

Project Administration Manual

Project Number: 52025-001
Loan Number: {LXXXX}
September 2020

People's Republic of China: Yunnan Sayu River
Basin Rural Water Pollution Management and
Eco-Compensation Demonstration Project

CURRENCY EQUIVALENTS

(as of 5 August 2020)

Currency unit	–	yuan (CNY)
CNY1.00	=	\$0.1434
\$1.00	=	CNY6.9736

ABBREVIATIONS

ADB	–	Asian Development Bank
COD	–	chemical oxygen demand
COVID-19	–	coronavirus disease
CSC	–	construction supervision company
EFMC	–	eco-compensation fund management committee
EIA	–	environmental impact assessment
EMA	–	environmental monitoring agency
EMDP	–	ethnic minority development plan
EMP	–	environmental management plan
ESMS	–	environmental and social management system
GAP	–	gender action plan
GRM	–	grievance redress mechanism
IWRM	–	integrated water resources management
LAR	–	land acquisition and resettlement
LCG	–	Ludian County Government
LPMO	–	local project management office
M&E	–	monitoring and evaluation
<i>mu</i>	–	a Chinese unit of measurement (1 <i>mu</i> = 666.67 square meters)
NH ₃ -N	–	ammoniacal nitrogen
NPS	–	nonpoint source
O&M	–	operation and maintenance
OCB	–	open competitive bidding
PMO	–	project management office
PRC	–	People's Republic of China
SDAP	–	social development action plan
SOE	–	statement of expenditures
SPS	–	Safeguard Policy Statement (2009)
YPFD	–	Yunnan Provincial Finance Department
YREB	–	Yangtze River Economic Belt
YWPCO	–	Yudong Reservoir Water Resources Protection Committee Office
ZCG	–	Zhaotong City Government
ZDG	–	Zhaoyang District Government

NOTE

In this report, "\$" refers to United States dollars.

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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 policies and procedures of the borrower, the Government of the People's Republic of China; and the Asian Development Bank (ADB). The PAM should include references to all available templates and instructions either through linkages to relevant URLs or directly incorporated in the PAM.

The Zhaotong City Government (ZCG), the executing agency; and the Yudong Reservoir Water Resources Protection Committee Office of the ZCG, the Zhaoyang District Government, and the Ludian County Government, the implementing agencies, are wholly responsible for the implementation of the ADB-financed projects, as agreed jointly between the borrower and ADB; and in accordance with the policies and procedures of the government and ADB. The ADB staff is responsible for supporting implementation, including compliance by the ZCG, the Yudong Reservoir Water Resources Protection Committee Office, the Zhaoyang District Government, and the Ludian County Government of their obligations and responsibilities for project implementation in accordance with ADB's policies and procedures.

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

After ADB Board's approval of the project's report and recommendations of the President, changes in the 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.

I. PROJECT DESCRIPTION

A. Rationale

1. The Yangtze River Economic Belt (YREB) covers nine provinces and two specially administered cities in the Yangtze River Basin. It accounts for more than 40% of the population of the People's Republic of China (PRC) and has 40% of the freshwater resources. It also serves as the drinking water source for 400 million people, provides 60% of the total fisheries production, has 20% of the total wetland area, and contributes about 45% of the PRC's economic output. The YREB has been earmarked as one of three key growth engines to ensure the PRC's future economic development.¹

2. The YREB has benefited from extensive development since the 1990s. Yet, economic growth in the middle and upper reaches of the Yangtze River Basin is lagging and below its potential capacity. The middle and upper reaches of the Yangtze River Basin still face significant development challenges because of (i) slow transformation for green development and economic diversification; (ii) limited integration of waterways, ports, and intermodal logistics; (iii) increasing pollution and pressure on natural resources; and (iv) weak institutional coordination for strategic planning.² The YREB faces a growing imbalance between economic achievements and the quality of the environment. For example, since 1980, water pollution in the Yangtze River Basin has risen by 73% because of the discharge of waste;³ soil erosion, which is critical in small watersheds;⁴ and agriculture-related nonpoint source (NPS) pollution.

3. To address these challenges, the Government of the PRC formulated the YREB Development Plan, 2016–2030,⁵ which stipulates the prioritization of ecological protection and the promotion of green development as the guiding principle for the YREB development.⁶ In relation to this, the Asian Development Bank (ADB) and the government agreed to adopt a framework approach, providing about \$2.0 billion of funding in the YREB during 2018–2020 to strategically program ADB's lending support for development initiatives in the YREB, prioritizing the following four areas: (i) ecosystem restoration, environmental protection, and water resources management; (ii) green and inclusive industrial transformation; (iii) construction of an integrated multimodal transport corridor; and (iv) institutional strengthening and policy reform.

4. Zhaotong City of Yunnan Province has been selected to demonstrate water pollution reduction in the Sayu River Basin. Zhaotong has one district, one county-level city, and nine counties, of which the district and all counties are nationally designated poverty areas. Zhaotong has 1,336,700 poor people (as of 2016)—the largest poor population in Yunnan. The Sayu River is a 186-kilometer long tertiary tributary of the Yangtze River. The Sayu River Basin, covering 3,558 square kilometers, is an important area for ecological protection in the upper Yangtze River Basin. It is the only centralized drinking water source in Zhaotong. Urban drinking water is

¹ The other flagship projects are the Belt and Road Initiative and the Beijing–Tianjin–Hebei Integrated Regional Development Strategy.

² Asian Development Bank (ADB). 2016. *Yangtze River Economic Belt Environmental Protection and Rehabilitation Project—A Preliminary Study*. Consultant's report. Manila (TA 9044-PRC).

³ The upper and middle reaches of the Yangtze River Basin account for 80% of the YREB's wastewater discharge, and the tributaries have the worst water quality in the basin. Among the rural villages in the YREB, about 40% do not have garbage collection facilities and about 80% lack basic sewage treatment.

⁴ Every year, the Yangtze River Basin loses 2.24 billion tons of soil, damaging 67,000 hectares of farmland because of soil erosion.

⁵ Government of the PRC. 2016. *Outline of the Yangtze River Economic Belt Development Plan, 2016–2030*. Beijing.

⁶ Green development aims to (i) change the traditional development model to a sustainable development model, (ii) address the challenges of rapid urbanization, and (iii) serve as a guide to socioeconomic development.

primarily provided from the Yudong Reservoir. The entire Yudong Reservoir Basin is part of Ludian County and Zhaoyang District in Zhaotong. Water in the Sayu River Basin, including the Yudong Reservoir, is polluted because of (i) waste discharging in the Sayu River Basin, (ii) high sediment runoff into the Sayu River because of soil erosion, and (iii) agriculture-related NPS pollution. In many locations of the Sayu River, the water quality is worse than the Class III national standard, which is unfit for drinking.⁷ Local people living around the Sayu River Basin, particularly women and the poor, suffer from water pollution. Poor water quality also increases the time spent by women seeking clean water for their families.

5. Rural domestic wastewater, solid waste, and human and animal wastes pollute the water in the Sayu River Basin because of inadequate waste management. Rural domestic wastewater and solid waste contribute 27% of the chemical oxygen demand (COD), 9% of the total nitrogen, 16% of the total phosphorus, and 22% of the ammoniacal nitrogen (NH₃-N) in the Sayu River.⁸ Human and animal wastes contribute 39% of the COD, 25% of the total nitrogen, 52% of the total phosphorus, and 48% of the NH₃-N in the Sayu River (footnote 8). Since forest coverage in the Sayu River Basin is only 30.2% because of the expansion of farmland, which is significantly smaller than the 60%–70% appropriate for centralized drinking water sources, soil erosion is quite serious in this basin. About 57.9% of the Sayu River Basin is prone to soil erosion, providing 1.1 million tons of soil per year. High sediment runoff caused by soil erosion contributes 34% of the COD, 21% of the total nitrogen, 11% of the total phosphorus, and 18% of the NH₃-N in the Sayu River (footnote 8). Water in the Sayu River Basin is further deteriorated by agriculture-related NPS pollution because of inadequate waste management systems, uncontrolled fertilizer release, and outdated production systems. Agriculture-related NPS pollution (e.g., farmland solid waste and fertilizer) contributes 45% of the total nitrogen, 21% of the total phosphorus, and 12% of the NH₃-N in the Sayu River (footnote 8). It also contributes to climate change through direct and indirect emission of greenhouse gases. This situation may be aggravated by intensified and more frequent rainfall events induced by global climatic changes, which contribute to soil erosion and agriculture-related pollution to water systems.

6. Capacity is lacking for holistic planning, financing, and implementing of water pollution reduction activities.⁹ Public awareness of water pollution problems, particularly interlinkages between household and economic activities and water quality, is also insufficient. As Zhaotong is considered a poor city, it urgently needs a sustainable financing mechanism for investments to address water pollution sustainably.

7. In 2006, the Zhaotong City Government (ZCG) established a fund for ecological restoration and remediation of water source protection areas of the Yudong Reservoir. The ZCG provided CNY3 million to the fund every year from 2006 to 2014. Since 2015, the fund has received CNY17 million annually.¹⁰ Deficiencies of this fund include the small contribution from beneficiaries—only CNY2 million out of CNY17 million annually (footnote 10); and lack of operational procedures of a committee managing the fund, including criteria for screening of

⁷ Following the PRC's Environmental Water Quality Standard (GB 3838-2002).

⁸ Zhaotong City Government (ZCG). 2015. *Zhaotong Yudong Reservoir Water Resources Protection Special Remediation Plan, 2015–2020*. Zhaotong. In 2013, the Sayu River had 14,345.51 tons of COD, 75,655 tons of total nitrogen, 3,818.98 tons of total phosphorus, and 185.12 tons of NH₃-N.

⁹ An example is the “river chief” system, which was introduced in the PRC in 2017. It assigns each part of a river and lake to a certain official. Currently, river chiefs have difficulties collecting the data and information necessary for river management.

¹⁰ This comprises CNY8 million from the ZCG, CNY5 million from the Zhaoyang District Government (ZDG), CNY2 million from the Ludian County Government (LCG), and CNY2 million of water resources utilization fees from a downstream hydropower station every year. Zhaoyang District and Ludian County are in Zhaotong City, and the LCG and the ZDG are the project implementing agencies (TableIII.1).

activities proposed for financing from the fund. The ZCG would like to upgrade the fund to a new eco-compensation fund, incorporating international good practices for sustainable financing mechanisms. In 2018, the ZCG established a district- and county-level horizontal (i.e., between the same levels of local government) eco-compensation mechanism, which consists of 14 horizontal eco-compensation agreements for 17 river sections crossing the borders of Zhaotong's one district, one county-level city, and nine counties.¹¹ However, these agreements have not yet been implemented because of lack of water quality monitoring facilities.

8. In February 2018, the State Council of the PRC promulgated a policy on rural vitalization as a driver for the PRC's modernization goals and for building a moderately prosperous society. The policy targets establishing an institutional framework by 2020, modernizing rural areas by 2035, and beautifying the countryside by 2050. Local governments will formulate and start implementing their plans, aimed at improving public services and promoting environmental protection, during 2018–2022. Yunnan Province, particularly Zhaotong, will be a government priority for this policy implementation.¹²

9. **COVID-19 pandemic.** The coronavirus disease (COVID-19) pandemic has amplified the effects of interlinkages between biodiversity, public health, and ecosystem-dependent global supply chains. COVID-19 is being contained in the PRC, but it remains a risk. With COVID-19 as a trigger, the need for measures to prevent the spread of future infectious diseases is attracting attention.

10. **Strategic fit.** The project aims to demonstrate water pollution management in the Sayu River Basin. This will contribute to the PRC's goal of building a harmonious and prosperous society through environmentally sustainable growth; and is consistent with (i) the PRC's Thirteenth Five-Year Plan, 2016–2020, which aims to realize “ecological civilization;”¹³ (ii) the YREB Development Plan, 2016–2030 (footnote 5), which emphasizes green development, environmental protection, rehabilitation, and management of water resources; (iii) the PRC's policy to vitalize rural areas (para. 8); (iv) ADB's Strategy 2030, which emphasizes the importance of environmentally sustainable and inclusive growth;¹⁴ (v) ADB's country partnership strategy, 2016–2020 for the PRC, which aims to improve the PRC's environment and manage climate change by realizing “ecological civilization;”¹⁵ and (vi) ADB's Water Operational Plan, 2011–2020, which emphasizes integrated water resources management (IWRM).¹⁶ It is also in line with the Sustainable Development Goals 1, 2, 3, 5, 6, 12, 13, and 15.¹⁷

¹¹ Each agreement is for one to three river sections crossing the border. Compensation is paid based on the water quality at the border. Of the 14 agreements, one is for the Longshu River in the Sayu River Basin and two other rivers outside the Sayu River Basin, signed by the LCG and the ZDG. Each of them provides CNY2.0 million per year; CNY2.4 million is allocated to the upstream LCG and CNY1.6 million to the downstream ZDG. At the border of Zhaoyang District and Ludian County, the water quality of the Longshu River and two other rivers in the Sayu River Basin is measured monthly (36 sets of monitoring data/year). Every year, CNY2.4 million multiplied by the ratio of monitoring data number which did not meet the standard agreed between the LCG and the ZDG is deducted from the LCG and added to the ZDG.

¹² State Council of the PRC. 2018. [Policies Released on China's Rural Vitalization](#). News release. 4 February.

¹³ Government of the PRC. 2015. [Outline of the Thirteenth Five-Year Plan on National Economic and Social Development, 2016–2020](#). Beijing.

¹⁴ ADB. 2018. [Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and Pacific](#). Manila.

¹⁵ ADB. 2016. [Country Partnership Strategy: People's Republic of China, 2016–2020—Transforming Partnership: People's Republic of China and Asian Development Bank](#). Manila.

¹⁶ ADB. 2011. [Water Operational Plan, 2011–2020](#). Manila.

¹⁷ United Nations. [Sustainable Development Goals](#).

B. Impact and Outcome

11. The project is aligned with the following impact: quality of life and sustainable aquatic ecosystem in the Yangtze River Basin improved (footnote 5). The project will have the following outcome: condition of water resources and environment in the Sayu River Basin improved.¹⁸

C. Outputs

12. **Output 1: Wastewater management and pollution control in the Sayu River Basin strengthened.** This includes (i) the development of waste management systems, particularly distributed systems, which have advantages over the traditional centralized system (e.g., lower operational cost); (ii) the development of solid waste management systems, including garbage pyrolysis facilities, with capacity and institutional development for garbage classification and collection; (iii) the development of pilot eco-villages to reduce emissions through environmental protection activities, education, and publicity; (iv) wetland construction to reduce the NPS pollution, introducing new types of artificial wetlands combined with wastewater treatment facilities; (v) afforestation and the establishment of a quantifiable soil and water conservation model to estimate afforestation's effects on soil and water conservation based on tree species, planting density, age of trees, and slope degrees.; and (vi) the promotion of low-emission agriculture with innovative technologies (ecological drainage ditches, gridded surface source pollution monitoring platforms, and measures to estimate at least necessary fertilizer volume) and incentives (establishing green and organic crop brands). The project will conduct baseline and "endline" surveys to compare the amount of time women spend on waste and solid waste management before and after the project.¹⁹

13. **Output 2: Water resources management in the Sayu River improved.** This includes (i) the establishment of a smart water integrated management platform by constructing monitoring facilities and integrating them with the existing irrigation area information system for real-time monitoring and actions in the event of water quality deterioration; and (ii) the establishment of a river protection model that links the existing river chief system in the PRC, a real-time water quality monitoring system (a subsystem of the smart water integrated management platform), and facilities to protect rivers from pollution (e.g., ecological embankments).

14. **Output 3: Eco-compensation mechanism for the Sayu River Basin established.** This includes the (i) implementation of the horizontal eco-compensation agreement between the Ludian County Government (LCG) and the Zhaoyang District Government (ZDG), (footnote 11); (ii) establishment and implementation of new town- and township-level horizontal eco-compensation mechanisms, consisting of six agreements; and (iii) establishment and implementation of an eco-compensation fund that will contribute to sustainable water pollution management.

15. For the implementation of the horizontal eco-compensation agreement and new town- and township-level horizontal eco-compensation mechanisms, water quality monitoring will be conducted to judge whether water quality targets set in the agreements were achieved, which will be the basis for compensation.

16. While the horizontal eco-compensation agreements incentivize good upper basin management and cost-sharing between upstream and downstream governments, (i) they lack the

¹⁸ The design and monitoring framework is in Section IX.

¹⁹ An "endline" survey aims to measure the effects at the end of the project.

involvement of ecosystem services providers and beneficiaries and value flow between the ecosystem service providers and beneficiaries; and (ii) compensation amounts to upstream governments are small and insufficient for interventions needed in the upstream areas. The eco-compensation fund will make up for these shortcomings of the horizontal eco-compensation agreements. It will be established by improving the fund for ecological restoration and remediation of water source protection areas of the Yudong Reservoir (para. 7). The eco-compensation fund will provide grants to relevant government agencies and private companies,²⁰ for (i) activities under Output 1, including wastewater management, solid waste management, pilot eco-villages, operation and maintenance (O&M) of the constructed wetlands, compensation for the farmland-to-forest conversion, and promotion of low-emission agriculture; (ii) the operation of the river protection model established under Output 2; (iii) the implementation of the seven horizontal eco-compensation agreements under Output 3 (para. 14); and (iv) management of the eco-compensation fund, excluding any civil works. The fund will be initially supported by the ZCG, LCG, ZDG, ADB, and a beneficiary,²¹ with the longer-term goal of collecting more funding from beneficiaries,²² to improve the sustainability of the fund and strengthen the direct linkage between upstream eco-service providers and downstream beneficiaries, following the principle that those who benefit should compensate. Assurances are included in the project agreement to ensure and increase contributions to the fund, particularly from beneficiaries. An eco-compensation fund management committee (EFMC), of which women will comprise at least 35%, will be established in the ZCG.²³ The EFMC will conduct screening of activities proposed for financing from the eco-compensation fund, following an environmental and social management system (ESMS). The Yudong Reservoir Water Resources Protection Committee Office (YWPCO) in the ZCG will manage the fund, following the decisions of the EFMC.²⁴ The Zhaotong City Finance Bureau (ZCFB) will open and manage an account for the eco-compensation fund, following decisions of the EFMC.

17. Output 4: Education, capacity, and public awareness for water pollution management strengthened. This includes (i) capacity development of government staff on rural water pollution management and eco-compensation; (ii) the education of students in rural water pollution management and eco-compensation; (iii) public awareness raising; and (iv) the dissemination and replication of project initiatives, with at least 40% participation by women.

18. Detailed project outputs and activities are given in Appendix 1.

19. Lessons. The project design has incorporated lessons from international practices and previous ADB-financed projects and studies on the IWRM and the environmental and ecosystem improvement, such as the importance of (i) implementation arrangements for funds,²⁵ (ii)

²⁰ Private companies will operate a wastewater treatment plant or conduct solid waste management based on contracts with the ZDG or the LCG.

²¹ From 2023, annual contributions to the eco-compensation fund will be as follows: ZCG, CNY8 million; ZDG, CNY5 million; and LCG, CNY2 million. Some CNY2 million of water resources utilization fees from the downstream Baohu hydropower station will be contributed to the fund every year from 2023. An ADB loan of about \$5 million will be contributed to the fund during the project.

²² Beneficiaries will include downstream water and hydropower users, irrigation water users, and the business sector.

²³ The chair of the EFMC will be the vice mayor of the ZCG; and the members will be the deputy directors general of about 10 ZCG agencies, including the Zhaotong City Development and Reform Committee, the Zhaotong City Finance Bureau, and the Zhaotong City Environment and Ecology Bureau.

²⁴ About 15 full-time staff of the YWPCO, which manages the fund for ecological restoration and remediation (para. 7), will manage the new eco-compensation fund.

²⁵ ADB. 2019. [*Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Anhui Huangshan Xin'an River Ecological Protection and Green Development Project*](#). Manila.

promoting the IWRM at river basin scale by prioritizing upstream–downstream and urban–rural linkages, (iii) promoting nature-based solutions, (iv) strengthening nonstructural measures, (v) supporting institutional reforms that contribute to sustainable IWRM, (vi) providing capacity development for project implementation and O&M, and (vii) establishing an effective monitoring and evaluation (M&E) system for project performance.

D. Value Added by ADB

20. The project has added value through integrated water pollution management, with innovations, including (i) distributed wastewater management systems with innovative information technology for operation and management, operated at low cost; (ii) animal feces collection tanks using a new material; (iii) garbage pyrolysis facilities with a shorter processing cycle, smaller floor space, and maximum volume reduction; (iv) pilot eco-villages to demonstrate integrated emissions management; (v) introducing new types of artificial wetlands; (vi) establishing a quantifiable soil and water conservation model, which will enable quantitative estimates of afforestation's effects on soil and water conservation; (vii) promoting low-emission agriculture with innovative technologies and incentives; (viii) establishing a river protection model with innovative information technology and institutional development; and (ix) establishing and implementing horizontal eco-compensation mechanisms and an eco-compensation fund as a sustainable funding mechanism for water pollution management. Experience and knowledge gained through the project can be replicated in other small tributaries in the upper and middle reaches of the Yangtze River, which account for 80% of the wastewater; and in other key river basins in Asia and the Pacific. Consultants will assist in the replication through workshops, publications, disclosure of project information on websites, submission of papers to academic associations, and a proposal of the project as a model for eco-civilization and awards.

21. **Response to COVID-19 pandemic.** The project will contribute to the holistic development of the YREB by shifting traditional investments toward valuing nature and reducing inequalities in rural areas. This is part of the nature-positive stimulus package for recovery from the COVID-19 pandemic which will promote a greener and healthier growth model.

22. Although COVID-19 is being contained in the PRC, measures to prevent the spread of future infectious diseases are strongly required for the post-COVID-19 world. The project will reduce the risk of future epidemics by creating a safe and healthy living environment through strengthened wastewater and solid waste management and pollution control and improved quality of source water for water supply.

II. IMPLEMENTATION PLANS

A. Project Readiness Activities

Table II-1: Project Readiness Activities

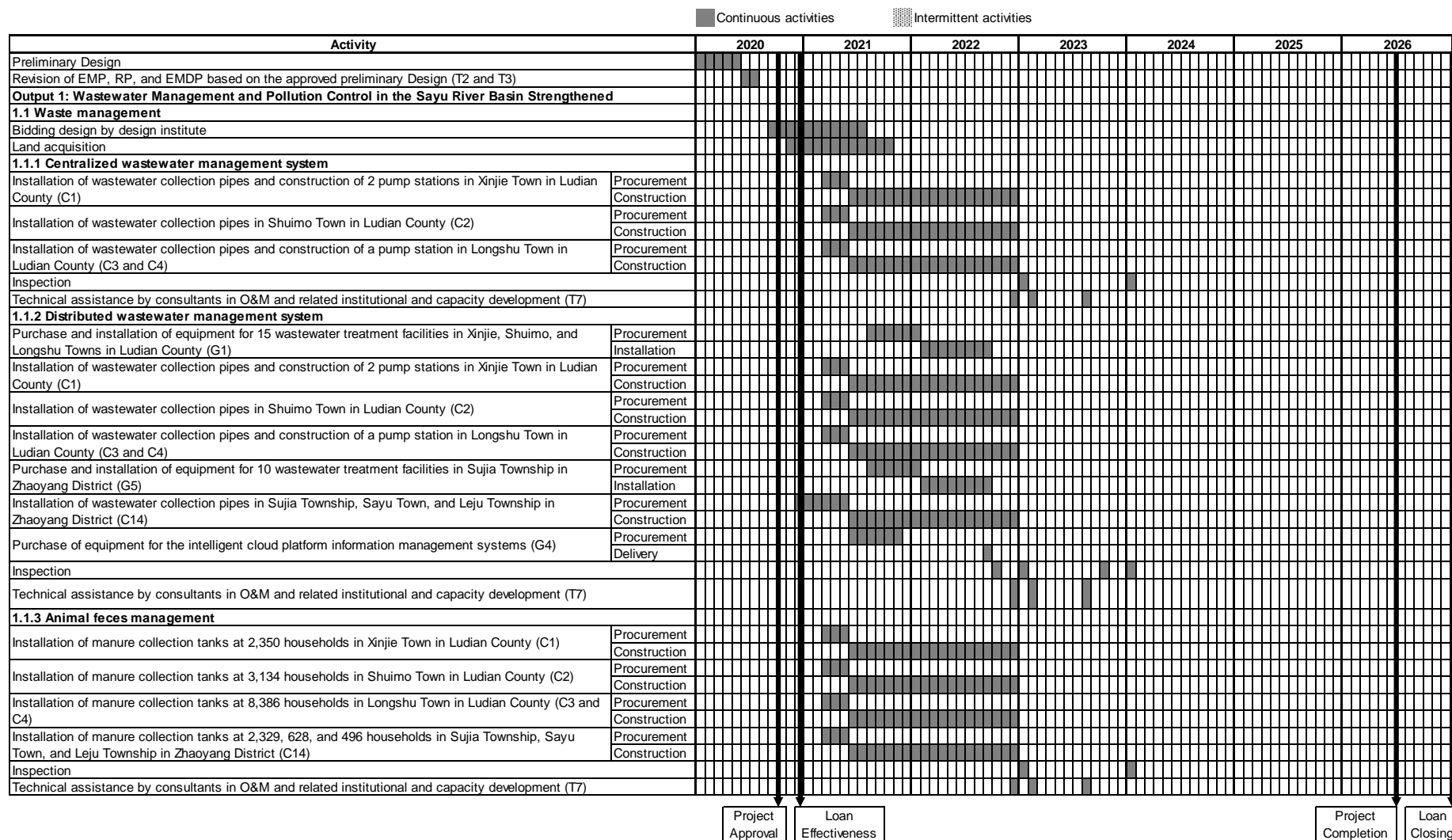
Indicative Activities	2020												Responsibility
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Procurement agent recruited													PMO
Advance contracting actions													PMO
Retroactive financing actions													ADB, YPG, PMO
Domestic FSR approved													YPDRC
FCUP approved													NDRC
EIA, RP, and EMDP approved													ADB
ADB management review													ADB
Loan negotiations													ADB, MOF, YPG, ZCG
ADB Board consideration													ADB
Loan and project agreements signed													ADB, MOF, YPG
Government legal opinion provided													MOF, YPG, ZCG
Government budget inclusion													ZCG, ZDG, LCG
Loan effectiveness													ADB, MOF

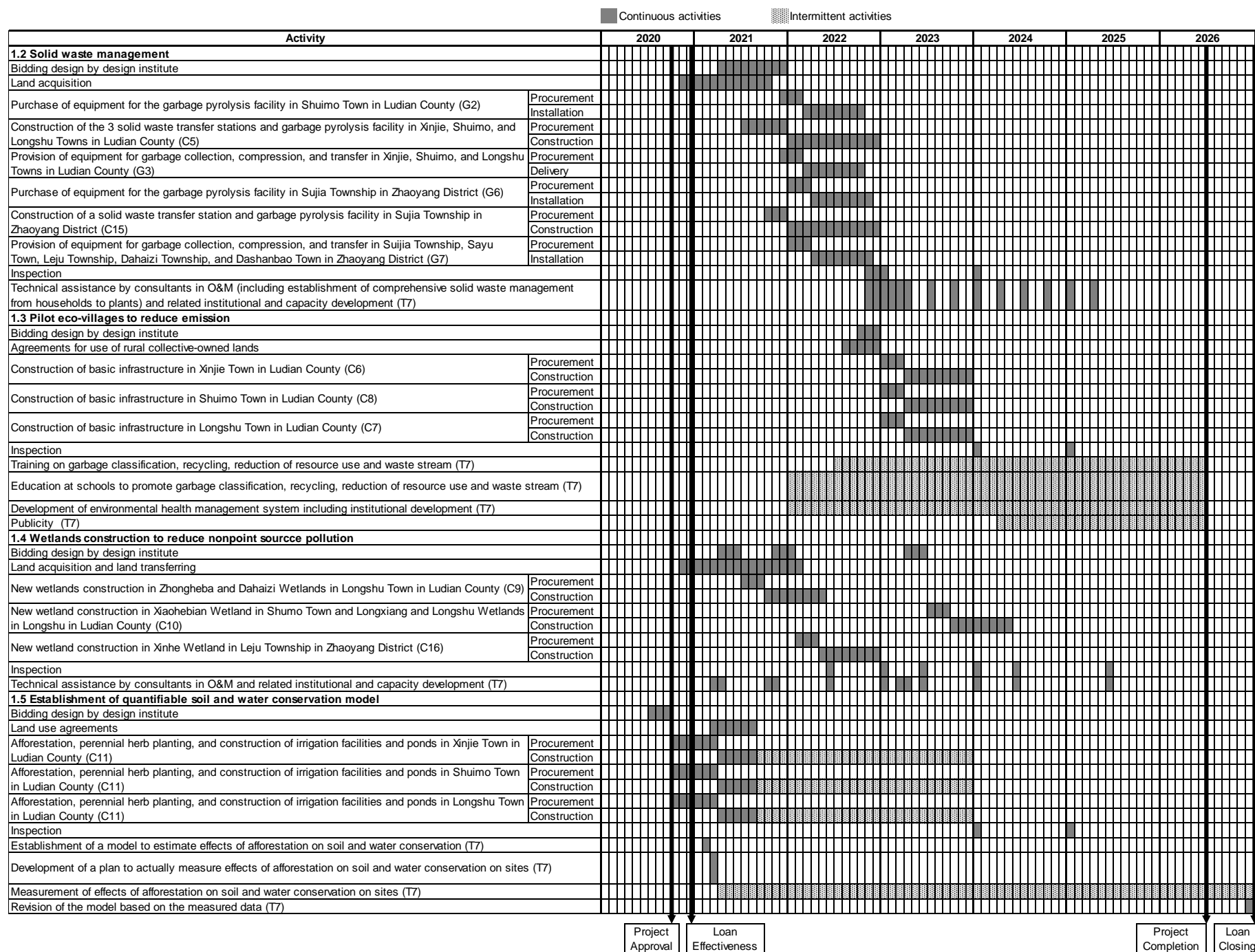
ADB = Asian Development Bank, EIA = environmental impact assessment, EMDP = ethnic minority development plan, FCUP = foreign capital utilization plan, FSR = feasibility study report, LCG = Ludian County Government, MOF = Ministry of Finance, NDRC = National Development and Reform Commission, PMO = project management office, RP = resettlement plan, YPDRC = Yunnan Provincial Development and Reform Committee, YPG = Yunnan Provincial Government, ZCG = Zhaotong City Government, ZDG = Zhaoyang District Government.

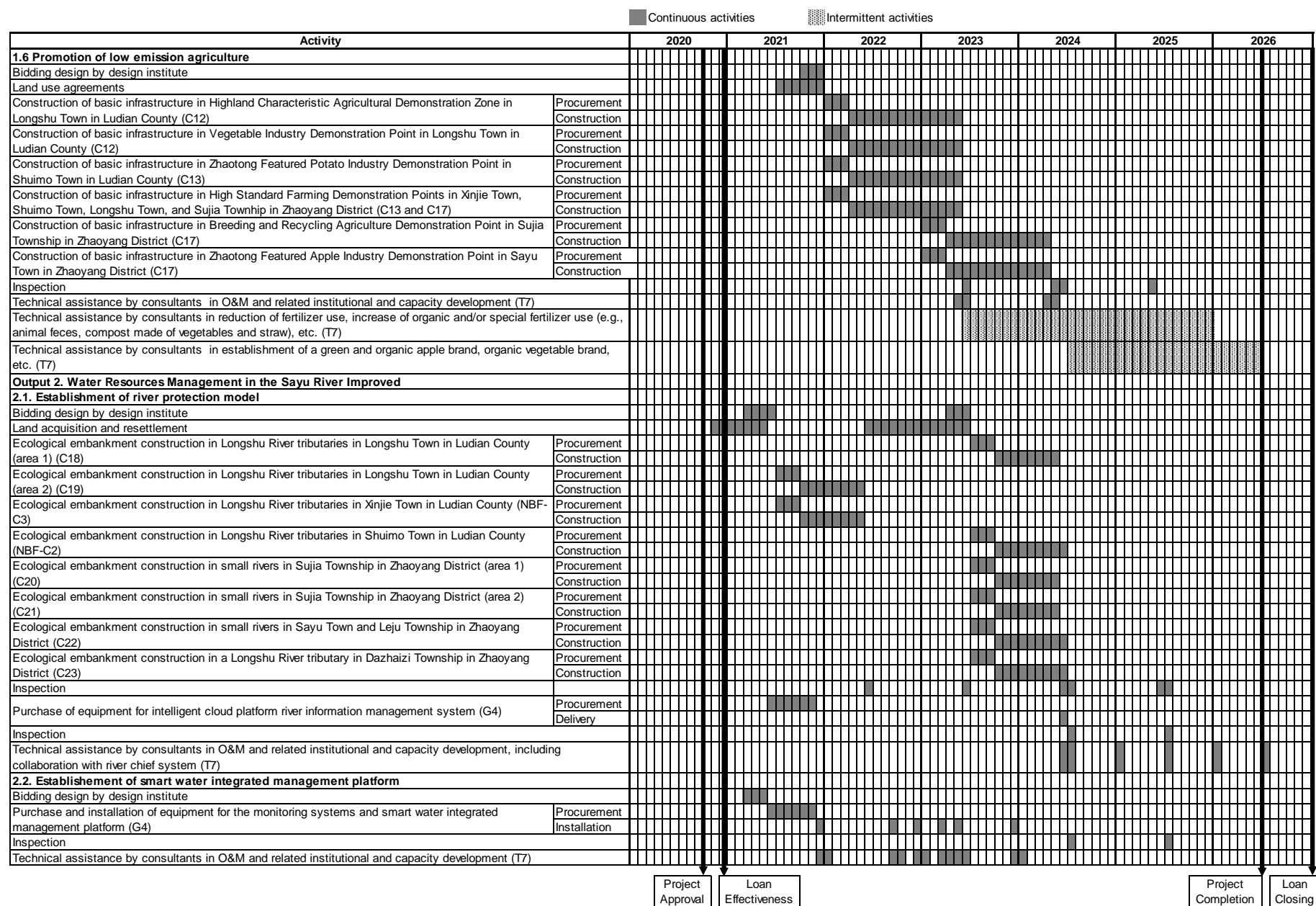
Source: Asian Development Bank.

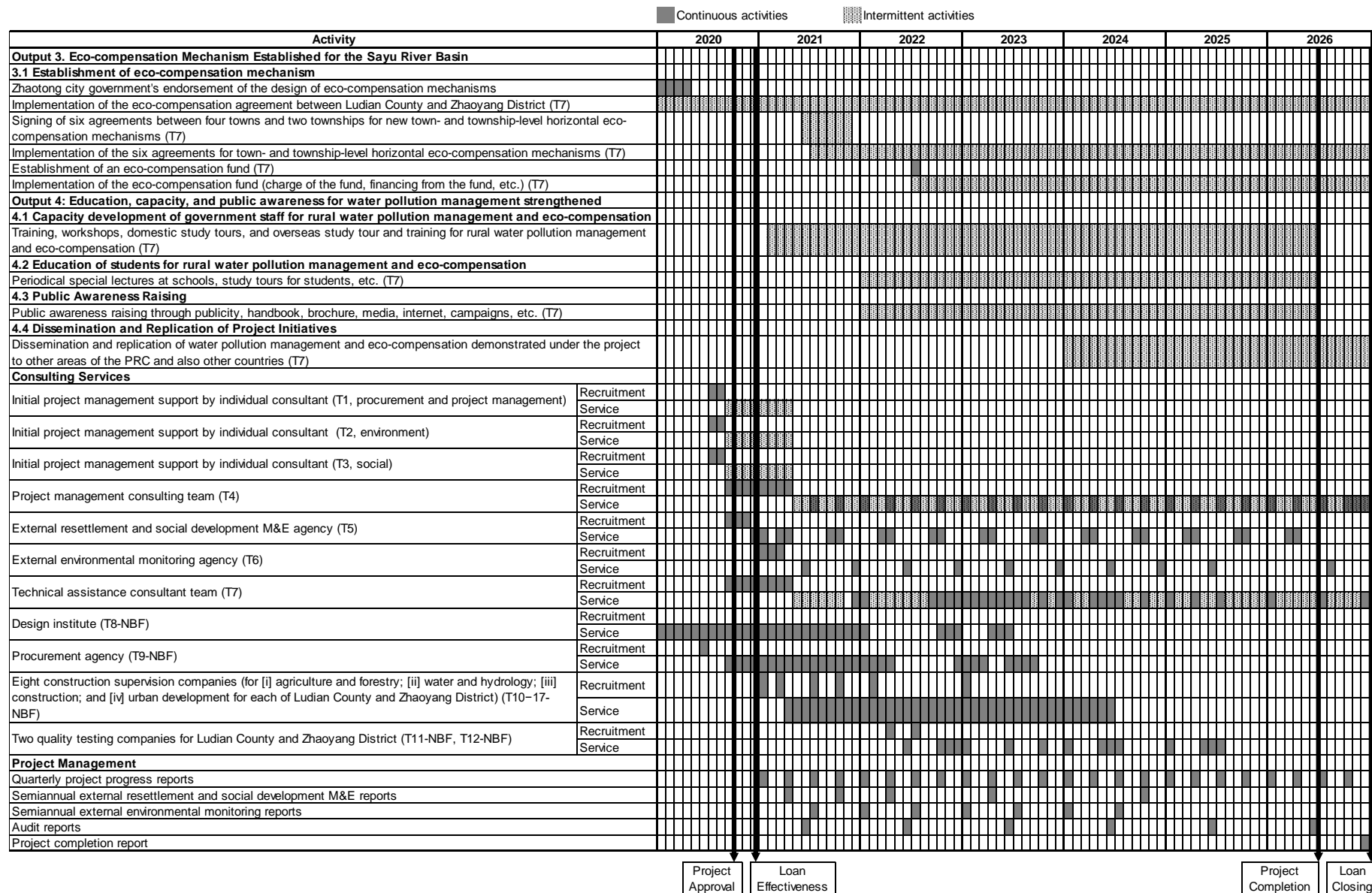
B. Overall Project Implementation Plan

Table II-2: Project Implementation Plan









EMDP = ethnic minority development plan, EMP = environmental management plan, M&E = monitoring and evaluation, O&M = operation and maintenance, PRC = People's Republic of China, RP = resettlement plan.
 Source: Asian Development Bank.

III. PROJECT MANAGEMENT ARRANGEMENTS

A. Project Implementation Organizations: Roles and Responsibilities

23. The ZCG is the executing agency; and the implementing agencies are the YWPCO,²⁶ the ZDG, and the LCG.²⁷ A project leading group has been established in the ZCG.²⁸ The project management office (PMO) has also been established under the project leading group in the ZCG, and it is in the YWPCO.

24. In each of the ZDG and the LCG, a district- or county-level local project leading group has been established,²⁹ under which a local PMO has also been established.³⁰ The local PMOs are located in water resources bureaus in both the ZDG and the LCG.

25. The outbreak of COVID-19 that occurred in the beginning of 2020 will not affect implementation of the project since, in the PRC, (i) the epidemic is being contained; and (ii) economic activities are returning to their previous states; and the agencies of the ZCG, the ZDG, and the LCG related to the project have returned to normal operations.

Table III-1: Project Implementation Organization

Project Implementation Organizations	Management Roles and Responsibilities
Executing agency— ZCG	<ul style="list-style-type: none"> • Conduct overall project preparation and management
Project leading group	<ul style="list-style-type: none"> • Oversee the preparation and implementation of the overall project and provide overall guidance
PMO	<ul style="list-style-type: none"> • Recruit individual consultants, consulting firms, an external resettlement social development M&E agency, an external environmental monitoring agency, design institutes, a procurement agency, etc. • Prepare semiannual environmental monitoring reports and submit them to ADB • Ensure submission of semiannual external resettlement and social development M&E reports to ADB • Monitor project progress and performance, and report to ADB through quarterly project progress reports • Coordinate for annual audit of project financial statements • Prepare and submit to ADB a project completion report • Conduct any other overall project management activities
Implementing agency 1— YWPCO	<ul style="list-style-type: none"> • Implement the following activities: (i) establishment of intelligent cloud platform information management systems for the 44 wastewater treatment facilities; (ii) establishment of intelligent cloud platform river information management system and related institutional development (including collaboration with the river chief system) and

²⁶ The YWPCO, whose director is the mayor of the ZCG, is on the same level as the other agencies of the ZCG such as the Yunnan Provincial Development and Reform Committee (YPDRC), and the finance and water resources bureaus.

²⁷ Zhaoyang District and Ludian County are in Zhaotong City.

²⁸ The project leading group comprises the Chair: Mayor; Vice Chair: Vice Mayor; Members: Deputy Secretary and representatives from relevant ZCG agencies, including the YPDRC; the Yudong Reservoir Management Bureau; and the finance and water resources bureaus.

²⁹ The district- or county-level project leading group comprises the Chair: Head of the ZDG or the LCG; Vice Chair(s): a Deputy Head in Zhaoyang District and three Deputy Heads in Ludian County; and members from relevant agencies.

³⁰ The local PMO Directors are the Director of the Water Resources Bureau in the ZDG and the Director of the Development and Reform Committee in the LCG.

Project Implementation Organizations	Management Roles and Responsibilities
	capacity development; (iii) establishment of water integrated management platform; (iv) establishment of eco-compensation mechanism; and (v) education, capacity, and public awareness for water pollution management
Implementing agency 2—ZDG	<ul style="list-style-type: none"> Implement the following activities in Zhaoyang District: (i) wastewater management; (ii) animal feces management; (iii) solid waste management; (iv) wetland construction; (v) promotion of low-emission agriculture; and (vi) ecological restoration of rivers, including construction of ecological embankments
Implementing agency 3—LCG	<ul style="list-style-type: none"> Implement the following activities in Ludian County: (i) wastewater management; (ii) animal feces management; (iii) solid waste management; (iv) pilot of eco-villages; (v) wetland construction; (vi) establishment of a quantifiable soil and water conservation model; (vii) promotion of low-emission agriculture; and (viii) ecological restoration of rivers, including construction of ecological embankments
District- or county-level project leading groups	<ul style="list-style-type: none"> Oversee the implementation of project components in Zhaoyang District and Ludian County
Local PMOs	<ul style="list-style-type: none"> Ensure the implementation of the EMP and environmental monitoring, and provide information and data to the PMO for the preparation of semiannual environmental monitoring reports Ensure semiannual external resettlement and social development M&E by the external monitor Monitor project progress and performance, and provide information and data to the PMO for preparation of quarterly project progress reports and a project completion report Conduct any other activities for the implementation of project components in the county
Yunnan Provincial Finance Department	<ul style="list-style-type: none"> Establish an advance account Manage the advance account, including disbursement of the ADB loan proceeds from the advance account at request Review, endorse, and submit to ADB withdrawal applications submitted from the PMO Establish and manage an account for the eco-compensation fund following decisions of the eco-compensation fund management committee
Zhaotong City Finance Bureau	<ul style="list-style-type: none"> Endorse withdrawal applications prepared by the PMO Receives the ADB loan proceeds from the advance account established by the Yunnan Provincial Finance Department
ADB	<ul style="list-style-type: none"> Conduct overall project preparation and administration, including (i) provision of orientation to the ZCG, including the PMO and local PMOs; LCG, YWPCO, and ZDG; (ii) review of project progress and performance and implementation of remedial measures through daily communication and missions; (iii) review and approval of documents for procurement; (iv) review and approval of withdrawal applications, and disbursement of loan proceeds; (v) changes in the project, as necessary; and (vi) preparation of the ADB-version project completion report

ADB = Asian Development Bank, EMP = environmental management plan, LCG = Ludian County Government, M&E = monitoring and evaluation, PMO = project management office, YWPCO = Yudong Reservoir Water Resources Protection Committee Office, ZCG = Zhaotong City Government, ZDG = Zhaoyang District Government.

