monitoring Framework

Impacts the Project is Aligned with:			
Groundwater supply for the agriculture sector in the Weifang–Zibo area sustained (State Council. 2011. <i>National Plan to Protect the Safety of Groundwater Resources, 2011–2020</i> . Beijing; State Council. 2015. <i>Action Plan to Tackle Groundwater Pollution</i> . Beijing)			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
<b>Outcome</b> Conservation and sustainable use of groundwater resources in Weifang and Zibo prefectures improved	By 2023 a. Average groundwater levels recovering over an area of 120,000 ha in the groundwater depression zone (2014 baseline: 0 ha)  b. Additional annual surface water retained to groundwater depression zone to the expected amount of 60 million m <sup>3</sup> (2014 baseline: 0 m <sup>3</sup> )	Project technical and progress reports  Annual groundwater monitoring and assessment reports from the SPG  Other available bulletins and assessment reports from the SPG	Inadequate institutional coordination among the local governments on improved water resource allocation  Water demand from urban and industrial sector increases to unsustainable levels
<b>Outputs</b> 1. Groundwater recharged and conserved	By 2022 1a. About 880 ha of wetlands created (2014 baseline: 0 ha)  1b. Annual water supply to Mata Lake and Judian Lake wetlands reaches 47 million m <sup>3</sup> (2014 baseline: 12 million m <sup>3</sup> )	1a. Project technical and progress reports  1b. Annual reports from the SPG and Weifang and Zibo prefectures	Late release of counterpart funds

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
	1c. Water resources monitoring system in Huantai County operational (2014 baseline: none)	1c. Surface water and groundwater monitoring data and reports from the SPG	
2. Surface water allocation improved and monitored	<p>By 2022</p> <p>2a. About 345 km of canals constructed, rehabilitated, and improved to reallocate water to water-scarce areas (2014 baseline: 0 km)</p> <p>2b. Capacity to retain and store up to 8.3 million m<sup>3</sup> of rainwater per year by the Nanzhai and Juchenghe reservoirs (2014 baseline: 3.7 million m<sup>3</sup>)</p> <p>2c. Capacity of water diversion by the reservoir connection works under the project increases to 49 million m<sup>3</sup> per year (2014 baseline: none)</p> <p>2d. 40 km of water supply pipes installed or upgraded in Gaomi and Qingzhou cities (2014 baseline: 0 km)</p>	<p>2a. Project technical and progress reports</p> <p>2b. Annual reports from the SPG and Weifang and Zibo prefectures</p> <p>2c. SPG flow monitoring data and water diversion records</p>	Implementation of resettlement plan encounters problems and delays
3. Capacity development for water resources management enhanced	<p>By 2022:</p> <p>3a. About 150 qualified SPG and city and county water resources management staff (at least 30% of whom are female) trained on water resources management information system establishment, water user association piloting, and water saving technologies promotion (2014 baseline: 0)</p> <p>3b. At least three knowledge products will be published to document the demonstration activities (2014 baseline: 0)</p>	<p>3a. Project technical and progress reports</p> <p>3b. Annual reports from the SPG</p>	High turnover of trained staff

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
	3c. Creation of about (i) 1,680 jobs during construction, with 20% women and 20% poor (with necessary trainings provided); and 170 jobs during operation of the project, with 20% women and 20% poor (with necessary trainings provided) (2014 baseline: 0)		

### Key Activities with Milestones

#### 1. Groundwater recharged and conserved

- 1.1 Acquire land and conduct temporary land occupation activities during 2015–2017
- 1.2 Rehabilitate and construct 1,600 ha of wetland areas for Judian Lake for the recharge of shallow groundwater resources by 2020
- 1.3 Implement technological innovation monitoring of groundwater recharge by 2021

#### 2. Surface water allocation improved and monitored

- 2.1 Acquire land and conduct resettlement activities for the Nanzhai Reservoir and canals during 2015–2019
- 2.2 Construct 45 km of new water allocation channels by 2020
- 2.3 Construct 40 km of new water allocation pipes and/or culverts by 2019
- 2.4 Rehabilitate 300 km of rivers and/or channels by 2020
- 2.5 Construct 29 million m<sup>3</sup> of wetland retention capacity of storm water by 2020
- 2.6 Improve surface water allocation by 2019
- 2.7 Establish modernized digital water flow and quality monitoring, including disclosure and dissemination of groundwater information by 2020

#### 3. Capacity development for water resources management enhanced

- 3.1 Support project final design and implementation during 2016–2022
- 3.2 Conduct capacity development and training for five staff members from the SPG and 30 from the city and county governments in ADB project management procedures, technical design and implementation, and safeguard supervision and monitoring by 2017
- 3.3 Develop and implement innovative economic and regulatory instruments for groundwater conservation by 2020
- 3.4 Complete a water pricing strategy by 2020
- 3.5 Provide overall project implementation support for staff from the SPG and the prefecture, city and county governments, including implementation of land acquisition and resettlement during 2015–2022

### Inputs

ADB	\$150.00 million
Government	\$194.03 million
Beneficiaries	\$TBD

### Assumptions for Partner Financing

Not Applicable

ADB = Asian Development Bank, ha = hectare, km = kilometer, m<sup>3</sup> = cubic meter, SPG = Shandong Provincial Government.