Source: Asian Development Bank.

B. Key Persons Involved in Implementation

Executing Agency

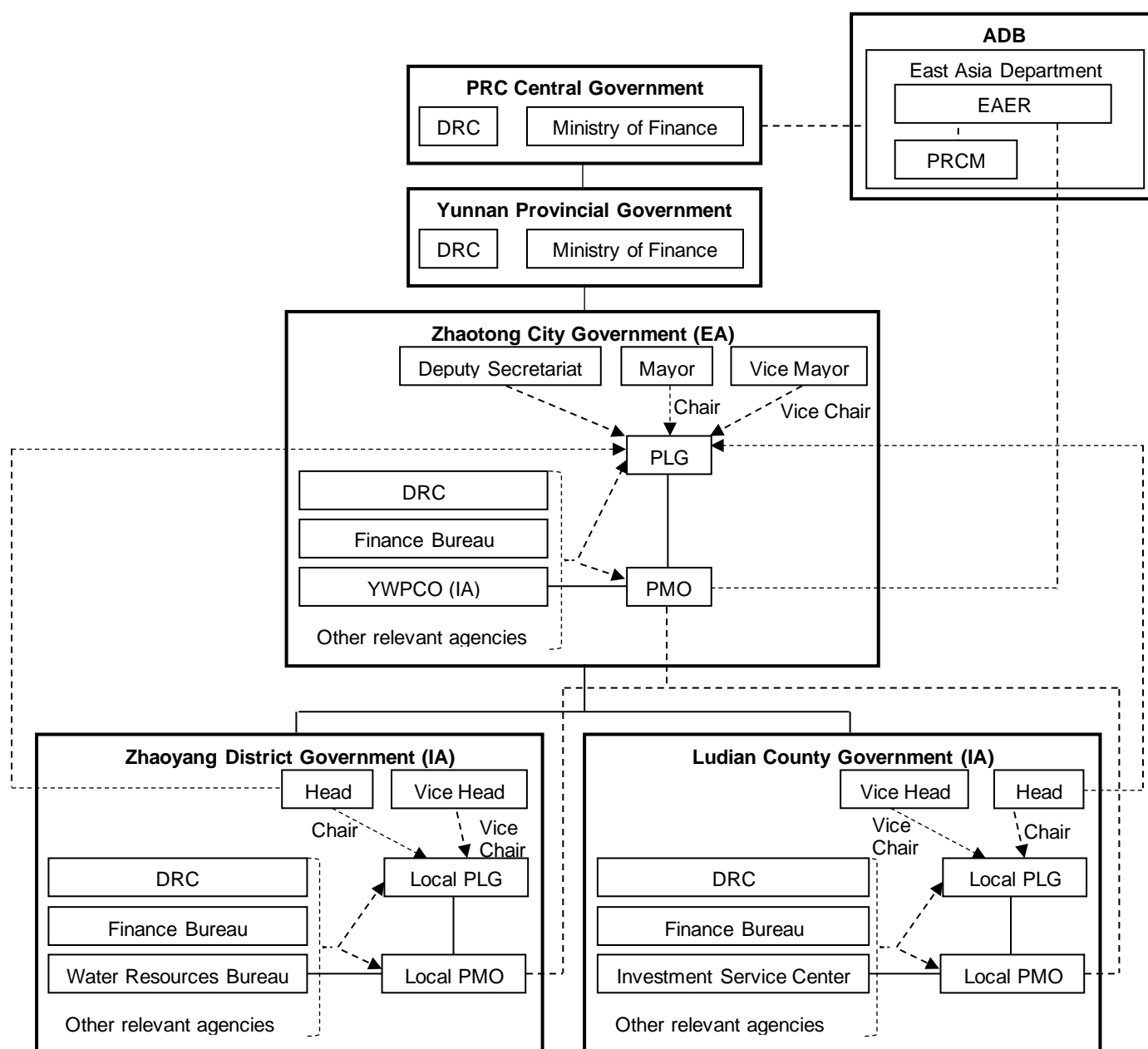
Zhaotong City Government	Officer's Name:	Mr. Shuqing Chen
	Position:	Director, Project Management Office
	Telephone:	+86 870 3188804, +86 870 3188829
	Facsimile:	+86 870-3188811
	Email address:	ztydsbb@163.com
	Office Address:	Asian Development Bank Project Management Office, Yudong Reservoir Water Resources Protection Committee Office, 110 Zhuquan Road, Zhaoyang District, Zhaotong City, Yunnan Province, People's Republic of China Postal Code: 657000

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Environment, Natural Resources, and Agriculture Division; East Asia Department	Staff Name:	Mr. Qingfeng Zhang
	Position:	Director
	Telephone:	+63 2 8632 6769/6161
	Facsimile:	+63 2 8636 2534/2444
	Email address:	qingfengzhang@adb.org

Mission Leader	Staff Name:	Mr. Yoshiaki Kobayashi
	Position:	Principal Water Resources Specialist
	Telephone:	+63 2 8632 6255/5584
	Facsimile:	+63 2 8636 2534/2444
	Email address:	yoshikobayashi@adb.org

C. Project Organizational Structure



ADB = Asian Development Bank, DRC = development and reform committee, EA = executing agency, EAER = Environment, Natural Resources, and Agriculture Division of East Asia Department, IA = implementing agency, PLG = project leading group, PMO = project management office, PRC = People's Republic of China, PRCM = PRC Resident Mission, YWPCO = Yudong Reservoir Water Resources Protection Committee Office.

Source: Asian Development Bank.

IV. COSTS AND FINANCING

26. The project is estimated to cost \$234.61 million. The outbreak of the COVID-19 pandemic that occurred in the beginning of 2020 has not affected the cost estimates since, in the PRC, (i) the epidemic is coming to an end; and (ii) economic activities are returning to their previous states; and the agencies of the ZCG, the ZDG, and the LCG related to the project have returned to normal operations.

27. The government has requested a regular loan of \$100.0 million from ADB's ordinary capital resources to help finance the project. The loan will have a 25-year term, including a grace period of 6 years; 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; and such other terms and conditions set forth in the draft loan and project agreements. Based on the annuity method, the average maturity is 18.53 years; and the maturity premium payable to ADB is 0.20% per year.

28. ADB will finance expenditures relating to works, goods, eco-compensation fund, capacity development, and consulting services. The government will finance expenditures relating to works, goods, eco-compensation fund, project preparation, procurement, supervision, audit, environmental management, land acquisition and resettlement (LAR), ethnic minority development, education, capacity development, public awareness raising, and others. The government will ensure that counterpart funds for the project are provided in a timely manner.

29. Climate mitigation is estimated to cost \$15.99 million, and climate adaptation is estimated to cost \$12.57 million. ADB will finance 80.6% of mitigation costs and 77.3% of adaptation costs.

A. Cost Estimates Preparation and Revisions

30. The cost estimates were prepared based on the feasibility study in accordance with ADB's Guidelines on Preparing and Presenting Cost Estimates for Projects and Programs Financed by ADB.

31. The cost estimates may be updated during the implementation of the project.

B. Key Assumptions

32. The following key assumptions underpin the cost estimates and financing plan:

- (i) Exchange rate: CNY6.9736 = \$1.00 (as of 5 August 2020)
- (ii) Price contingencies based on expected cumulative inflation over the implementation period are as follows:

Table IV-1: Escalation Rates for Price Contingency Calculation

Item	2020	2021	2022	2023	2024	2025	2026	Average
Foreign rate of price inflation	1.50%	1.60%	1.60%	1.60%	1.60%	1.60%	1.60%	1.59%
Domestic rate of price inflation	1.80%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	1.97%

Source: Asian Development Bank estimates.

C. Detailed Cost Estimates by Expenditure Category

Table IV-2: Detailed Cost Estimates by Expenditure Category

Table IV-2: Detailed Cost Estimates by Expenditure Category							
	(CNY million)			(\$ million)			
Item	Foreign Exchange	Local Exchange	Total Cost	Foreign Exchange	Local Exchange	Total Cost	% of Total Base Cost
A. Investment Costs							
1. Works	271.33	813.99	1,085.32	38.91	116.72	155.63	73.2%
a. ADB financing for Ludian County	133.05	399.14	532.19	19.08	57.24	76.32	35.9%
b. ADB financing for Zhaoyang County	53.49	160.48	213.98	7.67	23.01	30.68	14.4%
c. non-ADB finncing	84.79	254.36	339.15	12.16	36.48	48.63	22.9%
2. Goods	15.75	36.75	52.50	2.26	5.27	7.53	3.5%
a. ADB financing	12.70	29.64	42.35	1.82	4.25	6.07	2.9%
b. Non-ADB financing	3.04	7.10	10.15	0.44	1.02	1.46	0.7%
3. Consulting services	4.60	10.74	15.34	0.66	1.54	2.20	1.0%
4. Eco-compensation fund	-	103.00	103.00	-	14.77	14.77	6.9%
a. ADB financing	-	35.00	35.00	-	5.02	5.02	2.4%
b. Non-ADB financing	-	68.00	68.00	-	9.75	9.75	4.6%
5. Project preparation, procurement, supervision, and audit	-	114.11	114.11	-	16.36	16.36	7.7%
6. Land acquisition and resettlement	-	106.42	106.42	-	15.26	15.26	7.2%
7. Ethnic minority development	-	0.20	0.20	-	0.03	0.03	0.0%
8. Education, capacity development, and public awareness raising	-	6.62	6.62	-	0.95	0.95	0.4%
Subtotal (A)	291.68	1,191.83	1,483.50	41.83	170.91	212.73	100.0%
Total Base Cost	291.68	1,191.83	1,483.50	41.83	170.91	212.73	100.0%
B. Contingencies							
1. Physical Contingency	11.37	42.92	54.30	1.63	6.16	7.79	3.7%
2. Price Contingency	10.26	55.39	65.65	1.47	7.94	9.41	4.4%
Subtotal (B)	21.63	98.32	119.95	3.10	14.10	17.20	8.1%
C. Financing Charges During Implementation							
1. Interest During Implementation	30.53	-	30.53	4.38	-	4.38	2.1%
2. Commitment Charge	2.11	-	2.11	0.30	-	0.30	0.1%
Subtotal (C)	32.64	-	32.64	4.68	-	4.68	2.2%
Total Project Cost (A+B+C)	345.95	1,290.14	1,636.09	49.61	185.00	234.61	110.3%

ADB = Asian Development Bank.

Notes: Numbers may not sum precisely because of rounding.

Source: Asian Development Bank estimates.

D. Allocation and Withdrawal of Loan Proceeds**Table IV-3A: Allocation and Withdrawal of Loan Proceeds**

Number	Item	Total Amount Allocated for ADB Financing (\$)		Basis for Withdrawal from Loan Account
		Category	Subcategory	
1	Works	86,708,225		
1A	Works for Ludian County		58,396,638	Up to 100% of total expenditures claimed ^a
1B	Works for Zhaoyang District		28,311,587	Up to 100% of total expenditures claimed ^a
2	Goods, Consulting Services, and Eco-Compensation Fund	13,291,775		100% of total expenditure claimed
Total		100,000,000		

ADB = Asian Development Bank.

^a Detailed financing percentages to be used during disbursement are set out in Table IV-3B of the project administration manual.**Table IV-3B: Allocation and Withdrawal of Loan Proceeds (Detailed Financing Percentages)**

Number	Item	Total Amount Allocated for ADB Financing (\$)		Basis for Withdrawal from Loan Account
		Category	Subcategory	
1	Works	86,708,225		
1A	Works for Ludian County		58,396,638	76.5% of total expenditure claimed
1B	Works for Zhaoyang District		28,311,587	92.3% of total expenditure claimed
2	Goods, Consulting Services, and Eco-Compensation Fund	13,291,775		100.0% of total expenditure claimed
Total		100,000,000		

ADB = Asian Development Bank.

E. Detailed Cost Estimates by Financier

Table IV-4: Detailed Cost Estimates by Financier
(\$ million)

Item	ADB		Governments		Total Cost
	Amount	% of Cost Category	Amount	% of Cost Category	Amount
A. Investment Costs					
1. Works	86.71	55.7%	68.92	44.3%	155.63
a. ADB financing for Ludian County	58.40	76.5%	17.92	23.5%	76.32
b. ADB financing for Zhaoyang County	28.31	92.3%	2.37	7.7%	30.68
c. non-ADB financing	0.00	0.0%	48.63	100.0%	48.63
2. Goods	6.07	80.7%	1.46	19.3%	7.53
a. ADB financing	6.07	100.0%	0.00	0.0%	6.07
b. Non-ADB financing	0.00	0.0%	1.46	100.0%	1.46
3. Consulting services	2.20	100.0%	0.00	0.0%	2.20
0 Eco-compensation fund	5.02	34.0%	9.75	66.0%	14.77
a. ADB financing	5.02	100.0%	0.00	0.0%	5.02
b. Non-ADB financing	0.00	0.0%	9.75	100.0%	9.75
5. Project preparation, procurement, supervision, and audit	0.00	0.0%	16.36	100.0%	16.36
6. Land acquisition and resettlement	0.00	0.0%	15.26	100.0%	15.26
7. Ethnic minority development	0.00	0.0%	0.03	100.0%	0.03
8. Education, capacity development, and public awareness raising	0.00	0.0%	0.95	100.0%	0.95
Subtotal (A)	100.00	47.0%	112.73	53.0%	212.73
Total Base Cost	100.00	47.0%	112.73	53.0%	212.73
B. Contingencies					
1. Physical Contingency	0.00	0.0%	7.79	100.0%	7.79
2. Price Contingency	0.00	0.0%	9.41	100.0%	9.41
Subtotal (B)	0.00	0.0%	17.20	100.0%	17.20
C. Financing Charges During Implementation					
1. Interest During Implementation	0.00	0.0%	4.38	100.0%	4.38
2. Commitment Charge	0.00	0.0%	0.30	100.0%	0.30
Subtotal (C)	0.00	0.0%	4.68	100.0%	4.68
Total Project Cost (A+B+C)	100.00	42.6%	134.61	57.4%	234.61
Taxes and duties included ^a	7.86	57.3%	5.86	42.7%	13.72

ADB = Asian Development Bank.

^a The government will finance taxes and duties of \$5.70 million by cash contribution.

Notes: Numbers may not sum precisely because of rounding.

Source: Asian Development Bank estimates.

F. Detailed Cost Estimates by Output

Table IV-5: Detailed Cost Estimates by Output
(\$ million)

Item	Output 1: Wastewater Management and Pollution Control in the Sayu River Basin Strengthened				Output 2: Water Resources Management in the Sayu River Improved		Output 3: Eco- Compensation Mechanism for the Sayu River Basin Established		Output 4: Education, Capacity, and Public Awareness for Water Pollution Management Strengthened		Project Management	
	Total	% of Cost		% of Cost		% of Cost		% of Cost		% of Cost		
	Cost	Amount	Category	Amount	Category	Amount	Category	Amount	Category	Amount	Category	
A. Investment Costs												
1. Works	155.63	81.28	52.2%	74.35	47.8%	-	0.0%	-	0.0%	-	0.0%	
a. ADB financing for Ludian County	76.32	63.99	83.8%	12.33	16.2%	-	0.0%	-	0.0%	-	0.0%	
b. ADB financing for Zhaoyang County	30.68	11.73	38.2%	18.96	61.8%	-	0.0%	-	0.0%	-	0.0%	
c. non-ADB finncing	48.63	5.56	11.4%	43.07	88.6%	-	0.0%	-	0.0%	-	0.0%	
2. Goods	7.53	6.36	84.5%	1.17	15.5%	-	0.0%	-	0.0%	-	0.0%	
a. ADB financing	6.07	4.90	80.8%	1.17	19.2%	-	0.0%	-	0.0%	-	0.0%	
b. Non-ADB financing	1.46	1.46	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	
3. Consulting services	2.20	0.63	28.7%	0.05	2.3%	0.13	5.9%	0.19	8.6%	1.20	54.5%	
4. Eco-compensation fund	14.77	-	0.0%	-	0.0%	14.77	100.0%	-	0.0%	-	0.0%	
a. ADB financing	5.02	-	0.0%	-	0.0%	5.02	100.0%	-	0.0%	-	0.0%	
b. Non-ADB financing	9.75	-	0.0%	-	0.0%	9.75	100.0%	-	0.0%	-	0.0%	
5. Project preparation, procurement, supervision, and audit	16.36	-	0.0%	-	0.0%	-	0.0%	-	0.0%	16.36	100.0%	
6. Land acquisition and resettlement	15.26	6.62	43.4%	8.64	56.6%	-	0.0%	-	0.0%	-	0.0%	
7. Ethnic minority development	0.03	-	0.0%	-	0.0%	-	0.0%	-	0.0%	0.03	100.0%	
8. Education, capacity development, and public awareness raising	0.95	-	0.0%	-	0.0%	-	0.0%	0.95	100.0%	-	0.0%	
Subtotal (A)	212.73	94.89	44.6%	84.21	39.6%	14.90	7.0%	1.14	0.5%	17.59	8.3%	
Total Base Cost	212.73	94.89	44.6%	84.21	39.6%	14.90	7.0%	1.14	0.5%	17.59	8.3%	
B. Contingencies												
1. Physical Contingency	7.79	4.39	56.4%	2.73	35.1%	0.01	0.1%	0.06	0.7%	0.60	7.6%	
2. Price Contingency	9.41	3.95	42.0%	3.36	35.7%	1.42	15.1%	0.10	1.0%	0.58	6.1%	
Subtotal (B)	17.20	8.35	48.5%	6.09	35.4%	1.43	8.3%	0.15	0.9%	1.17	6.8%	
C. Financing Charges During Implementation												
1. Interest During Implementation	4.38	3.19	72.8%	1.02	23.2%	0.13	2.9%	0.00	0.1%	0.04	1.0%	
2. Commitment Charge	0.30	0.15	50.7%	0.11	37.8%	0.03	9.6%	0.00	0.4%	0.00	1.5%	
Subtotal (C)	4.68	3.34	71.3%	1.13	24.2%	0.16	3.3%	0.01	0.1%	0.05	1.1%	
Total Project Cost (A+B+C)	234.61	106.57	45.4%	91.44	39.0%	16.48	7.0%	1.30	0.6%	18.82	8.0%	

ADB = Asian Development Bank.

Notes: Numbers may not sum precisely because of rounding.

Source: Asian Development Bank estimates.

G. Detailed Cost Estimates by Year

Table IV-6: Detailed Cost Estimates by Year
(million)

Item	Total Cost	Until 2019		2020		2021		2022		2023		2024		2025		2026	
		Amount	Category	Amount	% of Cost	Amount	% of Cost	Amount	% of Cost	Amount	% of Cost	Amount	% of Cost	Amount	% of Cost	Amount	% of Cost
A. Investment Costs																	
1. Works	155.63	35.10	22.6%	-	0.0%	24.32	15.6%	45.11	29.0%	28.45	18.3%	22.35	14.4%	0.30	0.2%	-	0.0%
a. ADB financing for Ludian County	76.32	-	0.0%	-	0.0%	18.82	24.7%	34.43	45.1%	17.57	23.0%	5.49	7.2%	-	0.0%	-	0.0%
b. ADB financing for Zhaoyang County	30.68	-	0.0%	-	0.0%	2.79	9.1%	6.17	20.1%	8.61	28.1%	13.11	42.7%	-	0.0%	-	0.0%
c. non-ADB finncing	48.63	35.10	72.2%	-	0.0%	2.71	5.6%	4.51	9.3%	2.26	4.6%	3.76	7.7%	0.30	0.6%	-	0.0%
2. Goods	7.53	1.46	19.3%	-	0.0%	0.19	2.6%	5.25	69.8%	0.58	7.8%	0.04	0.5%	-	0.0%	-	0.0%
a. ADB financing	6.07	-	0.0%	-	0.0%	0.19	3.2%	5.25	86.5%	0.58	9.6%	0.04	0.7%	-	0.0%	-	0.0%
b. Non-ADB financing	1.46	1.46	100.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
3. Consulting services	2.20	-	0.0%	-	0.0%	0.45	20.4%	0.32	14.6%	0.34	15.6%	0.40	18.3%	0.35	16.1%	0.33	15.0%
4. Eco-compensation fund	14.77	-	0.0%	-	0.0%	-	0.0%	-	0.0%	3.87	26.2%	3.87	26.2%	3.87	26.2%	3.15	21.4%
a. ADB financing	5.02	-	0.0%	-	0.0%	-	0.0%	-	0.0%	1.43	28.6%	1.43	28.6%	1.43	28.6%	0.72	14.3%
b. Non-ADB financing	9.75	-	0.0%	-	0.0%	-	0.0%	-	0.0%	2.44	25.0%	2.44	25.0%	2.44	25.0%	2.44	25.0%
5. Project preparation, procurement, supervision, and audit	16.36	5.68	34.7%	1.07	6.6%	3.29	20.1%	2.94	18.0%	2.30	14.1%	0.75	4.6%	0.22	1.4%	0.10	0.6%
6. Land acquisition and resettlement	15.26	-	0.0%	1.62	10.6%	6.64	43.5%	4.37	28.6%	2.64	17.3%	-	0.0%	-	0.0%	-	0.0%
7. Ethnic minority devolment	0.03	-	0.0%	0.00	7.7%	0.00	15.4%	0.00	15.4%	0.00	15.4%	0.00	15.4%	0.00	15.4%	0.00	15.4%
8. Education, capacity development, and public awareness raising	0.95	-	0.0%	-	0.0%	0.03	3.0%	0.20	21.5%	0.20	21.5%	0.20	21.5%	0.20	21.5%	0.10	10.8%
Subtotal (A)	212.73	42.24	19.9%	2.69	1.3%	34.92	16.4%	58.21	27.4%	38.39	18.0%	27.63	13.0%	4.95	2.3%	3.69	1.7%
Total Base Cost	212.73	42.24	19.9%	2.69	1.3%	34.92	16.4%	58.21	27.4%	38.39	18.0%	27.63	13.0%	4.95	2.3%	3.69	1.7%
B. Contingencies																	
1. Physical Contingency	7.79	-	0.0%	0.13	1.7%	1.75	22.4%	2.91	37.4%	1.73	22.2%	1.19	15.3%	0.05	0.7%	0.03	0.3%
2. Price Contingency	9.41	-	0.0%	0.03	0.3%	1.00	10.6%	2.85	30.3%	1.96	20.8%	2.52	26.7%	0.56	6.0%	0.50	5.3%
Subtotal (B)	17.20	-	0.0%	0.16	0.9%	2.75	16.0%	5.76	33.5%	3.68	21.4%	3.70	21.5%	0.62	3.6%	0.53	3.1%
C. Financing Charges During Implementation																	
1. Interest During Implementation	4.38	-	0.0%	-	0.0%	0.10	2.2%	0.40	9.2%	0.74	16.9%	0.97	22.1%	1.08	24.6%	1.09	25.0%
2. Commitment Charge	0.30	-	0.0%	-	0.0%	0.14	45.1%	0.10	31.5%	0.05	16.3%	0.02	5.9%	0.00	1.0%	0.00	0.3%
Subtotal (C)	4.68	-	0.0%	-	0.0%	0.23	5.0%	0.50	10.6%	0.79	16.8%	0.99	21.1%	1.08	23.1%	1.10	23.4%
Total Project Cost (A+B+C)	234.61	42.24	18.0%	2.85	1.2%	37.90	16.2%	64.47	27.5%	42.87	18.3%	32.32	13.8%	6.65	2.8%	5.31	2.3%

ADB = Asian Development Bank.

Notes: Numbers may not sum precisely because of rounding.

Source: Asian Development Bank estimates.

H. Contract and Disbursement S-Curve

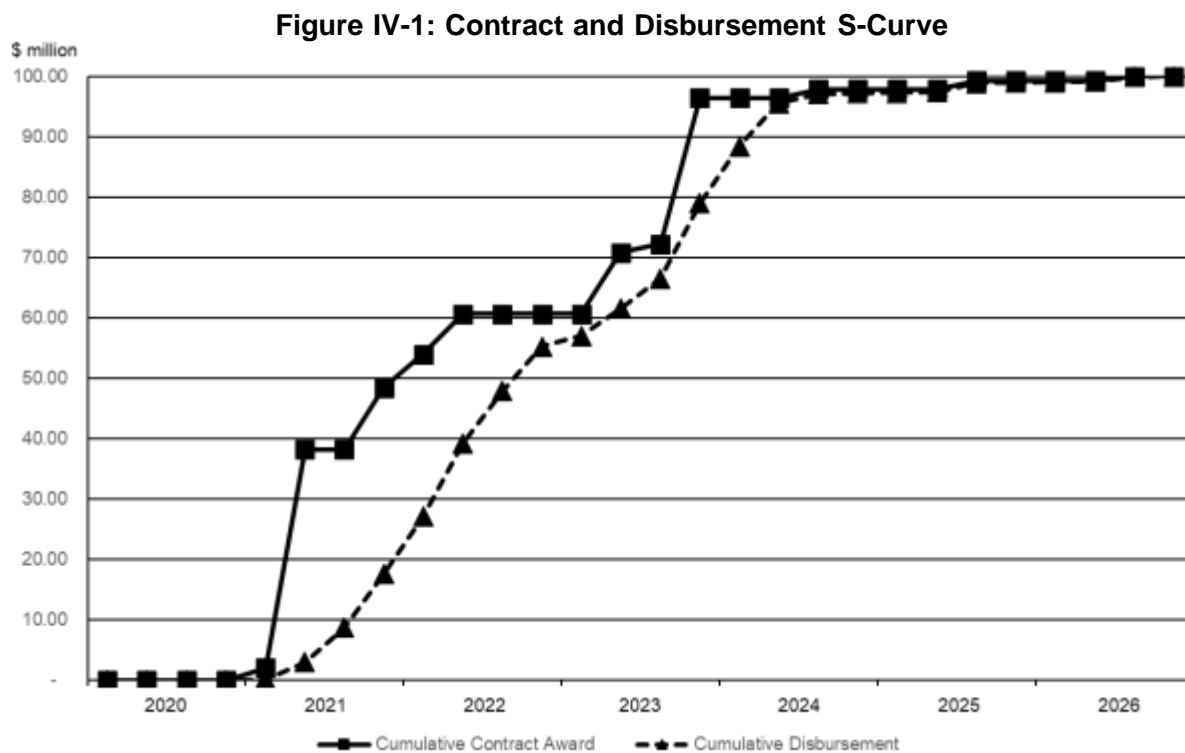
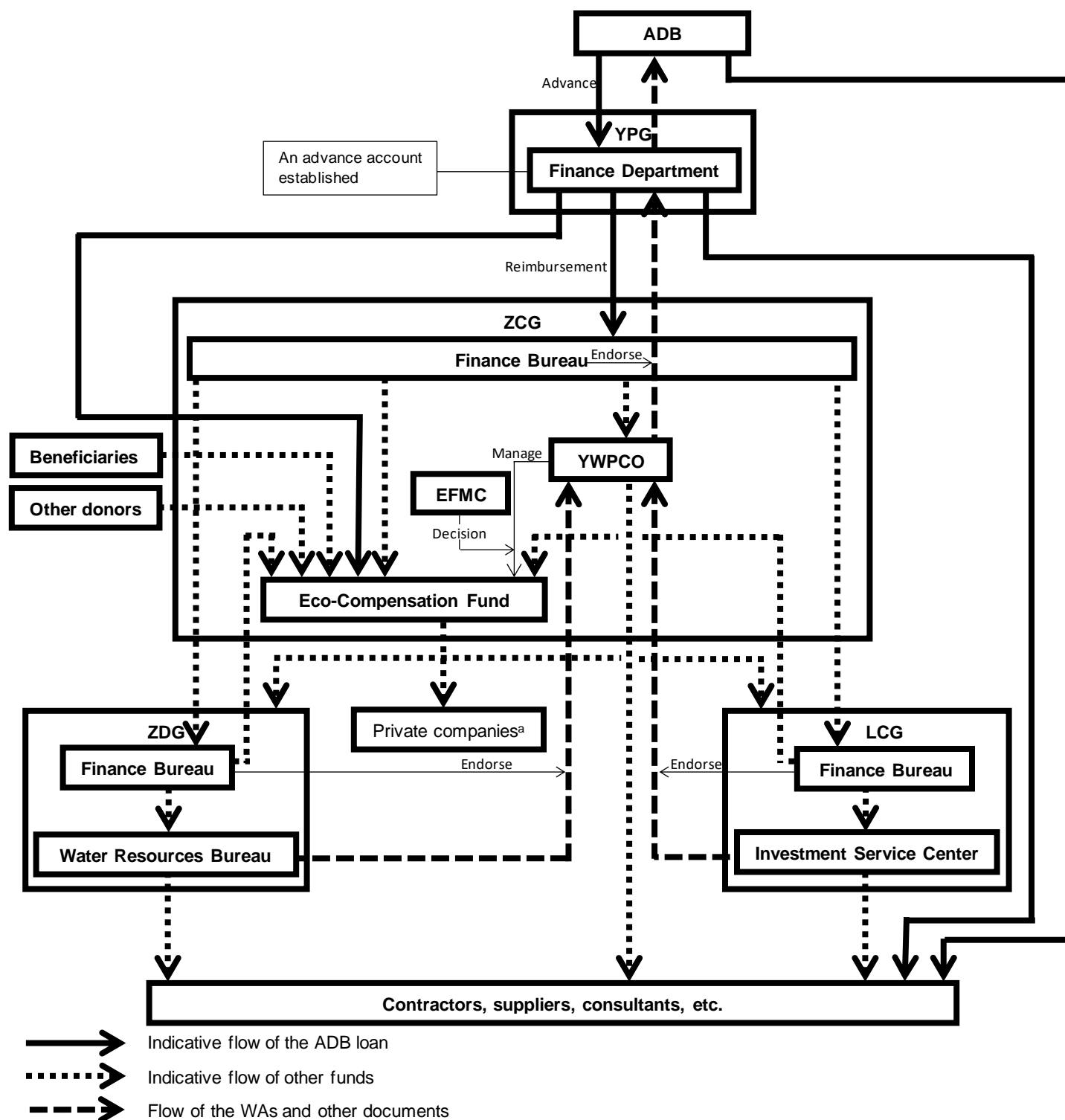


Table IV-7: Contract Award and Disbursement
(\$ million)

Year	Contract Award					Disbursement				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
2020	-	-	-	-	-	-	-	-	-	-
2021	2.10	36.12	-	10.25	48.48	0.18	2.88	5.68	8.89	17.62
2022	5.54	6.63	-	-	12.17	9.48	12.12	8.67	7.34	37.62
2023	-	10.12	1.43	24.21	35.77	1.75	4.50	5.01	12.50	23.76
2024	-	-	1.43	-	1.43	9.38	7.16	1.52	0.11	18.17
2025	-	-	1.43	-	1.43	0.08	0.10	1.51	0.10	1.79
2026	-	-	0.72	-	0.72	0.08	0.09	0.80	0.09	1.05
Total					100.00					100.00

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

I. Fund Flow Diagram



ADB = Asian Development Bank, EFMC = eco-compensation management committee, LCG = Ludian County Government, WA = withdrawal application, YWPCO = Yudong Reservoir Water Resources Protection Committee Office, YPG = Yunnan Provincial Government, ZCG = Zhaotong City Government, ZDG = Zhaoyang District Government.

^a Private company to operate a wastewater treatment plant and conduct solid waste management based on contracts with the ZDG and LCG.

V. FINANCIAL MANAGEMENT

A. Financial Management Assessment

33. The financial management assessment (FMA) was conducted in 2019 in accordance with ADB's Guidelines for the Financial Management and Analysis of Projects and the Financial Due Diligence: A Methodology Note. The FMA considered the capacity of the ZCG, ZDG, and LCG, including fund flow arrangements, staffing, accounting and financial reporting systems, financial information systems, and internal and external auditing arrangements. Based on the assessment, the key financial management risks identified are inherent risks, including country-specific risks (e.g., lack of or delay in counterpart funding); entity-specific risks (e.g., poor coordination among different agencies, organizational structure of the ZCG, ZDG, and LCG unfit for project supervision and implementation, and finance divisions in weak positions to exert influence on financial issues); and control risks (e.g., lack of the PMO's authority to control project activities, inadequate staff's skills and experiences and high staff turnover, inadequate accounting policies and procedures, delay in delivery of audited financial statements, and weak monitoring and reporting capacities). It is concluded that the overall pre-mitigation financial management risk of the ZCG, ZDG, and LCG is moderate. The FMA confirmed that, with the implementation of the financial management action plan below, the ZCG, ZDG, and LCG can properly conduct financial management, including fund flow management, use of statement of expenditures (SOE) procedures, accounting and financial reporting, and auditing. The ZCG, ZDG, and LCG have agreed to implement an action plan as key measures to address the deficiencies. The financial management action plan is provided in Table V-1. An advance account will be established and managed by the Yunnan Provincial Finance Department (YPFD). The YPFD has established and managed advance accounts for more than 10 ADB projects.

Table V-1: Financial Management Action Plan

	Action	Responsibility	Timeline
1	Undertake measures for job rotation, physical asset inventory, insurance on assets, etc.; and revise relevant policies	ZCG, LCG, and ZDG, especially finance bureaus	Immediately after the TRTA
2	Designate finance staff who understand project accounting	ZCG, LCG, and ZDG, especially finance bureaus	Before loan effectiveness
3	Establish a separate accounting mode specifically for the project	Accounting staff of the PMO and the LPMOs	Before loan effectiveness
4	Develop a comprehensive financial policies and procedures manual in the PMO to guide staff activities and ensure staff accountability, including a requirement for the PMO to endorse all payments requested by the LCG and the ZDG	PMO with external assistance	Before loan effectiveness
5	Modify written job descriptions of finance staff to reflect project responsibilities	Accounting staff of the PMO and the LPMOs	Before loan effectiveness
6	Prepare the project budget, covering the full project implementation period; and update this on an annual basis. The starting point for the preparation of the initial budget should be the project forecasts agreed between the YPG, the ZCG, and ADB at loan negotiations; and as subsequently recorded in the PAM. The budget should include physical and financial targets.	Accounting staff of the LPMOs; together with engineers of the LPMOs and accounting staff and engineers in the PMO	Before loan effectiveness

	Action	Responsibility	Timeline
7	Provide start-up financial management consulting support to the ZCG, the LCG, and the ZDG, particularly the PMO and the LPMOs, to assist them in the above tasks	Individual consultant for initial project management support, project management support consultant team	Consultants on board
8	Conduct regular liaison between the ZCG, the LCG, the ZDG, and ADB to ensure that ADB's guidelines are followed	Accounting staff of the PMO	After loan effectiveness
9	Put in place regular inter-agency coordination at all levels to discuss the portfolio performance of the project	Accounting staff of the PMO	After loan effectiveness
10	Conduct workshop training and on-the-job training on ADB's disbursement procedures and ADB's project accounting and financial reporting requirements for staff of the ZCG, the ZDG, and the LCG responsible for accounting for the project.	Financial specialist of project management support consultant team	Consultant on board
11	Maintain separate accounts for all project outputs financed by ADB and the governments	Accounting staff of the PMO and the LPMOs	After loan effectiveness
12	Verify invoice and supporting documents, prepare and submit loan withdrawal applications, and disburse funds	Accounting staff of the PMO and the LPMOs	After loan effectiveness
13	Conduct prompt financial reporting to project stakeholders after the end of each accounting period	Accounting staff of the PMO and the LPMOs	After loan effectiveness
14	Prepare financial section of the quarterly project progress reports	Accounting staff of the PMO	After loan effectiveness
15	Monitor compliance with loan covenants, including submission of audited project accounts	Accounting staff of the PMO	After loan effectiveness
16	Put in place regular back-up of all accounting systems and appropriate security measures over back-up data	Accounting and IT staff of the PMO and the LPMOs	After loan effectiveness
17	Training on physical asset management	LCG and ZDG	After loan effectiveness

ADB = Asian Development Bank, LCG = Ludian County Government, LPMO = local project management office, PAM = project administration manual, PMO = project management office, TRTA = transaction technical assistance, YPG = Yunnan Provincial Government, ZCG = Zhaotong City Government, ZDG = Zhaoyang District Government.

Source: Asian Development Bank.

B. Disbursement

1. Disbursement Arrangements for ADB Funds

34. The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2017, as amended from time to time),³¹ and detailed arrangements agreed upon between the government and ADB. Online training for project staff on disbursement policies and procedures is available.³² Project staff are encouraged to avail of this training to help ensure efficient disbursement and fiduciary control.

35. The YWPCO will be responsible for all disbursement arrangements for expenditures related to establishment of the intelligent cloud platform information management systems (under Outputs 1 and 2), establishment of the smart water integrated management platform (under

³¹ The handbook is available electronically from the ADB website (<http://www.adb.org/documents/loan-disbursement-handbook>).

³² Disbursement eLearning. http://wpqr4.adb.org/disbursement_elearning

Output 2), establishment of the eco-compensation fund (under Output 3), and consulting services. The LCG and the ZDG will be responsible for all disbursement arrangements for expenditures related to management of wastewater, animal feces, and solid waste; implementation of pilot eco-villages; construction of wetlands; establishment of a quantifiable soil and water conservation model; and promotion of low-emission agriculture (under Output 1) and ecological restoration of rivers (under Output 2).

36. The Water Resources Bureau of the ZDG and the Investment Service Center of the LCG will prepare and obtain endorsement of the withdrawal applications, respectively, from the ZDG's Finance Bureau or the LCG's Finance Bureau; and submit the endorsed withdrawal applications to the YWPCO of the ZCG. The YWPCO will prepare and obtain endorsement the consolidated withdrawal applications from the ZCG's Finance Bureau and submit them to the YPFD. The YPFD, after its review and endorsement, will submit the withdrawal applications to ADB.

37. **Advance fund procedure.** The YPFD will establish and maintain an advance account. The currency of the advance account is the United States dollar. The advance account is to be used exclusively for ADB's share of eligible expenditures. The YPFD that administers the advance account is accountable and responsible for proper use of advances to the advance account.

38. The total outstanding advance to the advance account should not exceed the estimate of ADB's share of expenditures to be paid through the advance account for the forthcoming 6 months. The ZCG through the YPFD may request for initial and additional advances to the advance account based on an Estimate of Expenditure Sheet, setting out the estimated expenditures to be financed through the account for the forthcoming 6 months.³³ Supporting documents should be submitted to ADB or retained by the YPFD, the ZCG, the ZDG, and the LCG in accordance with ADB's *Loan Disbursement Handbook* (2017, as amended from time to time) when liquidating or replenishing the advance account.

39. **Specific disbursement arrangements for eco-compensation fund.** An EFMC will be established in the ZCG to make decisions on management of the eco-compensation fund (para. 16). Before the eco-compensation fund is established, the EFMC will (i) finalize the draft ESMS in Appendix 4 with ADB's prior approval; (ii) issue a formal directive to integrate the ESMS into the EFMC's operational procedures with ADB's prior approval; and (iii) establish the EFMC's operational procedures integrating the ESMS, including screening, selection, and approval procedures for activities, financial transfer mechanisms, and technical and financial reporting, with ADB's prior approval. The EFMC will conduct screening of activities proposed for financing from the fund in accordance with EFMC's operational procedures. The YWPCO will manage the fund, following the decisions of the EFMC (footnote 24). The YWPCO will open an account for the fund. The YWPCO will manage the account following the decisions of the EFMC; and disburse grants from the fund to recipients based on EFMC's decisions through either the Zhaoyang District Finance Bureau or the Ludian County Finance Bureau (and relevant town or township finance bureau, as necessary). For the ADB loan, following the schedule for ADB's contributions to the eco-compensation fund (CNY10 million/year in 2023, 2024, and 2025 and CNY5 million in 2026) at the beginning of each year, the YWPCO, with endorsement of the ZCFB, will request the YPFD to disburse necessary loan amount from the advance account to the eco-compensation fund, ~~as advance~~. The YWPCO will issue to ADB an official document as a certificate for each contribution of the ADB loan to the eco-compensation fund.

³³ Estimate of Expenditure sheet is available in Appendix 8A of ADB's *Loan Disbursement Handbook* (2017, as amended from time to time),

40. **Statement of expenditure procedure.**³⁴ The SOE procedure may be used for reimbursement of eligible expenditures or liquidation of advances to the advance account. 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.

41. Before the submission of the first withdrawal application, the YPFD should submit to ADB sufficient evidence of the authority of the person(s) who will sign the withdrawal applications on behalf of the YPFD, together with the authenticated specimen signatures of each authorized person. The minimum value per withdrawal application is stipulated in the *Loan Disbursement Handbook* (2017, as amended from time to time). Individual payments below such amount should be paid (i) by the ZCG, the ZDG, or the LCG; and subsequently claimed to ADB through reimbursement; or (ii) through the advance fund procedure, unless otherwise accepted by ADB. The ZCG and the YPFD should ensure sufficient category and contract balances before requesting disbursements. Use of ADB's Client Portal for Disbursements system is encouraged for submission of withdrawal applications to ADB.³⁵

2. Disbursement Arrangements for Counterpart Fund

42. The ZCG, the ZDG, and the LCG will timely provide counterpart funds for works; goods; project preparation, procurement, supervision, and audit; LAR; ethnic minority development; education, capacity development, and public awareness raising; and contingencies as specified in the loan and project agreements. The ZCG, the ZDG, and the LCG will disburse counterpart funds to contractors, suppliers, service providers, people affected by the LAR, and others (e.g., villagers participating in pilot eco-villages).

43. The YWPCO of the ZCG, the Water Resources Bureau of the ZDG, and the Investment Service Center of the LCG will prepare annual disbursement projections and make requests for annual allocations of counterpart funds for the project. The requests will be reviewed in the ZCG, the ZDG, or the LCG; and approved by the city, district, or county people's congresses. Based on actual incurrence of costs, the ZCFB and the respective Finance Bureaus of the ZDG and the LCG will disburse counterpart funds to the YWPCO, the Water Resources Bureau of the ZDG, and the Investment Service Center of the LCG, respectively, at their requests.

C. Accounting

44. The ZCG will maintain, or cause to be maintained, separate books and records by funding source for all expenditures incurred on the project, following the Accounting Methods for Projects Financed by the World Bank (reference No. 2000 [13]).³⁶ The ZCG will prepare consolidated project financial statements in accordance with the government's accounting laws and regulations which are consistent with the international accounting principles and practices.

³⁴ SOE forms are available in Appendix 7B and 7D of ADB's *Loan Disbursement Handbook* (2017, as amended from time to time).

³⁵ ADB's Client Portal for Disbursements facilitates online submission of the withdrawal applications to ADB, resulting in faster disbursement. The forms to be completed by the Borrower are available online at <https://www.adb.org/documents/client-portal-disbursements-guide>.

³⁶ Accounting regulations issued by the Ministry of Finance for all foreign aid-funded projects.

D. Auditing and Public Disclosure

45. The ZCG will consolidate all financial information of the YWPCO, the ZDG, the LCG, and the utilization of the eco-compensation fund into one set of detailed project financial statements and cause the Yunnan Provincial Audit Department in the Yunnan Provincial Government, authorized by the National Audit Department of the PRC, to audit the consolidated detailed project financial statements in accordance with the PRC's auditing standards. The audited project financial statements for the whole project together with the auditor's opinion will be presented in the English language to ADB within 6 months from the end of the fiscal year by the ZCG.

46. The 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 an accurate 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 purposes of the project; and (iii) whether the ZCG was in compliance with the financial covenants contained in the legal agreements.

47. 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.

48. The ZCG, the ZDG, and the LCG 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.³⁷ 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.

49. Public disclosure of the audited project financial statements, including the auditor's opinion on the project financial statements, will be guided by ADB's Access to Information Policy.³⁸ After the review, ADB will disclose the audited project financial statements and the opinion of the auditors on the project financial statements not later than 14 days of ADB's confirmation of their acceptability by posting them on ADB's website. The management letter and additional auditor's opinions will not be disclosed.³⁹

³⁷ ADB's approach and procedures regarding delayed submission of audited project financial statements:

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

³⁸ Available at: <https://www.adb.org/sites/default/files/institutional-document/450636/access-information-policy.pdf>.

³⁹ This type of information would generally fall under access to information policy exceptions to disclosure. ADB. 2018. *Access to Information Policy*. Paragraph 17 (iv)– (vi).

VI. PROCUREMENT AND CONSULTING SERVICES

A. Advance Contracting and Retroactive Financing

50. All advance contracting and retroactive financing will be undertaken in conformity with ADB's Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time).⁴⁰ The issuance of invitations to bid under advance contracting and retroactive financing will be subject to ADB's approval. The ZCG, the ZDG, and the LCG have been advised that approval of advance contracting and retroactive financing does not commit ADB to finance the project.

51. **Advance contracting.** Advance contracting will apply to consulting services for (i) initial project management support by individual consultants (package numbers T1, T2, and T3; recruitment method: individual consultant selection); (ii) project management support consultant team (package number T4; recruitment method: quality- and cost-based selection [QCBS]); (iii) external resettlement and social M&E agency (package number T5; recruitment method: consultants' qualifications selection); and (iv) technical assistance consultant team (package number T7; recruitment method: QCBS).

52. **Retroactive financing.** Retroactive financing will apply to the recruitment of consultants. Retroactive financing will be subject to a maximum amount equivalent to 20% of the loan amount for eligible expenditures incurred prior to loan effectiveness, but not earlier than 12 months before the loan agreement is signed.

B. Procurement of Goods, Works, and Consulting Services

53. Procurements of all works and goods to be funded by ADB and recruitment of all consultants to be financed by ADB will be undertaken in accordance with the Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time), (footnote 40).

54. The project has a total of 37 contract packages to be financed by ADB, including 23 works contracts; 7 goods contracts; and 7 consulting services contracts.

55. **Open competitive bidding.** Open competitive bidding (OCB) with national advertisement will be used for all 30 works and goods contract packages. For procurement under the OCB with national advertisement: (i) an advertisement will be published on a national press, official gazette, or free and publicly accessible website, as well as on the national e-procurement information and monitoring portal at cebpubservice.com; (ii) the PRC's specific standard bidding documents (accepted by ADB, as updated in 2020) will be used unless otherwise agreed between the ZCG and ADB; and (iii) documents for bidding and contract will only be in Chinese language (except for documents which require ADB's review and approval), and the currencies for bidding and payment will be in Chinese yuan (CNY) unless otherwise agreed between the ZCG and ADB. The relevant sections of ADB's Anticorruption Policy (1998, as amended from time to time) will be included in all procurement documents and contracts.⁴¹

56. **Consulting services.** Individual consultant selection method will be applied to recruitments of three individual consultants for initial project management support (package

⁴⁰ <https://www.adb.org/documents/adb-procurement-policy>.

⁴¹ <http://www.adb.org/Documents/Policies/Anticorruption-Integrity/default.asp>

numbers T1, T2, and T3; inputs: 3.00 person-months [pm] of national inputs for each contract package); QCBS method with a quality–cost ratio of 90:10 will be applied to recruitments of a project management support consultant team (package number T4; inputs: 13.00 pm of international and 46.50 pm of national inputs), and a consultant team for rural water pollution management and eco-compensation (package number T7; inputs: 12.00 pm of international and 62.25 pm of national inputs); and consultants' qualifications selection method will be applied to recruitments of an external resettlement and social M&E agency (package number T5; inputs: 27.00 pm of national inputs), and an external environmental monitoring agency (EMA; package number T6; inputs: 14.00 pm of national inputs).

57. **ADB review.** There are two ADB review procedures for procurement of works and goods: prior review and post review (sampling). For contract packages for prior review, each step of bidding (bidding document, bid evaluation report, draft negotiated contract, and signed contract) needs ADB's prior review and approval. For contract packages for post-review (sampling), ADB reviews the bid evaluation report and signed contract after the contract is signed; and on sampling basis. Under the project, contract packages for works and goods for prior review are the first works and first goods contract packages to be procured by the LCG; the first works and first goods contract packages to be procured by the ZDG; and the first and only good contract package to be procured by the YWPCO. All the other contract packages for works and goods are for post-review (sampling). Regarding consulting services, all contract packages are for prior review. Each sample size should cover at least 20% of the total number of the post review (sampling) contracts awarded before the initial post review (sampling), or between two consecutive post reviews (sampling). Total sample size aggregated should capture contracts representing (i) about 30%–50% of total project value and (ii) about 20% of the total number of contracts identified for post review (sampling). It should ensure that, to the extent possible, all types of contracts are included in the sample.

58. **Procurement principles for eco-compensation fund.** The eco-compensation fund will provide grants for (i) wastewater management, solid waste management, activities for pilot eco-villages, the O&M of the constructed wetlands, compensation for the farmland-to-forest conversion, and promotion of low-emission agriculture under Output 1; (ii) operation of the river protection model established under Output 2; (iii) implementation of the horizontal eco-compensation mechanisms under Output 3; and (iv) management of the eco-compensation fund; but not to finance any civil works. Even if recipients of the grants (relevant government agencies and a private company to operate a wastewater treatment plant in Ludian County based on a contract with the LCG) procure goods for the above-mentioned activities, the size of each contract package will be quite small. If procurement is required, the grant recipients will conduct procurement following their own procedures; but should address the core procurement principles as stated in ADB's Procurement Policy and adopt appropriate procedures, including (i) payment of reasonable prices; and (ii) fair canvassing when selecting suppliers. All grant recipients will be encouraged to procure all goods through competitive bidding when it is most appropriate in the interest of economy and efficiency. The YWPCO should monitor the procurement and report to ADB if there occurs any inconsistency with ADB's core procurement principles and the PRC's procurement laws.

C. Procurement Plan

59. The procurement plan shall be updated as needed throughout the duration of the project.

Basic Data

Project Name: Yunnan Sayu River Basin Rural Water Pollution Management and Eco-Compensation Demonstration Project	
Project Number: 52025-001	Approval Number: XXX
Country: People's Republic of China	Executing Agency: Zhaotong City Government
Project Procurement Classification: B	Implementing Agency: Yudong Reservoir Water Resources Protection Committee Office, Zhaoyang District Government, and Ludian County Government
Procurement Risk: Moderate	
Project Financing Amount: \$234.61 million ADB Financing: \$100.00 million Non-ADB Financing: \$134.61 million	Project Closing Date: 31 December 2026
Date of First Procurement Plan: 6 August 2020	Date of this Procurement Plan: 6 August 2020

1. Methods, Review, and Procurement Plan

a. Procurement and Consultant Recruitment Methods

60. Except as ADB may otherwise agree, the following methods shall apply to procurement of goods and works and recruitment of consultants.

Procurement of Goods and Works	
Method	Comments
Open Competitive Bidding with National Advertisement	For all 30 works and goods contract packages

Consulting Services	
Method	Comments
Quality- and Cost-Based Selection	For recruitments of a project management support consultant team (package number T4) and a consultant team for rural water pollution management and eco-compensation (package number T7), (a quality–cost ratio of 90:10 for both packages)
Consultants' Qualifications Selection	For recruitments of an external resettlement and social monitoring and evaluation agency (package number T5) and an external environmental monitoring agency (package number T6)
Individual Consultant Selection	For recruitments of three individual consultants for initial project management support (package numbers T1, T2, and T3)

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

61. The following table lists goods and works contracts over the life of the project to cost more than \$1 million.

Package Number	General Description	Estimated Value (\$ million)	Procurement Method	Review (Prior/Post [Sampling])	Bidding Procedure	Advertisement Date (quarter/year)	Comments
C1	Wastewater management systems and manure collection tanks in Xinjie Town in Ludian County	6.236	OCB (NA)	Post (Sampling)	1S1E	Q1 2021	
C2	Wastewater management systems and manure collection tanks in Shuimo Town in Ludian County	6.309	OCB (NA)	Post (Sampling)	1S1E	Q1 2021	

Package Number	General Description	Estimated Value (\$ million)	Procurement Method	Review (Prior/Post [Sampling])	Bidding Procedure	Advertisement Date (quarter/year)	Comments
C3	Wastewater management systems and manure collection tanks in Longshu Town in Ludian County (area 1)	13.543	OCB (NA)	Post (Sampling)	1S1E	Q1 2021	
C4	Wastewater management systems and manure collection tanks in Longshu Town in Ludian County (area 2)	4.734	OCB (NA)	Post (Sampling)	1S1E	Q1 2021	
C5	Solid waste transfer stations and garbage pyrolysis facility in Ludian County	1.342	OCB (NA)	Post (Sampling)	1S1E	Q3 2021	
C6	Basic infrastructure for eco-village in Xinjie Town in Ludian County	3.809	OCB (NA)	Post (Sampling)	1S1E	Q1 2023	
C7	Basic infrastructure for eco-village in Longshu Town in Ludian County	3.011	OCB (NA)	Post (Sampling)	1S1E	Q1 2023	
C8	Basic infrastructure for eco-village in Shuimo Town in Ludian County	3.073	OCB (NA)	Post (Sampling)	1S1E	Q1 2023	
C9	New wetlands in Zhongheba and Dazhaizi Wetlands in Longshu Town in Ludian County	4.983	OCB (NA)	Post (Sampling)	1S1E	Q3 2021	
C10	New wetlands in Xiaohebian Wetland in Shuimo Town and Longxiang and Longshu Wetlands in Longshu in Ludian County	3.243	OCB (NA)	Post (Sampling)	1S1E	Q3 2023	
C11	Afforestation, perennial herb planting, and irrigation facilities in Ludian County	7.123	OCB (NA)	Prior	1S1E	Q4 2020	First works contract for LCG
C12	Basic infrastructure for low-emission agriculture promotion in Longshu Town in Ludian County	4.745	OCB (NA)	Post (Sampling)	1S1E	Q1 2022	
C13	Basic infrastructure for low-emission agriculture promotion in Shuimo Town in Ludian County	1.838	OCB (NA)	Post (Sampling)	1S1E	Q1 2022	
C14	Wastewater management systems and manure collection tanks in Zhaoyang District	7.576	OCB (NA)	Prior	1S1E	Q4 2020	First works contract for ZDG
C17	Basic infrastructure for low-emission agriculture promotion in Zhaoyang District	2.765	OCB (NA)	Post (Sampling)	1S1E	Q1 2023	
C18	Ecological embankment in Longshu River tributaries in Longshu Town in Ludian County (area 1)	5.541	OCB (NA)	Post (Sampling)	1S1E	Q3 2023	
C19	Ecological embankment in Longshu River tributaries in Longshu Town in Ludian County (area 2)	6.786	OCB (NA)	Post (Sampling)	1S1E	Q3 2021	
C20	Ecological embankment in small rivers in Sujia Township in Zhaoyang District (area 1)	4.987	OCB (NA)	Post (Sampling)	1S1E	Q3 2023	
C21	Ecological embankment construction in small rivers in Sujia Township in Zhaoyang	4.173	OCB (NA)	Post (Sampling)	1S1E	Q3 2023	

Package Number	General Description	Estimated Value (\$ million)	Procurement Method	Review (Prior/Post [Sampling])	Bidding Procedure	Advertisement Date (quarter/year)	Comments
	District (area 2)						
C22	Ecological embankment construction in small rivers in Sayu Town and Leju Township in Zhaoyang District	5.059	OCB (NA)	Post (Sampling)	1S1E	Q3 2023	
C23	Ecological embankment construction in a Longshu River tributary in Dazhaizi Township in Zhaoyang District	4.737	OCB (NA)	Post (Sampling)	1S1E	Q3 2023	
G2	Equipment for garbage pyrolysis facility in Ludian County	2.008	OCB (NA)	Post (Sampling)	1S1E	Q4 2021	
G4	Equipment for information management and water monitoring systems	1.249	OCB (NA)	Prior	1S1E	Q2 2021	First and only goods contract for the YWPCO

LCG = Ludian County Government, NA = national advertisement, OCB = open competitive bidding, Q = quarter, YWPCO = Yudong Reservoir Water Resources Protection Committee Office, ZDG = Zhaoyang District Government, 1S1E = one stage-one envelope.

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

62. The following table lists consulting services contracts over the life of the project to cost more than \$100,000. All consulting services contracts are for ADB's prior review.

Package Number	General Description	Estimated Value (\$ million)	Recruitment Method	Advertisement Date (quarter/year)	Type of Proposal	Comments
T4	Project management support consultant team	0.802	QCBS	Q2 2020	STP	For advance contracting
T5	External resettlement and social development M&E agency	0.217	CQS	Q2 2020	BTP	For advance contracting and retroactive financing
T7	Consultant team for rural water pollution management and eco-compensation	1.000	QCBS	Q2 2020	STP	For advance contracting

BTP = biodata technical proposal, CQS = consultants' qualifications selection, M&E = monitoring and evaluation, Q = quarter, QCBS = quality- and cost-based selection, STP = simple technical proposal.

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

63. The following table groups smaller-value goods and works contracts to cost less than \$1 million and consulting services contracts to cost less than \$100,000 for the life of the project.

Goods and Works							
Package Number	General Description	Estimated Value (\$ million)	Procurement Method	Review (Prior/Post [Sampling])	Bidding Procedure	Advertisement Date (quarter/year)	Comments
C15	Solid waste transfer station and garbage pyrolysis facility in Zhaoyang District	0.827	OCB (NA)	Post (Sampling)	1S1E	Q4 2021	
C16	New wetland construction in Xinhe Wetland in Leju Township in Zhaoyang District	0.560	OCB (NA)	Post (Sampling)	1S1E	Q1 2022	

Goods and Works							
Package Number	General Description	Estimated Value (\$ million)	Procurement Method	Review (Prior/Post [Sampling])	Bidding Procedure	Advertisement Date (quarter/year)	Comments
G1	Equipment for wastewater management system in Ludian County	0.481	OCB (NA)	Prior	1S1E	Q3 2021	First goods contract for LCG
G3	Equipment for garbage collection, compression, and transfer in Ludian County	0.957	OCB (NA)	Post (Sampling)	1S1E	Q4 2021	
G5	Equipment for wastewater management systems in Zhaoyang District	0.301	OCB (NA)	Prior	1S1E	Q3 2021	First goods contract for ZDG
G6	Equipment for garbage pyrolysis facility in Zhaoyang District	0.717	OCB (NA)	Post (Sampling)	1S1E	Q1 2022	
G7	Equipment for garbage collection, compression, and transfer in Zhaoyang District	0.360	OCB (NA)	Post (Sampling)	1S1E	Q1 2022	

LCG = Ludian County Government, NA = national advertisement, OCB = open competitive bidding, Q = quarter, ZDG = Zhaoyang District Government, 1S1E = one stage-one envelope.

Consulting Services						
Package Number	General Description	Estimated Value (\$ million)	Recruitment Method	Advertisement Date (quarter/year)	Type of Proposal	Comments
T1	Initial project management support by individual consultant (procurement and project management)	0.028	ICS	Q2 2020	NA	For advance contracting and retroactive financing
T2	Initial project management support by individual consultant (environment)	0.028	ICS	Q2 2020	NA	For advance contracting and retroactive financing
T3	Initial project management support by individual consultant (social)	0.028	ICS	Q2 2020	NA	For advance contracting and retroactive financing
T6	External environmental monitoring agency	0.097	CQS	Q1 2021	BTP	

BTP = biodata technical proposal, CQS = consultants' qualifications selection, ICS = individual consultant selection, NA = not applicable, Q = quarter.

2. List of Awarded and Ongoing, and Completed Contracts

64. The following tables list the awarded and ongoing contracts and completed contracts.

a. Awarded and Ongoing Contracts

Goods and Works							
Package Number	General Description	Estimated Value (\$ million)	Actual Contract Value (\$ million)	Procurement Method	Advertisement Date (quarter/year)	Date of ADB Approval of Contract Award	Comments

Consulting Services							
Package Number	General Description	Estimated Value (\$ million)	Actual Contract Value (\$ million)	Recruitment Method	Advertisement Date (quarter/year)	Date of ADB Approval of Contract Award	Comments

b. Completed Contracts

Goods and Works								
Package Number	General Description	Estimated Value (\$ million)	Contract Value (\$ million)	Procurement Method	Advertisement Date (quarter/year)	Date of ADB Approval of Contract Award	Date of Completion	Comments

Consulting Services								
Package Number	General Description	Estimated Value (\$ million)	Contract Value (\$ million)	Recruitment Method	Advertisement Date (quarter/year)	Date of ADB Approval of Contract Award	Date of Completion	Comments

3. Non-ADB Financing

65. The following table lists goods, works, consulting services, and other services contracts over the life of the project, financed by non-ADB sources.

Goods and Works				
General Description	Estimated Value (cumulative) (\$ million)	Estimated Number of Contracts	Procurement Method	Comments
Wastewater treatment plant in Longshu Town in Ludian County	5.563	1	Domestic method	Contract completed
Ecological embankment in Longshu River tributaries in Ludian County	13.530	2	Domestic method	
Ecological embankment in Longshu River in Ludian County	29.540	1	Domestic method	Contract completed
Equipment for one wastewater treatment facility in Ludian County	0.076	1	Domestic method	Contract completed
Equipment for 18 wastewater treatment facilities in the Zhaoyang District	1.379	1	Domestic method	Contract completed

Consulting Services and other services				
General Description	Estimated Value (cumulative) (\$ million)	Estimated Number of Contracts	Recruitment Method	Comments
Design institutes	10.377	3	Domestic method	Contracts awarded and ongoing
Procurement agency	0.340	1	Domestic method	
Quality testing company for Ludian County	0.183	1	Domestic method	
Quality testing company for Zhaoyang District	0.159	1	Domestic method	
Construction supervision companies for Ludian County	1.659	4	Domestic method	
Construction supervision companies for Zhaoyang District	0.540	4	Domestic method	
Operation of a wastewater treatment plant and conduct of solid waste management	0.000	3	Domestic method	For public-private-partnership

Open Competitive Bidding (with National Advertisement)

1. Regulation and Reference Documents

66. The procedures to be followed for the OCB (with national advertisement) shall be those set forth in ADB's Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time), (footnote 40); the Government Procurement Law of the 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 30 August 1999, with the clarifications and modifications described in the following paragraphs. Any relevant type of standard bidding documents issued by ADB (2018) or the PRC on specific standard bidding documents for goods and works accepted by ADB (updated in 2020) shall be used.

2. Procurement Procedures

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

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

b. Eligibility

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

c. Advertising

69. All invitations to prequalify or to bid shall be advertised in the national press (China Daily Newspaper) or a free and open access website (China Tendering & Bidding Public Service Platform). 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.

d. Bidding Period

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

e. Participation by Government-Owned Enterprises

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

f. Rebidding

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

3. Bidding Documents

g. Qualification Requirements

73. 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.

h. Bid Submission and Opening

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

75. All bids shall be opened in public, and 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.

i. Bid Evaluation and Award

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

77. 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 (i) to be substantially responsive to the bidding documents; and (ii) 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.

j. ADB Policy Clauses

78. 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.

79. A provision shall be included in all bidding documents (with national advertisement) for 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, either directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question.

80. A provision shall be included in all bidding documents for the OCB (with national advertisement) for 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, either 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

81. Indicative terms of reference for consulting services to be funded by ADB are in Appendix 2.

VII. SAFEGUARDS

A. Environment

82. **Institutional arrangements for environmental safeguards.** The project is classified by ADB as Category A for environment. Environmental safeguard assessments and documents for the project comprise (i) an environmental impact assessment (EIA), including an environmental management plan (EMP); and (ii) the ESMS. The EMP covers all project components, except Output 3: Eco-compensation mechanism for the Sayu River Basin established. Safeguards for the eco-compensation fund will be managed under the ESMS. Appendix 4 includes draft ESMS to be finalized by the EFMC with prior approval by ADB and the ZCG. The EIA, the EMP, and the ESMS have been prepared in compliance with ADB's Safeguard Policy Statement (SPS, 2009). For all project matters relating to environmental safeguards, the EIA, the EMP, and the ESMS form the basis of the loan and project agreements.

A-1. Environmental Management Plan

83. **Content of the environmental management plan.** The EMP in Appendix 3 (also in Appendix 1 of the EIA) describes the (i) environmental safeguard objectives for the project; (ii) roles and responsibilities for the EMP implementation; (iii) mitigation measures; (iv) inspection, monitoring, and reporting arrangements; (v) training and institutional strengthening; (vi) a project-specific grievance redress mechanism (GRM); (vii) public consultation during project implementation; and (viii) a feedback and adjustment mechanism. The EMP identifies specific roles and responsibilities for all agencies that will be involved in the EMP implementation, including the ZCG, the LCG, the ZDG, contractors, the construction supervision companies (CSCs), and operators of facilities constructed under the project. Mitigation measures are tailored to project-specific conditions and risks identified in the EIA. The scope and content of the EMP comply with ADB's SPS for environmental safeguards and the PRC's environmental laws and regulations. All agencies involved in the project are required to comply with the EMP.

84. **Environmental management plan implementation.** The EMP will be implemented in all phases of the project: design, pre-construction, construction, and operation. The ZCG will be responsible for ensuring that facilities under the project will be designed, constructed, decommissioned, and operated in accordance with (i) the national and local governments' environmental, health, and safety laws, regulations, procedures, and guidelines; (ii) ADB's SPS; and (iii) the EIA, including the EMP. The ZCG, through the PMO, holds final responsibility for the compliance with the EMP.

85. For preparation of preliminary designs for the project, the PMO will forward the EMP to a design institute which will prepare the preliminary designs.⁴² Environment officers of the PMO and the local PMOs (LPMOs) and an initial project management support consultant for environment will work with the design institute to ensure that safeguard risks identified in the EMP are considered in the preliminary designs; and avoided, minimized, or mitigated. The EMP will be updated based on the preliminary design, as needed. To ensure that contractors respond to the EMP requirements, the PMO and the LPMOs will prepare and provide the following specification clauses for incorporation into bidding documents and contracts for works: (i) a list of environmental management requirements to be budgeted by bidders in their proposals; (ii) environmental clauses for contractual terms and conditions; and (iii) domestic EIA and the ADB-version EIA (including the updated EMP) for compliance. All bidders for works will be required to

⁴² Preliminary designs in the PRC are equivalent to detailed designs in other countries.

include and fully address the EMP requirements, especially the mitigation and monitoring measures.

86. **Personnel.** The EMP will be coordinated by the following personnel: (i) one full-time and qualified environment officer of the PMO appointed by the ZCG, who will be responsible for overall coordination for the EMP; (ii) two full-time environment officers of the LPMOs appointed by the LCG and the ZDG, who will lead daily coordination for the EMP at the site level; and will coordinate closely with the PMO environment officer. The environment officers of the PMO and the LPMOs will be supported in their roles by (i) an initial project management support consultant for environment to provide interim support to the PMO and the LPMOs before a project management support consultant team is recruited; (ii) a national environmental specialist in the project management support consultant team; and (iii) an external EMA. The consultants will support the environment officers of the PMO and the LPMOs in the establishment and implementation of the EMP, including the assessments to decide whether the preliminary designs are consistent with the scope of the feasibility study report and the EMP; or whether new safeguard assessments are required, integration of the EMP into bidding documents and contracts for works, site visits, and liaison with contractors and the CSCs; and support for preparation of the semiannual environmental monitoring reports for submission to ADB. The external EMA will conduct the environmental monitoring listed in the EMP. The indicative terms of reference for the consultants and agency are in Appendix 2.

87. **Capacity building.** The ZCG, the LCG, and the ZDG do not have previous experience in the ADB-funded projects or in ADB's safeguard requirements. To ensure effective implementation of the EMP, a capacity building program is included in the EMP for training of relevant agencies in the EMP implementation, mitigation measures, supervision, monitoring, reporting, and the GRM. Training will be provided by consultants. Trainees will include the staff of the ZCG, including the PMO and the LPMOs, the LCG, the ZDG, the CSCs, and the contractors.

88. **Procedures for feedback and adjustment of the environmental management plan, in the event of noncompliance.** Based on site inspections and monitoring reports, the PMO shall decide, in consultation with relevant consultants for environment, whether (i) further mitigation measures are required as corrective actions; or (ii) improvements are required for environmental management practices. Effectiveness of mitigation measures and monitoring plans will be evaluated by a feedback reporting system. Adjustment to the EMP will be made, if necessary. The environment officers of the PMO and the LPMOs, the initial project management support consultant for environment, and the national environmental specialist in the project management support consultant team will play critical roles in the feedback and adjustment mechanism. If substantial deviation from the EMP is observed during inspection and monitoring; or any changes are made to the project that may cause substantial adverse environmental impacts, or increase the number of affected people, then the PMO will immediately consult with ADB; and form an environmental assessment team to conduct additional environmental assessment. If necessary, further public consultation will be undertaken. The new or updated domestic EIA and the ADB-version EIA (including the EMP) will be prepared and submitted to ADB for review, appraisal, and public disclosure. The revised EMP will be passed to contractors, the CSCs, and operators of facilities constructed under the project for implementation.

A-2. Environmental Assurances

89. Project-specific environmental safeguard conditions are included in the loan and project agreements and include the need for all project agencies to comply with the EMP and the ESMS.

B. Involuntary Resettlement

90. **Category and impacts.** The project is classified as Category A for involuntary resettlement. The land use of the project (for Outputs 1–2) will include (i) permanent acquisition of 743.38 *mu* of collective land, (ii) land user right transfer of 416.49 *mu* of collective land, (iii) land use for ecological farming or forestry of 25,765.59 *mu*, (iv) land use for rural public infrastructure of 15.40 *mu*, (v) state-owned land occupation of 1,973.88 *mu*, and (vi) temporary land use of 4,828.06 *mu*. The project will not involve any residential house or structure demolition. Permanent land acquisition under the project will affect 1,257 households with 4,386 persons, and is mainly related to widening or straightening of ecological embankments in some river sections. Households will not be physically relocated.

91. **Resettlement plan.** A resettlement plan prepared following ADB's SPS and relevant PRC laws and regulations includes adequate measures for compensation, resettlement, and rehabilitation of affected people. It is based on surveys and consultations with affected people during project preparation. A GRM has been established and incorporated into the resettlement plan. The resettlement plan also includes measures of (i) the capacity building of the executing and implementing agencies to implement the resettlement plan in compliance with ADB's requirements; and (ii) internal and external monitoring and reporting on the resettlement plan implementation.

92. **Updating resettlement plan.** The resettlement plan will be (i) updated based on the final design, detailed measurement survey, and census of affected persons, (ii) disclosed to affected persons, and (iii) submitted to ADB for review and approval prior to the award of civil works contract and commencement of the LAR.

93. **Capacity building for implementation of the resettlement plan in compliance with ADB's requirements.** The ZCG, the LCG, and the ZDG have the capacity to implement domestically funded projects. Their capacity will be strengthened to implement the resettlement plan in compliance with ADB's requirements through several measures, including (i) the ZCG, the LCG, and the ZDG will each appoint a social officer; (ii) a project management support consultant team will include a national resettlement specialist and a national social development specialist; (iii) relevant staff of the ZCG, the LCG, and the ZDG, the PMO, and the LPMOs will be trained on social safeguard measures; (iv) an initial project management support consultant for social safeguards and social development will provide training on ADB's relevant policy requirements, and will assist the LCG and the ZDG to update and finalize the resettlement plan; and (iv) an external agency will be recruited for semiannual external resettlement and social development M&E.

C. Indigenous People

94. The Hui, Miao, and Yi ethnic minority groups in the project area will benefit from the project, including (i) improved wastewater and solid waste management, (ii) pilot development of eco-villages, (iii) job opportunities during construction and operation, (iv) livelihood support from the eco-compensation fund, and (v) capacity development. A social assessment during project preparation revealed that the socioeconomic and livelihood systems of the ethnic minority groups are not different from those of the Han majority. However, they maintain distinct cultural characteristics, such as distinct traditional festivals and different religious beliefs. Project activities, such as pilot eco-villages development in the ethnic minority villages, will consider such cultural characteristics. An ethnic minority development plan (EMDP) was prepared following ADB's SPS and relevant PRC laws and regulations. It includes both mitigation and enhancement

measures for ethnic minority communities. The PMO, with assistances from the social development specialist in the project management support consultant team, will conduct internal monitoring and report the results of the internal monitoring to ADB through quarterly project progress reports. The external agency recruited for resettlement and social development M&E will also cover the M&E of the EMDP implementation. The project will strengthen capacities of the ZCG, the LCG, and the ZDG to implement and monitor the EMDP during project implementation.

D. Environmental and Social Management System

95. Content of the ESMS and safeguards selection criteria. Draft ESMS in Appendix 4 describes (i) institutional framework of the ESMS, including legislative and policy framework, roles and responsibilities of each specified position, and activity selection criteria; (ii) activities that the eco-compensation fund will or will not support (including activities listed under ADB's prohibited investment activity list); (iii) implementation steps for the ESMS; (iv) integration of the ESMS into the EFMC's operational procedures; and (v) capacity building and training for the EFMC, the PMO, and the YWPCO to implement the ESMS. For environmental safeguards, activities that will not be supported by the eco-compensation fund include (i) activities which may cause significant and irreversible impacts to the environment and are classified as Category A or B for environment under ADB's SPS; (ii) are located in or next to a designated water source protection zone, protected area, cultural heritage site, or critical natural habitat; and (iii) involve large-scale landscape alteration (e.g., quarrying, or terracing on slopes greater than 25 degree). For social safeguards, activities that will not be supported by the eco-compensation fund include (i) activities involving involuntary resettlement which meet the definition of ADB's Category A or B for resettlement safeguards, and any involuntary resettlement issues from past land acquisition or existing facilities as defined under ADB's SPS; (ii) activities which have significant impacts on vulnerable ethnic minorities (Category A), or any unmitigated issues or pending issues of indigenous peoples or ethnic minority communities from past activities or existing facilities as defined under ADB's SPS; and (iii) commercial activities involving natural or cultural resources and/or indigenous knowledge rights in ethnic minority communities' lands without their consent. The EFMC is required to ensure that these requirements are met during the screening of newly identified activities in accordance with the procedures stipulated in the ESMS.

96. **Establishment of the eco-compensation fund and its operational procedures.** Before the eco-compensation fund is established, the EFMC will (a) finalize the draft ESMS in Appendix 4 with ADB's prior approval; (b) issue a formal directive to integrate the ESMS into the EFMC's operational procedures with ADB's prior approval; and (c) establish the EFMC's operational procedures integrating the ESMS, including screening, selection, and approval procedures for activities, financial transfer mechanisms, and technical and financial reporting, with ADB's prior approval. The EFMC will comply with and implement its operational procedures in which the ESMS is integrated into, and review and approve all activities to be financed from the eco-compensation fund in accordance with the EFMC's operational procedures. The EFMC will ensure that all users of the eco-compensation fund comply with the EFMC's operational procedures.

97. The EFMC will submit proposed safeguards screening documents and safeguard classification with the description of the activity to ADB for prior review and approval, for the first two activities in each type of category. If such proposed safeguards classifications are satisfactory to ADB, any subsequent activities in the same type of category shall only be subject to ADB's post review through semiannual environmental monitoring reports and quarterly project progress reports, including the ESMS implementation progress.

98. **Personnel.** The environment and social officers of the PMO who are responsible for

overall implementation of the project safeguards will also be responsible for the ESMS implementation. These two officers will work under the PMO for safeguards related to project Outputs 1, 2, and 4 and for the EFMC for project Output 3 (i.e., the ESMS), including the finalization of the ESMS; integration of the ESMS into the EFMC's operational procedures; and daily implementation of the ESMS procedures for safeguard screening, safeguard categorization, and management of approved activities.

99. **Implementation procedures.** The EFMC will ensure that each approved activity meets requirements of the ESMS (i.e., screening procedures have been completed, the proposed activities meet the ESMS criteria, and proposed designs seek to maximize environmental and social benefits). To support the design process, the PMO environment and social officers and applicants will consult with relevant government agencies. The PMO environment and social officers will also work with relevant consultants, as necessary, for technical feedback and support. All approved activities shall comply with ADB's SPS. The EFMC shall submit to the PMO and ADB all records, and documents as may be requested from time to time.

100. **Monitoring and reporting.** The EFMC will submit semiannual safeguard progress reports, including progress of the ESMS implementation, to the PMO, which should include the number and types of applications received, details of approved activities, issues and lessons learned, and supporting safeguard documents for approved activities (copies of relevant domestic environmental and social safeguard approval documents and project-specific documents). The PMO, consolidating these findings and data, will prepare and submit to ADB the semiannual environmental monitoring reports and quarterly project progress reports, including progress of the ESMS implementation. Within 12 months of establishment of the eco-compensation fund, the PMO, the EFMC, and ADB will conduct a tripartite review of progress of the fund and the ESMS; and will jointly agree on revisions and/or recommendations, as needed, to resolve any issues. The draft safeguard progress reports will be submitted to ADB within 30 days of the reporting period.

E. Grievance Redress Mechanism

101. A project-specific GRM has been developed in compliance with ADB's SPS requirements to address environmental, health, safety, and social concerns associated with the ADB-funded projects. The GRM complements and builds upon existing PRC mechanisms for environmental complaints, including a national environmental complaint hotline. The GRM is designed to achieve the following objectives: (i) provide channels of communication for communities to raise concerns about environmental and social-related grievances which might result from the project, (ii) prevent and mitigate adverse environmental and social impacts to communities caused by construction and operation for the project, and (iii) build trust and respect and promote productive relationships between the project agencies and local villages and communities. The GRM is accessible to all members of the villages and communities, including women, youth, minorities, and poverty-stricken villagers and residents. Multiple points of entry are available, including face-to-face meetings, written complaints, telephone conversations, e-mail, and social media. The details of the GRM, including a time-bound flow chart of procedures, are described in the EMP.

102. Specific GRM procedures have been incorporated into the EMP, resettlement plan, and the ESMS. The complaint channels are slightly different for environmental and social issues, but the PMO will maintain an integrated system to document, follow-up, and report on all cases. Before construction starts, the LPMO and district or county administration offices will notify the project design and impacts to the affected persons. The environment and social officers of the PMO and the LPMOs will be the lead coordinators for the GRM implementation. Relevant staff of the ZCG, including the PMO, the LCG, the ZDG, and the LPMOs will be trained in the GRM.

F. Prohibited Investment Activities

103. Pursuant to ADB's SPS, the ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of ADB's SPS and also stated in Appendix 2 of the ESMS in Appendix 4 of this project administration manual.

VIII. GENDER AND SOCIAL DIMENSIONS

A. Poverty Reduction and Social Strategy

104. The project is classified *general intervention* for poverty reduction. A poverty and social analysis was undertaken based on intensive stakeholder consultations and socioeconomic surveys. A total of 127,015 residents in the project area, including 59,697 women (47.0%) and 25,403 low-income people (20%), are expected to directly benefit from the project through reduced solid waste and water pollution, improved river management, and better environmental and ecological protection in the Sayu River Basin. Other residents in Zhaoyang District and Ludian County of Zhaotong will also benefit indirectly from improved environment. The project will create 1,834 jobs during project implementation and 372 jobs during project operation. A social development action plan (SDAP) prepared based on the poverty and social analysis has specific targets for poor and low-income people (Table VIII-1). Consultations were undertaken with local residents and other stakeholders during project preparation.

B. Gender

105. The project is classified *effective gender mainstreaming*, following ADB's Guidelines for Gender Mainstreaming Categories of ADB Projects.⁴³ Gender analysis indicates that women are the primary caretakers of household wastewater and solid waste management, and initial estimates suggest that project investments will result in an important reduction in time (50%) spent on these tasks through improved systems. Migration is a key livelihood strategy in the area, especially among the young. However, nonmigrant women expressed interested in job opportunities to be created by the project, which will include skilled and unskilled positions for the construction and operation of facilities. A gender action plan (GAP) has been prepared for the project that will (i) measure results toward gender equality, particularly time savings as a result of improved waste management systems for women through baseline and endline surveys; (ii) set targets for women's participation in decision making and in skilled and unskilled employment; (iii) set targets to ensure women farmers' participation in training to facilitate their transition to low-emission agriculture; and (iv) set targets for ensuring the active participation of women in the EFMC which is responsible for screening and improvement of activities proposed to be financed from the fund.

⁴³ ADB. 2012. [Guidelines for Gender Mainstreaming Categories of ADB Projects](#). Manila.

Table VIII-1: Social Development Action Plan

Actions	Targets and Indicators	Timeframe	Responsible Agencies	Budget Sources
A. Output 1: Wastewater management and pollution control in the Sayu River Basin strengthened				
A.1 Ensure communities participate in and benefit from rural wastewater management for improved sanitary conditions	15,359 households (including 59,286 people, of which 20% are poor and/or low-income people) connected with wastewater facilities (2019 baseline: 0 person) Animal feces collection tanks installed for 17,323 households (including 66,867 people, of which 20% are poor and/or low-income people) (2019 baseline: 0 person)	2021–2026	ZCG, including the PMO, the LCG, the ZDG, the LPMOs, consultants, contractors, and suppliers (supported by town and township governments, village committees, and the PAOs)	Governments' counterpart funds and loan fund
A.2 Ensure communities participate in and benefit from rural solid waste management for better living environment	Solid waste management facilities developed for 30,890 households (including 118,798 people, of which 20% are poor and/or low-income people) (2019 baseline: 0 household)			
A.3 Ensure communities participate in and benefit from pilot eco-villages construction for improved infrastructure and living environment	2,500 people, of which 20% are poor and/or low-income people, in the pilot eco-villages participate in activities for and/or education on environmental protection (2019 baseline: NA)			
A.4 Ensure communities participate in and benefit from wetlands construction, soil and water conservation, and low-emission agriculture promotion for reduced nonpoint source pollution	10,489 people, of which 20% are poor and/or low-income people, benefitted from constructed wetlands (2019 baseline: NA) 12,941 people, of which 20% are poor and/or low-income people, benefitted from soil and water conservation (2019 baseline: NA) 33,946 people, of which 20% are poor and/or low-income people, benefitted from low-emission agriculture promotion (2019 baseline: NA)			
A.5 Ensure community representatives participate in consultations on detailed design of relevant project components and public hearings on solid waste and wastewater tariff proposals	100 representatives of beneficiaries, of which 20% are poor and/or low-income people, participate in consultations on detailed designs of relevant project components and public hearings on wastewater and solid waste tariff proposals (2019 baseline: NA)			

Actions	Targets and Indicators	Timeframe	Responsible Agencies	Budget Sources
A.6 Ensure community-based designated cleaning teams and designated environmental supervision groups are established and operated well in the pilot eco-villages	Designated cleaning teams and designated environmental supervision groups established and operated well in each pilot eco-village (2019 baseline: does not exist)			
B. Output 2: Water resources management in the Sayu River improved				
B.1 Ensure communities participate in and benefit from construction of ecological river embankments for better ecology and environment B.2 Ensure public representatives participate in consultations on detailed design of relevant project components	Ecological river embankments constructed for 4,811 people, of which 20% poor and/or low-income people (2019 baseline: NA) 60 representatives of beneficiaries, of which 20% poor and/or low-income people, participate in consultations on detailed designs of relevant project components (2019 baseline: NA)	2021–2026	ZCG, including the PMO, the LCG, the ZDG, the LPMOs, consultants, contractors, and suppliers (supported by town and township governments, village committees, and PAOs)	Government counterpart funds and loan fund
C. Output 3: Eco-compensation mechanism for the Sayu River Basin established				
C.1 Ensure communities participate in and benefit from eco-compensation mechanisms for improved environment	20% of participants in design and implementation of eco-compensation mechanism are poor and/or low-income people (2019 baseline: NA) 20% of beneficiaries from the eco-compensation fund are poor and/or low-income people (2019 baseline: NA)	2021–2026	ZCG, including the YWPCO and the PMO, consultants, uses of the eco-compensation fund (supported by town and township governments, village committees, and the PAOs)	Government counterpart funds/eco-compensation funds and loan fund
D. Output 4: Education, capacity, and public awareness for water pollution management strengthened				
D.1 Ensure government staff participate in capacity development programs on water pollution management D.2 Ensure students participate in education on water pollution management D.3 Ensure communities participate in awareness-raising activities on water pollution management	Capacity of 200 people (of which at least 20% are poor and/or low-income people) for water pollution management developed (2019 baseline: 0) 12,550 students (of which at least 20% are poor and/or low-income people) educated in water pollution management (2019 baseline: 0) 32,750 people's awareness of water pollution management (of which at least 20% are poor and/or low-income people) are raised (2019 baseline: 0)	2021–2026	ZCG, including the PMO, the LCG, the ZDG, the LPMOs, schools, and consultants, (supported by town and township governments, village committees, and the PAOs)	Government counterpart funds and loan fund
E. For All Outputs: Generating Job Opportunities				
E.1 During construction, create a total of 1,834 temporary jobs, including 825 skilled and	1,834 jobs created during construction, of which 20% are provided to poor and/or low-income	2021–2026	ZCG, including the PMO, the LCG, the ZDG, the	Government counterpart

Actions	Targets and Indicators	Timeframe	Responsible Agencies	Budget Sources
<p>1,009 unskilled jobs</p> <p>E.2 During operation, create a total of 372 jobs, including 360 skilled and 12 unskilled jobs (for maintenance of facilities and landscaping of rivers and wetlands)</p> <p>E.3 Ensure timely advertisement of job vacancies and give priority to poor and/or low-income people for hiring</p>	<p>people (2019 baseline: NA)</p> <p>372 jobs created during operation, of which 20% are provided to poor and/or low-income people (2019 baseline: NA)</p>		<p>LPMOs, contractors, and consultants (supported by town and township governments, village committees, LSSBs, and the PAOs)</p>	<p>funds and loan fund</p>
F. For All Outputs: Comply with labor laws and core labor standards				
<p>F.1 Ensure contractors comply with labor laws and core labor standards, including “no child labor”, minimum wages, equal payment to equal work, and occupational health and safety</p> <p>F.2 Ensure appropriate service providers engaged by contractors disseminate information on the risks of sexually transmitted diseases, including HIV/AIDS, to the employees of contractors engaged under the project and to members of local communities surrounding the project area</p> <p>F.3. Provide separate toilets and sanitation facilities to workers</p>	<p>100% of contractors comply with labor laws and core labor standards (2019 baseline: NA)</p> <p>1,834 employees of contractors engaged under the project receive information on the risks of sexually transmitted diseases, including HIV/AIDS (2019 baseline: NA)</p> <p>524 members of local communities surrounding the project area receive information on the risks of sexually transmitted diseases, including HIV/AIDS (2019 baseline: 0)</p> <p>100% of workers have access to separate toilets and sanitation facilities (2019 baseline: NA)</p>	<p>2021–2026</p>	<p>ZCG, including the PMO, the LCG, the ZDG, the LPMOs, contractors, and consultants (supported by town and township governments, village committees, and the LSSBs)</p>	<p>Government counterpart funds and loan funds</p>
G. For All Outputs: Project implementation management support				
<p>G.1 Ensure a social development specialist is included in a project management support consultant team to guide and assist in implementation of the SDAP and provide training to the PMO, the LPMOs, and other government agencies.</p> <p>G.2. Assign a social and gender focal staff in each of the PMO and the LPMOs to ensure effective implementation of the SDAP</p>	<p>A social development specialist recruited as a member of the project management support consultant team to guide and assist in implementation of the SDAP (2019 baseline: NA)</p> <p>At least one social and gender focal person assigned in each of the PMO and the LPMOs to implement the SDAP activities (2019 baseline: NA)</p>	<p>2021–2026</p>	<p>ZCG, including the PMO, the LCG, the ZDG, the LPMOs, and consultants (supported by town and township governments, village committees, and the PAOs)</p>	<p>Government counterpart funds and loan fund</p>

Actions	Targets and Indicators	Timeframe	Responsible Agencies	Budget Sources
<p>G.3 Provide training to the PMO, the LPMOs, and other government agencies on (i) social development policies of the Asian Development Bank; (ii) how to implement and monitor the SDAP; and (iii) social issues related to project components and importance of social inclusion in all project components</p> <p>G.4 Collect data disaggregated by income status</p>	<p>Relevant staff of the PMO, LPMOs, and other government agencies receive the training (2019 baseline: NA)</p> <p>Disaggregated data by income status collected during project implementation (2019 baseline: NA)</p>			

AIDS = acquired immune deficiency syndrome, HIV = human immunodeficiency virus, LCG = Ludian County Government, LPMO = local project management office, LSSB = labor and social security bureau, NA = not applicable, PAO = poverty alleviation office, PMO = project management office, SDAP = social development action plan, YWPCO = Yudong Reservoir Water Resources Protection Committee Office, ZCG = Zhaotong City Government, ZDG = Zhaoyang District Government. Source: Asian Development Bank.