Source: ADB estimates.

## **B. Monitoring**

### **1. Project performance monitoring**

123. **Project performance monitoring.** To monitor project progress in achieving the planned outcome and outputs, the PMO will establish and maintain PPMS, which will be designed to permit adequate flexibility to adopt remedial action regarding project design, schedules, activities, and development impacts. The PPMS will adopt agreed indicators relating to the following aspects of the project: (i) project physical and financial progress, (ii) improvement in groundwater level and groundwater conservation, (iii) improvement in surface water allocation, (iv) safeguard compliance and SGAP implementation, and (v) results of project implementation support through training and management.

124. At the beginning of project implementation, the PMO will develop comprehensive PPMS procedures to systematically generate data in the above areas in consultation with the implementing agency, and with the assistance of consultants. The PMO will refine the PPMS framework, confirm achievable targets, monitoring and recording arrangements, and establish relevant systems and procedures not later than 6 months after loan effectiveness. The PMO will assign staff, or contract consultants to collect baseline and progress data at the requisite time intervals, including annual reporting. The PMO will be responsible for analyzing and consolidating reported data through its management information system, and reporting outcomes to ADB through semiannual progress reports.

125. **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 remedial 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.

### **2. Safeguards monitoring**

#### **a) Environment**

126. The project monitoring program focuses on the environment in the project areas of influence in the five project cities/counties. A detailed environmental monitoring program is in Table EMP-8 of the project EMP (including parameters, time and frequency, implementing and supervising agencies, and estimated costs). The monitoring shall comply with the methodology provided in the relevant national environmental monitoring standards. Other associated standards to be followed are the national environmental quality standards of air, surface water, groundwater and noise, and the pollutant discharge standards.

127. **Internal monitoring and supervision and reporting by CSCs.** During construction, the CSCs will be responsible for conducting internal environmental monitoring in accordance with the monitoring plan (Table EMP-7, Table EMP-8 of the EMP). Supervision results will be reported through the CSC reports to the PIOs.

128. **EMP implementation monitoring 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 semiannual EMP monitoring and progress reports. The reports will include (i) progress made in 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 LIEC will help PMO prepare the reports and submit the English report to ADB for appraisal and disclosure.

129. **Project completion environmental audits.** Upon completion of each subproject, environmental acceptance monitoring and audit reports 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 semiannual EMP monitoring and progress reporting process. These subproject completion reports shall be finalized within 3 months after each subproject completion, or no later than 1 year with permission of the local environment protection bureaus.

130. **Environmental compliance monitoring by local EMS.** The PIOs in each city or county will contract the city or county EMS to conduct environmental monitoring in accordance with the monitoring program. A detailed cost breakdown will be provided by the county EMS when the environmental monitoring program is updated at the start of each component implementation. Monitoring will be conducted during construction and operation period, until a PCR is issued. Semiannual monitoring reports will be prepared by the EMSs and submitted to PMO and the PIOs.

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

- (i) Regulations of QA/AC 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.

#### **b) Land Acquisition and Resettlement**

132. Requirements for both the internal and external monitoring and evaluation (M&E) are included in the resettlement plans. The Shandong Province PMO will summarize LAR progress in the quarterly progress reports to ADB. Furthermore, the Shandong Province PMO will ensure an external resettlement monitoring institute or firm is engaged to assess progress and evaluate results. Resettlement baseline surveys will be completed before the LAR begins and the first monitoring report will be submitted in December 2015. After that and until the project completion, semiannual monitoring reports will be prepared and submitted to ADB and the PMO.

### **3. Social and gender monitoring**

133. **Social and gender action plan.** Monitoring and evaluation of the SGAP will be incorporated into the overall monitoring and evaluation plan for the project. The PMO and PIOs will be responsible for establishing and coordinating regular monitoring and evaluation. ADB staff with expertise in gender issues will participate in the midterm review. The project implementation consultant will work with Shandong PMO and PIO staff to create an

implementation and monitoring plan for each of the tasks outlined, help to complete the first semiannual progress report, and review the second semiannual report prepared by the PMO and PIOs.

### **C. Evaluation**

134. In addition to regular monitoring, project performance will be reviewed at least once a year jointly by ADB and the SWRD. 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 and SWRD 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. Within 3 months of physical completion of the project, SWRD will submit a PCR to ADB.

### **D. Reporting**

135. SWRD will provide ADB with (i) quarterly progress reports in a format consistent with ADB's project performance reporting system; (ii) consolidated annual reports including (a) progress achieved by output as measured through the indicator's performance targets, (b) key implementation issues and solutions; (c) updated procurement plan and (d) updated implementation plan for next 12 months; and (iii) a PCR within 6 months of physical completion of the project. To ensure projects continue to be both viable and sustainable, project accounts and the executing agency AFSs, together with the associated auditor's report, should be adequately reviewed.