Table VIII-2: Gender Action Plan

Actions	Targets and Indicators	Timeframe	Responsible Agencies	Budget Sources
A. Output 1: Wastewater management and pollution control in the Sayu River Basin strengthened				
<p>A.1. Baseline and endline survey on women's time spent for wastewater, garbage, and animal feces collection and treatment conducted at the beginning and end of the project (2019 baseline: NA)</p> <p>A.2. Quotas for women are set for skilled and unskilled jobs created under Output 1 during construction and operation.</p> <p>A.3. Increase women's access to sanitation services by constructing wastewater facilities and animal feces collection tanks in rural areas.</p> <p>A.4. Improve women's access to solid waste management services for improved environmental condition.</p> <p>A.5. Promote women's participation in environmental protection activities in the pilot eco-villages through outreach and education.</p> <p>A.6. Support the transition to low-emission/ low-pollution agriculture among female farmers.</p> <p>A.7. Conduct consultations on detailed design that include the needs and views from women and men, including on wastewater and solid waste tariff proposals.</p> <p>A.8. Establish cleaning teams and designated environmental supervision groups in the pilot eco-villages with women's representation.</p>	<p>A.1. By 2026, 60,000 women with increased time savings for wastewater, animal feces, and solid waste management (2019 baseline: NA)</p> <p>A.2.1. 466 skilled jobs created during construction, of which at least 20% provided to women (2019 baseline: 0)</p> <p>A.2.2. 360 skilled jobs created during operation, of which 30% are provided to women (2019 baseline: NA)</p> <p>A.2.3. 569 unskilled jobs created during construction, of which 40% for women (2019 baseline: NA)</p> <p>A.3.1. 15,359 households (including 59,286 people, of which 47% are women) connected with wastewater facilities (2019 baseline: 0 person)</p> <p>A.3.2. Animal feces collection tanks installed for 17,323 households (including 66,867 people, of which 47% are women) (2019 baseline: 0 person)</p> <p>A.4. Solid waste management facilities developed for 30,890 households (including 118,798 people, of which 47% are women) (2019 baseline: 0 household)</p> <p>A.5. 2,500 people, of which 40% are women, in the pilot eco-villages participate in environmental and education activities on environmental protection (2019 baseline: NA)</p> <p>A.6.1. 16,000 female farmers receive training and participate in promotion of low-emission agriculture (2019 baseline: NA)</p> <p>A.6.2. 12,941 people, of which 47% are women, benefitted from soil and water conservation (2019 baseline: NA)</p> <p>A.7. 100 representatives of beneficiaries, of which at least 40% are women, participate in consultations on detailed designs of relevant project components and in public hearings on wastewater and solid waste tariff proposals (2019 baseline: NA)</p> <p>A.8. 40% representatives of the designated cleaning teams and environmental supervision groups are women (2019 baseline: NA)</p>	2021–2026	ZCG, including LCG, ZDG, PMO, LPMOs, consultants, contractors, and suppliers (supported by town and township governments, village committees, and ACWF)	Governments' counterpart funds and loan fund

Actions	Targets and Indicators	Timeframe	Responsible Agencies	Budget Sources
B. Output 2: Water resources management in the Sayu River improved				
<p>B.1. Quotas for women are set for skilled and unskilled jobs created by Output 2 during construction and operation.</p> <p>B.2. Improve women's living conditions by constructing ecological river embankments.</p> <p>B.3. Improve women's access to river and water management and benefit from improved water quality.</p> <p>B.4. Conduct consultations on detailed design that include the needs and views from women and men, including of relevant project components.</p>	<p>B.1.1. 440 unskilled jobs created during construction, of which 40% are provided to women (2019 baseline: NA)</p> <p>B.1.2. 359 skilled jobs created during construction, of which 15% are provided to women (2019 baseline: NA)</p> <p>B.2. Ecological river embankments constructed for 4,811 people, of which 47% are women (2019 baseline: NA)</p> <p>B.3. 4,811 people, of which 47% are women, benefitted from the intelligent cloud platform river information management system; and the smart water integrated management platform (2019 baseline: NA)</p> <p>B.4. 60 representatives of beneficiaries, of which at least 40% are women (2019 baseline: NA)</p>	2021–2026	ZCG, including LCG, ZDG, PMO, LPMOs, consultants, contractors, and suppliers (supported by town and township governments, village committees, and ACWF)	Government counterpart funds and loan fund
C. Output 3: Eco-compensation mechanism for the Sayu River Basin established				
C.1. Women represented in the implementation of the eco-compensation mechanism.	C.1. By 2023, at least 35% of the eco-compensation fund management committee members are women (2019 baseline: NA)	2021–2026	ZCG, including the Yudong Reservoir Water Resources Protection Committee Office and the PMO	Government counterpart funds and loan fund
D. Output 4: Education, capacity, and public awareness for water pollution management strengthened				
D.1. Women are trained on water pollution management.	<p>D.1.1. 200 people (of which at least 40% are women) with water pollution management capacity enhanced (2019 baseline: 0 person)</p> <p>D.1.2. 12,550 students (of which at least 40% are women) trained on water pollution management (2019 baseline: 0 student)</p> <p>D.1.3. 32,750 people with awareness of water pollution management (of which at least 40% are women) increased (2019 baseline: 0 person)</p>	2021–2026	ZCG, including LCG, and ZDG, PMO, LPMOs, schools, and consultants (supported by town and township governments, village committees, and ACWF)	Government counterpart funds and loan fund
E. For all outputs: Project management				
E.1. Ensure a gender specialist is included in the project management support consultant team to guide and assist in the implementation of the GAP and provide training to the PMO, the LPMOs, and other government agencies.	E.1. A gender specialist recruited as a member of the project management support consultant team to guide and assist in the implementation of the GAP (2019 baseline: NA)	2021–2026	ZCG, including LCG, ZDG, PMO, LPMOs, and consultants (supported by town and township governments,	Government counterpart funds and loan fund

Actions	Targets and Indicators	Timeframe	Responsible Agencies	Budget Sources
<p>E.2. Assign a social and gender focal staff in each of the PMO and the LPMOs to ensure effective implementation of the GAP.</p> <p>E.3. Provide training to the PMO, the LPMOs, and other government agencies on (i) gender equality and mainstreaming policies of the Asian Development Bank; (ii) how to implement and monitor the GAP; and (iii) gender issues in relevant project components.</p> <p>E.4. Collect sex-disaggregated data.</p> <p>E.5. Prepare monitoring reports on the GAP implementation.</p>	<p>E.2. At least one social and gender focal person assigned in each of the PMO and the LPMOs to implement the GAP activities (2019 baseline: NA)</p> <p>E.3. Relevant staff of the PMO, the LPMOs, and other government agencies receive training (2019 baseline: NA)</p> <p>E.4. Sex-disaggregated data collected during project implementation (2019 baseline: NA)</p> <p>E.5. Monitoring reports on the GAP implementation included in the quarterly project progress reports and the semiannual external resettlement and social development monitoring and evaluation reports (2019 baseline: NA)</p>		village committees, and ACWF)	

ACWF = All China Women's Federation, GAP = gender action plan, LCG = Ludian County Government, LPMO = local project management office, NA = not applicable, PMO = project management office, ZCG = Zhaotong City Government, ZDG = Zhaoyang District Government.

Source: Asian Development Bank.

IX. PERFORMANCE MONITORING, EVALUATION, REPORTING, AND COMMUNICATION

A. Project Design and Monitoring Framework

Impact the Project is Aligned with Quality of life and sustainable aquatic ecosystem in the Yangtze River Basin improved (Yangtze River Economic Belt Development Plan, 2016–2030) ^a			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Outcome Condition of water resources and environment in the Sayu River Basin improved	a. By 2027, monthly average total nitrogen in the Yudong Reservoir meets the Class III standard 10 times per year (2019 baseline: 9 times) ^b b. By 2027, monthly average total phosphorus in the Yudong Reservoir meets the Class II standard 10 times per year (2019 baseline: 8 times) ^c	a.–b. Zhatong City Water Resources Bureau's data	Population exerts heavier pollution load than forecast.
Outputs 1. Wastewater management and pollution control in the Sayu River Basin strengthened 2. Water resources management in the Sayu River improved	1a. By 2023, wastewater treatment capacity in the Sayu River Basin increased to 2,738 m ³ /day (2019 baseline: 2,535 m ³ /day) 1b. By 2026, 15,359 households (including 59,286 people, of whom 47.0% are women) in the Sayu River Basin connected with wastewater facilities (2019 baseline: 0 households, 0% women) (OP 5.1) 1c. By 2023, 138,584 m ³ /year of animal feces collected in tanks installed at 17,323 households (including 66,867 people, of whom 47.0% are women) in the Sayu River Basin (2019 baseline: not applicable, 0 households, 0 persons, 0% woman) 1d. By 2024, 84 tons/day of solid waste from 30,890 households (including 118,798 people, of whom 47.0% are women) in the Sayu River Basin treated (2019 baseline: 25 tons/day, 0 households, 0 persons, 0% woman) ^d 1e. By 2026, 60,000 women with increased time savings for wastewater, animal feces, and solid waste management (2019 baseline: not applicable) (OP 2.4.1) 1f. By 2026, 2,500 people (of whom 40% are women) in three pilot eco-villages participate in activities for and/or education on environmental protection (2019 baseline: not applicable) (OP 2.5.1) 1g. By 2025, six artificial wetlands operational to reduce nonpoint-source pollution (2019 baseline: Not applicable) (OP 3.1.5) 1h. By 2026, the quantifiable soil and water conservation model tentatively established using available monitoring data (2019 baseline: not applicable) ^e (OP 3.3.4) 1i. By 2026, chemical fertilizer nitrogen loss reduced to 3.920 kg/ha; and phosphor loss reduced to 0.077 kg/ha in the low-emission agriculture pilot areas (2017 baseline: 5.670 kg/ha [nitrogen] and 0.110 kg/ha [phosphor]) ^f 1j. 16,000 female farmers receive training and participate in the promotion of low-emission agriculture (2019 baseline: not applicable) (OP 2.2) 2a. By 2024, data on water quality in rivers in the Sayu River Basin automatically sent to mobile devices of the “river chiefs” in real time (2019 baseline: not applicable) ^g	1a. Operation reports of the WWT plant and 44 WWT facilities 1b.–1c. and 1e. Surveys conducted by village committees 1d. Operation reports of the two pyrolysis plants 1f. and 1j. Project progress reports and/or external resettlement and social development M&E reports 1g. Environmental monitoring reports 1h. Surveys by consultants 1i. Reports of soil and fertilizer stations of Zhaotong City, Zhaoyang District, and Ludian County 2a. Surveys by consultants	Changes in administrative procedure or budgetary process delay the provision of counterpart funds.

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
3. Eco-compensation mechanism for the Sayu River Basin established	<p>3a. By 2021, six eco-compensation agreements signed with Longshu, Shuimo, and Xinjie towns in Ludian County; and Leju and Sujia townships, and Sayu Town, in Zhaoyang District (2019 baseline: not applicable) (OP 3.3.2)</p> <p>3b. By 2026, beneficiaries' cumulative payment into the eco-compensation fund exceeds CNY28.0 million (2019 baseline: not applicable) (OP 6.1)</p> <p>3c. By 2023, at least 35% of the eco-compensation fund management committee members are women (2019 baseline: not applicable) (OP 2.3)</p>	<p>3a. Surveys by consultants</p> <p>3b.–3c. Reports of the eco-compensation fund management committee and/or the Yudong Reservoir Water Resources Protection Committee Office</p>	
4. Education, capacity, and public awareness for water pollution management strengthened	<p>4a. By 2026, at least 12,550 students (of whom at least 40% are women) educated in water pollution management (2019 baseline: not applicable) (OP 2.2)</p> <p>4b. By 2026, at least 200 people (of whom at least 40% are women) report enhanced knowledge and skills on water pollution management (2019 baseline: not applicable) (OP 2.2)</p> <p>4c. By 2026, at least 32,750 people (of whom at least 40% are women) report enhanced awareness on water pollution management (2019 baseline: not applicable)</p> <p>4d. By 2026, garbage classification conducted in 20% of households in the Sayu River Basin and upper Yudong Reservoir (2019 baseline: 0%)</p> <p>4e. By 2026, at least five other projects referenced this project in their project documents (2019 baseline: 0)</p>	<p>4a.–4c. and 4e. Surveys by consultants and/or project progress reports</p> <p>4d. Surveys by village committees</p>	
Key Activities with Milestones <ol style="list-style-type: none"> Wastewater management and pollution control in the Sayu River Basin strengthened <ol style="list-style-type: none"> 1.1 Land acquisition and resettlement for facilities to reduce water pollution sources (Q4 2020–Q1 2022) 1.2 Procurement for facilities to reduce water pollution sources (Q4 2020–Q3 2023, intermittent) 1.3 Construction of facilities to reduce water pollution sources (Q2 2021–Q2 2024, intermittent) 1.4 Technical assistance by consultants in the reduction of water pollution sources (Q1 2021–Q2 2026, intermittent) Water resources management in the Sayu River improved <ol style="list-style-type: none"> 2.1 Land acquisition and resettlement for ecological embankment (Q4 2020–Q2 2023, intermittent) 2.2 Procurement for ecological embankment and smart water integrated management platform (Q2 2021–Q3 2023, intermittent) 2.3 Construction of ecological embankment and development of smart water integrated management platform (Q4 2021–Q2 2024, intermittent) 2.4 Technical assistance by consultants in the establishment of a river protection model and a smart water integrated management platform (Q4 2021–Q3 2026, intermittent) Eco-compensation mechanism for the Sayu River Basin established <ol style="list-style-type: none"> 3.1 Implementation of the eco-compensation agreement between Ludian County and Zhaoyang District with consulting services (Q2 2021–Q4 2026, intermittent) 3.2 Establishment and implementation of new town- and township-level horizontal eco-compensation mechanisms with consulting services (Q2 2021–Q4 2026, intermittent) 3.3 Establishment and implementation of an eco-compensation fund (Q3 2022–Q4 2026, intermittent) Education, capacity, and public awareness for water pollution management strengthened <ol style="list-style-type: none"> 4.1 Training, workshops, and domestic and overseas study visits and training for rural water pollution management and eco-compensation (Q1 2021–Q2 2026, intermittent) 4.2 Periodical special lectures at schools and study visits for students (Q1 2022–Q2 2026, intermittent) 4.3 Public awareness raising through publicity, handbook, brochures, media, internet, and campaigns. (Q1 2022–Q2 2026, intermittent) 4.4 Dissemination and replication of water pollution management and eco-compensation demonstrated under the project to other areas of the People's Republic of China and other countries (Q1 2024–Q4 2026, intermittent) 			

Project Management Activities

Recruit individual consultants for initial project management support (Q3 2020)
 Conduct initial project management with individual consultants' assistance (Q3 2020–Q2 2021)
 Recruit a consultant team for project management support (Q3 2020–Q2 2021)
 Conduct project management with consultant team's assistance (Q2 2021–Q4 2026)
 Recruit an external environmental monitoring agency (Q1 2021)
 Submit semiannual environmental monitoring reports to ADB (Q2 2021–Q2 2024)
 Recruit an external agency for external resettlement and social development M&E (Q3–Q4 2020)
 Submit semiannual external resettlement and social development M&E reports to ADB (Q2 2021–Q4 2025)
 Monitor and evaluate project impact, outcome, and outputs using the project performance management system; and submit quarterly project progress reports to ADB (Q1 2021–Q4 2026)
 Submit the project completion report to ADB (Q4 2026)

Inputs

ADB: \$100.0 million (ordinary capital resources, regular loan)
 Government: \$134.6 million

Assumptions for Partner Financing.

Not applicable

ADB = Asian Development Bank, CNY = Chinese yuan, DMF = design and monitoring framework, ha = hectare, kg = kilogram, m³ = cubic meter, M&E = monitoring and evaluation, OP = operational priority, Q = quarter, RFI = results framework indicator, WWT = wastewater treatment.

- ^a Government of the People's Republic of China. 2016. *Outline of the Yangtze River Economic Belt Development Plan, 2016–2030*. Beijing.
- ^b The monthly average total nitrogen met the Class III standard twice in 2017 and three times in 2018.
- ^c The monthly average total phosphorus met the Class II standard four times in 2017 and five times in 2018.
- ^d Some 25 tons/day of solid waste is being treated at four pyrolysis plants. However, all four plants will be closed; and by 2024, 84 tons/day of solid waste will be treated by new two pyrolysis plants constructed under the project.
- ^e To complete the quantifiable soil and water conservation model, the effects of afforestation on soil and water conservation need to be measured in the fields for about 10 years.
- ^f The chemical fertilizer nitrogen (phosphor) loss is the amount of nitrogen (phosphor) included in the chemical fertilizer that has not been absorbed by crops and remains in the water and deep soil. Data on chemical fertilizer nitrogen (phosphor) loss from the soil and fertilizer stations in 2017 are the latest (the stations do not conduct annual surveys).
- ^g The “river chief” system was introduced in the People's Republic of China in 2017. It assigns each part of a river and lake to a certain official.

Contribution to Strategy 2030 Operational Priorities

Expected values and methodological details for all OP indicators to which this operation will contribute results are detailed in Contribution to Strategy 2030 Operational Priorities (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President). {In addition to the OP indicators tagged in the DMF, this operation will contribute results for

- OP 1.3: Poor and vulnerable people with improved standards of living (number)
- OP 3.1.1: Additional climate finance mobilized (\$)
- OP 3.3.1: Pollution control enhancing infrastructure assets established or improved (number)
- OP 5.1.1: Rural infrastructure assets established or improved (number)

Source: Asian Development Bank.

B. Monitoring

1. Project Performance Monitoring

106. In well advance of loan effectiveness, the PMO will prepare a format of quarterly project progress reports acceptable to ADB; and make necessary arrangements for preparation of the reports, including a flow of data and information collection, responsibility definition of each of the PMO and the LPMOs, and reporting formats (from contractors to the LPMOs, from consultants to the PMO, from the LPMOs to the PMO, etc.). Quarterly project progress reports will include progress of the overall project and each component; status of consulting services and activities performed by each consultant; information on training, workshops, and study visits conducted; status of the LAR based on internal monitoring; status of the implementation of the EMDP, the SDAP, and the GAP; records of grievance and complaints; project performance (achievement of each performance indicator against the target); and particular issues.

2. Compliance Monitoring

107. The ZCG, including the YWPCO, the ZDG, the LCG, and the project management support consultants, will closely monitor the compliance of all the covenants included in the loan and project agreements. The compliance status of the covenants will be reported through quarterly progress reports. ADB will verify the compliance by reviewing quarterly project progress reports, communicating with the PMO, and/or conducting review missions.

3. Safeguard Monitoring

3-1. Environment

108. The environmental monitoring program focuses on the environment in the affected project areas. The environmental monitoring program is included in the EMP, including the scope of monitoring, parameters, time, and frequency, implementing and supervising agencies, and estimated costs. Three types of monitoring will be conducted in accordance with the EMP: (i) internal monitoring, to be conducted by the LPMOs and the CSCs; (ii) external monitoring of air, water, noise, and soil standards, to be conducted by an external EMA; and (iii) compliance monitoring, to be conducted by a national environment specialist in a project management support consultant team, to ensure that the EMP is being implemented. 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 ambient air, surface water, sediment and noise, and the pollutant discharge standards. ADB will oversee the compliance based on the semiannual environmental monitoring reports provided by the PMO and review missions.

109. **Internal monitoring.** During construction, the CSCs and the LPMOs will be responsible for conducting the internal environmental monitoring in accordance with the monitoring plan. Results will be reported through the CSCs' monthly reports to the LPMOs and the PMO.

110. **External monitoring.** The PMO will contract an external EMA to conduct the external environmental monitoring described in Table EMP-5 in Appendix 3. A detailed cost breakdown will be provided by the EMA. The external monitoring will be conducted during the entire construction phase and first full year of operation of the relevant facility. The EMA will prepare semiannual monitoring reports of the methods and results. The EMA will submit the reports to the PMO and the LPMOs at the same time to ensure independence.

111. **Compliance monitoring.** The environmental specialist in the project management support consultant team will review project progress and compliance with the EMP based on field visits, consultations with the PMO and the LPMO environment officers, contractors, and the CSCs, and review of the monitoring reports prepared by the CSCs and the EMA. The findings of the environmental specialist will be reported to ADB through semiannual environment monitoring reports.

112. **Semiannual environmental monitoring reports.** The PMO will submit the semiannual environmental monitoring reports to ADB. The reports will include (i) progress made in the EMP implementation; (ii) overall effectiveness of the EMP implementation (including public and occupational health and safety); (iii) environmental monitoring and compliance; (iv) institutional strengthening and training; (v) public consultation (including the GRM); and (vi) any problems encountered during construction and operation, and the relevant corrective actions undertaken. The environmental specialist will help the PMO prepare the reports and submit the English reports to ADB for disclosure.

113. **Environmental acceptance reporting.** Following the PRC's Regulation on Project Completion Environmental Audit (Ministry of Environmental Protection, 2001), within 3 months after the completion of major subprojects, an environmental acceptance report for each subproject shall be (i) prepared by the implementing agency (the LCG or the ZDG) or a capable environmental monitoring institute in accordance with the PRC's Guideline on Project Completion Environmental Audit (2017); and (ii) finally reported to ADB through semiannual environmental monitoring reports. The environmental acceptance reports will indicate the timing, extent, and effectiveness of completed mitigation and maintenance; and needs for additional mitigation measures and monitoring during operations.

3-2. Resettlement Plan, EMDP, SDAP, GAP, and ESMS (Social Measures)

114. Internal and external monitoring of the implementation of the resettlement plan, the EMDP, the SDAP, the GAP, and the ESMS will be conducted. For monitoring of the implementation of the resettlement plan, the EMDP, and the ESMS, monitoring methodologies are specified in the resettlement plan, the EMDP, and the ESMS. For monitoring of implementation of the SDAP and the GAP, clear targets and indicators are in the SDAP and the GAP; and some indicators are also included in the design and monitoring framework.

115. To ensure implementation and monitoring of the resettlement plan, the EMDP, the SDAP, the GAP, and the ESMS, the resettlement specialist, the social development specialist, and the gender specialist in the project management support consultant team will assist the PMO and the LPMOs by working with relevant focal staff of the PMO and the LPMOs in (i) setting up effective monitoring systems; (ii) internally monitoring implementation of the plans; and (iii) reporting the results of the internal monitoring to ADB through quarterly project progress reports and disclosing relevant information locally until the project completion. The PMO and the LPMOs will ensure that civil works contractors comply with applicable labor laws and core labor standards and provide relevant training to their workers.

116. An external resettlement and social development M&E agency will conduct external M&E of the implementation of the resettlement plan, the EMDP, the SDAP, and the GAP semiannually.⁴⁴ The cost of the external resettlement M&E will be funded from the ADB loan. External resettlement and social development M&E reports will be forwarded directly to ADB.

⁴⁴ The M&E of the implementation of the resettlement plan will be conducted semiannually during the implementation of the resettlement plan and annually for 2 years after that.

C. Evaluation

117. In addition to regular monitoring, project progress and performance will be monitored at least once a year jointly by ADB and the ZCG during ADB's review mission. ADB and the ZCG will undertake a midterm review in the mid-year of the project implementation period to conduct a detailed evaluation of the project scope, implementation arrangements, progress of the overall project and each component, and status of achieving the performance targets; and recommend appropriate measures, including changes in the project scope and/or implementation arrangements, reallocation of loan proceeds, changes in the ADB financing ratios, and extension of the loan closing date. Promptly after physical completion of the project, but in any event not later than 6 months thereafter or such later date as ADB may agree for this purpose, the PMO will prepare and submit to ADB a project completion report, in such form and in such detail as ADB shall reasonably request, on the implementation and evaluation of the project.

D. Reporting

118. The ZCG will provide ADB with (i) quarterly project progress reports in a format agreed by ADB; (ii) semiannual environmental monitoring reports; and (iii) a project completion report promptly after physical completion of the project, but in any event not later than 6 months thereafter or such later date as ADB may agree for this purpose. The ZCG will also ensure that an external resettlement and social development M&E agency will submit the M&E reports to ADB. To ensure that project will continue to be both viable and sustainable, project accounts and the audited project financial statement together with the associated auditor's report should be adequately reviewed.

E. Stakeholder Communication Strategy

119. Project information will be disclosed through ADB's and the government's websites, meetings, interviews, focus group discussions, and community consultation meetings in accordance with the requirements of ADB's information disclosure policy. Main stakeholders are the different agencies of the ZCG, the ZDG, the LCG, beneficiaries, affected persons, and participants in the project implementation. Stakeholder communication is also part of the EIA, including the EMP, resettlement plan, the EMDP, the SDAP, and the GAP; and will be monitored accordingly.

120. **Environment.** Meaningful consultation, participation, and information disclosure was conducted during project preparation. Information disclosure and public consultation included newspaper disclosure; informal communication with key stakeholders, including residents, local authorities, and sector specific institutions and authorities; questionnaire surveys; and wider stakeholder meetings attended by affected people and other concerned stakeholders. A GRM has been defined to address community concerns, reduce risks, and assist the project in maximizing environmental and social benefits. Meaningful consultation will continue throughout project implementation, especially prior to and during civil works. Planning for public consultations will ensure that environmental and social safeguard requirements are discussed.

121. **Involuntary resettlement.** Affected villagers and households were consulted during project preparation and socioeconomic surveys. Local representatives participated in resettlement planning and their concerns have been integrated into the resettlement plan. The resettlement plan has also been posted on ADB's website. Resettlement information booklets were distributed locally. The grievance redress procedures have been established and explanations have been included in the resettlement information booklets.

122. **Ethnic minority development, social development, and gender action plans.** Consultations with communities were conducted and will be continued during the implementation of the EMDP, the SDAP, and the GAP. Special attention will be paid to the participation of women, the poor and/or low-income people, and ethnic minority groups. Information from monitoring reports will be disclosed periodically.

123. **Public disclosure.** ADB and the ZCG, including the YWPCO with the PMO; and the ZDG and the LCG, including the LPMOs, will disclose relevant project information to the public and interested parties. This includes particularly the information regarding the overall project and environment and social safeguards. The information disclosure measures for different stakeholders are described in Table IX-2.

Table IX-2: Public Disclosure Measures

Information	Means of Communication	Responsibility	Audience	Frequency
Report and Recommendation of the President with links to relevant documents	ADB website	ADB	Public	Once
Project information during design and construction phase	Stakeholder consultations and public notice boards	ZCG, including PMO, LCG, ZDG, and LPMOs	Project beneficiaries and affected people	Regular intervals during design and construction phase
Environmental monitoring reports	ADB and ZCG websites, and public notice boards	ZCG, including PMO, LCG, ZDG, and LPMOs	Affected people and other interested stakeholders	Semiannually
Information on RPs, EMDPs, SDAPs, and GAP activities	Stakeholder consultation, ADB and ZCG websites, and public notice boards	ZCG, including PMO, LCG, ZDG, and LPMOs	Affected people and other interested stakeholders	Regularly
External resettlement and social development M&E reports	ADB and ZCG websites, and public notice boards	ZCG, including PMO, LCG, ZDG, and LPMOs	Affected people and other interested stakeholders	For LAR, semiannually during LAR implementation and annually for 2 years after LAR completion. For social development, semiannually during project implementation
Audited project financial statements	ADB website	ADB ZCG, including PMO Audit office	Public	Annually
Project Information Documents	ADB Website	ADB	Public	Quarterly
Project Completion Report	ADB Website	ADB	Public	Once

ADB = Asian Development Bank, EMDP = ethnic minority development plan, GAP = gender action plan, LAR = land acquisition and resettlement, LCG = Ludian County Government, LPMO = local project management office, M&E = monitoring and evaluation, PMO = project management office, RP = resettlement plan, SDAP = social development action plan, ZCG = Zhaotong City Government, ZDG = Zhaoyang District Government.

Source: Asian Development Bank.

124. Detailed consultation, participation, and information disclosure related to social and environmental safeguards are included in the EMP, resettlement plan, and the EMDP.

X. ANTICORRUPTION POLICY

125. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy relating to the project.⁴⁵ All contracts financed by ADB shall include provisions specifying the right of ADB to audit and examine the records and accounts of the executing agency and all project contractors, suppliers, consultants, and other service providers. Individuals and/or entities on ADB's anticorruption debarment list are ineligible to participate in ADB-financed activity and may not be awarded any contracts under the project.⁴⁶

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

XI. ACCOUNTABILITY MECHANISM

127. 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 an effort in good faith to solve their problems by working with the concerned ADB operations department. Only after doing that and if they are still dissatisfied, they should approach the Accountability Mechanism.⁴⁷

XII. RECORD OF CHANGES TO THE PROJECT ADMINISTRATION MANUAL

128. All revisions and/or updates during the course of implementation should be retained in this section to provide a chronological history of changes to implemented arrangements recorded in the project administration manual, including revision to contract awards and disbursement S-curves.

⁴⁵ Anticorruption Policy: <https://www.adb.org/sites/default/files/institutional-document/32026/anticorruption.pdf>

⁴⁶ ADB's web site on anticorruption and integrity: <https://www.adb.org/site/integrity/main>

⁴⁷ ADB's website on accountability mechanism. <https://www.adb.org/site/accountability-mechanism/main>

Table A1.1: Detailed Project Outputs and Activities

IA	Activities		Contracts	Innovativeness	Remarks
Output 1: Wastewater management and pollution control in the Sayu River Basin strengthened					
1.1 Waste management					
1.1.1 Centralized wastewater management system					
LCG	<p>Xinjie Town: Installation of wastewater collection pipes and construction of a first-class pump station (capacity of 333.86 m³/day for 30 m pumping up) and a second-class pump station (capacity of 631.85 m³/day for 40 m pumping up).</p> <p>Shuimo Town: Installation of wastewater collection pipes.</p> <p>Longshu Town: Installation of wastewater collection pipes (for self-flow by gravity), construction of a local pump station (capacity of 63.55 m³/day for 15 m pumping up), and an existing WWTP where the collected wastewater will be treated.</p>	<p>The WWTP will be operated by a private company (under negotiation with a private company for, tentatively, 5 years).</p> <p>The current capacity of the WWTP is 2,000 m³/day. The actual wastewater treatment volume will be 1,899 m³/day in 2035. The WWTP has adequate land for additional capacity of 2,000 m³/day.</p> <p>The WWTP meets class 1A standard.</p> <p>The centralized wastewater management system will cover (registered) 14,557 households and 56,979 people against the (registered) 32,905 households and 127,015 people in the Sayu River Basin upper Yudong Reservoir (44.24% and 44.86%).</p> <p>Wastewater collection pipes to the 14,557 households will be installed. Currently, at the households, wastewater is collected in the toilet. Each household needs to remodel the toilet (including installation of connecting pipes for wastewater) so that wastewater will be collected to the installed wastewater collection pipes. Actual numbers of households and people from which wastewater is collected will be smaller than the numbers covered by the centralized wastewater management system.</p> <p>The target set for 1.1.1 and 1.1.2 is that 15,359 households (including</p>	<p>C1: for Xinjie Town</p> <p>C2: for Shuimo Town</p> <p>C3 and C4: for Longshu Town</p> <p>NBF-C1: construction of the WWTP in Shuimo Town (completed)</p> <p>T7: technical assistance by consultants in O&M and related institutional and capacity development</p>		<p>Since the WWTP is an associated facility, due diligence was conducted for environment, LAR, and ethnic minority development.</p> <p>The cost of the WWTP (design cost, LAR cost, construction cost, and O&M cost until the completion of this project) was included in the project cost.</p>

IA	Activities		Contracts	Innovativeness	Remarks
		59,286 people, of which 47.0% are women) in the Sayu River Basin connected with the centralized wastewater management system (1.1.1) or the distributed wastewater management system (1.1.2).			
1.1.2 Distributed wastewater management system					
LCG	<p>Xinjie Town: One existing treatment facility (is ready for operation [waiting for households to connect to installed wastewater collection pipes]), construction of four treatment facilities, and installation of wastewater collection pipes.</p> <p>Shuimo Town: construction of seven treatment facilities and installation of wastewater collection pipes.</p> <p>Longshu Town: construction of four treatment facilities and installation of wastewater collection pipes.</p>	<p>The treatment capacities are 2–150 m³/day</p> <p>Existing: 10 m³/day (2), 15 m³/day (9), 30 m³/day (5), 40 m³/day (2), and 150 m³/day (1)</p> <p>New: 2 m³/day (1), 5 m³/day (13), 10 m³/day (6), 15 m³/day (4), 16 m³/day (1)</p> <p>All the treatment facilities meet or will meet class 1A standard.</p> <p>A2O technology has been or will be applied to all 44 treatment facilities.</p>	<p>G1: purchase and installation of equipment for the 15 treatment facilities in Xinjie, Shuimo, and Longshu towns</p> <p>C1: installation of wastewater collection pipes in Xinjie Town</p> <p>C2: installation of wastewater collection pipes in Shuimo Town</p> <p>C3 and C4: installation of wastewater collection pipes in Longshu Town</p> <p>NBF-G1: purchase and installation of equipment for one treatment facility in Xinjie Town (completed)</p> <p>G5: purchase and installation of equipment for the 10 treatment facilities in Sujia Township</p> <p>C14: installation of wastewater collection pipes in Leju and Sujia townships and Sayu Town</p> <p>(A design institute will design the intelligent cloud platform information management systems and prepare the technical specifications.)</p> <p>G4: purchase of equipment for the intelligent cloud platform information management systems (procurement will be conducted by YWPCO)</p> <p>T7: technical assistance by consultants in O&M and related institutional and capacity</p>	<p>Introduction of distributed wastewater management system which has advantages to traditional centralized wastewater management system in rural area (e.g., wastewater treatment tailored to the water quality in the location and cost reduction).</p> <p>Application of A2O technology to small wastewater treatment facilities.</p> <p>Use of solar energy for wastewater treatment.</p> <p>Intelligent cloud platform information management systems which automatically</p>	<p>Since the 19 existing wastewater treatment facilities are associated facilities, due diligence was conducted for environment, LAR, and ethnic minority development.</p> <p>The costs for the facilities (design cost, LAR cost, construction cost, and O&M cost until the completion of this project) were included in the project cost.</p>
ZDG	<p>Sujia Township: 15 existing treatment facilities (but are not being operated due to lack of wastewater collection pipes), construction of 10 treatment facilities, and installation of wastewater collection pipes.</p> <p>Sayu Town: Two existing treatment facilities (but are not being operated due to lack of wastewater collection pipes) and installation of wastewater collection pipes.</p> <p>Leju Township: One existing treatment facility (but is not being operated due to lack of wastewater collection pipes) and installation of wastewater collection pipes.</p>	<p>Solar panels have been or will be installed for 42 out of 44 treatment systems (19 existing and 25 to be constructed).</p> <p>The distributed wastewater management system will cover (registered) 4,641 households and 17,382 people against registered 32,905 households and 127,015 people in the Sayu River Basin upper Yudong Reservoir of 127,015 (14.10% and 13.68%).</p> <p>Wastewater collection pipes to the 4,641 households will be installed. Currently, at the households, wastewater is collected in the toilet.</p> <p>Each household needs to remodel the toilet (including installation of connecting pipes for wastewater) so that wastewater will be collected to</p>			

IA	Activities		Contracts	Innovativeness	Remarks
		<p>the installed wastewater collection pipes. Actual numbers of households and people from which wastewater is collected will be smaller than the numbers covered by the centralized wastewater management system.</p> <p>The target set for 1.1.1 and 1.1.2 is that 15,359 households (including 59,286 people, of which 47.0% are women) in the Sayu River Basin connected with the centralized wastewater management system (1.1.1) or the distributed wastewater management system (1.1.2).</p>	development	send data on wastewater treatment to mobiles of staff responsible for facilities operation.	
YWPCO	Establishment of intelligent cloud platform information management systems for 43 out of 44 treatment facilities (excluding the existing station in Wangjiapingzi, Xinjie Town).	The systems automatically send data on wastewater treatment to mobiles of staff responsible for facilities operation.			
1.1.3 Animal feces management					
LCG	<p>Xinjie Town: Installation of manure collection tanks at 2,350 households (one tank for each household).</p> <p>Shuimo Town: Installation of manure collection tanks at 3,134 households (one tank for each household).</p> <p>Longshu Town: Installation of manure collection tanks at 8,386 households (one tank for each household).</p>	<p>The purpose is to reduce scattered stacking animal feces in fields which are washed away by rain and enters rivers.</p> <p>The capacity of each tank is 5 m³.</p> <p>Manure will be used for farming directly or after fermentation.</p> <p>The tanks will cover (registered) 17,323 households against (registered) 32,905 households in the Sayu River Basin upper Yudong Reservoir (52.65%).</p>	C1: for Xinjie Town C2: for Shuimo Town C3 and C4: for Longshu Town C14: for Leju and Sujia townships and Sayu Town T7: technical assistance by consultants in O&M and related institutional and capacity development	Use of glass steel tanks, which are more economical, easier for installation, more corrosion resistant, and more impermeable than traditional concrete tanks.	
ZDG	<p>Sujia Township: Installation of manure collection tanks at 2,329 households (one tank for each household).</p> <p>Sayu Town: Installation of manure collection tanks at 628 households (one tank for each household).</p> <p>Leju Township: Installation of manure collection tanks at 496 households (one tank for each household).</p>				

IA	Activities		Contracts	Innovativeness	Remarks
1.2 Solid waste management					
LCG	<p>Xinjie Town: Construction of a solid waste transfer station (capacity of 20 tons/day).</p> <p>Provision of bins (39), trash cans (218), compression trucks (3), detachable container garbage trucks (4), electric tricycles (58), and mobile compression dustbins (2).</p> <p>Shuimo Town: Construction of a solid waste transfer station (capacity of 20 tons/day)</p> <p>Construction of a garbage pyrolysis facility (capacity of 70 tons/day) with automatic monitoring and warning system (for SOx, NOx, temperature, etc.).</p> <p>Provision of bins (22), trash cans (433), compression trucks (2), hook-arm garbage truck (1), detachable container garbage truck (1), electric tricycles (34), and mobile compression dustbins (2).</p> <p>Longshui Town: Construction of a solid waste transfer station (capacity of 35 tons/day).</p> <p>Provision of bins (72), trash cans (435), compression truck (2), hook-arm garbage trucks (6), detachable container garbage truck (1), electric tricycles (16), and mobile compression dustbins (2).</p>	<p>Garbage will be classified to recyclable garbage (papers; books; plastic, glass, and metal bottles; other metals, etc.), food waste (will be thrown into manure collection tanks installed under the project and will be used for farming), and other unrecyclable garbage (will be collected, compressed, transferred, and treated).</p> <p>It is assumed that, in 2025, 20% of the total population covered by the two garbage pyrolysis facilities will conduct garbage classification; and the garbage will be reduced by 35% in rural areas, and by 25% in towns and villages; and in 2035, 40% of the total population covered by the two garbage pyrolysis facilities will conduct garbage classification; and the garbage will be reduced by 40% in rural areas, and by 31% in towns and villages.</p> <p>To ensure only unrecyclable garbage is collected and transferred, in each village (the population is less than 1,000), 1–4 certain persons responsible for garbage boxes in the public place; and garbage classification and cleaning of the place will be designated.</p>	<p>G2: purchase of equipment for the garbage pyrolysis facility, including the automatic monitoring and warning system in Shuimo Town</p> <p>C5: construction of the three solid waste transfer stations and garbage pyrolysis facility in Xinjie, Shuimo, and Longshu towns</p> <p>G3: provision of equipment for garbage collection, compression, and transfer in Xinjie, Shuimo, and Longshu towns.</p> <p>G6: purchase of equipment for the garbage pyrolysis facility, including the automatic monitoring and warning system in Sujia Township</p> <p>C15: construction of the solid waste transfer station and garbage pyrolysis facility in Sujia Township</p> <p>G7: provision of equipment for garbage collection, compression, and transfer in Dazhaizi, Leju, and Sujia townships; and Dashanbao and Sayu towns</p> <p>T7: technical assistance by consultants in O&M (including establishment of comprehensive solid waste management from households to plants) and related institutional and capacity development.</p>	<p>Introduction of garbage pyrolysis facilities with shorter processing cycle, smaller floor space, maximum volume reduction, and wider application to waste.</p> <p>Comprehensive solid waste management from households to plants (including garbage classification), with institutional and capacity development.</p>	

IA	Activities		Contracts	Innovativeness	Remarks
ZDG	<p>Sujia Township: Construction of solid waste transfer station (capacity of 15 tons/day).</p> <p>Construction of a garbage pyrolysis facility (capacity of 20 tons/day) with automatic monitoring and warning system (for SOx, NOx, temperature, etc.).</p> <p>Provision of bins (5), trash cans (577), compression trucks (3), hook-arm garbage truck (1), detachable container garbage truck (1), electric tricycles (60), and mobile compression dustbins (2).</p> <p>Sayu Town: Provision of trash cans (85).</p> <p>Leju Township: Provision of trash cans (85).</p> <p>Dazhaizi Township: Provision of trash cans (35).</p> <p>Dashanbao Town: Provision of trash cans (80).</p>	<p>To ensure that the two garbage pyrolysis facilities will comply with applicable air emission standards, technologies used for a successful case in Nanning Municipality will be used, including selection of pyrolysis technology and qualified equipment manufacturer.</p> <p>The two garbage pyrolysis facilities will cover (registered) 30,890 households and 118,798 people against (registered) 32,905 households and 127,015 people in the Sayu River Basin upper Yudong Reservoir (93.88% and 93.53%).</p> <p>The new solid waste management system will provide new job opportunities to 343 people for O&M.</p>			
1.3. Pilot eco-villages					
LCG	<p>Xinjie Town: Jiufang (administrative) Village, including Anjasongbao (natural) Village (132 households, 566 people); Xiaohedian (natural) Village (127 households, 587 people); and Pojiao (natural) Village (190 households, 835 people)</p> <p>Shuimo Town: Shuimo (administrative) Village, including Goutou (natural) Village (129 households, 474 people); and Alukuai (natural) Village (335 households, 1,271 people)</p> <p>Longshui Town: Xinle (administrative) Village, including Liyuan (natural) Village (805 households, 3,312 people)</p>	<p>(i) Development of basic infrastructure (permeable pavements and green space, drainage systems, public eco-toilets, ecological riverbank, etc.)</p> <p>(ii) Training on garbage classification, recycling, reduction of resource use and waste stream (including phasing out of single-use plastics replacing them with locally sourced reusable and compostable products)</p> <p>(iii) Education at schools to promote garbage classification, recycling, reduction of resource use and waste stream (including phasing out of single-use plastics replacing them</p>	<p>C6: construction of basic infrastructure in Xinjie Town</p> <p>C8: construction of basic infrastructure in Shuimo Town</p> <p>C7: construction of basic infrastructure in Longshu Town</p> <p>T7: technical assistance by consultants in (i) training; (ii) education at schools; (iii) development of environmental health management system; and (iv) publicity</p>	<p>Piloting of eco-villages, with integrated approaches, including innovative basic infrastructure (permeable pavements and green space, public eco-toilets, ecological riverbank, etc.); introduction of garbage classification; promotion of</p>	

IA	Activities	Contracts	Innovativeness	Remarks
	<p>with locally sourced reusable and compostable products)</p> <p>(iv) Development of environmental health management system, including institutional development (establishment of designated cleaning teams and designated environmental supervision groups, including their training, establishment of awarding program, etc.).</p> <p>(v) Publicity (construction of cultural activity rooms, environmental protection bulletin boards, audio systems, display screens, and other publicity facilities) to promote garbage classification, recycling, reduction of resource use and waste stream (including phasing out of single-use plastics replacing them with locally sourced reusable and compostable products) and to introduce activities by special cleaning teams and special environmental supervision groups.</p>		<p>recycling; reduction of resource use and waste stream; education; training; publicity; and development of environmental health management system with institutional development.</p>	
1.4 Wetlands construction to reduce nonpoint source pollution				
LCG	<p>Shuimo Town: Construction of a new wetland in Xiaohebian Wetland partially in basic farmland Process: pond for sedimentation → pond for oxidation → wetland for horizontal subsurface flow → wetland for surface flow + membrane treatment facility (water quality needs to meet class 3 standard) New wetland area: 86.92 <i>mu</i>, out of which 25.29 <i>mu</i> is in basic farmland Treatment capacity: 1,577.97 m³/day (wastewater: 136.81 m³/day; rainwater: 1,441.15 m³/day)</p> <p>Longshui Town: Construction of a new wetland in Zhongheba Wetland Process: pond for sedimentation → pond for oxidation → wetland for horizontal subsurface flow → wetland for surface flow + membrane treatment facility (water quality needs to meet class 3 standard) New wetland area: 113.76 <i>mu</i> Treatment capacity: 3,783.49 m³/day (wastewater: 255.94 m³/day + 2,000 m³/day [from WWTP]; rainwater: 1,527.55 m³/day)</p>	<p>C9: New wetland construction in Zhongheba and Dazhaizi Wetlands in Longshu Town</p> <p>C10: New wetland construction in Xiaohebian Wetland in Shumo Town and Longxiang and Longshu Wetlands in Longshu Town</p> <p>C16: New wetland construction in Xinhe Wetland in Leju Township</p> <p>T7: technical assistance by consultants in O&M and related institutional and capacity development</p>	<p>Introduction of new artificial wetlands which can be constructed in basic farmlands.</p> <p>Introduction of combination of artificial facilities (ponds for sedimentation and oxidation, membrane treatment facility, etc.) and artificial</p>	

IA	Activities	Contracts	Innovativeness	Remarks
	<p>Construction of a new wetland in Longshu Wetland in basic farmland Process: wetland for surface flow with aquatic economic crops New wetland area: 115.02 <i>mu</i> Treatment capacity: 1,201.33 m³/day (wastewater: 168.85 m³/day; rainwater: 1,032.48 m³/day)</p> <p>Construction of a new wetland in Longxiang Wetland in basic farmland Process: wetland for surface flow with aquatic economic crops New wetland area: 50.81 <i>mu</i> Treatment capacity: 941.49 m³/day (wastewater: 112.05 m³/day; rainwater: 829.44 m³/day)</p> <p>Construction of a new wetland in Dazhaizi Wetland in basic farmland Process: wetland for surface flow with aquatic economic crops New wetland area: 189.03 <i>mu</i> Treatment capacity: 2,773.07 m³/day (wastewater: 310.67 m³/day; rainwater: 2,462.40 m³/day)</p>		wetland.	
ZDG	<p>Leju Township: Construction of a new wetland in Xinhe Wetland Process: pond for sedimentation → pond for oxidation → wetland for horizontal subsurface flow → wetland for surface flow New wetland area: 14.93 <i>mu</i> Treatment capacity: 980.31 m³/day (wastewater: 153.46 m³/day; rainwater: 826.85 m³/day)</p>			
1.5 Establishment of quantifiable soil and water conservation model				
LCG	<p>Xinjie Town: Afforestation (economic forest: 550.83 <i>mu</i>; ecological forest: 2,109.11 <i>mu</i>) which will increase forest coverage in the town from 32.18% to 33.72% by 1.54%, perennial herb planting (1,234.08 <i>mu</i>), construction of irrigation facilities for 498.52 <i>mu</i> perennial herb planting, and construction of ponds (1,000 m³ x 4 + 1,500 m³ x 2) for perennial herb planting</p> <p>Shuimo Town: Afforestation (ecological forest in Maobizi Water Source: 894.16 <i>mu</i>; ecological forest in the other areas: 837.56 <i>mu</i>) which will increase forest coverage in the town from 29.51% to 29.94% by 0.43%, perennial herb planting (199.55 <i>mu</i>), construction of irrigation facilities for 127.05 <i>mu</i></p>	<p>Afforestation for ecological forest will be conducted in 18 patterns using mainly 10 species.</p> <p>Afforestation for economic forest will be conducted using one species.</p> <p>For perennial herb planting, one species will be used.</p> <p>For establishment of quantifiable soil and water conservation model, four afforestation patterns and bare ground were selected for each of 15-, 25-, and 35-degree slopes (15 patterns in total). For each pattern four monitoring areas were selected (60 monitoring areas in total). Effects of afforestation on soil and water</p>	<p>C11: 3 years contract for purchase, planting, tending, and management of seedlings and disease and insect pest control.</p> <p>T7: technical assistance by consultants in (i) establishment of a model to estimate effects of afforestation on soil and water conservation; (ii) develop a plan to actually measure effects of afforestation on soil and water conservation on sites; (iii) measurement of effects of afforestation on soil and water conservation on sites; and (iv) revision of the model based on the measured data</p>	

IA	Activities	Contracts	Innovativeness	Remarks
	<p>perennial herb planting, and construction of ponds (600 m³ x 2 + 1,000 m³ x 1) for perennial herb planting</p> <p>Longshui Town: Afforestation (ecological forest: 235.92 <i>mu</i>) which will increase forest coverage in the town from 26.40% to 26.54% by 0.14%, perennial herb planting (664.98 <i>mu</i>), construction of irrigation facilities for 261.14 <i>mu</i> perennial herb planting, and construction of ponds (600 m³ x 5 + 1,000 m³ x 3 + 1,500 m³ x 2) for perennial herb planting</p>	<p>conservation will be estimated using existing model. After that, effects of afforestation on soil and water conservation will be actually measured at the 60 monitoring areas; and based on the measured data, the model will be revised. It is expected to take about 10 years to get data adequate to revise the model. However, tentatively improved model will be presented by the project completion or project completion report preparation at latest.</p> <p>For compensation for farmland-to-ecological forest conversion, 2,174.23 <i>mu</i> x CNY600/<i>mu</i>/year x 15 years = CNY19,568,070 will be needed.</p> <p>For compensation for farmland-to-perennial herb area conversion (for 3–5 years before the herb grows and makes a profit), 2,098.61 <i>mu</i> x CNY300/<i>mu</i>/year x 4 years = CNY2,518,331 will be needed.</p> <p>These compensations will be paid from the eco-compensation fund to be established under the project.</p>		
1.6 Promotion of low-emission agriculture				
LCG	<p>Longshu Town: In the Highland Characteristic Agricultural Demonstration Zone to be established for the project (pilot area: 1,028.10 <i>mu</i>), development of a formula to estimate necessary fertilizer volume (based on crop type, water volume, fertilizer type, etc.), integration of water and fertilizer to reduce fertilizer use, construction of ecological drainage ditches,^a construction of a gridded surface source pollution monitoring platform,^b improvement of soil sampling</p>	<p>It is estimated that CNY18.69 million will be used from the eco-compensation fund to be established under the project, agricultural experimental areas (CNY6.05 million), compensation for fertilizer reduction (CNY5.01 million), and compensation for pesticide use reduction (CNY7.56 million).</p>	<p>C12: Construction of basic infrastructure in the Highland Characteristic Agricultural Demonstration Zone and in the Vegetable Industry Demonstration Point in Longshu Town in Ludian County</p> <p>C13: Construction of basic infrastructure in the Zhaotong Featured Potato Industry Demonstration Point in Shuimo</p>	<p>Promotion of low-emission agriculture with innovative technologies (ecological drainage ditches, gridded surface source pollution monitoring platform,</p>

IA	Activities	Contracts	Innovativeness	Remarks
	<p>and testing, etc.</p> <p>Shuimo Town: In the Zhaotong Featured Potato Industry Demonstration Point to be established for the project (pilot area: 1,000.00 <i>mu</i>), development of a formula to estimate necessary fertilizer volume (based on crop type, water volume, fertilizer type, etc.), reduction of pesticides, improvement of soil sampling and testing, etc.</p> <p>Longshu Town: In the Vegetable Industry Demonstration Point to be established for the project (pilot area: 1,077.17 <i>mu</i>), development of a formula to estimate necessary fertilizer volume (based on crop type, water volume, fertilizer type, etc.), integration of water and fertilizer to reduce fertilizer use, increase of organic fertilizer application, construction of ecological drainage ditches (endnote a), establishment of organic vegetable brand, improvement of soil sampling and testing, etc.</p>	<p>Town and in the High Standard Farming Demonstration Points in Xinjie Town in Ludian County C17: Construction of basic infrastructure in the High Standard Farming Demonstration Points and in the Breeding and Recycling Agriculture Demonstration Point in Sujia Township and basic infrastructure in the Zhaotong Featured Apple Industry Demonstration Point in Sayu Town in Zhaoyang District</p> <p>T7: technical assistance by consultants in (i) O&M and related institutional and capacity development; (ii) reduction of fertilizer use, increase of organic and/or special fertilizer use (e.g., use of animal feces, composting of vegetables and straw), etc.; and (iii) establishment of a green and organic apple brand, organic vegetable brand, etc.</p>	<p>measures to estimate at least necessary fertilizer volume and reduce fertilizer use, recycling, etc.) and incentive (establishment of green and organic crop brand).</p>	
ZDG	<p>Xinjie Town, Shuimo Town, Longshu Town in Ludian County and Sujia Township in Zhaoyang District: In the High Standard Farming Demonstration Points to be established for the project (pilot area: 13,106.33 <i>mu</i>), controlled fertilizer release, increase of organic and special fertilizer application, construction of ecological drainage ditches (endnote a), improvement of soil sampling and testing, etc.</p> <p>Sujia Township: In the Breeding and Recycling Agriculture Demonstration Point to be established for the project (pilot area: 580.00 <i>mu</i>), construction of composters, use of animal feces for farming to realize circular agriculture and</p>			

IA	Activities		Contracts	Innovativeness	Remarks
	zero emission, improvement of soil sampling and testing, etc.				
	Sayu Town: In the Zhaotong Featured Apple Industry Demonstration Point to be established for the project (pilot area: 564.18 <i>mu</i>), integration of water and fertilizer to reduce fertilizer use, increase of organic and special fertilizer application, establishment of a green and organic apple brand, improvement of soil sampling and testing, etc.				
Output 2: Water resources management in the Sayu River improved					
2.1 Establishment of smart water integrated management platform					
YWPCO	<p>Installation of</p> <p>(i) three water quality monitoring stations at the borders between the Zhaoyang District and the Ludian County; the Shuimo and Xinjie towns in Ludian County; and the Longshu and Shuimo towns in Ludian County for COD, BOD, TP, TN, and NH₄-NH₃;</p> <p>(ii) four water level and video monitoring stations for four rivers: Miaozhai Small River, Liyuan Ditch, Xin Small River, and Daijia Ditch;</p> <p>(iii) four 360-degree video monitoring stations at newly constructed wetlands in Xiaohebian Wetland, Zhongheba Wetland, Dazhaizi Wetland, and Longxiang/Longshu Wetlands (excluding the small new wetland in Xinhe Wetland);^c</p> <p>(iv) two 360-degree video monitoring stations at the two constructed garbage pyrolysis facilities in the Shuimo Town and the Sujia Township (independent from the automatic monitoring and warning systems installed in those garbage pyrolysis facilities);</p> <p>(v) one 360-degree video monitoring station at the existing WWTP in the</p>	Smart water integrated management platform will be established, by integrating these developed monitoring facilities and an existing irrigation area information system.	<p>(A design institute will design the monitoring facilities and smart water integrated management platform and prepare the technical specifications.)</p> <p>G4: purchase and installation of equipment for the monitoring systems and smart water integrated management platform (procurement will be conducted by the YWPCO)</p> <p>T7: technical assistance by consultants in O&M and related institutional and capacity development</p>	Smart water integrated management platform, for real-time monitoring and actions in the event of water quality deterioration.	

IA	Activities		Contracts	Innovativeness	Remarks
	<p>Shuimo Town (independent from water quality monitoring system of the WWTP);</p> <p>(vi) two 360-degree video monitoring stations at two of the 44 wastewater treatment facilities (one with the capacity of 25 m³/day in Suja in Sujia Township and another with the capacity of 15 m³/day in Goumenkou in Shuimo Town) (independent from the intelligent cloud platform information management systems established for the wastewater treatment facilities) (the other 42 wastewater treatment facilities will be are covered by [viii] below);</p> <p>(vii) three 360-degree video monitoring stations at the three pilot eco-villages: Jiufang Village, Shuimo Village, and Xinle Village;^d</p> <p>(viii) 60 360-degree video monitoring stations at river entry points into the Yudong Reservoir; and</p> <p>(ix) seven rainfall stations for seven main rivers flowing into the Yudong Reservoir.^e</p>				
2.2 Establishment of river protection model					
LCG or ZDG	<p>Longshu River Basin (basin area: 532.7 km²) for 68.3 km ecological restoration in the Longshu, Shuimo, and Xinjie towns in Ludian County; and the Dazhaizi and Sujia townships in Zhaoyang District</p> <p>Yanjiashan River small basin (basin area: 7.0 km²) for 1.8 km ecological restoration in Sayu Town in Zhaoyang District</p> <p>Guazhai River small basin (basin area: 20.1 km²) for 4.1 km ecological restoration in Sujia Township in Zhaoyang District</p> <p>Lan River small basin (basin area: 29.6 km²) for 6.1 km ecological restoration in Sujia Township in Zhaoyang District</p>	<p>Ecological restoration, including construction of ecological embankments (plants on the embankments protect the river from nonpoint source pollution) of 98.3 km environmentally sensitive river sections</p>	<p>C18: Ecological embankment construction in Longshu River tributaries in Longshu Town in Ludian County (area 1)</p> <p>C19: Ecological embankment construction in Longshu River tributaries in Longshu Town in Ludian County (area 2)</p> <p>NBF-C4: Ecological embankment construction in River tributaries in Xinjie Town in Ludian County (completed)</p> <p>NBF-C3: Ecological embankment construction in River tributaries in Xinjie Town in Ludian County</p>	<p>River protection model using the intelligent cloud platform river information management system, which will help river chiefs under the PRC's existing river chief system.</p>	

IA	Activities		Contracts	Innovativeness	Remarks
	<p>Buchu River small basin (basin area: 12.4 km²) for 2.2 km ecological restoration in Sujia Township in Zhaoyang District</p> <p>Xin River small basin (basin area: 24.0 km²) for 8.5 km ecological restoration in Leju Township in Zhaoyang District</p> <p>Other small rivers (basin area: 65.1 km²) for 7.3 km ecological restoration in Sujia Township and Sayu Town in Zhaoyang District</p>		<p>NBF-C2: Ecological embankment construction in Longshu River tributaries in Shuimo Town in Ludian County</p> <p>C20: Ecological embankment construction in small rivers in Sujia Township in Zhaoyang District (area 1)</p> <p>C21: Ecological embankment construction in small rivers in Sujia Township in Zhaoyang District (area 2)</p> <p>C22: Ecological embankment construction in small rivers in Sayu Town and Leju Township in Zhaoyang District</p> <p>C23: Ecological embankment construction in a Longshu River tributary in Dazhaizi Township in Zhaoyang District</p>		
YWPCO	Link the existing river chief system in the PRC, a real-time water quality monitoring system (a subsystem of the smart water integrated management platform), and facilities to protect rivers from pollution (e.g., ecological embankments); with related institutional development and capacity development.		T7: technical assistance by consultants in O&M and related institutional and capacity development, including collaboration with the river chief system		
Output 3: Eco-compensation mechanism for the Sayu River Basin established					
3.1 Establishment of eco-compensation mechanism					
ZDG, LCG, and YWPCO	Implementation of the eco-compensation agreement between the Zhaoyang District (downstream) and the Ludian County (upstream) ^f		T7: technical assistance by consultants in (i) implementing the eco-compensation agreement between the Zhaoyang District (downstream) and the Ludian County (upstream); (ii) establishing and implementing new town- and township-level horizontal eco-compensation mechanisms between four towns and two townships in the		
ZDG, LCG, and YWPCO	Establishment and implementation of new town- and township-level horizontal eco-compensation mechanisms between four towns and two townships in the Zhaoyang District and the Ludian County with six agreements.				

IA	Activities		Contracts	Innovativeness	Remarks
YWPCO	Establishment and implementation of a Yudong Reservoir eco-compensation fund (long-term platform for proactive management of the Yudong Reservoir water quality). Beneficiaries pay into the funds and the government covers up the fund. The fund can be used to leverage other financing sources (philanthropic grants, social entrepreneurs, additional national government support, etc.).		Zhaoyang District and the Ludian County with six agreements; and (iii) establishing and implementing the Yudong Reservoir eco-compensation fund (long-term platform for proactive management of the Yudong Reservoir water quality)		
Output 4: Education, capacity, and public awareness for water pollution management strengthened					
4.1 Capacity development of government staff for rural water pollution management and eco-compensation					
YWPCO	Training, workshops, and domestic and overseas study visits and training (but requirements for implementation of international training are becoming strict) for rural water pollution management and eco-compensation; with assistance from consultants to be recruited during project implementation.		T7: technical assistance by consultants in planning and implementing training, workshops, and domestic and overseas study visits and training for government staff for rural water pollution management and eco-compensation (excluding those conducted under Outputs 1–3)		
4.2 Education of students for rural water pollution management and eco-compensation					
YWPCO	Periodical special lectures at schools, study visits for students, etc.		T7: technical assistance by consultants in periodical special lectures at schools, study visits for students, etc.		
4.3 Public awareness raising					
YWPCO	Public awareness raising through publicity, handbook, brochure, media, internet, campaigns, etc. (the targets include achievement of garbage classification by 20% of the population in the Sayu River Basin upper Yudong Reservoir in 2025 and 40% in 2035)		T7: technical assistance by consultants in public awareness raising through campaigns, publicity, handbooks, brochures, medias, internet, etc.		
4.4 Dissemination and replication of project initiatives					
YWPCO	Dissemination and replication of water pollution management and eco-compensation demonstrated under the project to other areas of the PRC and also other countries, through workshops, publications, disclosure of project information on website, submission of papers to academic societies, application		T7: technical assistance by consultants in dissemination and replication of water pollution management and eco-compensation demonstrated under the project to other areas of the PRC and also other countries		

IA	Activities	Contracts	Innovativeness	Remarks
	for a model project for eco-civilization, application for award programs, etc.			

A2O = anaerobic-anoxic-oxic, BOD = biological oxygen demand, COD = chemical oxygen demand, CNY = Chinese yuan, IA = implementing agency, km = kilometer, km² = square kilometer, LAR = land acquisition and resettlement, LCG = Ludian County Government, m = meter, m³ = cubic meter, *mu* = a Chinese unit of measurement (1 *mu* = 666.67 square meters), NH₃ = ammonia, NH₄ = ammonium, NO_x = nitrogen oxides, O&M = operation and maintenance, PRC = People's Republic of China, SO_x = sulfur oxides, TN = total nitrogen, TP = total phosphorus, WWTP = wastewater treatment plant, YWPCO = Yudong Reservoir Water Resources Protection Committee Office, ZDG = Zhaoyang District Government, % = percent.

^a Aquatic plants in the ditches effectively reduces nitrogen and phosphorus.

^b To monitor quality of water from the farmland for immediate actions in the event of water quality deterioration.

^c Water quality monitoring for the five constructed wetlands will be conducted by sampling (not by fixed stations).

^d Water quality monitoring for the three pilot eco-villages will be conducted by sampling (not by fixed stations).

^e (i), (ii), and (ix) will be also connected to the intelligent cloud platform river information management system for the establishment of river protection model under Output 2.1.

^f The agreement includes that (i) the Ludian County pays to the Zhaoyang District CNY0.5 million/month if the water quality is worse than the standard; and (ii) the Zhaoyang District pays to the Ludian County CNY1.0 million/year if the water quality is better than the standard (based on monthly water quality measurement).

Source: Asian Development Bank.

INDICATIVE TERMS OF REFERENCE FOR CONSULTING SERVICES FOR PACKAGE T1: INITIAL PROJECT MANAGEMENT SUPPORT (PROCUREMENT AND PROJECT MANAGEMENT)

A. Introduction

1. This document sets out indicative terms of reference for consulting services needed to ensure the smooth initial management of the Yunnan Sayu River Basin Rural Water Pollution Management and Eco-Compensation Demonstration Project. The direct client of the consulting services is the project management office (PMO). The PMO is under the Zhaotong City Government (the executing agency of the project) and physically located in the Yudong Reservoir Water Resources Protection Committee Office (an implementing agency). The consulting services will be also provided to two local PMOs (LPMOs). One LPMO is physically located in the Water Resources Bureau of the Zhaoyang District Government (an implementing agency) and another LPMO is physically located in the Investment Service Center of the Ludian County Government (an implementing agency).

B. Implementation Arrangements

2. The consulting services will be carried out by an individual consultant (national procurement and project management specialist). The consulting services will be financed by the Asian Development Bank (ADB); and the consultant will be recruited by the PMO according to ADB's Procurement Policy (2017, as amended from time to time), and ADB's Procurement Regulations for ADB Borrowers (2017, as amended from time to time). The consultant will be selected using the individual consultant selection method. The consulting services are expected to start on 7 September 2020 until on 9 April 2021.

C. Reporting Requirements

3. By the end of the assignment, the specialist will submit a report on his/her activities to ADB and the PMO (a soft copy of the English version to ADB and soft copies of the English and Chinese versions to the PMO).

D. Detailed Scope of Services and Consultants' Inputs

4. The individual national procurement and project management specialist will provide a total of 3.0 person-months of consulting services. The consultant shall have a university degree or higher in management, accounting, or related field. He/she shall be proficient in English; and has at least 10 years of experience in procurement, consultant recruitment, and project management for projects funded by ADB or other international funding agencies. Knowledge on ADB's Procurement Policy (2017, as amended from time to time), ADB's Procurement Regulations for ADB Borrowers (2017, as amended from time to time), and other ADB procedures for procurement and consultant recruitment are required.

5. The specialist will undertake the following tasks: (i) understand the format of quarterly project progress reports provided by ADB, and provide the PMO with guidance on how to fill-in the format by assisting them in preparing the first report; (ii) improve internal procedures of routine data collection and filling and information exchange among the PMO, the LPMOs, and other agencies of the Zhaotong City Government, the Zhaoyang District Government, and the Ludian County Government for smooth project implementation and quarterly project progress reporting; (iii) assist the PMO in recruiting a consultant team for project management support (package

number T4), a competent external monitoring agency for external monitoring and evaluation of land acquisition and resettlement and social development (package number T5), a competent external monitoring agency for environmental monitoring (package number: T6), and a consultant team for rural water pollution management and eco-compensation (package number: T7); (iv) provide any supports to the LPMOs and a procurement agency engaged by the PMO for procurement of works and goods, including preparation of bidding documents; (v) develop capacities of the PMO and the LPMOs for procurement, consultant recruitment, and project management; and (vi) perform any other tasks for project management, procurement, and consultant recruitment during the start-up phase of the project.

E. Cost Estimate

Table A2.1: Cost Estimate

Item		Total Cost (\$'000)
1.	Consultant	
	a. Remuneration and per diem	
	National consultant (3.0 person-months)	24.0
	b. Local travel	1.5
	c. Reports and communications	0.1
2.	Miscellaneous administration and support costs	1.0
3.	Contingencies	1.4
	Total	28.0

Source: Asian Development Bank estimates.

INDICATIVE TERMS OF REFERENCE FOR CONSULTING SERVICES FOR PACKAGE T2: INITIAL PROJECT MANAGEMENT SUPPORT (ENVIRONMENT)

A. Introduction

1. This document sets out indicative terms of reference for consulting services needed to ensure the establishment of preparatory administrative and technical work required for efficient implementation of the Yunnan Sayu River Basin Rural Water Pollution Management and Eco-Compensation Demonstration Project in the early stage of project implementation. The direct client of the consulting services is the project management office (PMO). The PMO is under the Zhaotong City Government (ZCG, the executing agency of the project) and physically located in the Yudong Reservoir Water Resources Protection Committee Office (an implementing agency). The PMO's overall responsibility includes implementation of the environmental management plan (EMP). The consulting services will be also provided to two local PMOs (LPMOs). One LPMO is physically located in the Water Resources Bureau of the Zhaoyang District Government (ZDG, an implementing agency) and another LPMO is physically located in the Investment Service Center of the Ludian County Government (LCG, an implementing agency). The LPMOs will implement the project at the field level.

B. Implementation Arrangements

2. The consulting services will be carried out by an individual consultant (national environment specialist). The consulting services will be financed by the Asian Development Bank (ADB) and the consultant will be recruited by the PMO according to ADB's Procurement Policy (2017, as amended from time to time) and ADB's Procurement Regulations for ADB Borrowers (2017, as amended from time to time). The consultant will be selected using the individual consultant selection method. The consulting services are expected to start on 7 September 2020 until on 9 April 2021, and a project management support consultant team (package number: T4), including an environment specialist, will take over project management support to provide long-term support to the PMO and the LPMOs.

C. Reporting Requirements

3. Upon completion of the consultancy, the specialist will submit a written report describing the work accomplished, any key challenges encountered and/or technical concerns for further consideration, and lessons learned to ADB and the PMO (a soft copy of the English version to ADB and soft copies of the English and Chinese versions to the PMO).

D. Detailed Scope of Services and Consultants' Inputs

4. The individual national environment specialist will provide a total of 3.0 person-months of consulting services. The consultant shall have (i) a master's degree or higher in environmental management or related field; (ii) at least 12 years of experience in environmental management, monitoring, and/or environmental impact assessment (EIA), including specific experience in management and monitoring of environmental projects; (iii) familiarity with ADB's Safeguard Policy Statement (2009), ADB's 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 good physical health and fitness to regularly visit project sites; and (vii) proficiency in spoken and written English.

5. The specialist will undertake the following tasks: (i) work closely with the PMO, the LPMOs, and design institutes to ensure that relevant preliminary design incorporates designs and mitigation measures described in the EIA, the EMP, and the environmental and social management system (ESMS); (ii) update the EIA, the EMP, and the ESMS based on the preliminary design, as necessary (including, but not be limited to, major changes in proposed alignments and/or locations of facilities, new subcomponents requiring civil works and/or impacting environment, and/or cancellation of components); prepare any new impact assessments and/or updates, as required; and obtain ADB's approval of them (the ADB-approved documents cannot be changed without prior approval of relevant government agency and ADB); (iv) assist the PMO and the LPMOs in establishing the grievance redress mechanism, including procedures to ensure documentation and reporting of complaints, follow-up actions, and results; (v) provide training to staff of the PMO, the LPMOs, and relevant agencies of the ZCG, the ZDG, and the LCG so that they will understand ADB's Safeguard Policy Statement (2009), other policies, and compliance requirements for environmental management; national and local regulations and standards for environmental protection, health, labor, and occupational safety; and the EIA, the EMP, and the ESMS; (vi) assist the PMO, the LPMOs, and relevant agencies of the ZCG, the ZDG, and the LCG in establishing an internal environmental monitoring and reporting system and provide hands-on guidance in preparing the first environmental monitoring report; (vii) assist the PMO, the LPMOs, and relevant agencies of the ZCG, the ZDG, and the LCG in constructing, operating, maintaining, and monitoring the project facilities in strict conformity with all applicable laws and regulations, including national and local regulations and standards for environmental protection, health, labor, and occupational safety; ADB's Safeguard Policy Statement (2009); and the EIA, the EMP, and the ESMS; (viii) assist the PMO and the LPMOs in handing over relevant documents and files to the project management support consultant team engaged in package number T4 and brief the team, particularly the environment specialist in the team, on status and outstanding issues; and (ix) perform any other environmental management related tasks during the start-up phase of the project.

E. Cost Estimate

Table A2.2: Cost Estimate

Item		Total Cost (\$'000)
1.	Consultant	
a.	Remuneration and per diem	
	National consultant (3.0 person-months)	24.0
b.	Local travel	1.5
c.	Reports and communications	0.1
2.	Miscellaneous administration and support costs	1.0
3.	Contingencies	1.4
	Total	28.0

Source: Asian Development Bank estimates.

**INDICATIVE TERMS OF REFERENCE FOR CONSULTING SERVICES
FOR PACKAGE T3: INITIAL PROJECT MANAGEMENT SUPPORT (LAND ACQUISITION
AND RESETTLEMENT AND SOCIAL DEVELOPMENT)**

A. Introduction

1. This document sets out indicative terms of reference for consulting services needed to ensure the smooth initial management of the Yunnan Sayu River Basin Rural Water Pollution Management and Eco-Compensation Demonstration Project. The direct client of the consulting services is the project management office (PMO). The PMO is under the Zhaotong City Government (ZCG, the executing agency of the project) and physically located in the Yudong Reservoir Water Resources Protection Committee Office (an implementing agency). The consulting services will be also provided to two local PMOs (LPMOs). One LPMO is physically located in the Water Resources Bureau of the Zhaoyang District Government (ZDG, an implementing agency) and another LPMO is physically located in the Investment Service Center of the Ludian County Government (LCG, an implementing agency).

B. Implementation Arrangements

2. The consulting services will be carried out by an individual consultant (national land acquisition and resettlement [LAR] and social development specialist). The consulting services will be financed by the Asian Development Bank (ADB); and the consultant will be recruited by the PMO according to ADB's Procurement Policy (2017, as amended from time to time), and ADB's Procurement Regulations for ADB Borrowers (2017, as amended from time to time). The consultant will be selected using the individual consultant selection method. The consulting services are expected to start on 7 September 2020 until on 9 April 2021.

C. Reporting Requirements

3. By the end of the assignment, the specialist will submit a report on his/her activities to ADB and the PMO (a soft copy of the English version to ADB and soft copies of the English and Chinese versions to the PMO).

D. Detailed Scope of Services and Consultants' Inputs

4. The individual national LAR and social development specialist will provide a total of 3.0 person-months of consulting services. The consultant shall have a university degree or above in resettlement, social, or related field. He/she shall be proficient in English and have at least 10 years of experience in the LAR in the People's Republic of China on projects funded by ADB or other international funding agencies. Knowledge on ADB's Safeguard Policy Statement (2009) and ADB's or other international funding agencies' procedures for the LAR are required.

5. The specialist will undertake the following tasks: (i) assist the PMO and the LPMOs; the relevant agencies of the ZCG, the ZDG, and the LCG; and the design institute in updating the resettlement plan and ethnic minority development plan (EMDP) approved by ADB, in the ADB formats, and based on the preliminary design, disclosing them to the affected persons prior to ADB's approval; and obtaining ADB's approval of them; (ii) assist the PMO and the LPMOs in ensuring adequate resettlement readiness prior to the LAR and social development readress (for implementation of the EMDP, social development action plan, and gender action plan); (iii) assist the PMO and the local PMOs in establishing effective grievance redress mechanisms, including mechanisms to ensure reporting of complaints; follow-up actions; and results; (iv)

provide training to relevant staff of the PMO and the LPMOs; and the relevant agencies of the ZCG, the ZDG, and the LCG so that they will understand ADB's policies and compliance requirements for the LAR, ethnic minority development, social development, and gender; (v) assist the PMO and the LPMOs; and the relevant agencies of the ZCG, the ZDG, and the LCG in establishing an internal monitoring and reporting system for implementation of the resettlement plan, the EMDP, social development action plan, and gender action plan; (vi) assist the PMO and the LPMOs in handing over relevant documents and files to the project management support consultant team engaged in package number T4; and brief the team, particularly the resettlement specialist, social development specialist, and gender specialist in the team, on status and outstanding issues; and (vii) perform any other LAR and social development related tasks during the start-up phase of the project.

E. Cost Estimate

Table A2.3: Cost Estimate

Item	Total Cost (\$'000)
1. Consultant	
a. Remuneration and per diem	
National consultant (3.0 person-months)	24.0
b. Local travel	1.5
c. Reports and communications	0.1
2. Miscellaneous administration and support costs	1.0
3. Contingencies	1.4
Total	28.0

Source: Asian Development Bank estimates.

INDICATIVE TERMS OF REFERENCE FOR CONSULTING SERVICES FOR PACKAGE T4: PROJECT MANAGEMENT SUPPORT CONSULTANT TEAM

A. Introduction

1. This document sets out indicative terms of reference for consulting services needed to ensure the smooth management of the Yunnan Sayu River Basin Rural Water Pollution Management and Eco-Compensation Demonstration Project. The direct client of the consulting services is the project management office (PMO). The PMO is under the Zhaotong City Government (ZCG, the executing agency of the project) and physically located in the Yudong Reservoir Water Resources Protection Committee Office (YWPCO, an implementing agency). The consulting services will be also provided to two local PMOs (LPMOs). One LPMO is physically located in the Water Resources Bureau of the Zhaoyang District Government (ZDG, an implementing agency) and another LPMO is physically located in the Investment Service Center of the Ludian County Government (LCG, an implementing agency).

B. Implementation Arrangements

2. The consulting services for project management support will be carried out by a team of consultants through a firm. A total of 59.5 person-months of international and national consulting services will be required. The consulting services will be financed by the Asian Development Bank (ADB); and the consultants will be recruited by the PMO according to ADB's Procurement Policy (2017, as amended from time to time), and ADB's Procurement Regulations for ADB Borrowers (2017, as amended from time to time). The consulting firm will be selected by (i) inviting simplified technical proposals; and (ii) using the quality- and cost-based selection method, with a quality-cost ratio of 90:10. The consulting services are expected to start in 5 April 2021 until 31 December 2026.

C. Reporting Requirements

3. The consultant team will produce (i) an inception report within 4 weeks of the start of the consulting services, (ii) an annual report by the end of each year during 2021–2025, (iii) draft project completion report (PCR) by 31 October 2026, and (iv) a final PCR by 31 December 2026. The inception and annual reports and draft PCR will be subject to tripartite reviews by ADB, the PMO, and consultants. All reports are to be written in English and translated into Chinese. One soft and three hard copies of each report are to be submitted to ADB (English version only) and the PMO (both Chinese and English versions).

4. The inception report will present an approach for the consulting services, including a work plan and an implementation schedule. The annual reports will present activities conducted by the consultants, effects of the consulting services, issues encountered, and recommendations to improve project management. The draft and final PCRs will include summary and evaluation of project implementation; environmental management; land acquisition and resettlement (LAR); ethnic minority development; implementation of the social development action plan (SDAP) and the gender action plan (GAP); compliance to the loan and project covenants; and achievements of the project impact, outcome, and outputs; as well as lesson learned from the project implementation and follow-up actions recommended.

D. Other Requirements

5. The consultant team will provide a fully qualified interpreter to work with the consultants on a full-time basis and support the ADB missions.

E. Scope of Services and Consultants' Inputs

6. For the international consultant position, (i) possession of a related degree, qualification, memberships of related academic societies, and/or participation in related training courses; (ii) experience in similar positions for projects or technical assistance; and (iii) experience in working in many countries and experience in working in the People's Republic of China will be highly evaluated. For each of the national consultant positions, (i) possession of a related degree, qualification, memberships of related academic societies, and/or participation in related training courses, (ii) experience in similar positions for projects or technical assistance; and (iii) experience in working with international organizations and consultants will be highly evaluated.

1. Project Management Specialist/Team Leader (international, 13.00 person-months [pm])

7. The specialist should have experience in project management support; have experience in working in several countries, including the People's Republic of China; and be proficient in spoken and written English. Possession of memberships of related academic societies and/or completion of related training courses will be highly regarded.

8. The specialist will (i) coordinate all project management support activities as team leader; (ii) finalize approaches for project management support; (iii) prepare the inception report, annual reports, draft PCR, and final PCR; (iv) assist the PMO in implementing, monitoring, and evaluating the overall project and subprojects; (v) assist the PMO in preparing quarterly project progress reports in a format provided by ADB; (vi) assess needs for capacity development for staff of the PMO, the LPMOs, and others; and plan, design, organize, and implement seminars, workshops, and/or training for project management; financial management; disbursement arrangements; implementation, monitoring and evaluation (M&E) of the LAR, ethnic minority development, social development, gender development, and environmental management; and project M&E, if necessary;¹ (vii) monitor compliance with the loan and project covenants, assess key implementation issues, and make recommendations for improvement; and (viii) conduct any other necessary work for smooth and appropriate implementation of the project.

2. Procurement and Contract Management Specialist (national, 4.25 pm)

9. The specialist should have a related degree, qualification, and/or memberships of related academic societies and/or have completed related training courses; have experience in procurement and contract management for projects, and in working with international organizations and consultants; and be proficient in spoken and written English.

10. The specialist will (i) assist the PMO in recruiting a competent external monitoring agency for environmental monitoring (package number: T6) and a consultant team for rural water pollution management and eco-compensation (package number: T7), as necessary; (ii) monitor

¹ Costs for seminars, workshops, and training, excluding consulting services (costs for venues, printing, accommodation and transport for participants, etc.), will be funded from the ADB loan under the project separately from the contract for the consulting services.

procurement activities under the project and assist the PMO in updating and implementing the procurement plan; (iii) assist the PMO in conducting management of contracts for civil works, goods, and consulting services, including, but not limited to, supervision and inspection of activities under contracts; payments to contractors, suppliers, and consultants; preparation of withdrawal applications; improvement of fund flow efficiency by streamlining the preparation of withdrawal applications; and contract variations; (iv) assist the project management specialist and/or team leader in monitoring compliance with the loan covenants, assess key implementation issues, and make recommendations for improvement from procurement and contract management viewpoint; (v) provide the PMO with support for the preparation of procurement and contract management aspects of quarterly progress reports; (vi) provide support to the project management specialist and/or team leader for assessing needs for capacity development; and planning, designing, organizing, and implementing seminars, workshops, and/or training for procurement and contract management; (vii) provide support to the project management specialist and/or team leader for preparing the inception report, annual reports, draft PCR, and final PCR; and (viii) conduct any other necessary work for procurement and contract management assigned by the project management specialist and/or team leader.

3. Environmental Specialist (national, 14.50 pm)

11. The specialist should have (i) a degree in environmental management or related field (preferable master's or higher degree); (ii) experience in environmental management, monitoring, and/or impact assessment, including specific experience in management and monitoring of environmental projects (preferably for 12 years or more); (iii) familiarity with ADB's project management requirements and the 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.

12. For the environmental management plan (EMP), (i) before civil works start, the specialist will (a) ensure project environmental readiness (including inclusion of the EMP in all civil works contracts, compliance of all civil works contracts with the EMP, and incorporation of relevant sections of the EMP in plans and contracts for all civil works); (b) assist the PMO and the LPMOs in implementing the grievance redress mechanism (GRM) (including establishment and publicity of the GRM and collation and evaluation of grievances received); (c) develop procedures to monitor the EMP implementation, (d) undertake training for relevant agencies of the ZCG, the ZDG, and the LCG, as required, by the training plan in the EMP; and (e) provide hands-on support and on-the-job training to the PMO, the LPMOs, and contractors on specific requirements of the EMP, as required; and (ii) during implementation of civil works and operation, the specialist will (a) undertake site visits to the Zhaoyang District and the Ludian County during civil works and operation; (b) assist in ongoing public consultation process as described in the environmental impact assessment; (c) conduct the EMP compliance assessments, identify any environment-related implementation issues, and propose necessary responses in corrective action plans; (d) undertake training for relevant agencies of the ZCG, the ZDG, and the LCG, as required, by the training plan in the EMP; (e) undertake simple and cost-effective on-site quantitative measurements to regularly check that the civil works comply with the environmental monitoring standards and targets, especially for noise and dust, using a basic hand-held meter; (f) collate and evaluate data required in the environmental monitoring program in the EMP; and (g) prepare and submit semiannual environmental monitoring reports to ADB.

13. For the environmental and social management system (ESMS) for the eco-compensation fund to be established under the project, the specialist will (i) support the environment and social

officers of the PMO to oversee implementation of the ESMS; (ii) ensure that the steps of the ESMS are incorporated into the business procedures of the YWPCO; (iii) deliver training in the ESMS procedures for screening, categorizing, and assessing environmental impact and the ESMS record-keeping and reporting; (iv) assist the YWPCO in establishing and publicizing the GRM for activities funded by the eco-compensation fund, ensuring that the GRM publicity is appropriate to the scale and complexity of the activities; and includes, as a minimum, the disclosure of all contact persons for lodging complaints; (v) review the operation of the GRM; and revise GRM procedures, as required; (vi) conduct regular checks on the YWPCO's compliance with the ESMS; review the ESMS workbooks; undertake site visits, as required; identify problems; and propose necessary corrective actions; and (vi) assist the PMO in reporting the implementation of the ESMS to ADB through the semiannual environmental monitoring reports and the quarterly project progress reports.