136. Within 6 months after project completion, the PMO will prepare, in coordination with the PIO and SPG, and submit to ADB a PCR evaluating the performance of the PMO and PIO; and summarizing the loan funds utilization, project implementation, attainment of project impact, outcome, and outputs, implementation experience, project performance, actual costs incurred, benefits, and other information requested by ADB, and assessing the accomplishment of the purposes of the loan.

### **E. Stakeholder Communication Strategy**

137. Relevant project information, including implementation progress, will be disclosed in ADB website and at the PMO and PIOs. This may include the DMF, the environmental assessment, the EMP, resettlement plans, and SGAP. Stakeholder workshops will be held throughout project implementation to encourage key stakeholders, particularly workers and residents in project areas, to participate in achieving the project benefits and to make sure all stakeholders, including women, poor and other vulnerable groups, benefit from the project.

## **X. ANTICORRUPTION POLICY**

138. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy relating to the project.<sup>22</sup> 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.

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<sup>22</sup> Available at: <http://www.adb.org/Documents/Policies/Anticorruption-Integrity/Policies-Strategies.pdf>

Individuals/entities on ADB's anticorruption debarment list are ineligible to participate in ADB-financed activity and may not be awarded any contracts under the project.<sup>23</sup>

139. To support these efforts, relevant provisions are included in the loan agreement and the bidding documents for the project.

## **XI. ACCOUNTABILITY MECHANISM**

140. 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.<sup>24</sup>

## **XII. RECORD OF PAM CHANGES**

141. All revisions and/or updates during course of implementation should be retained in this Section to provide a chronological history of changes to implemented arrangements recorded in the PAM.

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<sup>23</sup> ADB's Integrity Office web site is available at: <http://www.adb.org/integrity/unit.asp>

<sup>24</sup> For further information see: <http://www.adb.org/Accountability-Mechanism/default.asp>.

## **DRAFT TERMS OF REFERENCE FOR ENVIRONMENTAL POSITIONS**

### **1. PMO 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 include implementation of an environment management plan (EMP), which is prepared as part of the project environment impact assessment. 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 (6 years).

#### **C. Qualifications**

3. The officer will have: (i) a bachelor's 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 environmental impact assessment (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, and provincial and municipal agencies for environment 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 responsible for the internal environment monitoring described in the EMP understand their tasks and will implement the monitoring in a timely fashion.
- (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) preparation of 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) preparation of 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 the implementation agencies 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 implementation agencies, 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). Ensure that all information is stored in the PMO filing system, backed up, and can be easily retrieved.
- (xi) Prepare semiannual environment progress reports.
- (xii) Work closely with the PMO, implementation agencies, 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 the 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.
- (iii) Overall coordination, including review of the draft semiannual monitoring reports, and final responsibility for submission of the monitoring reports to ADB.

## **2. Project Implementation Office Environment Officer**

### **A. Background**

6. The project will be coordinated by a PMO. Overall coordination of the project EMP is the responsibility of the PMO environment officer. At the field level, implementation of the EMP will be undertaken by the project implementation office (PIO) in each of the five project counties. For this purpose, the PIO requires a PIO environment officer.

### **B. Scope and Duration of Work**

7. The officer will work on behalf of the PIO to implement the project EMP. The officer will report directly to the PIO manager and work closely with the county environment protection bureau (EPB), environment monitoring station (EMS), and PMO environment officer. The position is for the entire project duration (6 years).

### **C. Qualifications**

8. The officer will have: (i) a bachelor's 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 PIO environment officer will have a detailed understanding of the project EMP and supporting documents, including the domestic environmental reports, project 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, 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 environment 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 PIO and PMO environment officer.
- (vi) Implement the project 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.
- (ix) Support the PMO environment officer in all of their tasks.

#### **E. Reporting Requirements**

10. Monthly reports to the PIO and PMO environment officer.

### **3. Loan Implementation Environmental Consultant**

#### **A. Background**

11. The project will be coordinated by a PMO, whose overall responsibility includes implementation of the project EMP. At the field level, the project will be implemented by a PIO in each of the five project counties. The PMO and PIOs will be assisted by a loan implementation consultant team. The loan implementation environmental consultant (LIEC) will be a part of this team and will support the PMO and PIOs to implement the project EMP.

#### **B. Scope and Duration of Work**

12. This position could be a firm or an individual engaged by the PMO. It is an independent position. It is not part of the PMO in-house environmental team or the implementing agencies. The specialist will report directly to the PMO. The position is for the entire project duration (6 years). 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) a bachelor's 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 PIO environmental officers, the LIEC will do the following.

15. 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 PIOs to implement the GRM, including: (i) establish and publicize the GRM; and (ii) collate and evaluate 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) Undertake training of project agencies as required by the EMP training plan.
- (v) Provide hands-on support and on-the-job training to the PMO, implementing agencies, and contractors on the specific requirements of the EMP as required.

16. During project implementation:

- (i) Undertake site visits to all implementing agencies during subproject construction and operating phase.
- (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.
- (v) Assist the PMO to prepare semiannual environmental monitoring progress reports for submission to ADB.