14. Overall, the specialist will (i) work closely with the PMO, the LPMOs, and other consultants; and relevant agencies of the ZCG, the ZDG, and the LCG, as necessary, to conduct the tasks mentioned above; and (ii) undertake any other necessary work assigned by the project management specialist and/or team leader.

4. Resettlement Specialist (national 8.50 pm)

15. The specialist should have a related degree, qualification, and/or memberships of related academic societies and/or have completed related training courses; have experience in the LAR for projects, and in working with international organizations and consultants; and be proficient in spoken and written English.

16. The specialist will (i) if there is a change in the project scope, assist the PMO, the LPMOs, and design institute in updating the resettlement plan approved by ADB, in ADB's format, and based on the change; disclose them to the affected persons prior to ADB's approval; and obtain ADB's approval of them; (ii) assist the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG in implementing and monitoring the LAR in accordance with the resettlement plan and the ESMS; (iii) assist the LPMOs and relevant agencies of the ZDG and the LCG in supervising contractors to ensure compliance with requirements of the resettlement plan, the ESMS, applicable laws and regulations, and ADB's Safeguard Policy Statement; (iv) assist the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG in supervising the processes of the LAR by collecting and updating basic data; and closely coordinating between the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG; and an external resettlement and social development monitor; (v) review external resettlement and social development M&E reports prepared by the external resettlement and social development M&E agency; review ADB's comments on the reports; monitor compliance with the resettlement plan and the ESMS; assess the degree of impacts and key implementation issues; explain key issues to the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG; and assist them in conducting follow-up actions to address the key issues; (vi) assist the PMO in monitoring compliance with the resettlement plan and the ESMS, assessing key implementation issues, and formulating remedial measures; and assist them in conducting follow-up actions; (vii) provide the PMO with support for the preparation of the LAR aspects for the semiannual internal resettlement monitoring reports and the quarterly project progress reports; (viii) provide support to the project management specialist and/or team leader for assessing needs for capacity development; and planning, designing, organizing, and implementing seminars, workshops, and/or training for implementation and the M&E of the LAR; (ix) provide support to the project management specialist and/or team leader for preparing the

inception report, annual reports, draft PCR, and final PCR; and (x) undertake any other necessary work assigned by the project management specialist and/or team leader.

5. Social Development Specialist (national, 4.50 pm)

17. The specialist should have a related degree, qualification, and/or memberships of related academic societies and/or have completed related training courses; have experience in ethnic minority and social development for projects, and in working with international organizations and consultants; and be proficient in spoken and written English.

18. The specialist will (i) if there is a change in the project scope, assist the PMO, the LPMOs, and design institute in updating the ethnic minority development plan (EMDP) approved by ADB, in ADB format, and based on the change; and obtain ADB's approval of it; (ii) assist the PMO and the LPMOs in implementing and monitoring the EMDP, the ESMS, and the SDAP prepared during project preparation; (iii) assist the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG in supervising contractors to ensure compliance with requirements of the EMDP, the ESMS, and the SDAP; and applicable laws and regulations; (iv) assist the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG in supervising implementation of the EMDP, the ESMS, and the SDAP by collecting and updating basic data; and closely coordinating between the PMO and the LPMOs; relevant agencies of the ZCG, the ZDG, and the LCG; and the external resettlement and social development monitor; (v) review external resettlement and social development M&E reports prepared by the external resettlement and social development monitor; review ADB's comments on the reports; monitor compliance with the EMDP, the ESMS, and the SDAP; assess the degree of impacts and key implementation issues; explain key issues to the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG; and assist them in conducting follow-up actions to address the key issues; (vi) assist the PMO in monitoring compliance with the EMDP, the ESMS, and the SDAP, assessing key implementation issues, and formulating remedial measures; and assist them in conducting follow-up actions; (vii) provide the PMO with support for the preparation of ethnic minority and social development aspects for the quarterly project progress reports; (viii) provide support to the project management specialist and/or team leader for assessing needs for capacity development; and planning, designing, organizing, and implementing seminars, workshops, and/or training for implementation and the M&E of the EMDP, the ESMS, and the SDAP; (ix) provide support to the project management specialist and/or team leader for preparing the inception report, annual reports, draft PCR, and final PCR; and (x) undertake any other necessary work assigned by the project management specialist and/or team leader.

6. Gender Specialist (national, 8.50 pm)

19. The specialist should have a related degree, qualification, and/or memberships of related academic societies and/or have completed related training courses; have experience in gender development for projects, and in working with international organizations and consultants; and be proficient in spoken and written English.

20. The specialist will (i) assist the PMO and the LPMOs in implementing and monitoring the GAP prepared during project preparation; (ii) assist the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG in supervising contractors to ensure compliance with requirements of the GAP; and applicable laws and regulations; (iii) assist the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG in supervising implementation of the GAP by collecting and updating basic data; and closely coordinating between the PMO and the LPMOs; relevant agencies of the ZCG, the ZDG, and the LCG; and the external resettlement

and social development monitor; (iv) review external resettlement and social development M&E reports prepared by the external resettlement and social development monitor; review ADB's comments on the reports; monitor compliance with the GAP; assess the degree of impacts and key implementation issues; explain key issues to the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG; and assist them in conducting follow-up actions to address the key issues; (v) assist the PMO in monitoring compliance with the GAP, assessing key implementation issues; and formulating remedial measures; and assist them in conducting follow-up actions; (vi) provide the PMO with support for the gender development aspects for quarterly project progress reports; (vii) provide support to the project management specialist and/or team leader for assessing needs for capacity development; and planning, designing, organizing, and implementing seminars, workshops, and/or training for implementation and the M&E of the GAP; (viii) provide support to the project management specialist and/or team leader for preparing the inception report, annual reports, draft PCR, and final PCR; and (ix) undertake any other necessary work assigned by the project management specialist and/or team leader.

7. Economist (national, 2.25 pm)

21. The specialist should have a related degree, qualification, and/or memberships of related academic societies and/or have completed related training courses; have experience in economic analysis for projects, and in working with international organizations and consultants; and be proficient in spoken and written English.

22. The specialist will (i) review background documents, including the economic analysis of the project undertaken during project preparation; (ii) conduct economic analyses of the overall project and each subproject to determine economic internal rate of return of the overall project and each subproject at the midterm of project implementation (in 2023), and at physical completion of the project; (iii) provide support to the project management specialist and/or team leader for assessing needs for capacity development; and planning, designing, organizing, and implementing seminars, workshops, and/or training for economic analysis, as necessary; (iv) provide support to the project management specialist and/or team leader for preparing the inception report, annual reports, draft PCR, and final PCR; and (v) undertake any other necessary work assigned by the project management specialist and/or team leader.

8. Finance Specialist (national, 4.00 pm)

23. The specialist should have a related degree, qualification, and/or memberships of related academic societies and/or have completed related training courses; have experience in financial analysis and financial management assessment for projects, and in working with international organizations and consultants; and be proficient in spoken and written English.

24. The specialist will (i) review background documents, including the financial analysis and financial management assessment of the project undertaken during project preparation; (ii) conduct financial analysis at the midterm of project implementation (in 2023); and at physical completion of the project, including (a) financial sustainability analysis to assess the fiscal sustainability and debt repayment capacity of the ZDG and the LCG; and (b) an assessment of the financial viability of the revenue-generating components, i.e., wastewater management; (iii) assist the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG in establishing and implementing a financial management system; (iv) assist the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG in preparing withdrawal applications; and streamlining the preparation of withdrawal applications; (v) assist the Yunnan Provincial Finance Department, the Yunnan Provincial Audit Office, the PMO, and the LPMOs in

meeting requirements of the financial management action plan (Table V-1, project administration manual); (vi) provide support to the project management specialist and/or team leader for assessing needs for capacity development; and planning, designing, organizing, and implementing seminars, workshops, and/or training for financial analysis and financial management, as necessary; (vii) provide support to the project management specialist and/or team leader for preparing the inception report, annual reports, draft PCR, and final PCR; and (ix) undertake any other necessary work assigned by the project management specialist and/or team leader.

F. Cost Estimate

Table A2.4: Cost Estimate

Item		Total Cost (\$'000)
1.	Consultants	
	a. Remuneration and per diem	
	International consultant (13.0 person-months)	296.7
	National consultants (46.5 person-months)	335.3
	b. International travel	42.5
	c. Local travel	45.3
	d. Reports and communications	2.0
2.	Surveys	9.0
3.	Workshops, training, seminars, and conferences	6.0
4.	Equipment	4.0
5.	Miscellaneous administration and support costs	21.1
6.	Contingencies	40.1
	Total	802.0

Source: Asian Development Bank estimates.

INDICATIVE TERMS OF REFERENCE FOR CONSULTING SERVICES FOR PACKAGE T5: EXTERNAL RESETTLEMENT AND SOCIAL DEVELOPMENT MONITORING AND EVALUATION AGENCY

A. Introduction

1. This document sets out the indicative terms of reference for external resettlement and social development monitoring and evaluation (M&E) agency needed to ensure that the Yunnan Sayu River Basin Rural Water Pollution Management and Eco-Compensation Demonstration Project will be implemented in conformity with the laws and regulations of the People's Republic of China (PRC); and the Asian Development Bank's (ADB) Safeguard Policy Statement (2009), including involuntary resettlement and indigenous people. The direct client is the project management office (PMO). The PMO is under the Zhaotong City Government (ZCG, the executing agency of the project) and physically located in the Yudong Reservoir Water Resources Protection Committee Office (an implementing agency). The external resettlement and social development M&E will be conducted for land acquisition and resettlement (LAR) and social issues (implementation of the ethnic minority development plan [EMDP], the social development action plan [SDAP], and the gender action plan [GAP]) in Zhaoyang District and Ludian County. A local PMO (LPMO) for Zhaoyang District is physically located in the Water Resources Bureau of the Zhaoyang District Government (ZDG, an implementing agency) and another LPMO for Ludian County is physically located in the Investment Service Center of the Ludian County Government (LCG, an implementing agency).

B. Implementation Arrangements

2. The external resettlement social development M&E will be carried out by a team of specialists through a competent external M&E agency. The M&E will be financed by ADB, and the team of specialists will be recruited by the PMO according to ADB's Procurement Policy (2017, as amended from time to time) and ADB's Procurement Regulations for ADB Borrowers (2017, as amended from time to time) through consultants' qualifications selection. The PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG will assist the M&E agency, particularly in the aspects of field survey, staffing, and logistics. The consulting services are expected to start in December 2020 until April 2026.

C. Reporting Requirements

3. The M&E agency will submit to ADB, the PMO, and the LPMOs external resettlement and social development M&E reports semiannually.² For each report, the M&E agency will submit a soft copy of the English version to ADB; and soft copies of the English and Chinese versions to each of the PMO and the LPMOs, not later than 30 days after the completion of the field investigations.

4. The M&E agency will take full responsibility for the content and quality of the reports; and if necessary, must revise reports based on the comments of ADB. Format of the reports will be proposed by the M&E agency in the technical proposal. The M&E agency may seek guidance from ADB's relevant sourcebooks on resettlement, ethnic minorities, gender, etc. and from examples of reports on ADB's website.

² The M&E of the implementation of the resettlement plan will be conducted semiannually during the implementation of the resettlement plan and annually for 2 years after that.

D. Scope of Services and Consultants' Inputs

5. According to ADB's requirements, the implementation of the resettlement plan, the EMDP, the SDAP, and the GAP—besides internal monitoring undertaken by the PMO and the LPMOs—should be monitored by the M&E agency. The M&E agency will monitor the implementation of the resettlement plan, the EMDP, the SDAP, and the GAP; and report progress to ADB semiannually (footnote 2).

6. The general objective of the external resettlement and social development M&E is to assess the compliance with principles, policies, and requirements mentioned in the resettlement plan, the EMDP, the SDAP, and the GAP, including (i) determining and assessing whether or not the relevant project activities are being carried out in compliance with principles, requirements, and procedures according to the resettlement plan, the EMDP, the SDAP, and the GAP; (ii) reviewing whether or not the objectives of the resettlement plan (especially those that improve or at least restore affected persons' living standards), the EMDP, the SDAP, and the GAP are adequately implemented and achieved; and (iii) reviewing shortcomings in the implementation of the resettlement plan, the EMDP, the SDAP, and the GAP; and developing recommended solutions for discussion with the PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG.

7. To carry out the M&E, the M&E agency will address the following tasks:

- (i) **Periodic monitoring and evaluation of the land acquisition and resettlement.** For each subproject during the implementation of the LAR, the M&E agency will semiannually monitor and evaluate the implementation of the resettlement plan.
- (ii) **Post monitoring and evaluation of the land acquisition and resettlement.** For each subproject for 2 years after the completion of the LAR, the M&E agency will annually carry out post-LAR M&E for 2 years to evaluate the results of the implementation of the resettlement plan and its impact of the affected persons.
- (iii) **Social development monitoring and evaluation.** For each subproject during project implementation, the M&E agency will semiannually monitor and evaluate the implementation of the EMDP, the SDAP, and the GAP.
- (iv) Participate with the PMO in ADB's review missions, as required.

8. **Monitoring indicators.** There are various monitoring indicators on the implementation of the resettlement plan, the EMDP, the SDAP, and the GAP. Once selected, the M&E agency will have to present in detail the monitoring indicators to the PMO and ADB for approval. Below are main monitoring indicators:

- (i) For compliance of compensation payment and support provision
 - (a) In case of land-for-land compensation, whether the replaced land is equal in area and location as well as production, living conditions compared with the affected land; in case of cash-for-affected land, whether the replacement cost principle is ensured.
 - (b) Whether compensation for affected structures is equal to materials and labor replacement cost according to standards and specification of the work; whether reused materials are not deducted or discounted; and whether assets are depreciated based on age.

- (c) Whether compensation for trees and/or crops takes into account market rates.
 - (d) Whether compensation is fully paid to affected persons; either through single installment or multiple installments.
 - (e) Whether other assistance as specified in the resettlement plan is provided to affected persons, as required.
- (ii) For compliance of information disclosure and community consultation
 - (a) Whether project documents (resettlement information booklet and relevant documents) are disseminated to communities.
 - (b) Whether information (results of detailed measurement survey, prices application, disbursement of payment) is promulgated at public places, and whether the process was effective.
 - (c) Whether the affected persons are fully consulted about issues of land recovery, policies on compensation, resettlement, livelihood restoration, and access to a grievance redress mechanism (GRM).
 - (d) Whether the concerns and recommendations of the affected persons are resolved during the implementation of the resettlement plan; as well as the manner by which they have been addressed.
- (iii) For relocation plan and implementation (if applicable based on the resettlement plan updated during project implementation)
 - (a) Resettlement methods, participation in relocation planning, announcement of relocation plan, and support to relocated households.
- (iv) For compliance of the implementation for the relocated affected persons (if applicable based on the resettlement plan updated during project implementation)
 - (a) Housing and living conditions in resettlement sites (such as road, domestic power, water distribution and/or drainage system); and restoration of community, education, and health services.
 - (b) Whether replacement housing was provided in a complete and timely manner.
 - (c) Any issues related to transitional housing and/or period.
 - (d) Whether the new location has had any impact on the affected persons' livelihoods.
- (v) For compliance of income restoration and support to livelihood stabilization
 - (a) Whether support to income restoration is adequately provided, and efficiency of the income restoration support (e.g., training, credit assistance).
 - (b) Post-resettlement life and production stabilization, and how affected persons stabilize their life and production.
 - (c) Problems that affected persons are facing during the income restoration and life stabilization.
 - (d) Compensation and restoration of temporary land occupation.
- (vi) For compliance of the satisfaction of the affected persons
 - (a) Satisfaction of the determination of losses and compensation valuation.
 - (b) Satisfaction of compensation payment and other assistance.
 - (c) Satisfaction of information disclosure and consultation.
 - (d) Satisfaction on life stabilization and income restoration support activities.

- (e) Satisfaction of resettlement site, relocation site, and completeness of facilities (if applicable based on the resettlement plan updated during project implementation).
- (vii) For compliance of the GRM of the affected persons
 - (a) Degree of efficiency of the GRM (time, efficiency of resolution).
 - (b) Results of complaint resolution at various levels.
 - (c) Satisfaction of the GRM.
- (viii) For social development, monitoring indicators are in the EMDP, the SDAP, the GAP, and the design and monitoring framework (Table IX-1).

9. **Methodology of monitoring and evaluation.** The M&E agency will apply both qualitative and quantitative methods during M&E, including the following:

- (i) Quantitative methods
 - (a) Conduct baseline survey for the LAR (prior to start of the LAR) covering a representative sample of affected persons, focusing more on those seriously affected and vulnerable affected persons.
 - (b) Conduct semiannual and annual questionnaire survey during project implementation for 50% of severely affected households and 20% of all other affected households.
 - (c) Use the existing statistical data at local levels, and data from district and/or county resettlement bureaus.
 - (d) Survey affected businesses and workers.
 - (e) Conduct final M&E of the LAR implementation (prior to project completion) by conducting a sample survey on 50% of severely affected households and 20% of all other affected households.
 - (f) Collect quantitative data against targets and indicators in the EMDP, the SDAP, and the GAP.
- (ii) Qualitative methods
 - (a) Review project documents (feasibility study reports and resettlement plan); ADB's relevant policies; and laws and regulations of the PRC, Yunnan Province, Zhaotong City, Zhaoyang District, and Ludian County.
 - (b) Consult and discuss with different stakeholders, including the ZCG, the ZDG, the LCG, and social organizations, through consultation meetings, in-depth interviews, and group discussions.
 - (c) Undertake focused group discussions, in-depth interviews with the target affected persons; and/or groups such as severely affected households, relocated households (if any), vulnerable households, and women's groups.
 - (d) Collect qualitative information on the progress of the EMDP, the SDAP, and the GAP.
- (iii) **Site visits.** Visit sites, including original housing areas and resettlement sites (if any), as well as project construction sites; and identify potential impacts on local people during civil works.

10. All information and data collected will be processed, analyzed, and included in the baseline or subsequent M&E reports. The M&E agency must store the processed data to be used

for the next M&E. These data will belong to (and will be the asset of) the PMO and will be made available to ADB and the PMO on request. All documentation will be transferred to the PMO at the completion of the contract.

11. **Qualification required and detailed tasks of personnel.** The M&E agency should be a registered social organization (research institution, design institute, consulting institution, firm, university, or nongovernment organization) without direct administrative subordination relations with the ZCG, the ZDG, and the LCG. The M&E agency should have five or more qualified technical staff members. Professional staff members of the M&E agency should have degree in economics, sociology, and/or anthropology, or relevant field of social sciences; be familiar with ADB's or World Bank's resettlement and social development policies and procedures; and have previous experience in the M&E of resettlement and social development for projects funded by ADB or the World Bank. The M&E agency should also have experience in undertaking resettlement and social development M&E for similar projects in the PRC.

12. The M&E agency will establish an M&E team. The main duties of the team are to (i) carry out the M&E on the resettlement plan, the EMDP, the SDAP, and the GAP implementation, ensuring that it is in compliance with the resettlement plan, the EMDP, the SDAP, and the GAP; (ii) advise the PMO and the LPMOs; and other relevant agencies of the ZCG, the ZDG, and the LCG on the implementation of the resettlement plan, the EMDP, the SDAP, and the GAP to ensure that policies and procedures are complied with; and (iii) provide information and data, monitoring results, and observations that the team leader will aggregate into the external resettlement and social development M&E reports.

13. All team members must be fluent in English as well as Chinese, and reports to ADB will be in English. For each of the members, (i) possession of a related degree, qualification, and/or memberships of related academic societies; and/or past participation in related training courses; and (ii) experience in similar positions for projects; and in working with international organizations and/or international consultants will be highly evaluated.

1. Resettlement Specialist and Team Leader (national, 9.0 person-months)

14. The specialist will undertake the following tasks: (i) lead all the activities of the team; (ii) lead and set up the M&E methodology, including design of baseline and tracer surveys; (iii) work and coordinate with relevant agencies and/or bodies within the project to implement the task of M&E activities; (iv) lead and conduct the M&E activities and required surveys to collect data and information at office and project sites, and then analyze the findings; (v) prepare external resettlement and social development M&E reports which include conclusions and recommendations; (vi) discuss findings with the PMO, the LPMOs, and other relevant agencies of the ZCG, the ZDG, and the LCG to reach agreement on follow-up actions; and (vii) participate in ADB's review missions.

2. Social Evaluation Specialist (national, 9.0 person-months)

15. The specialist will undertake the following tasks: (i) monitor the LAR (including compensation payments and livelihood restoration of the affected persons), ethnic minority development, social development, and gender development activities mentioned in the resettlement plan, the EMDP, the SDAP, and the GAP to ensure that they are being carried out in compliance with principles, requirements, and procedures according to the plans and the governments' laws and/or regulations; (ii) provide inputs to the external resettlement and social development M&E reports, which would include progress, challenges, and/or bottlenecks during

implementation; and propose solutions and/or recommendations to address these issues; (iii) participate in ADB's review missions, if required; and (iv) conduct any other duties assigned by the resettlement specialist and/or team leader.

3. Field Surveyors (national, two positions, 4.5 person-months each)

16. The surveyors will (i) assist the resettlement and social evaluation specialists in carrying out the monitoring on the implementation of the resettlement plan, the EMDP, the SDAP, and the GAP to ensure that the implementation is in compliance with the resettlement plan, the EMDP, the SDAP, and the GAP; (ii) under the guidance of the resettlement and social evaluation specialists, carry out field surveys; (iii) analyze the data collected from the field surveys; (iv) provide assistance to the resettlement and social evaluation specialists for the preparation of the external resettlement and social development M&E reports; and (v) conduct any other duties assigned by the resettlement specialist and/or team leader.

E. Cost Estimate

Table A2.5: Cost Estimate

Item	Total Cost (\$'000)
1.	Consultants
a.	Remuneration and per diem
	National consultants (27.0 person-months)
	188.6
b.	Local travel
	9.0
c.	Reports and communications
	0.5
2.	Surveys
	4.5
3.	Miscellaneous administration and support costs
	4.2
4.	Contingencies
	10.2
Total	
	217.0

Source: Asian Development Bank estimates.

INDICATIVE TERMS OF REFERENCE FOR CONSULTING SERVICES FOR PACKAGE T6: EXTERNAL ENVIRONMENTAL MONITORING AGENCY

A. Introduction

1. This document sets out the indicative terms of reference for external environmental monitoring to ensure that the Yunnan Sayu River Basin Rural Water Pollution Management and Eco-Compensation Demonstration Project will be implemented in conformity with the laws and regulations of the People's Republic of China; and the Asian Development Bank's (ADB) Safeguard Policy Statement (2009). The direct client is the project management office (PMO). The PMO is under the Zhaotong City Government (ZCG, the executing agency of the project) and physically located in the Yudong Reservoir Water Resources Protection Committee Office (an implementing agency). The consulting services will be also provided to two local PMOs (LPMO). One LPMO is physically located in the Water Resources Bureau of the Zhaoyang District Government (ZDG, an implementing agency) and another LPMO is physically located in the Investment Service Center of the Ludian County Government (LCG, an implementing agency). The project includes the construction of two garbage pyrolysis plants, four garbage transfer stations, and other facilities. As a part of the loan conditions, an environmental impact assessment (EIA) and an environmental management plan (EMP) have been prepared. The EMP requires that environmental monitoring of the construction and operation of the facilities be conducted by an external environmental monitoring agency (EMA).

B. Implementation Arrangements

2. The external environmental monitoring will be carried out by a team of specialists through a competent EMA twice a year during the construction of the facilities and in the first year of the operation of the facilities. The monitoring will be financed by ADB, and the team of specialists will be recruited by the PMO according to ADB's Procurement Policy (2017, as amended from time to time) and ADB's Procurement Regulations for ADB Borrowers (2017, as amended from time to time) through consultants' qualifications selection. The EMA will work closely with the environment officers of the PMO and the LPMOs; the Ecological and Environmental Protection Bureaus of the ZCG, the ZDG, and the LCG; and contractors, consultants, communities, and/or other personnel, as required. The consulting services are expected to start in April 2021 until August 2026.

3. The PMO and the LPMOs; and relevant agencies of the ZCG, the ZDG, and the LCG will provide assistance to the EMA, particularly in the aspects of field survey, staffing, and logistics. Specifically, they will (i) provide the EMA with hard and soft copies of the EMP, domestic and ADB-version EIAs, domestic feasibility study report, loan and project agreements, maps, and other supporting materials, as necessary; (ii) facilitate and arrange meetings with key project agencies, including contractors and construction supervision companies (CSCs); (iii) conduct overall coordination, including review of external environmental monitoring reports; and a consolidated external environmental monitoring report; and (iv) take final responsibility for submission of the external environmental monitoring reports and the consolidated external environmental monitoring report to ADB.

C. Reporting Requirements

4. The EMA will submit to ADB, the PMO, and the LPMOs the external environmental monitoring reports regularly twice a year during the construction of the facilities and in the first year of the operation of the facilities; and a consolidated external environmental monitoring report

within 2 months after the completion of the project. For each report, the EMA will submit a soft copy of the English version to ADB and soft copies of the English and Chinese versions to each of the PMO and the LPMOs.

5. The external environmental monitoring reports will include, but not be limited to, (i) description of activities conducted in the reporting period and results; (ii) all cumulative data collected up to the current reporting period; (iii) any cases of noncompliance with the target standards; (iv) any additional observations (qualitative or quantitative); (iv) lessons learned; and (f) work schedule for the next semiannual monitoring period.

6. The consolidated external environmental monitoring report will summarize the results, conclusions, lessons learned, and recommendations for the overall monitoring program. All raw data will be handed over to the PMO and the LPMOs in a clear and simple format. The EMA will submit to ADB (i) a draft final consolidated external monitoring report for review by ADB, the PMO, and the LPMOs; and (ii) a final report incorporating comments made by ADB, the PMO, and the LPMOs.

7. The EMA will take full responsibility for the content and quality of the reports; and if necessary, must revise reports based on comments of ADB. Format of the reports will be proposed by the EMA in the technical proposal. The EMA may seek guidance from examples of reports on ADB's website.

D. Scope of Services

8. The EMA should (i) possess relevant domestic certifications required to conduct environmental monitoring; (ii) ensure the provision of all certified equipment and other resources needed for monitoring, analyses, and reporting, including field sampling and laboratory equipment and logistical resources (vehicles etc.); and (iii) assign qualified and experienced staff to be directly involved in site visits, monitoring, analyses, and reporting activities who has (a) a degree in environmental management or related field (preferable master's or higher degree); (b) an ability to communicate and work effectively with local communities, contractors, and government agencies; (c) experience in data collection and analyses and report preparation; and (d) good physical health and fitness to visit remote project construction sites and in different seasons.

9. The EMA will conduct the following tasks.

(i) Gain familiarity with the project sites and monitoring requirements through (a) review of the items listed as "external monitoring" in Table EMP-5 of the EMP, as well as the overall EIA and EMP; (b) meetings with the project agencies; and (c) site visits.

(ii) If needed, recommend additional monitoring variables and/or changes in the monitoring methods (e.g., monitoring locations or frequency) for the items listed as "external monitoring" in Table EMP-5 of the EMP; and provide a clear rationale for any proposed changes. Note: No changes to the monitoring plan in Table EMP-5 will be made without the prior review and endorsement by the PMO and ADB.

(iii) Design an environmental monitoring plan which (a) focuses on specific variables listed in Table EMP-5 of the EMP for "external monitoring"; (b) includes a clear methodology and work schedule; and (c) includes any additional variables recommended.

- (iv) Design and establish a simple database (e.g., in Excel) to store all collected data. Data should be entered and stored in a clear and simple format that enables comparison of values over time; and ensure that data is backed up on at least one external storage device.
- (v) Implement the monitoring program.
- (vi) While on site, provide demonstrations to the project agencies (including the PMO, the LPMOs, the CSCs, and contractors) in the monitoring; and emphasize the links between good construction practices and reduction of environmental risks.
- (vii) Immediately report to the LPMOs any cases of noncompliance with the EMP monitoring standards and/or any other environmental management issues that may be observed while on site.
- (viii) Identify any cases of exceedance of values against the project standards, and the reasons for such exceedance.
- (ix) Prepare and submit external environmental monitoring reports and a consolidated external environmental monitoring report (paras. 4–7).
- (xi) Work closely with the PMO, the LPMOs, the CSCs, contractors, consultants, communities, and other stakeholders, as necessary, to conduct these tasks.

10. Three (3) national specialist positions will provide a total of 14.0 person-months of consulting services to support extremal environmental monitoring. The key responsibilities are proposed but not limited to the following.

1. Environmental Specialist/Team Leader (national, 7.0 person-months)

11. The specialist will undertake the following tasks: (i) lead all the activities of the team; (ii) lead and set up the monitoring methodology, including design of baseline and tracer surveys; (iii) work and coordinate with relevant agencies and/or bodies within the project to implement the task of monitoring activities; (iv) lead and conduct the monitoring activities and required surveys to collect data and information at office and project sites, and then analyze the findings; (v) prepare external environmental monitoring reports which include conclusions and recommendations; (vi) discuss findings with the PMO and the LPMOs to reach agreement on follow-up actions; and (vii) participate in ADB's review missions. Specifically, the specialist will

- (i) coordinate overall monitoring activities in compliance with contract requirements;
- (ii) develop detailed work plan and procedures;
- (iii) conduct regular site visits for guidance to local site workers;
- (iv) hold regular meetings to review work progress, and propose actions for improvement;
- (v) review monitoring work plan;
- (vi) review and finalize monitoring reports and consolidated monitoring report;
- (vii) propose suggestions based on progress, and participate in handling pollution accidents; and
- (viii) review environmental sections contained in construction management plans, and review compliance of environmental protection systems developed by contractors.

2. Field Surveyors (national, two positions, 3.5 person-months each)

12. The surveyors will (i) assist the environmental specialists in carrying out external environmental monitoring to ensure that environmental management is in compliance with the EMP; (ii) under the guidance of the environmental specialists, carry out field surveys; (iii) analyze data collected from the field surveys; (iv) provide assistance to the environmental specialists for the preparation of external environmental monitoring reports; and (v) conduct any other duties assigned by the environmental specialist and/or team leader. Specifically, the surveyors will

- (i) undertake field survey and inspection under the guidance of environmental specialist;
- (ii) participate in preparation of environmental monitoring procedures;
- (iii) conduct environmental monitoring at project sites, and evaluate control of pollutants for compliance with relevant environmental standards and regulations;
- (iv) identify issues, report them in a timely manner, and propose mitigation measures;
- (v) arrange site meetings for effective coordination with clients and contractors, and deliver training on a need basis;
- (vi) participate in handling pollution accidents under the guidance of the environment specialist;
- (vii) prepare external environmental monitoring reports and consolidated monitoring report; and
- (viii) undertake other tasks assigned by the environmental specialist.

E. Cost Estimate

Table A2.6: Cost Estimate

Item	Total Cost (\$'000)
1.	Consultants
a.	Remuneration and per diem
	National consultants (14.0 person-months)
	82.6
b.	Local travel
	3.6
c.	Reports and communications
	0.3
2.	Surveys
	3.5
3.	Miscellaneous administration and support costs
	2.2
4.	Contingencies
	4.8
Total	
	97.0

Source: Asian Development Bank estimates.

INDICATIVE TERMS OF REFERENCE FOR CONSULTING SERVICES FOR PACKAGE T7: CONSULTANT TEAM FOR RURAL WATER POLLUTION MANGEMENT AND ECO-COMPENSATION

A. Introduction

1. This document sets out indicative terms of reference for consulting services for rural water pollution management and eco-compensation for the Yunnan Sayu River Basin Rural Water Pollution Management and Eco-Compensation Demonstration Project. The direct client of the consulting services is the project management office (PMO). The PMO is under the Zhaotong City Government (ZCG, the executing agency of the project) and physically located in the Yudong Reservoir Water Resources Protection Committee Office (YWPCO, an implementing agency). The consulting services will be also provided to two local PMOs (LPMOs). One LPMO is physically located in the Water Resources Bureau of the Zhaoyang District Government (ZDG, an implementing agency) and another LPMO is physically located in the Investment Service Center of the Ludian County Government (LCG, an implementing agency).

B. Implementation Arrangements

2. The consulting services will be carried out by a team of consultants through a firm. A total of 12.00 person-months of international and 117.25 person-months of national consulting services will be required. The consulting services will be financed by the Asian Development Bank (ADB); and the consultants will be recruited by the PMO according to ADB's Procurement Policy (2017, as amended from time to time), and ADB's Procurement Regulations for ADB Borrowers (2017, as amended from time to time). The consulting firm will be selected by (i) inviting simplified technical proposals; and (ii) using the quality- and cost-based selection method, with a quality-cost ratio of 90:10. The consulting services are expected to start on May 2021 until December 2026.

C. Reporting Requirements

3. The consultant team will produce (i) an inception report within 4 weeks of the start of the consulting services, (ii) an annual report by the end of each year during 2021–2025, (iii) draft final report by 31 October 2026, and (iv) a final report by 31 December 2026. The inception, annual, and draft final reports will be subject to tripartite reviews by ADB, the PMO, and consultants. All reports are to be written in English and translated into Chinese. One soft and three hard copies of each report are to be submitted to ADB (English version only) and the PMO (both Chinese and English versions).

4. The inception report will present an approach for the consulting services, including a work plan and an implementation schedule. The annual, draft final, and final reports will present activities conducted by the consultants, effects of the consulting services, issues encountered, and recommendations.

D. Other Requirements

5. The consultant team will provide a fully qualified interpreter to work with the consultants on a full-time basis and support the ADB missions.

E. Scope of Services and Consultants' Inputs

6. The consultant team will undertake the following tasks:

1. Output 1: Water pollution sources in the Sayu River Basin reduced

1.1 Waste management

- (i) Provide relevant agencies of the ZDG and the LCG with technical assistance in operation and maintenance (O&M) and related institutional and capacity development for centralized and distributed wastewater management and animal feces management.

1.2 Solid waste management

- (ii) Provide relevant agencies of the ZDG and the LCG with technical assistance in O&M and related institutional and capacity development for solid waste management (including establishment of comprehensive solid waste management from households to plants with institutional and capacity development).

1.3 Pilot eco-villages to reduce emission

- (iii) Train residents in the pilot eco-villages on garbage classification, recycling, and reduction of resource use and waste stream (including phasing out of single-use plastics, and replacing them with locally sourced reusable and compostable products).
- (iv) Conduct education at schools in the pilot eco-villages to promote garbage classification, recycling, and reduction of resource use and waste stream (including phasing out of single-use plastics replacing them with locally sourced reusable and compostable products).
- (v) Develop environmental health management systems in the pilot eco-villages, including institutional development (establishment of special cleaning teams and special environmental supervision groups, including their training, establishment of awarding program, etc.).
- (vi) Conduct publicity (construction of cultural activity rooms, environmental protection bulletin boards, audio systems, display screens, and other publicity facilities) to promote garbage classification, recycling, and reduction of resource use and waste stream (including phasing out of single-use plastics, and replacing them with locally sourced reusable and compostable products) and to introduce activities by special cleaning teams and special environmental supervision groups.

1.4 Wetlands construction to reduce nonpoint source pollution

- (vii) Provide relevant agencies of the ZDG and the LCG with technical assistance in the O&M of wetlands constructed under the project and related institutional and capacity development.

1.5 Establishment of quantifiable soil and water conservation model

- (viii) Establish a model to estimate effects of afforestation on soil and water conservation.

- (ix) Develop a plan to actually measure the effects of afforestation on soil and water conservation on sites in Ludian County.
- (x) Measure effects of afforestation on soil and water conservation on sites in Ludian County.
- (xi) Revise the model based on the measured data.

1.6 Promotion of low-emission agriculture

- (xii) Provide relevant agencies of the LCG with technical assistance in the O&M of basic infrastructures constructed in pilot areas and related institutional and capacity development.
- (xiii) Assist relevant agencies of the LCG in reducing fertilizer use; developing a formula to estimate necessary fertilizer volume (based on crop type, water volume, fertilizer type, etc.); increasing organic and/or special fertilizer application; using animal feces for farming to realize circular agriculture and zero emission; and promoting composting of vegetables and straw, etc.
- (xiv) Assist relevant agencies of the LCG in establishing a green and organic apple brand, organic vegetable brand, etc.

2. Output 2: Water resources in the Sayu River Basin protected from pollution

2.1 Establishment of river protection model

- (xv) Provide staff of relevant agencies of the ZCG (particularly the YWPCO), the ZDG, and the LCG and relevant river chiefs with technical assistance in the O&M of an intelligent cloud platform river information management system established under the project and related institutional and capacity development, including collaboration with river chief system.

2.2 Establishment of smart water integrated management platform

- (xvi) Provide staff of relevant agencies of the ZCG (particularly YWPCO), the ZDG, and the LCG with technical assistance in the O&M of a smart water integrated management platform established under the project and related institutional and capacity development.

3. Output 3: Eco-compensation mechanism established for the Sayu River Basin

3.1 Establishment of eco-compensation mechanism

- (xvii) Assist the ZDG and the LCG in implementing the eco-compensation agreement between them.
- (xviii) Assist four towns and two townships in Zhaoyang District and Ludian County in signing and implementing six agreements between them for new town- and township-level horizontal eco-compensation mechanisms.
- (xix) Assist the YWPCO in establishing and implementing an eco-compensation fund (charge of the fund, financing from the fund, etc.).

4. Output 4: Education, capacity, and public awareness for water pollution management strengthened

4.1 Capacity development of government staff for rural water pollution management and eco-compensation

- (xx) Plan and implement training, workshops, and domestic and overseas study visits for staff of the ZCG, the ZDG, and the LCG for rural water pollution management and eco-compensation (excluding those conducted under Outputs 1–3).

4.2 Education of students for rural water pollution management and eco-compensation

- (xxi) Conduct periodical special lectures at schools, study visits for students, etc.

4.3 Public awareness raising

- (xxii) Conduct public awareness raising through campaigns, publicity, handbooks, brochures, medias, internet, etc.

4.4 Dissemination and replication of project initiatives

- (xxiii) Disseminate and replicate water pollution management and eco-compensation demonstrated under the project to other areas of the People's Republic of China and also other countries through workshops, publications, disclosure of project information on website, submission of papers to academic societies, application for a model project for eco-civilization, application for award programs, etc.

- 7. Each consultant's input to each activity is shown in Table A2.7 below.

Table A2.7: Consultants' Inputs

Activities	Consultants Inputs (person-months)											
	Waste Management Specialists		Wetland SP	Afforestation Specialist	Associate Afforestation Specialists 1 and 2	Low-Emission Agriculture Specialist	Composting Specialist	Agri-Business Specialist	River Mgmt. SP	Eco-Compensation Specialists		EDU, CD, and CP SP
	INT (TL)	NA	NA	NA	NA	NA	NA	NA	NA	INT	NA	NA
Output 1: Wastewater management and pollution control in the Sayu River Basin strengthened												
1.1 Waste management												
(i) Technical assistance in O&M and related institutional and CD	1.946	1.879										
1.2 Solid waste management												
(ii) Technical assistance in O&M and related institutional and CD	1.134	1.112										0.730
1.3 Pilot eco-villages to reduce emission												
(iii) Training of residents	0.485	0.485										0.405
(iv) EDU at schools	0.946	1.757										0.876
(v) Development of environmental health management system	0.946	1.757										1.751
(vi) Publicity	0.485	0.818										0.780
1.4 Wetlands construction to reduce nonpoint source pollution												
(vii) Technical assistance in O&M and related institutional and CD			2.375									
1.5 Establishment of quantifiable soil and water conservation model												
(viii) Establishment of a model to estimate effects of afforestation on soil and water conservation				0.500								
(ix) Development of a plan to actually measure effects of afforestation on soil and water conservation on sites				0.250								
(x) Measurement of effects of afforestation on soil and water conservation on sites				4.750	12.000							
(xi) Revision of the model based on the measured data				0.250								
1.6 Promotion of low-emission agriculture												
(xii) Technical assistance in O&M and related institutional and CD						1.500						
(xiii) Reduction of fertilizer use, development of a formula to estimate necessary fertilizer volume, increase of organic and/or special fertilizer application, use of animal feces for farming, promotion of composting, etc.						3.208	2.000					
(xiv) Establishment of a green and organic apple brand, organic vegetable brand, etc.								3.000				

Activities	Consultants Inputs (person-months)											
	Waste Management Specialists		Wetland SP	Afforestation Specialist	Associate Afforestation Specialists 1 and 2	Low-Emission Agriculture Specialist	Composting Specialist	Agri-Business Specialist	River Mgmt. SP	Eco-Compensation Specialists		EDU, CD, and CP SP
	INT (TL)	NA	NA	NA	NA	NA	NA	NA	NA	INT	NA	NA
Output 2: Water resources management in the Sayu River improved												
2.1 Establishment of river protection model												
(xv) Technical assistance in O&M and related institutional and CD including collaboration with the river chief system									1.208			1.250
2.2 Establishment of smart water integrated management platform												
(xvi) Technical assistance in O&M and related institutional and CD									1.313			1.250
Output 3: Eco-compensation mechanism for the Sayu River Basin established												
3.1 Establishment of eco-compensation mechanism												
(xvii) Recommend on micro-financing										1.104	1.729	
(xviii) Conduct domestic study visits										1.104	1.729	
(xix) Disseminate project's initiatives										0.729	1.479	
Output 4: Education, capacity, and public awareness for water pollution management strengthened												
4.1 Capacity development of government staff for rural water pollution management and eco-compensation												
(xx) Planning and implementation of training, workshops, and domestic and overseas study visits	0.616	0.772	0.188	0.250		0.146			0.146	0.438	0.125	0.179
4.2 Education of students for rural water pollution management and eco-compensation												
(xxi) Periodical special lectures at schools, study visits for students, etc.	0.354	0.354										0.768
4.3 Public awareness raising												
(xxii) Public awareness raising through campaigns, publicity, handbooks, brochures, medias, internet, etc.	0.863	0.841										1.334
4.4 Dissemination and replication of project initiatives												
(xxiii) Dissemination and replication of water pollution management and eco-compensation demonstrated under the project	0.473	0.473	0.688	1.500		0.646			0.583	0.375	0.938	0.179
Total	8.250	10.250	3.250	7.500	12.000	5.500	2.000	3.000	3.250	3.750	6.000	9.500

CD = capacity development, CP = community participation, EDU = education, INT = international, mgmt. = management, NA = national, O&M = operation and maintenance, SP = specialist, TL = team leader.

Note: Numbers may not sum precisely because of rounding.

Source: Asian Development Bank.

F. Cost Estimates**Table A2.8: Cost Estimate**

Item	Total Cost (\$'000)
1.	Consultants
a.	Remuneration and per diem
	International consultant (12.00 person-months) 290.4
	National consultants (62.25 person-months) 440.0
b.	International travel 42.5
c.	Local travel 59.4
d.	Reports and communications 2.4
2.	Surveys 12.0
3.	Workshops, training, seminars, and conferences 20.0
4.	Equipment 68.0
5.	Miscellaneous administration and support costs 15.3
6.	Contingencies 50.0
Total	
	1,000.0

Source: Asian Development Bank estimates.

**ENVIRONMENTAL MANAGEMENT PLAN
FOR THE YUNNAN SAYU RIVER BASIN RURAL WATER POLLUTION MANAGEMENT
AND ECO-COMPENSATION DEMONSTRATION PROJECT**

People's Republic of China

Prepared by the Zhaotong City Government for the Asian Development Bank

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In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, ADB does not intend to make any judgments as to the legal or other status of any territory or area.

ABBREVIATIONS

ADB	– Asian Development Bank
CSC	– construction supervision company
DEIA	– environmental impact assessment
EEB	– ecology and environment bureau
EIA	– environmental impact assessment
EMA	– environmental monitoring agency
EMP	– environmental management plan
GRM	– grievance redress mechanism
LPMO	– local project management office
PMO	– project management office
PRC	– People's Republic of China
QA	– quality assurance
QC	– quality control

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A. Objectives

1. This environmental management plan (EMP) is for the Yunnan Sayu River Basin Rural Water Pollution Management and Eco-compensation Demonstration Project. The EMP is to be implemented in all phases of the project—design, pre-construction, construction, and operation. The EMP aims to ensure project compliance with environmental laws of the People's Republic of China (PRC) and the Asian Development Bank's (ADB) Safeguard Policy Statement (2009). The EMP describes the roles and responsibilities of all project agencies to implement this EMP; anticipated impacts and mitigation measures; inspection, monitoring, and reporting arrangements; training and institutional strengthening; grievance redress mechanism (GRM); and future public consultation.

2. In the detailed design stage, the Zhaotong City project management office (PMO) will pass this EMP to the design institutes for incorporating mitigation measures into the detailed engineering designs.¹ 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 the implementing agencies will prepare and provide the specification clauses for incorporation into the bidding documents: (i) a list of environmental management requirements to be budgeted by the bidders in their bids, (ii) environmental clauses for contractual terms and conditions, and (iii) the component domestic environmental impact assessment (DEIA), and the ADB-version environmental impact assessment (EIA) for the project (project EIA), including the updated EMP for compliance.

B. Organizations and Their Responsibilities for the Environmental Management Plan Implementation

3. The Zhaotong City Government, represented by the Zhaotong City Yudong Reservoir Water Resources Protection Committee Office, is the executing agency of the project. At the city-level, the Zhaotong City Government has established the project leading group to provide policy guidance and coordination; and the PMO to manage, supervise, and coordinate overall project implementation. The PMO comprises the Director (part-time), four Deputy Directors (all part-time), one chief engineer (full-time), and 21 full-time staff, including an environment officer. Each of the two implementing agencies, the Zhaoyang District Government, and the Ludian County Government, has established a local PMO (LPMO) to implement their project components and subprojects. The EMP implementation arrangements and responsibilities of governmental organizations are summarized in Table EMP-1.

Table EMP-1: Institutional Responsibilities for the Environmental Management Plan Implementation

Agency	Environmental Management Roles and Responsibilities
Zhaotong City Project Leading Group	<ul style="list-style-type: none"> • Ensure timely national, provincial, and inter-agency coordination and support for the project, as needed • High-level support to executing agency • Provide advice on project implementation • Review project progress
Zhaotong City Government	<ul style="list-style-type: none"> • Project executing agency • Overall accountability and responsibility for project planning, management, and implementation • Ensure timely and effective execution of the loan agreements • Coordinate with ADB

¹ In the People's Republic of China (PRC), preliminary design is equivalent to detailed (engineering) designs in other countries.

Agency	Environmental Management Roles and Responsibilities
PMO	<ul style="list-style-type: none"> • Supervise and manage daily project implementation • Recruit and manage design institutes, procurement agents, consultants, contractors, CSCs, in accordance with government and ADB regulations • Submit bidding documents, bid evaluation reports, and other documents, as needed, to ADB for endorsement • Supervise construction and monitor quality control • Coordinate with ADB on all aspects of project implementation <p>Environment safeguards – all project outputs</p> <ul style="list-style-type: none"> • Engage environmental specialists (consultants); and the EMA for external environmental monitoring • Assign one PMO environment officer and one PMO social officer • Respond to any unanticipated safeguard issues; and take corrective actions, as needed • Ensure project compliance with the loan and project agreements (including all safeguard provisions), the EMP, and the ESMS • Prepare semiannual environment monitoring reports to ADB • Draft terms of reference for the PMO environment officer are in Appendix 2 <p>Project EIA and EMP—all project outputs except the Eco-Compensation Fund (Output 3)</p> <ul style="list-style-type: none"> • Update project EIA and/or EMP, as needed, especially during the stage of detailed engineering designs^a • Ensure that the EMP, especially all relevant mitigation measures, are included in the detailed engineering designs • Establish the EMP grievance redress mechanism <p>ESMS – for Eco-compensation Fund (Output 3)</p> <ul style="list-style-type: none"> • Support the Zhaotong City Finance Bureau and the fund committee to finalize the ESMS, submit the updated draft ESMS to ADB for endorsement, and implement the fund and the ESMS • Facilitate safeguard training for the Zhaotong City Finance Bureau and the fund committee • Incorporate monitoring and progress on the ESMS implementation in the semiannual environment monitoring reports to ADB
Zhaoyang District Government, Ludian County Government, and their respective LPMOs (for all civil works)	<ul style="list-style-type: none"> • Implement subprojects, including finance, administration, technical and procurement matters, monitoring, evaluation, and safeguards • Coordinate with the PMO for project implementation • Prepare tendering contracts; and submit bidding documents, bid evaluation reports, and other documents to the PMO • Recruit design institutes, contractors, and the CSCs; and manage contractors and suppliers • Submit the withdrawal applications to finance bureau • Supervise construction and quality control • Assign the LPMO environment officer (one per LPMO), with the draft terms of reference in Appendix 2 of the project EIA • Incorporate the EMP into bidding documents • Supervise and monitor the EMP implementation and progress reporting to the PMO • Participate in capacity building and training programs • Contract the EMA to conduct environmental monitoring

Agency	Environmental Management Roles and Responsibilities
	<ul style="list-style-type: none"> • Coordinate and nominate the local town and township governments that will be responsible for operation and maintenance of the garbage transfer stations, wastewater treatment stations, river embankments, constructed wetlands • Commission the constructed facilities
Eco-compensation Fund Management Committee (to manage the eco-compensation fund under Output 3)	<ul style="list-style-type: none"> • Implementing agency for the eco-compensation fund (Output 3) • Establish, manage, and implement the fund and the ESMS • Prepare semiannual environment monitoring reports to the PMO for consolidation within progress reports by the PMO to ADB
<p>Project Facility Operators: under the two implementing agencies</p> <p>Project Facility Operators: the city agencies, town and/or village governments, or district and/or county Housing and Urban–Rural Development Bureaus, Urban Construction and Investment Companies, Ecology and Environment Bureaus, and Water Resources Bureaus</p>	<ul style="list-style-type: none"> • With the LPMOs, commission the constructed facilities: the garbage pyrolysis plants, garbage transfer stations, wastewater treatment stations, river embankments, and constructed wetlands • Operate and maintain the completed facilities, including environmental management, monitoring, and reporting responsibilities
Initial project management support consultant (environment)	<ul style="list-style-type: none"> • Short-term national position to support the PMO and the LPMOs with start-up support for the EMP and the ESMS establishment; while a team of consultants for project management support, including an environmental specialist, is being recruited • Assess whether the detailed engineering designs are within the scope of the EMP and/or whether new safeguard assessments are required • Help integrate the EMP within the project bidding documents • Assist the PMO to establish the GRM for the EMP and the ESMS • Provide initial training to project agencies for the EMP and the ESMS implementation
Environmental specialist in team of consultants for project management support	<ul style="list-style-type: none"> • Support the executing and implementing agencies in their tasks to coordinate and implement the EMP and the ESMS • Provide ongoing training for the EMP and the ESMS implementation, including the EMP capacity building (Table EMP-6) • Review the detailed engineering designs and assess whether the project EIA and/or the EMP requires update • Support the update of the project EIA and/or the EMP, as needed • Review bidding documents to ensure that the EMP clauses are incorporated • Review site-specific EMPs (prepared by contractors) to ensure compliance with the EMP • Conduct site inspections to assess compliance with the EMP • Review environment monitoring reports prepared by contractors • Assist the PMO to prepare the semiannual environmental monitoring reports to ADB • Refer to the indicative terms of reference in Appendix 2
External environment monitoring agency (intermittent throughout project)	<ul style="list-style-type: none"> • Required by ADB for projects that are Category A for environment • Certified agency that will conduct the external environment monitoring described in Table EMP-5 • Monitor compliance of the identified parameters with the required project targets and standards, and identify noncompliance • Submit independent progress reports to the PMO, the LPMOs, and ADB

Agency	Environmental Management Roles and Responsibilities
Contractors (intermittent throughout project)	<ul style="list-style-type: none"> • Ensure sufficient funding and human resources for full implementation of mitigation and monitoring measures in the EMP • Develop site-specific EMPs based on this EMP, including the specific contractor performance targets listed in Table EMP-2 • Timely and effective implementation of the EMP measures for works
Construction supervision company (intermittent throughout construction)	<ul style="list-style-type: none"> • Ensure sufficient funding and human resources for supervising and instructing contractors for proper and timely implementation of required mitigation and monitoring measures in the EMP • Supervise construction progress and quality • Appoint qualified EHS officer for regular onsite supervision of contractors • Supervise the contractor's EMP implementation performance • Undertake simple and cost-effective on-site quantitative measurements to regularly check that construction complies with the project environmental monitoring standards and targets, especially for noise and air quality (especially during works in urban areas and villages), using a basic hand-held meter • Submit monthly EMP monitoring reports to the LPMOs and the PMO
ADB	<ul style="list-style-type: none"> • Oversee project administration and timely execution of the loan agreements by the executing and implementing agencies • Disburse loan proceeds • Review procurement, consultant recruitment, progress reports, and audit reports • Review project compliance and targets against the design and monitoring framework, the EMP, the ESMS, social plans, and project administration manual • Review and endorse updated project EIA, the EMP, and/or the ESMS, as needed • Monitors project progress and conducts review missions • Discloses monitoring reports on ADB's public website

ADB = Asian Development Bank, CSC = construction supervision company, EIA = environmental impact assessment, EMA = environmental monitoring agency, EMP = environmental management plan, ESMS = environmental and social management system, GRM = grievance redress mechanism, LPMO = local project management office, PMO = project management office in the Zhaotong City Government, project EIA = ADB-version EIA for the project.

^a In the People's Republic of China, preliminary design is equivalent to detailed (engineering) designs in other countries. Source: Asian Development Bank.

4. Environment staff within the PMO and the LPMOs: One full-time PMO environment officer and two district and/or county LPMO environment officers (one per implementing agency) will be appointed. These personnel will be responsible for coordination and implementation of the EMP. The PMO environment officer will be responsible for overall EMP coordination. The officer will work full-time for the project and will take charge of (i) supervising the implementation of mitigation measures during project design, construction, and operation; (ii) ensuring that environmental management, monitoring, and mitigation measures are incorporated into bidding documents, construction contracts, and operation management manuals; (iii) submitting semiannual EMP monitoring and progress reports to ADB; (iv) coordinating the GRM; and (v) responding to any unforeseen adverse impacts. The PMO environment officer will be technically supported by environmental specialists (consultants). Each LPMO will nominate one environment officer and one social officer to check the overall implementation of environmental management provisions of the EMP, and work in close coordination with the PMO environment officer. The PMO environment

officer and the PMO social officer will also be responsible for implementation of the environmental and social management system (ESMS), (Appendix 4).

5. **Consultants.** The PMO will engage consultants for project management support, including environmental specialists. The environmental specialists will support the PMO to provide capacity building and coordination for implementation of the EMP and the ESMS.

6. Indicative terms of reference for the environmental specialists are included in Appendix 2. Draft terms of reference for the PMO and the LPMO environment officers are described in Appendix 2 of the project EIA.

C. Potential Impacts and Mitigation Measures

7. Tables EMP-2 and EMP-3 list potential impacts of the project components in the project areas during project preparation, design, construction, and operation; and proposed mitigation measures. The mitigation measures will be incorporated into detailed design, bidding documents, construction contracts, and operational management manuals by a design institute (during detailed design) and contractors (during construction) under the supervision of the PMO and the LPMO environment officers and the construction supervision companies (CSCs), with technical support from the environmental specialists (consultants), (footnote 1). The effectiveness of these measures will be evaluated based on environmental inspections and monitoring to determine whether they should be continued, improved, or adjusted.

Table EMP-2: Potential Impacts and Mitigation Measures during Pre-Construction and Construction Phases

Item	Potential Impacts/ Issues	Mitigation Measures	Who Implements	Who Supervises
A. DESIGN AND CONSTRUCTION PHASES				
Detailed design stage^a	Institutional strengthening for the EMP implementation and supervision	<ul style="list-style-type: none"> At least 1 month before any construction: (i) reconfirm the full-time status of the PMO environment officer; (ii) appoint at least one environment officer in each LPMO. At least 2 months before any construction, the PMO engages a team of consultants for project management support, including an environmental specialist. At least 2 months before any construction, provide training to all environmental staff for the EMP implementation and supervision. Confirm that at least one certified EMA has been recruited for the project at least 2 months before any construction. Coronavirus disease (COVID-19) safety management – prescreening ahead of works. Establish early screening measures and procedures to ensure that all new project personnel are tested negative before commencing on-site work. See also requirements under occupational health and safety (Construction Phase, below) for preparation of a COVID-19 health and safety plan. Organize and conduct training on the project EMP for appropriate staffs of the PMO, implementing agencies, the LPMOs, contractors, and the CSCs. 	PMO, LPMOs	PMO
	Updating EMP	<ul style="list-style-type: none"> Update the mitigation measures defined in this EMP, as needed, based on final detailed design. Asbestos. Under ADB's List of Prohibited Investment Activities (SPS 2009), the use of asbestos is prohibited except for the "purchase and use of bonded asbestos cement sheeting where the asbestos content is <20%" (SPS, 2009: 76). However, (i) in practice, it is difficult to assess whether asbestos content is <20%; and (ii) international development banks are increasingly banning the use of all asbestos from their projects. To ensure international best practice for human health and safety for this project: no asbestos of any kind will be used in any materials supported by the project. Check with the design institute and the PMO to ensure the proposed materials do not include the use of asbestos. Submit the updated EMP to ADB for review. In case of major changes of project location and/or additional physical components, form a DEIA team to conduct additional DEIA and public consultation. The revised DEIA will be submitted to EEBs of Zhaotong City, Zhaoyang District, and Ludian County; and ADB for approval and disclosure. ADB will determine if the change is minor or major. 	PMO, consultant	EEBs, ADB
Construction Preparation	Environmental monitoring plan	<ul style="list-style-type: none"> Prior to construction, the PMO or the LPMOs will hire an EMA for environmental monitoring. Prepare detailed monitoring plan in accordance with the monitoring plan in this EMP. 	PMO, LPMOs, EMA	PMO, LPMOs
	Detailed design	<ul style="list-style-type: none"> River embankments will be designed and identified in detail to avoid impacts to local and downstream ecosystems. 	Design institute	PMO

Item	Potential Impacts/ Issues	Mitigation Measures	Who Implements	Who Supervises
		<ul style="list-style-type: none"> Afforestation subcomponent will be designed by a combined team of an ecological specialist and forester, not only forestry specialist or infrastructure engineers. Manure collection tanks will be located at a safe distance from waterways and construction and operation will avoid any contamination of streams or rivers. 		
	Bidding and contract documents	<ul style="list-style-type: none"> Mitigation measures in the EMP are incorporated in all bidding documents. Bidding documents are sent to ADB for review. Prepare environmental contract clauses for contractors. 	Design institute, PMO, LPMOs	Consultant, EPD, EEBs, ADB
	EMP training	<ul style="list-style-type: none"> Environmental specialist (consultant or invited) and/or officials from EEBs provide training on construction environmental management, implementation, supervision, to contractors and CSCs, in accordance with the training plan in this EMP. 	Consultant	PMO, EEBs
	Establish GRM	<ul style="list-style-type: none"> Responsibility for GRM implementation is assigned to the PMO and the LPMO environment officers and social officers and is included in their terms of reference. The PMO and the LPMO personnel will be aware of, and trained in, the GRM; and will help support the environment and social officers, when necessary. Key contact details for the GRM (phone number, WeChat, address, email) will be provided on the PMO, implementing agency, and/or EEB public websites and information boards at construction sites. 	PMO, LPMOs	Consultant
	Site EMPs	<ul style="list-style-type: none"> Prior to any works, prepare site-specific EMP for individual construction sites 	Contractor	CSC
		<ul style="list-style-type: none"> Review and ensure that the site EMP complies with the measures in this EMP 	PMO, LPMO	Consultant
B. CONSTRUCTION PHASE				
Topography and Soils	Earthwork, soil erosion, soil contamination	<ul style="list-style-type: none"> Coordinate with other utility service providers to establish presence of existing utility easements and avoid risk of damage and/or repeated excavation/filling All project earthworks located within 50 m of rivers and channels, will only be conducted between the calendar months of October to April (the dry season) Plan and implement construction in staged sections (≤ 500 m), with one section completed and stabilized before beginning the next. Define spoil disposal sites and borrow pit locations, in the construction tender documents. Construct intercepting channels to prevent construction runoff entering waterways. Divert runoff from sites to sedimentation ponds or existing drainage. Limit construction and material handling, particularly for the river embankment works, during rain (rainy season is May to September) and high winds (April to May). Minimize open excavation areas and trenches, including for pipeline works and embankments to ≤ 300 m sections of active works. Use appropriate compaction techniques for pipe trenches (sewer pipelaying). Properly store petroleum products, hazardous materials, and wastes on impermeable surfaces in secured and covered areas. 	Contractor	CSC, LPMO, PMO, EEB, WRB, consultant

Item	Potential Impacts/ Issues	Mitigation Measures	Who Implements	Who Supervises
		<ul style="list-style-type: none"> • Stabilize all cut slopes, river and wetland banks, tree pits and planting areas, and other soil erosion-prone working areas through terraces, silt barriers, sediment traps, and other measures, as needed. • Strip and stockpile topsoil, and cover (by geotechnical cloth) or seed temporary soil stockpiles. • Provide temporary detention ponds or containment to control silt runoff. • Stabilize earthwork areas within 15 days after earthworks have ceased at the sites. • Rehabilitate all sediment, and spoil disposal sites, embankments, and revetments, after completion. Properly slope or re-vegetate disturbed surfaces, e.g., pipeline trenches and cut banks. Use only native species for rehabilitation and landscaping. • Situate construction camps and storage areas to minimize land area required. • Remove construction wastes from the site to the approved disposal sites. • Establish emergency preparedness and response plan for spills, including cleanup equipment at each construction site and training in emergency spill response procedures. • Train contractors and crews in emergency spill response procedures. • Conduct site inspections and monitoring for soil erosion and contamination. 		
Ambient Air	Dust generated by construction activities, gaseous air pollution (SO ₂ , CO, NO _x) from construction machinery and asphalt pavement after pipeline laying	<ul style="list-style-type: none"> • Equip material stockpiles and concrete mixing equipment with dust shrouds. • Spray water on construction sites and earth/material handling routes. • Cover materials during truck transport. • Purchase pre-mixed asphalt for road surface paving after pipeline laying; if asphalt is heated and mixed onsite, asphalt mixers must be located ≥200 m from villages and other sensitive receptors. • Store petroleum or other harmful materials in appropriate places. • Ensure emissions from vehicle and machinery comply with the PRC standards of GB18352-2005, GB17691-2005, GB11340-2005, GB2847-2005, and GB18285-2005. • Provide high-horsepower equipment with tail gas purifiers. • Conduct ambient air monitoring including H₂S caused by rubbish transferring and collection. 	Contractor	CSC, LPMO, PMO, consultant
Noise and vibration	Noise and vibration generated from construction activities	<ul style="list-style-type: none"> • Ensure construction machinery conform to the PRC standard of GB12523-2011. • Properly maintain vehicles and machineries to minimize noise. • Apply noise reduction devices or methods where noisy machinery is operating, such as construction of the GTSs, GPPs, and WWTS, within 300 m of sensitive sites. • Prohibit operation of machinery generating high levels of noise, and movement of heavy vehicles along urban and village roads between 20:00 and 06:00. • Place temporary hoardings or noise barriers around noise sources during construction. • Conduct checks for cracks at sites before and after vibration-inducing works. • Monitor noise at sensitive areas and consult villagers and/or residents at regular intervals (Table EMP-5). If noise standards are exceeded, equipment and construction conditions 	Contractor	CSC, LPMO, PMO, consultant

Item	Potential Impacts/ Issues	Mitigation Measures	Who Implements	Who Supervises
		<p>shall be checked, and mitigation measures shall be implemented to rectify the situation.</p> <ul style="list-style-type: none"> • Conduct interviews with residents adjacent to construction sites to identify and resolve issues, including adjustment of work hours of noise-generating machinery. • For about 1,341 households that will be within 40 m of construction works (project EIA Section VI.C.5), particular attention will be provided. This will include (i) follow-up consultations with these households prior to the start of any works to specify the exact planned dates and schedule of works, nature of works, equipment to be used, safety measures, and public access during construction; (ii) installation of noise barriers to reduce as much of the emissions as possible; and/or installation of additional layers on the windows of the affected homes, as necessary, based on the assessment of the most technically effective method and feedback from the community consultations; (iii) agreement on the duration of daily works. 		
Soil and water pollution	Impact from wastewater pollution	<ul style="list-style-type: none"> • Labor camps, fuel storage, machinery maintenance workshop and vehicle cleaning areas must be stationed at least 500 m away from waterways. • Storage facilities for fuels, oil, and other hazardous materials will be within secured areas on impermeable surfaces and provided with bunds and clean-up installations. • Prior to any earthworks along rivers and channels, install sediment traps and curtains to minimize sediment runoff. • For embankments, sewer pipeline works by riverbanks; and afforestation sites by riverbanks, pump slurry to bank and dispose spoil. • Collect construction wastewater in retention ponds and filter tanks to remove silts, oil. • Equip machine wash-down sites with water collection basins and sediment traps. • Install oil-water separators before the sedimentation tank for oily wastewater treatment. • Equip all sites for washing of construction equipment with water collection basins and sediment traps. • Install portable toilets at work sites and on-site wastewater pre-treatment systems for worker camps along with maintenance protocols. • Domestic wastewater from worker camps will be disposed in two ways: (i) for work sites accessible to municipal sewerage systems, the wastewater will be discharged into the nearest sewerage system; and (ii) for work sites neither close to villages nor sewerage systems, temporary septic tanks will be constructed for the centralized treatment of domestic wastewater. • Contractors will develop actions for control of oil and other dangerous substances as part of their site EMPs. • Contractors' fuel suppliers must be properly licensed. They shall follow proper protocol for transferring fuel and the PRC standard of JT3145-91 (Transportation, Loading and Unloading of Dangerous or Harmful Goods. revised). • Tailings and wastewater from work sites will only be discharged into the tributaries when 	Contractor	CSC, LPMO, PMO, consultant

Item	Potential Impacts/ Issues	Mitigation Measures	Who Implements	Who Supervises
		<p>the concentration of SS is less than 20 mg/liter.</p> <ul style="list-style-type: none"> Water quality (for pollutants such as SS, COD_{Cr}, NH₃-N, and petroleum) in the project waterways will be monitored by the EMA during construction (Table EMP-5). 		
Solid Waste	Solid waste generated by construction activities and from workers' camps	<ul style="list-style-type: none"> Provide appropriate waste collection and storage containers at locations away from surface water or sensitive spots. Arrange with municipal waste collection services for regular collection of waste. Properly remove and dispose residual materials, wastes, and contaminated soils. Paving or vegetating shall be done as soon as the materials are removed to stabilize the soil. Burning of waste is strictly prohibited. Provide sufficient garbage bins at strategic locations and ensure that they are protected from birds and vermin and emptied regularly by the municipal waste collection systems. Construction waste. Construction waste will be regularly transported off-site by the contractor, for disposal at two designated "Green Building Material Factories" (Table V-9; Section V.D.f), where the construction spoil (waste concrete, waste bricks and other solid waste) will be used for manufacturing building materials (permeable bricks and hollow wall material). <p>CONTRACTOR PERFORMANCE TARGET: No uncollected waste at close of construction activities each day.</p>	Contractor	CSC, LPMO, PMO, consultant
Biological resources	Protection of flora and fauna around construction sites	<ul style="list-style-type: none"> Prior to construction, demarcate vegetations, e.g., vegetated roadsides, trees, riverbanks. At mainstream of Longshu River and the constructed wetlands, prior to construction, clearly demarcate the natural areas to avoid damage to the natural vegetation. For the afforestation component, the design will be led by a qualified flora specialist or ecologist, working with other design institute specialists including a forestry specialist. This will ensure the designs avoid risks of monoculture, inappropriate species selection, and other issues associated with "classic" forestry designs As far as possible avoid clearance of any vegetation. After construction, immediately replant vegetation in any sites subject to clearance. In compliance with the Yunnan Regulation for Landscaping Management: (i) the area of compensatory plantings will be double that of the area of vegetation that is cleared; and (ii) a minimum survival rate of 80% of the planted vegetation is required. Survival rate will be monitored by the contractor and the Zhaotong City Forestry Bureau and the contractor will maintain and replace plants as needed for at least the first year. All planting activities, including re-vegetation, embankment construction, wetlands, landscaping, and rehabilitation of construction sites, will only use plant species which are (i) native (i.e., naturally occurring) to the Sayu River Basin; and (ii) are sourced from local stock within Zhaotong City to minimize the risk of spreading invasive species through the long-distance transport of soil or materials. In the event that non-native seedlings are required for rapid stabilization of exposed soils 	Contractor	LPMOs, PMO, consultant, Zhaotong City Forestry Bureau

Item	Potential Impacts/ Issues	Mitigation Measures	Who Implements	Who Supervises
		<p>and sites, then only sterile seedlings will be used to prevent the spread of weeds.</p> <ul style="list-style-type: none"> • No plant species will be used that are classified in the PRC as weeds, as defined by the China National Invasive Plant Database (http://www.agripests.cn; 229 species) and by the MEE and the Chinese Academy of Sciences (19 species). • To avoid pollution of the Yudong Reservoir and the Longshu River, no top-dressing fertilizers will be used for any of the re-vegetation, planting, afforestation, or landscaping activities. For all planting activities, fertilizer will be applied at the root mass of each plant. • No pesticides or agricultural chemicals listed as hazardous under Classes I or II by the World Health Organization or listed as prohibited or strictly controlled use under the PRC's national regulations for pesticide management will be used for the project activities. This includes the project components for afforestation, replanting for site rehabilitation and landscaping, and the pilot farming sites. 		
Physical cultural resources	Damage to known or unknown above or below-ground cultural relics	<ul style="list-style-type: none"> • Establish chance-find procedures for physical and cultural resources. • If a new site is unearthed, work shall be stopped immediately and the PMO, the LPMO, and cultural relics bureau promptly notified. The construction will resume only after a thorough investigation and with the permission of appropriate authority. 	Contractor	LPMO, consultant, cultural relic bureau
Socio-economic resources	Temporary interruption to water supply from pipeline or embankment construction	<ul style="list-style-type: none"> • Use coffer dams and temporary diversion channels to maintain continued water flow while works are conducted. • Prior to works, re-confirm the planned construction schedule and site EMP actions. • Inform residents at least 2 days before any planned water interruptions. • Assist residents if requested with community water storage during the interruption period. • Interruptions to water supply should not be longer than 1 day. • In case of accidental interruption, immediately inform affected communities; and assist with water supply until the issue is resolved. 	Contractor	CSC, LPMO, PMO, consultant
Community and occupational health and safety	Community consultation, health, and safety	<p>Community consultations</p> <ul style="list-style-type: none"> • Prior to any works, inform residents and businesses in advance through media, information boards, and direct consultations of the construction activities, dates, and duration of expected disruption. • Especially for the communities within 40 m of works and who will be subjected to higher noise and/or dust levels, conduct meetings with residents prior to any works. • Record all community feedback and solutions discussed and agreed. • Based on feedback from the community consultations: (i) update contractor site plans as needed to incorporate the solutions, including revisions in work schedules, daily working hours, construction methods, and/or mitigation methods; (ii) revise the CSC monitoring schedules and monitoring criteria as needed to reflect the updated contractor site management plans. <p>Community health, safety, and minimizing disruption to daily life</p> <ul style="list-style-type: none"> • Prepare and implement a traffic control plan for approval by the local traffic management 	Contractor, CSC	CSC, LPMO, PMO, consultant

Item	Potential Impacts/ Issues	Mitigation Measures	Who Implements	Who Supervises
		<p>administration before construction. This will include scheduling or diverting construction traffic to avoid peak hours, regulating traffic at road crossings, selecting routes to reduce disturbance, reinstating roads, and opening them to traffic when construction is completed.</p> <ul style="list-style-type: none"> • For all works involving excavation along roads and easements which already have existing subsurface utilities (power cables, sewage pipes, water pipes, telecommunication cables), (i) plan and coordinate the project sewage pipeline construction with the utility managers; and (ii) check whether there are pending domestic projects to upgrade these utilities; coordinate works to avoid repeated excavation of the same sections of road or easement; and work with utility managers to minimize the risk of damage or disruption to the existing utilities. • Install signs at construction sites to inform people of the project GRM, potential dangers (e.g., moving vehicles, hazardous materials, excavations), and safety issues. • Install safety barricades around all excavations. • Assign personnel to direct pedestrians around dangerous work areas. • Ensure that all sites are secure, discouraging access through appropriate fencing. • Lock and secure all work sites to prevent unauthorized access. • Night-time (8:00 pm – 6:00 am) use of heavy machinery is strictly prohibited. 		
	Occupational health and safety	<ul style="list-style-type: none"> • Prepare environmental, health, and safety plan to include (i) clean and sufficient supply of fresh water for construction sites, camps, offices; (ii) sufficient latrines and other sanitary arrangements at construction sites and work camps; (iii) garbage receptacles and regular emptying; and (iv) provision of safety clothing and equipment, as needed, in accordance with health and safety regulations. • Prepare emergency response plan and submit to the PMO and the EEB for approval, establish emergency phone links with township hospitals, and maintain a first-aid base in each construction camp. • Establish a records management system for occupational accidents, diseases, incidents that (i) includes a tracking system to ensure that incidents are followed-up; (ii) can easily retrieve records; and (iii) can be used during compliance monitoring and audits. The system will be backed up on at least one external hard drive to protect records against loss or damage. The records will be reviewed during compliance monitoring and audits. • Establish worker camps in conformance with relevant domestic guidelines. • Safety communication. Publicize occupational health and safety matters to all project personnel and install on-site signs and give regular training. • Train all workers in basic sanitation, health and safety matters, and work hazards; and implement awareness and prevention program for HIV/AIDS and other diseases—target the local community and construction workers. • Provide personal protection equipment to workers, as needed, e.g., safety boots, helmets, gloves, protective clothing, goggles, ear protection. 	Contractor	CSC, LPMO, PMO, consultant

Item	Potential Impacts/ Issues	Mitigation Measures	Who Implements	Who Supervises
		<ul style="list-style-type: none"> • Asbestos. In the event that materials containing asbestos are suspected, (i) the contractor will immediately inform the LPMO, who will inform the PMO; (ii) the contractor will subcontract the municipal center for hazardous waste, who will be responsible for the safe handling, transport, and disposal of the materials; and (iii) such materials will only be disposed in a landfill site certified and designed to receive hazardous materials. • COVID-19. Prepare and implement a coronavirus (COVID-19) health and safety plan to address COVID-19 health risks. The plan will be prepared in line with government regulations and guidelines on COVID-19 prevention and control, and in consultation with public health agencies in the area. The plan should include (i) measures to record the locations that workers have visited and/or lived immediately before and during project work; (ii) schedules for disinfecting and/or cleaning offices, yards, stores, and labor camps; (iii) measures to implement temperature checks and other health checks on site; (iii) physical distancing measures, particularly in worker camps; (iv) requirements for mandatory use of personal protective equipment, such as facemasks; and provision of handwashing stations, hand sanitizers, and other appropriate protective measures; (v) how workers and residents living near project sites will be provided with information to protect themselves from COVID-19; (vi) procedures to be adopted in the event a worker is suspected to have contracted COVID-19; and (vii) other COVID-19 prevention and control measures appropriate for the local context. <p>CONTRACTOR PERFORMANCE TARGET: Camps clean, emergency response plans in place, and 100% of workers aware of emergency response procedures.</p>		

ADB = Asian Development Bank, CO = carbon monoxide, COD_{Cr} = common chemical oxygen demand, COVID-19 = coronavirus disease, CSC = construction supervision company, DEIA = domestic environmental impact assessment, EEB = ecology and environment bureau, EIA = environmental impact assessment, EMA = environmental monitoring agency, EMP = environmental management plan, EPD = environmental protection department, GRM = grievance redress mechanism, H₂S = , LPMO = local project management office (under project implementing agency), m = meter, MEE = Ministry of Ecology and Environment, NH₃-N = ammoniacal nitrogen, NO_x = nitrogen oxides, mg = milligram, PMO = Zhaotong City project management office, PRC = People's Republic of China, project EIA = ADB-version EIA for the project, SO₂ = sulfur dioxide, SPS = ADB's Safeguard Policy Statement (2009), SS = suspended solid, WRB = water resources bureau, WWT = wastewater treatment.

^a In the PRC, preliminary design is equivalent to detailed designs in other countries.

Source: ADB.

Table EMP-3: Potential Impacts and Mitigation Measures during Operation

Issue	Mitigation Measure	Implement	Supervise
Garbage pyrolysis plants – minimize noise, odors, leachate leakage, and health and safety risks	<p><u>Air emissions:</u></p> <ul style="list-style-type: none"> • Locate the plants a minimum of 430 m (Sujia) and 700 m (Shuimo) from the nearest residences • Maintain equipment of the plant in good working condition through adequate training, detailed O&M manual, and regular maintenance, and supervision • Ensure that the dust control facilities (bag filter, dust collector, conveying pipe), odor reducing ventilating device, and noise-proof facilities (insulation), heat-proof thermal insulation layer, and radiator ventilation are in good condition • Ensure flue gas chimney is at least 4.5 m high to assist air dispersion • Implement air quality monitoring program (Table EMP-5) <p><u>Soil and/or water pollution from fly ash, slag, and/or leachate:</u></p> <ul style="list-style-type: none"> • Waste subject to magnetic filtering, then crushing and sieving • Metals will be sold or recycled • Sealed treatment system, subject to regular inspection and maintenance • Storage room to be constructed on impermeable ground with drainage capture to prevent leachate contamination • Disposal of leachate through either pyrolysis or (for large volumes) treatment at the on-site leachate treatment plant at the Yongfeng and Jiupu Town Landfill • Flue ash: classified as hazardous in the PRC. The design of the plants includes a mixing chamber in which the ash will be mixed with a chelator (bonding agent) and cement, to bond the ash particles and render any toxic materials inert. Ash from both plants will be compressed into bricks on-site then transported to the Zhaoyang District Yongfeng and Jiupu Town Landfill for disposal • Slag: Shuimo – slag will be converted to construction bricks and sold. Sujia – slag will be disposed at the Zhaoyang District Yongfeng and Jiupu Town Landfill • Implement soil and water monitoring program (Table EMP-5) <p><u>Wastewater from cleaning the plant machinery and floors, and domestic wastewater (toilets, showers, dishwashing, and laundry):</u></p> <ul style="list-style-type: none"> • Wastewater to be treated at on-site to 1A standard. • Discharged onto grounds of the plants for greening. <p><u>Odor:</u></p> <ul style="list-style-type: none"> • Stockpile waste in sealed rooms to minimize odors. <p><u>Noise:</u></p> <ul style="list-style-type: none"> • Install low-noise equipment with shock absorption, sound insulation cover on the blowers and pumps • Prohibit truck activity between 8:00 pm and 6:00 am. <p><u>Occupational health and safety:</u></p> <ul style="list-style-type: none"> • All staff to be equipped with labor protection supplies (including dust and gas masks) • All staff shall have a physical examination every 6 months. If any worker is found to be physically abnormal, he/she will be transferred to out of the plants in a timely manner and all other staff will immediately have check-ups. 	Operator (to be identified)	PMO, LPMO, EEB

Issue	Mitigation Measure	Implement	Supervise
	<ul style="list-style-type: none"> Newly recruited workers will undergo pre-employment occupational health examination Emergency response measures will be prepared as part of the detailed engineering designs, so that any leak is quickly detected and staff react quickly to protect themselves and if possible directly address the issue.^a 		
Garbage transfer station – ensure good O&M and avoid risks of leachate leakage, minimize odors	<ul style="list-style-type: none"> Coordinate planning of this component with component on environmental education of residents, to maximize recycling and reuse prior to solid waste collection Install >3 m wide buffer zone and greening belt > 2 m wide around the station (in accordance with the PRC's Technical Specifications for Domestic Solid Waste Transfer Stations) Sorting at station to extract items for recycling or on-selling, e.g., metals Transport vehicles to have sealed containers to minimize odors and leakage Station to have drainage channels to capture any leachate Transport leachate in sealed containers to on-site leachate treatment plant at the Zhaoyang District Yongfeng and Jiupu Town Landfill for treatment and disposal Store solid waste in sealed containers and rooms to minimize odors Transport compacted rubbish on daily basis to the garbage pyrolysis plants Regular cleaning with disinfectant to reduce odors and disease risk Train staff in O&M safety. All workers to be equipped with labor protection supplies, including gloves and strong footwear Town or township government may contract a 3rd party for O&M, and transport and collection of solid waste Regular consultation with residents to identify potential issues, e.g., odor-related disturbance 	Town or township government	EEB
Longshu WWTP – ensure good O&M, minimize noise disturbance	<ul style="list-style-type: none"> A 3rd party will be contracted to operate and maintain the WWTP, e.g., Yunnan Water Management Co. Maintain acoustic barriers and sound absorbing materials. Consult nearby residents in first 3 months of operation and assess any noise impacts. In the event that effluent exceeds compliance standards, a maintenance check of the facility will be conducted; and the problem resolved within 1 week. Pending the rates of inflow, influent will be temporarily stored while the problem is being resolved. 	Operator (to be identified) EMA (for noise monitoring)	PMO, LPMOs, EEB
WWTFs – ensure good O&M and avoid risks of effluent or sludge leakage	<ul style="list-style-type: none"> Ensure simple emergency response plan is prepared and in place, with clear lines of responsibility Semi-annual checks of WWTFs to ensure normal operation Immediately visit the WWTFs after rural power failure, floods, or other extreme weather and inspect for any damage Initiate repairs through recruitment of a contractor as needed Ensure the water quality monitoring sensor on the discharge outlet is operating normally and that the monitoring data is being received by the local EEB and/or the Yudong Reservoir Administration In the event that effluent exceeds compliance standards, a maintenance check of the facility will be conducted; and the problem resolved within 1 week. Pending the rates of inflow, influent will be temporarily stored while the problem is being resolved Ensure timely and safe emptying of sludge in septic tanks (expected to be every 3–4 years given the small rural populations). Mobilize township personnel and/or contractor. Ensure personnel are wearing safety 	Town or township government	EEB

Issue	Mitigation Measure	Implement	Supervise
	clothing to avoid hygiene risks • Sludge to be disposed on nearby fields as fertilizer to maximize reuse and avoid costs and risks (e.g., odor, leakage) of transport to landfill		
Embankments – maintenance, stability	• Integrate routine maintenance activities into existing work program of county WRB • Maintenance (at least monthly in summer) of re-vegetated embankments—pruning, weeding, replacement of dead or plants • Inspect for signs of plant disease and/or pests and implement control measures, as necessary • At least once a year in May–June (i.e., before rainy season) remove solid waste and debris—dispose in municipal landfill • Prohibit or remove any illegal structures which are found to maintain free water flow • Implement annual (as a minimum) inspections of all project embankments for physical integrity. If signs of failure are discovered, implement a repair program immediately	District or county WRB	PMO, LPMOs
Constructed wetlands – ensure good O&M	• Integrate routine maintenance activities into existing work program of town or township government • Maintenance (at least semiannual in summer)—pruning, weeding, replacement of dead or plants, as needed • Inspect for signs of plant disease and/or pests and implement control measures, as necessary • Implement annual (as a minimum) inspections to ensure overall condition and intactness	Town or township government	Forestry Bureau
Afforestation and agriculture pilot activities – nonpoint source pollution from use of pesticides and/or top-dressing fertilizers	• No top-dressing fertilizers will be used for any of the re-vegetation, planting, or landscaping activities. For all planting activities, fertilizer will be applied once, at the root mass of each plant, during planting • No pesticides or agricultural chemicals listed as hazardous under Classes I or II by the World Health Organization or listed as prohibited or strictly controlled use under the PRC's national regulations for pesticide management will be used for the project activities. This includes the project components for afforestation, replanting for site rehabilitation and landscaping, and the pilot farming sites.	Operator	Forestry Bureau, EEB

EEB = ecology and environment bureau, EMA = environmental monitoring agency, EMP = environmental management plan, H₂S = hydrogen sulfide, LPMO = local project management office, m = meter, O&M = operation and maintenance, PMO = project management office, PRC = People's Republic of China, WRB = water resources bureau, WWTF = wastewater treatment facility, WWTP = wastewater treatment plant.

^a In the PRC, preliminary design is equivalent to detailed (engineering) designs in other countries.

Source: Asian Development Bank.

D. Environmental Monitoring, Inspection, and Reporting

8. Three types of project monitoring will be conducted under the EMP: (i) internal monitoring—to be conducted by the LPMOs and the CSCs; (ii) external monitoring—of air, water, noise and soil standards—to be conducted by an environmental monitoring agency (EMA); and (iii) compliance monitoring—to be conducted by a national environment specialist in a project management support consultant team to ensure the EMP is being implemented.

9. The monitoring program (Table EMP-5) describes the scope of monitoring, 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 ambient air, surface water, sediment and noise, and the pollutant discharge standards.

10. **Internal monitoring.** During construction, the CSCs and the LPMOs will be responsible for conducting the internal environmental monitoring in accordance with the monitoring plan. Results will be reported through the CSC monthly reports to the LPMOs and the PMO.

11. **External monitoring.** The PMO will contract an external EMA to conduct the external environmental monitoring described in Table EMP-5. A detailed cost breakdown will be provided by the EMA. The external monitoring will be conducted during the entire construction phase and first full year of operation of the relevant facility. The EMA will prepare semiannual monitoring reports of the methods and results. The EMA will submit the reports to the PMO and the LPMO at the same time to ensure independence.

12. **Compliance monitoring.** The environmental specialist in the project management support consultant team will review project progress and compliance with the EMP based on field visits, consultations with the PMO and the LPMO environment officers, contractors, and the CSCs; and review of the monitoring reports prepared by the CSCs and the EMA. The site visits will include comparison of the works and conditions observed with the EMP mitigation and monitoring measures in Tables EMP-2, EMP-3, and EMP-5. The site visits will include, but not be limited to, visual inspection of worker and construction solid waste at worker camps and work sites; evidence of soil erosion, water pollution, and sewage; community and occupational health and safety (camp hygiene, availability of clean water); and evidence that emergency response plans are in place and that workers are familiar with them. Frequency for these inspections is not set; and the environmental specialist will make site visits as often as possible within the available budget, focused especially on periods of peak construction. The findings of the environmental specialist will be reported to ADB through the semiannual environment monitoring reports.

13. **Semiannual environmental monitoring reports.** The PMO will submit these reports to ADB. They will include (i) progress made in the EMP implementation, (ii) overall effectiveness of the EMP implementation (including public and occupational health and safety), (iii) environmental monitoring and compliance, (iv) institutional strengthening and training, (v) public consultation (including GRM), and (vi) any problems encountered during construction and operation, and the relevant corrective actions undertaken. The environmental specialist (consultant) will help the PMO prepare the reports and submit the English reports to ADB for disclosure. A standard reporting template will be provided by ADB to the PMO to assist in report preparation.

14. **Environmental acceptance reporting.** Following the PRC's Regulation on Project Completion Environmental Audit (Ministry of Environmental Protection, 2001), within 3 months after the completion of major subprojects, an environmental acceptance report for each subproject shall be (i) prepared by the implementing agency or a capable environmental monitoring institute in accordance with the PRC's Guideline on Project Completion Environmental Audit (2017); and (ii) finally reported to ADB through semiannual environmental monitoring reports. The environmental acceptance reports will indicate the timing, extent, and effectiveness of completed mitigation and maintenance, and needs for additional mitigation measures and monitoring during operations.

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

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

Table EMP-4: Environmental Reporting Plan

Report	From	To	Frequency of Reporting
A. Construction Phase			
Internal progress reports	CSC	LPMO	Monthly
External reports	EMA	PMO, LPMOs, ADB	Semiannually
Environmental acceptance monitoring and audit reports	Licensed institute	EEB, PMO, LPMOs	Within 3 months after component completion
Environmental monitoring report	PMO	ADB	Semiannually
B. Operation Phase			
EMP progress reports	PMO	ADB	Semiannually

ADB = Asian Development Bank, CSC = construction supervision company, EEB = ecology and environment bureau, EMA = environmental monitoring agency, EMP = environmental management plan, LPMO = local project management office, PMO = project management office.

Source: ADB.

Table EMP-5: Environmental Monitoring Program for “Internal” and “External” Monitoring

See text for description of “compliance monitoring”.

Subject	Parameter	Location	Frequency	Implement	Supervise
CONSTRUCTION STAGE					
1. Internal monitoring – by the contractors, CSCs, and PMO and LPMO environment officers					
Ambient air quality	Compliance with dust mitigation measures (Table EMP-2)	Visual inspection at all construction sites	1 time/week	Contractor, CSC, LPMO	PMO, consultant
Noise	LAeq: measured with hand-held meter Contractor performance targets: (i) noise level meets standard at site boundary; (ii) for 1,341 households most at risk from the construction noise, the installed noise barriers reduce noise levels by at least 80%^a	Construction site boundary	1 time/week minimum during peak construction levels at work sites	CSC, LPMO, consultant	PMO, consultant
Solid waste	Garbage and construction wastes Contractor	Visual inspection at all construction sites and work-camps	Daily	Contractor, CSC, LPMO	PMO, EEB, Sanitation bureau

Subject	Parameter	Location	Frequency	Implement	Supervise
	performance target: no uncollected waste at end works each day				
Soil erosion and re-vegetation	Soil erosion intensity and survival rate of re-vegetation	Visual inspection at spoil sites and all construction sites, especially embankment sections of project river sections	1 time/week; and immediately after heavy rainfall	Contractor, CSC, LPMO	PMO, consultant
	Re-vegetation of embankments and other areas,	Visual inspection along embankment sections and all revegetation areas	At least 2 times/year	Contractor, CSC, LPMO	PMO
Occupational health and safety	Camp hygiene, safety, availability of clean water, EMRs Contractor performance target: camps clean, EMRs in place; 100% of workers aware of EMR procedures	Visual inspection at all construction sites and work-camps	1 time/month	Contractor, CSC, LPMO	PMO

2. External monitoring – by certified environment monitoring agencies

Quality of sewage and discharge channels at work camps	pH, SS, NH ₃ -N, COD _{Cr} , petroleum	Domestic wastewater discharge at work-camps	2 times/year during construction	EMA	EEB, PMO
Construction wastewater	SS, oil, pH	(i) 100 m upstream and 100 m downstream of river embankment works, and (ii) at wastewater discharge points of all construction sites	2 times/year during construction	EMA	EEB, PMO
Ambient air quality	TSP	All construction sites (at least 1 point upwind, 1 point downwind) and nearby sensitive receivers (Section IV of project EIA)	2 times/year during construction	EMA	EEB, PMO, consultant
Noise	LAeq	Boundaries of all construction sites and sensitive receivers (Chapter V-sensitive receivers within project area of influence)	2 times/year (twice a day: once in day-time and once at night-time, for 2 consecutive days)	EMA	EEB, PMO, consultant

OPERATION PHASE – external monitoring, by certified environment monitoring agencies

Garbage pyrolysis facilities – two

Ambient air quality: flue gas emissions and/or odor ^b	Flue gas emissions: NH ₃ , H ₂ S, HCl, CO, Hg, Cd, Pb, As, Cr, Cu, Mn, Ni, dioxins Odor: H ₂ S, NH ₃	Flue gas emissions: (i) at chimney outlet; (ii) 100 m downwind of each GPP Odor: at boundary of the garbage pyrolysis plants	1 baseline sampling before operation (to complement the project EIA sampling in May 2019); then 4 times/year during operation	EMA	PMO, LPMO EEB
Quality of leachate discharge	pH, Cd, Hg, As, Cu, Pb, Cr, Zn, Ni, dioxins	Monitor liquid discharge at inlet and outlet	2 times/year	EMA	PMO, LPMO, EEB
Soil quality	pH, Cd, Hg, As, Cu, Pb,	Three locations per garbage	1 time/year	EMA	PMO,

Subject	Parameter	Location	Frequency	Implement	Supervise
	Cr, Zn, Ni, dioxins	pyrolysis plant: (i) 1 point within garbage pyrolysis plant; (ii) 1 point 5 m outside garbage pyrolysis plant; (iii) 2 points within farmland between 113 m and 146 m from garbage pyrolysis plant			LPMO EEB
Groundwater	Cu, Zn, Fe, Mn, Pb, Cd, As, Hg, Cr ₆₊ , pH, NH ₃ -N, total hardness, total dissolved solids, COD _{Mn} , sulfate, nitrate, nitrite, chloride, fluoride, volatile phenol, total bacterial count, total coliform group, petroleum	Groundwater near garbage pyrolysis plant (same sampling sites as those used in May 2019; project EIA Section IV.G.b)	1 time/year	EMA	PMO, LPMO EEB
Noise	LAeq	Boundary of garbage pyrolysis plant	2 times/year (twice a day: 1 in day and 1 at night for 2 consecutive days)	EMA and operator	PMO, LPMO, EEB
Garbage transfer stations – four					
Groundwater	As for garbage pyrolysis plants	Selected locations close to transfer station	1 time/year	EMA	PMO, LPMO EEB
Odor	H ₂ S, NH ₃	Boundary of garbage transfer stations	4 times/year	EMA	PMO, LPMO, EEB
Noise	LAeq	Boundary of garbage transfer stations	2 times/year (twice a day: 1 in day and 1 at night for 2 consecutive days)	EMA and operator	PMO, LPMO, EEB
Wastewater treatment facilities – spot testing (random selection) among the 44 facilities					
Effluent from WWTFs	COD _{Cr} , NH ₃ -N, TN, TP	1. At inlet of WWTF, to monitor influent quality 2. At discharge outlet of WWTF, to monitor effluent quality	2 times/year. Will complement the auto-monitoring by sensors installed at discharge outlet of each WWTFs	EMA	PMO, LPMO EEB
Noise	LAeq	Boundary of WWTFs	2 times/year (twice a day: 1 in day and 1 at night for 2 consecutive days)	EMA and operator	PMO, LPMO, EEB
Longshu wastewater treatment plant					
Effluent from WWTP	COD _{Cr} , NH ₃ -N, TN, TP	1. At inlet, to monitor influent quality 2. At discharge outlet, to monitor effluent quality	2 times/year. Will complement the auto-monitoring by sensors installed at discharge outlet of WWTP	EMA	PMO, LPMO EEB
Noise	LAeq	Boundary of WWTP	2 times / year (twice a day: 1 in day and 1 at night for 2 consecutive days)	EMA and operator	PMO, LPMO, EEB
Constructed wetlands – six					
Water quality downstream of wetlands	pH, SS, DO, NH ₃ -N, oil, COD _{Cr} , Cr ₆₊ , BOD ₅ , TN, TP, chloride, NO ₃ -N, total	1. At inlet of wetland 2. At outlet of wetland 3. 50 m downstream	4 times/year	EMA	PMO, LPMO EEB

Subject	Parameter	Location	Frequency	Implement	Supervise
	coliforms	4. 500 m downstream			
Afforestation sites					
Soil and Vegetation	Plant survival and coverage	All re-vegetated sites	Spot check, twice a year	Forestry Bureau	Forestry Bureau

As = Arsenic, BOD₅ = 5-day biochemical oxygen demand; Cd = cadmium, CO = carbon monoxide, COD_{Cr} = common chemical oxygen demand, COD_{Mn} = chemical oxygen demand by potassium permanganate, Cr = chromium, Cr₆₊ = hexavalent chromium, CSC = construction supervision company, Cu = copper, DO = dissolved oxygen, EEB = ecology and environment bureau, EIA = environmental impact assessment, EMA = environmental monitoring agency, EMP = environmental management plan, EMR = emergency response plan, Fe = iron, HCl = hydrochloric acid, Hg = mercury, H₂S = hydrogen sulfide, LAeq = equivalent continuous A-weighted sound pressure level, LPMO = local project management office, m = meter, Mn = manganese, NH₃ = ammonia, NH₃-N = ammonia nitrogen, Ni = Nickel, NO₃-N = nitrate nitrogen, Pb = lead, PMO = project management office, project EIA = ADB-version EIA for the project, SS = suspended solids, TN = total nitrogen, TP = total phosphorus, TSP = total suspended particle, WWTF = wastewater treatment facility, WWTP = wastewater treatment plant, Zn = zinc.

^a Compared by measuring noise on each side of the noise barrier with a hand-held meter.

^b Parameters selected to measure potential odors and/or hazardous air emissions from heavy metals, acids (for flue gas emissions) and odors (from stockpiled waste). The People's Republic of China currently does not have national standards for measuring emissions from garbage pyrolysis plants. The monitoring will help establish a baseline as well as detection of such hazards.

Notes: In the event that monitoring detects that standards are exceeded: (i) this will be immediately reported to the PMO and operator of the project facility; (ii) actions will be taken within 1 week to address the issue; (iii) compliance with standards will be confirmed by immediate subsequent testing; and (iv) all issues will be included in the environmental monitoring reports from the PMO to ADB.

Source: Asian Development Bank.

E. Training and Capacity Building

16. The PMO and the implementing agencies do not have previous experience with the ADB-funded projects or safeguard requirements. The experience of individual staff within the city, the district and county ecology and environment bureaus (EEBs) for environmental management varies considerably. The DEIA and project approvals generally include limited mitigation measures, but there is not yet a regulatory requirement in the PRC for the EMPs of the scope required by ADB. Implementation of the current EMP represents a significant new task for the local agencies. During project preparation, preliminary training on the EMP implementation was provided by consultants engaged for project preparation, including roles and responsibilities of contractors and the CSCs for the EMP implementation, project impacts, and mitigation measures.

17. During implementation, a capacity building program will be implemented for safeguards and technical capacity for the designed components, including (i) implementation of the EMP, including the mitigation measures, monitoring, and reporting; (ii) operation and maintenance of the constructed facilities; and (iii) management of the Yudong Reservoir, including water quality protection, internal zoning, and watershed management. Training will be provided by the environmental specialist (consultant) and the Zhaotong City EEB, facilitated by the PMO and the LPMOs. Trainees will include the PMO, implementing agencies, the LPMOs, contractors, the CSCs, and relevant local bureaus (including water resources, agriculture, forestry).

Table EMP-6: Project Environmental Training Program

Training Program	Scope of Training	Trainer	Trainee	Time	Days	Persons
Procurement and contract management (emphasize EMP implementation)	<ul style="list-style-type: none"> • ADB procurement guidelines • Bidding document and contract preparation, including the EMP clauses • Risk of improper procurement and mitigation measures, and handling variation orders and contract management 	Consultant	PMO, LPMOs, EFMC	2	2	50

Training Program	Scope of Training	Trainer	Trainee	Time	Days	Persons
Implementation of EMP	<ul style="list-style-type: none"> • ADB safeguard policy statement requirements for EMP implementation and progress reporting • Roles, responsibilities, monitoring, inspection, reporting in the EMP • Environmental monitoring program • Odor impact from garbage pyrolysis plants and garbage transfer stations and mitigation measures • Public consultation and participation • GRM implementation, coordination, reporting, working with the public • Environment, health, and safety during project construction and operation for workers and the community • Occupational health and safety, including (i) prevention and control of transmissible diseases and HIV/AIDS, (ii) implementation of COVID-19 health and safety plan (see Table EMP-2) 	Consultant, EEB	PMO, LPMOs, EEB, other local bureaus	2	2	50
Operation and maintenance of the completed project facilities	<ul style="list-style-type: none"> • Topics to be tailored to each project component • Soil erosion control and afforestation. 	Consultant, EEB	As above	2	2	50
Reservoir and watershed management	<ul style="list-style-type: none"> • Water quality protection; point and nonpoint source pollution control • Land use planning • Internal zoning • Wetlands and ecology 	Consultant, EEB	As above	2	2	50
Climate change resilience	<ul style="list-style-type: none"> • Energy saving and GHG emission reduction • Carbon sink by revegetation and afforestation 	Consultant	LPMO, operator, WRB	1	1	50
Solid wastes collection and treatment	<ul style="list-style-type: none"> • International and domestic experience and technology in garbage collection and disposal • Operation, management, and maintenance of the garbage pyrolysis plants and garbage transfer stations 		LPMO, operator			
Emergency preparedness and response planning	<ul style="list-style-type: none"> • Response mechanism, e.g., for spills • Mitigation measures for hydraulic sectors • Emergency response team, procedure, and actions 	Experts from EEBs, consultant	PMO, operator, other bureaus	1	1	50
Total				10	10	300

ADB = Asian Development Bank, AIDS = acquired immunodeficiency syndrome, COVID-19 = coronavirus disease, EEB = environmental protection bureau, EFMC = eco-compensation fund management committee, EMP = environmental management plan, GHG = greenhouse gas, GRM = grievance redress mechanism, HIV = human immunodeficiency virus, LPMO = local project management office, PMO = project management office, WRB = water resources bureau.

Source: ADB.

F. Grievance Redress Mechanism

18. This project GRM is a joint GRM for (i) the initial identification, documentation, and preliminary management of both environmental and social safeguard-related grievances; (ii) the resolving of environmental safeguard-related grievances; and (iii) the resolving of and/or timely referral of social safeguard-related grievances. Environmental and social safeguard-related grievances may differ considerably in the nature of grievances and agencies, procedures, and

timing required to address them: the GRM provides a simple, time-based mechanism to meet project needs, as required. Social safeguard issues beyond the scope of the GRM procedures, including issues related to land acquisition or resettlement, will be referred to relevant agencies, as needed.

19. The PMO environment officer and social officer and LPMO environment officers and social officers will lead the coordination of the GRM. However, all project agencies and staff will be trained in the GRM and are expected to take an active role for implementing the GRM. At the PMO level, the PMO environment officer and PMO social officer will establish a GRM tracking and documentation system, conduct daily coordination with the LPMO officers, arrange meetings and conduct site visits as necessary, maintain the overall project GRM database, and prepare the reporting inputs for progress reports to ADB. At the LPMO level, the environment and social officers will instruct contractors and the CSCs on the GRM procedures, and coordinate with the local EEBs and other government divisions, as necessary. The PMO and the LPMO staff will be trained and supported by consultants.

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

21. If a complaint is received and filed, the PMO and the LPMO officers will identify if the complaint is eligible for management under the GRM. Eligible complaints under the GRM include those where (i) the complaint pertains to the project; and (ii) the issues arising in the complaint fall within the scope of environmental and/or social issues that the GRM is authorized to address. Ineligible complaints include those where (i) the complaint is not project-related; (ii) the nature of the issue is outside the mandate of the GRM (such as fraud or corruption); and/or (iii) other procedures would be more appropriate to address the issue. Ineligible complaints will be documented and provided to the relevant authorities and the complainant will be informed of these steps. The procedure and timeframe for the GRM is as follows and summarized in Figure EMP-1.

- (i) **Stage 1 (5 calendar days).** If a concern arises during construction or operation, the affected person may submit a written or oral complaint to the contractor (construction phase) or operator of the project facility (operation phase). The contractor will (a) respectfully acknowledge the issue and immediately stop the causal activity (e.g., on-site construction causing high noise levels to a nearby household); (b) not resume the activity until the complaint has been resolved; (c) inform the LPMO of the incident on the same day of the incident occurring and how the contractor has responded or will respond; (d) give a clear reply to the affected person within 2 calendar days; and (e) as far as possible, resolve the problem within 5 calendar days from receiving the complaint. The contractor will keep the LPMO fully informed at all stages. The LPMO will inform the PMO, the local village committee, and the EEB of the incident within 1 working day of being informed by the contractor; and subsequently keep these parties informed at all stages.
- (ii) **Stage 2 (5 calendar days).** If the issue cannot be resolved in Stage 1, after 5 calendar days, the LPMO and/or the PMO will take over responsibility. Eligibility of the complaint will be assessed, and a recommended solution given to the complainant and contractors within 2 calendar days. If the solution is agreed by the complainant, the contractors and/or

facility operators (in operation) will implement the solution within 5 calendar days from the LPMO or the PMO taking over responsibility of the complaint. Written records will be made of all stages and outcomes. At the expiration of Stage 2, the PMO will inform ADB of the outcome.

- (iii) **Stage 3 (15 calendar days).** If a solution cannot be identified by the PMO and/or the LPMO, and/or the complainant is not satisfied with the proposed solution, the PMO and/or the LPMO will organize, within 7 calendar days, a stakeholder meeting (including the complainant, contractor, and/or operator of the facility; the EEB, the LPMO, and the PMO). A solution acceptable to all shall be identified including clear steps. The contractors (during construction) and facility operators (during operation) will immediately implement the agreed solution. All attempts will be made to fully resolve the issue within 15 calendar days. Written records will be made of all stages and outcomes. At the expiration of Stage 3, the PMO will inform ADB of the outcome.

22. The contractor and/or LPMO will ensure the affected person is updated at all times, in each stage, of the progress toward resolving the grievance. The GRM does not affect the right of an affected person to submit their complaints to any agency they wish to, for example, the local village committee, community leaders, courts, the PMO, and the LPMOs; governments of Zhaotong City, Zhaoyang District, and Ludian County; and/or ADB.

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

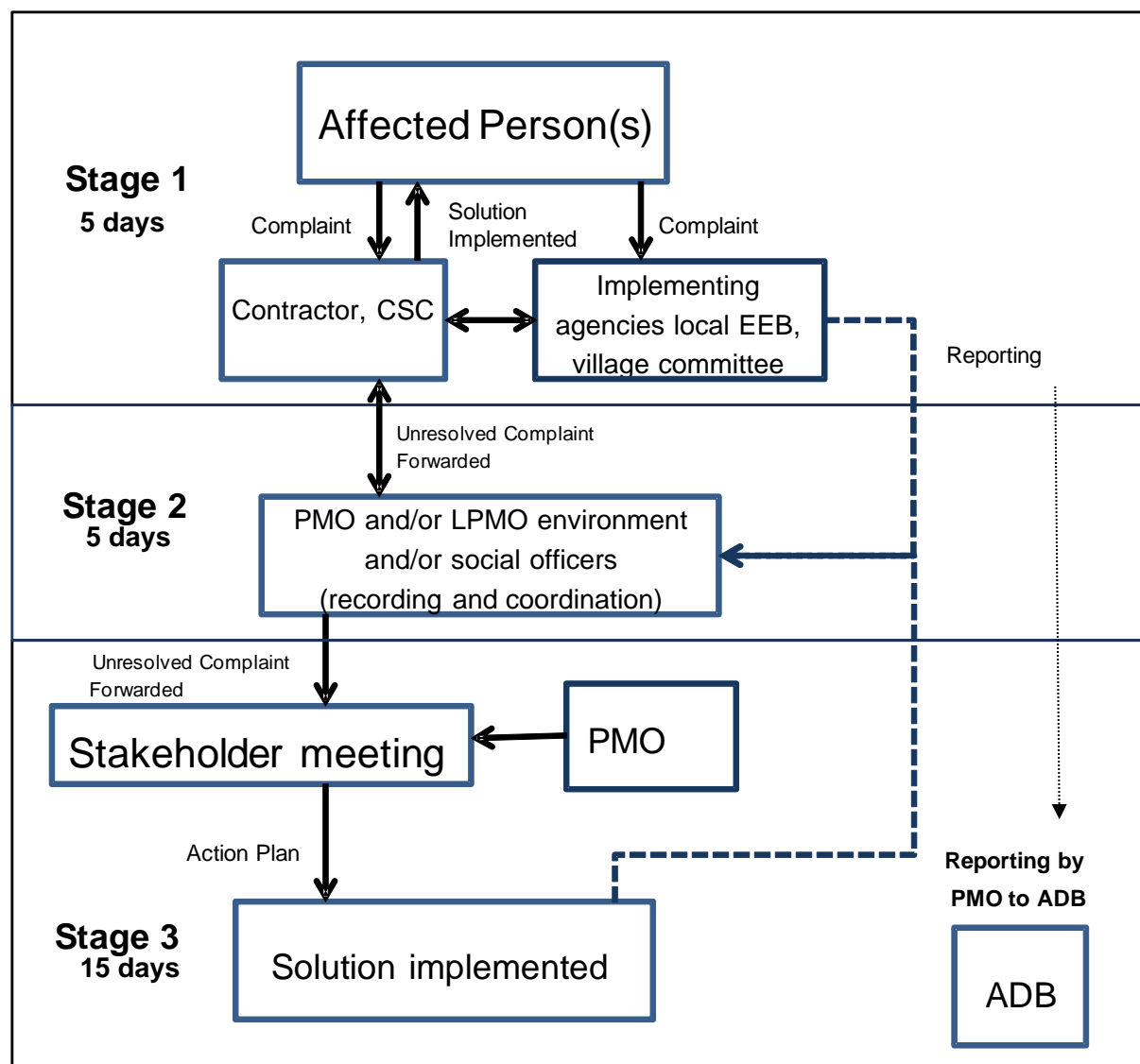


Figure EMP-1: Operation Chart of the Grievance Redress Mechanism

ADB = Asian Development Bank, CSC = construction supervision company, EEB = ecology and environmental bureau, LPMO = local project management office, PMO = project management office.

Source: ADB.

G. Public Consultation and Awareness Raising

24. Three rounds of public consultation were conducted during project preparation (project EIA Section VII). During construction, the project will continue to seek public consultation and raise awareness of project activities, especially those that may impact the public such as noise, dust, or odor. The public consultation plan is in Table EMP-7 and includes public participation in evaluating environmental benefits and impacts. The PMO environment officer and social officer will be responsible for public participation during project implementation, supported by the LPMOs and consultants.

Table EMP-7: Public Consultation and Participation Plan

Organizer	Approach	Times/Frequency	Subjects	Participants
Construction				
PMO, LPMOs, consultant	Questionnaire survey, site visits, informal interviews	Once a year during peak construction	Construction impacts; adjusting mitigation measures if necessary; feedback	Workers, residents in construction areas
	Site-specific basis	At least 1 month before the start of construction at any new site	Anticipated risks – noise, odor, others; Procedures in the event of interruptions to water and wastewater services	
	Public workshops and hearing	At least once during peak construction period	EMP implementation progress; construction impacts; adjusting mitigation measures if necessary; feedback	Residents, affected persons, social sectors
Operation				
PMO, implementing agencies, operators	Consultation and site visits	At least once in first year of operation	Effects of mitigation measures, impacts of operation, feedback	Affected persons and/or agencies
	Public workshop	As needed based on consultations	As above	As above
	Public survey	At least once after 1 year of operation	Comments and suggestions	Project beneficiaries

EMP = environmental management plan, LPMO = local project management office, PMO = project management office.
Source: Asian Development Bank.

H. Cost Estimates

25. This section provides an estimate of the cost of the EMP implementation. The cost comprises expenses for three categories: the mitigation measures described in Tables EMP-2 and EMP-3; monitoring (Table EMP-5); and training (Table EMP-6). Costs are presented for the construction phase of 5 years and the first year of operation, i.e., a total of 6 years. The costs do not include (i) detailed design revisions and adjustments;¹ (ii) internal monitoring and inspection of solid wastes disposal, soil erosion and re-vegetation, occupational health, and safety during construction, as this will be included in the design, construction, and construction supervision contracts; and (iii) salaries of the PMO and the LPMO staff. Costs for mitigation measures and training are based on estimates in the DEIA and/or the experience of the consultants from other similar projects. All costs were discussed with the DEIA Institute, the PMO, and the implementing agencies.

26. The total estimated cost for the EMP implementation (Table EMP-8) only accounts for about 1.1% of the total project investment (\$234.61 million including \$100.00 million ADB loan).

¹ In the PRC, preliminary design is equivalent to detailed designs in other countries.

Table EMP-8. Estimated Cost for the Environmental Management Plan Implementation for 5 Years of Construction and First Year of Operation (x CNY10,000)

(Construction-phase costs will be paid by the contractors as part of their contracts. Operational-phase costs will be paid by relevant implementing agencies).

Item	Unit	Unit Cost	Times /Year	Cost /Year	Years	Total Cost
Pre-construction phase (Table EMP-2)						
1.1 Public consultation (meetings, surveys, etc.)	CNY	2.00				2.00
1.2 Consultant	CNY	18.00				18.00
Subtotal						20.00
Construction phase (Table EMP-2)						
2.1 Soil erosion and contamination	CNY	776.00				776.00
2.2 Dust and air pollution control	CNY	115.00				115.00
2.3 Noise and vibration	CNY	60.00				60.00
2.4 Surface water pollution	CNY	186.00				186.00
2.5 Solid waste	CNY	60.00				60.00
2.6 Protection of flora and fauna	CNY	153.00				153.00
2.7 Community health and safety	CNY	50.00				50.00
2.8 Occupational health and safety	CNY	50.00				50.00
Subtotal						1,450.00
Operational phase (Table EMP-3)						
3.1 Operation of exhausted gases treatment (garbage pyrolysis plants and garbage transfer stations)	CNY/Year	120.00		120.00	1	120.00
3.2 Garbage pyrolysis plant ash transport and disposal	CNY/Year	5.23		5.23	1	5.23
3.3 Operation of the 26 rural WWTFs	CNY/Year	32.40		32.40	1	32.40
3.5 Control Noise from pump stations	CNY/Year	8.00		8.00	1	8.00
3.5 Operation and maintenance of the six constructed wetlands	CNY/Year	10.00		10.00	1	10.00
3.6 Update and implement EMP	CNY/Year	0.00		0.00	1	0.00
Subtotal						175.63
4. Monitoring during construction (costs paid by relevant implementing agencies)						
4.1 Surface water quality	CNY/Time/Year	2.50	2	5.00	5	25.00
4.2 Construction wastewater including water quality downstream of reservoir	CNY/Time/Year	0.50	2	1.00	5	5.00
4.3 Ambient air	CNY/Time/Year	1.80	2	3.60	5	18.00
4.4 Noise	CNY/Time/Year	0.30	2	0.60	5	3.00

Item	Unit	Unit Cost	Times /Year	Cost /Year	Years	Total Cost
Subtotal						51.00
5. Monitoring during operation (costs to be paid by relevant implementing agencies)						
5.1 Garbage pyrolysis plants and garbage transfer stations						
5.1-1 Wastewater	CNY/Time/Year	0.50	4	2.00	1	2.00
5.1-2 Exhaust gas	CNY/Time/Year	4.00	4	16.00	1	16.00
5.1-2 Odor gas	CNY/Time/Year	3.00	4	12.00	1	12.00
5-1-3 Noise	CNY/Time/Year	0.10	4	0.40	1	0.40
5-1-4 Soil (garbage pyrolysis plants)	CNY/Time/Year	2.40	1	2.40	1	2.40
5-1-5 Groundwater (garbage pyrolysis plants and garbage transfer stations)	CNY/Time/Year	1.00	4	4.00	1	4.00
5-1-6 Ambient air	CNY/Time/Year	4.00	1	4.00	1	4.00
Subtotal						40.80
5.2 Effluence from the WWTFs	CNY/Time/Year	1.80	2	3.60	1	3.60
5.3 Aquatic ecosystem survey (river embankment works) ¹	CNY/Time/Year	20.00	1	20.00	1	20.00
5.4 Soil (Nonpoint source pollution control component)	CNY/Time/Year	6.00	1	6.00	1	6.00
5.5 Vegetation survival (wetlands, rivers, and afforestation)	CNY/Time/Year	10.00	1	10.00	1	10.00
Subtotal						80.40
Grand Total (x CNY10,000)						1,757.03
Grand Total (x USD10,000)						249.17
Proportion of Total Investment (%)						About 1.1%

CNY = Chinese yuan, EMP = environmental management plan, USD = United States dollar, WWTF = wastewater treatment facility, % = percent.

¹This survey will be conducted after the completion of the river embankment works and compared with the baseline surveys conducted during project preparation.

Source: Domestic environmental impact assessment.

I. Mechanisms for Feedback and Adjustment

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

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

ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM
for
Eco-Compensation Fund Management Committee
of
Yunnan Sayu River Basin Rural Water Pollution Management and
Eco-Compensation Demonstration Project

Prepared by the Zhaotong City Government for
Yunnan Sayu River Basin Rural Water Pollution Management and Eco-Compensation
Demonstration Project

September 2020

ABBREVIATIONS

ADB	-	Asian Development Bank
EEB	-	ecology and environmental bureau
EFMC	-	eco-compensation fund management committee
EIA	-	environmental impact assessment
EIRF	-	environmental impact registration form
EIT	-	environmental impact table
EMDP	-	ethnic minority development plan
EMP	-	environmental management plan
ESMS	-	environmental and social management system
GAP	-	gender action plan
GDP	-	gross domestic product
GRM	-	grievance redress mechanism
LPMO	-	local project management office
LURT	-	land use rights transfer
PAM	-	project administration manual
PMO	-	project management office
PRC	-	People's Republic of China
SCL	-	safeguard commitment letter
SDAP	-	social development action plan
SPS	-	Safeguard Policy Statement (2009)
YWPCO	-	Yudong Reservoir Water Resources Protection Committee Office
ZCG	-	Zhaotong City Government

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I. INTRODUCTION

1. This document is a draft environmental and social management system (ESMS) for an eco-compensation fund to be established under the Yunnan Sayu River Basin Rural Water Pollution Management and Eco-Compensation Demonstration Project. The project is supported by a \$100.0 million loan from the Asian Development Bank (ADB) to the Zhaotong City Government (ZCG). The project has four outputs: (i) water pollution sources in the Sayu River Basin reduced; (ii) water resources in the Sayu River Basin protected from pollution; (iii) eco-compensation mechanism for the Sayu River Basin established; and (iv) education, capacity, and public awareness for water pollution management strengthened. The ZCG is the executing agency. The implementing agencies are the Yudong Reservoir Water Resources Protection Committee Office (YWPCO) in the ZCG, the Zhaoyang District Government, and the Ludian County Government. Environmental safeguards for Outputs 1, 2, and 4 are managed under the project environmental management plan (EMP). This draft ESMS is specifically to manage safeguards for activities to be supported under Output 3.

2. Of the \$100 million ADB loan, about \$5.0 million will be utilized to establish and implement an eco-compensation fund under Output 3. The aim of the fund is to support improved water quality protection and environmental management in the Yudong Reservoir Basin, which is located within Zhaoyang District and Ludian County. The fund will provide grants (not loans). The fund will be established by and under the YWPCO and will be managed by a government committee, an eco-compensation fund management committee (EFMC), which will be established for the project. The EFMC will screen, endorse, and coordinate approved activities that will receive grants from the fund. The majority of activities to be supported under the fund are expected to be non-structural, e.g., fund transfers for operation and maintenance of the facilities constructed under the other project outputs (and for which environment safeguard measures are already defined in the EMP). The beneficiaries of the fund will be local government agencies and other stakeholders who will receive grants in exchange for approved environmental services. The anticipated scope of activities to be supported is summarized in Section II.D. The fund and the ESMS structure are described in Section IV.

3. This draft ESMS is for the eco-compensation fund that will only provide grants and has been designed accordingly. It is an internal management system for the EFMC to screen and manage potential environmental and social risks of activities to be supported under the fund. All activities to be supported will be Category C for environment and involuntary resettlement and Category B or C for indigenous peoples, as defined by ADB's Safeguard Policy Statement (SPS).

4. This is the first time an ESMS will be implemented in Zhaotong City. This draft ESMS is written in non-technical language and provides step-by-step procedures to assess and manage potential environmental and social risks associated with applications under the eco-compensation fund. The ESMS will be finalized by the EFMC during project implementation, with technical assistance from consultants and ADB; and will be modeled closely on this template.

II. INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

A. Legislative and Policy Framework

5. The overall project, including the eco-compensation fund and the ESMS, will be implemented within the context of relevant policies and laws of the People's Republic of China

(PRC) and policies of the ADB. Within the PRC, over 40 laws, regulations, standards, and guidelines concerning natural resources management and agriculture sector are relevant to the project (ESMS-Appendix 1). For the environment, these include environmental protection, planning, and impact assessment, water resources management, quality standards and guidelines for air, water, soil, and noise, disposal of solid waste, and protection of flora, fauna, and cultural resources. For social issues, these include the management of the land use rights transfer (LURT), involuntary resettlement, ethnic minorities, and protection of the rights of vulnerable groups, including women, the poor, the low-income, and the disabled.

6. The ESMS complies with the requirements of the ADB's SPS. ADB's SPS comprises three operational policies for the environment, involuntary resettlement, and indigenous peoples. These seek to avoid, minimize, or mitigate adverse environmental and social impacts. Under ADB's SPS, the ESMS contents include environmental and social policies; screening, categorization, and assessment; document preparation requirements and review procedures; organizational structure and staffing, including skills and competencies in environmental and social areas; training requirements; and monitoring and reporting.

B. Definitions of Terms Used

7. This section provides the definitions of key terms used in the ESMS.

"Affected person" means a person directly or indirectly affected by an activity financed from the eco-compensation fund.

"Applicant" means an individual or agency proposing an activity for funding under the eco-compensation fund. It is anticipated that proposals for most activities will be led by local government agencies.

"Gender action plan" means a plan for the project with measurable indicators to strengthen gender-inclusive designs. The gender action plan (GAP) is in the project administration manual (PAM).

"Grievance redress mechanism" means a mechanism to receive and facilitate resolution of affected persons' concerns, complaints, and grievances about the project's environmental or social performance (see Section V).

"Implementing agency" means an agency which implements the project. For the eco-compensation fund, the YWPCO in the ZCG is the implementing agency.

"Involuntary resettlement" is defined by ADB's SPS as physical displacement (relocation, loss of residential land, or loss of shelter) and/or economic displacement (loss of land, assets, access to assets, income sources, or means of livelihoods), as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.

"Indigenous people" is defined by ADB's SPS as a distinct, vulnerable, social, and cultural group. Safeguards are triggered if a project directly or indirectly affects the dignity, human rights, livelihood systems, culture, or cultural resources of such groups.¹

¹ The Government of the PRC uses the term "ethnic minorities". This may trigger ADB's safeguard requirements in accordance with the above definition.

“Land use rights transfer” means leasing or renting farmland use rights without any change in the land ownership and/or the agricultural use.

“Project administration manual” means a summary document describing all administrative, financial, procurement, and safeguard procedures for the overall project. The PAM and other project documents are available on the ADB public website.

“Project management office” works on behalf of the ZCG to coordinate the project. The project management office (PMO) has been established under the ZCG and is physically located in the YWPCO (see Section II.C).

“Environment officer and social officer” means qualified officers appointed by the PMO to lead the implementation of the ESMS (see Section II.C).

“Social development action plan” means a plan with measurable indicators to strengthen socially inclusive designs. The social development action plan (SDAP) is in the PAM.

C. Roles and Responsibilities for the Environmental and Social Management System

8. This section identifies the roles and responsibilities of agencies in implementing the ESMS.

Table ESMS-II.1: Institutional Responsibilities for Implementation of the Environmental and Social Management System

Agency	Roles and Responsibilities
Zhaotong City Project Leading Group	<ul style="list-style-type: none"> • Ensure timely national, provincial, and inter-agency coordination and support for the project, as needed • High-level support to the Zhaotong City Government • Provide advice on project implementation • Review project progress
Zhaotong City Government	<ul style="list-style-type: none"> • Executing agency • Overall accountability and responsibility for project planning, management, and implementation • Ensure timely and effective execution of the loan and project agreements • Coordinate with ADB
PMO	<ul style="list-style-type: none"> • Support the YWPCO and the EFMC to finalize the ESMS and implement the ESMS • Submit the updated draft ESMS to ADB for endorsement • Establish the GRM for the project • Support the EFMC to review and strengthen the environmental and social design of eco-compensation applications before approval • Facilitate safeguard training for relevant staff of the YWPCO, members of the EFMC, and environment and social officers of the PMO • Prepare and submit to ADB quarterly project progress reports (including internal resettlement and social development monitoring reports) and semiannual environmental monitoring reports (including ESMS implementation progress) • Ensure project compliance with the loan and project agreements (including all safeguard provisions) and ESMS

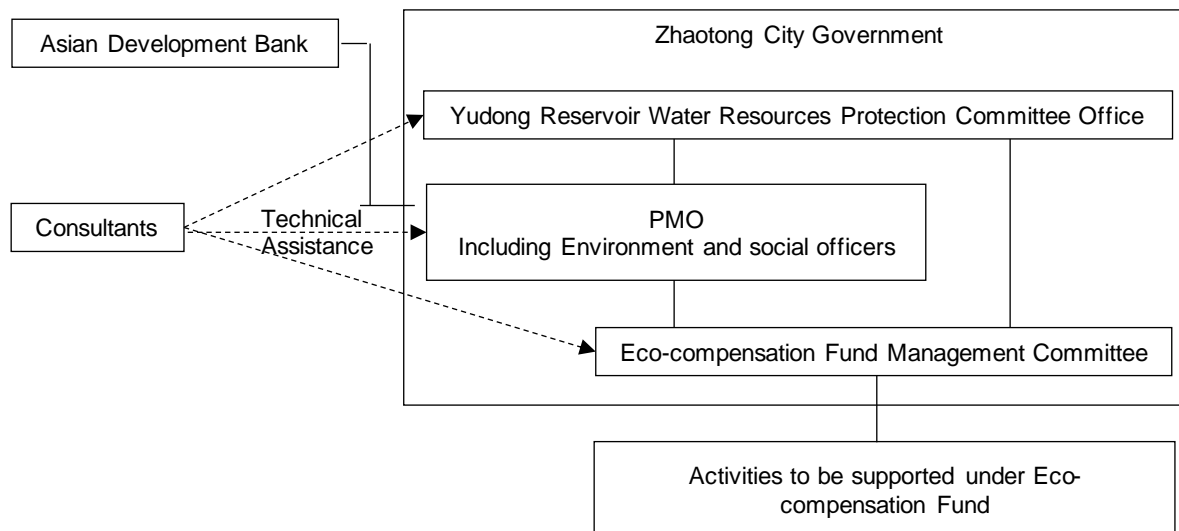
Agency	Roles and Responsibilities
Environment and social officers of the PMO	<ul style="list-style-type: none"> • Work closely with the YWPCO and the EFMC to implement the ESMS, review proposed activities against ESMS steps A-F (Section III of the ESMS), and manage the ESMS database • Implement the GRM • Facilitate training related to safeguards and project design • Monitor the ESMS implementation • Prepare internal resettlement and social development monitoring parts of quarterly project progress reports and semiannual environmental monitoring reports, including the ESMS implementation progress • Terms of reference for the PMO environment officer is in Appendix 2 of the ADB-version EIA for the project
YWPCO	<ul style="list-style-type: none"> • Implementing agency for the eco-compensation fund • Establish and manage the eco-compensation fund, following the EFMC's decision • Establish the EFMC • Finalize the ESMS, following the EFMC's decision • Document the results of Steps A-F for each proposed activity, in an ESMS database • As a secretariat of the EFMC, prepare semiannual safeguard progress reports, including progress of the ESMS implementation, for the EFMC • Liaise with the ZCG, the PMO, the EFMC, and other agencies, as necessary, to ensure relevant safeguard approvals and design considerations are achieved
EFMC	<ul style="list-style-type: none"> • Make decisions on management of the eco-compensation fund implementing the ESMS • Integrate the ESMS within the EFMC's operation procedures • Receive and review applications against the ESMS steps A-F (Section III of the ESMS), working with the YWPCO, the PMO, and other agencies, as necessary • Monitor and report compliance of eco-compensation beneficiaries with the safeguard conditions • Submit to the PMO semiannual safeguard progress reports, including progress of the ESMS implementation
Applicants	<ul style="list-style-type: none"> • Work with the EFMC to identify and develop activities to be supported under the eco-compensation fund • Implement and comply with any environmental or social conditions required as part of the eco-compensation fund
Initial project management support consultant (environment)	<ul style="list-style-type: none"> • Assist the PMO in establishing the GRM • Provide initial training for the ESMS implementation to relevant staff of the YWPCO and environment and social officers of the PMO
Environmental, resettlement, and social development specialists (project management support consultants)	<ul style="list-style-type: none"> • Assist relevant staff of the YWPCO, members of the EFMC, and environment and social officers of the PMO to establish and implement the ESMS • Provide ongoing training for ESMS implementation to relevant staff of the YWPCO, members of the EFMC, and environment and social officers of the PMO • Assist the PMO in preparing quarterly project progress reports, including internal resettlement and social development monitoring reports and semiannual environmental monitoring reports, including the ESMS implementation progress • Terms of reference are in Appendix 2 of the PAM
ADB	<ul style="list-style-type: none"> • Oversee project administration and timely execution of the loan and project agreements by the ZCG and the implementing agencies • Review project compliance and targets against the design and monitoring framework, the EMP, the ESMS, resettlement plan, the EMDP, the SDAP, the GAP, and the PAM • Review and endorse updated ESMS, as needed • Monitor project progress and conduct review missions • Disclose monitoring reports on ADB's public website, as necessary

ADB = Asian Development Bank, EFMC = eco-compensation fund management committee, EIA = environmental impact assessment, EMDP = ethnic minority development plan, EMP = environment management plan, ESMS = environmental and social management system, GAP = gender action plan, GRM = grievance redress mechanism, PAM = project administration manual, PMO = Zhaotong City project management office, SDAP = social development and action plan, YWPCO = Yudong Reservoir Water Resources Protection Committee, ZCG = Zhaotong City Government.

Source: ADB.

9. The relationship among the project agencies for the ESMS is shown in Figure ESMS-II.1.

Figure ESMS-II.1: Organization Chart of Project Agencies for Environmental and Social Management System



PMO = Zhaotong City project management office.
Source: Asian Development Bank.

D. What the Project will and will not Support

10. The ZCG agrees to the following terms and restrictions for the eco-compensation fund.

- (i) The eco-compensation fund will only support activities which:
 - have minimal or do not have environmental impacts;
 - have all relevant domestic environmental approvals and/or land permits, as well as for any associated facilities or operations;
 - have a clearly defined geographic location;
 - are clearly based on participatory consultation and agreement with other stakeholders, especially affected persons (for activities involving multiple parties and lands);
 - do not result in changes to land ownership (e.g., from village land to other categories) or official land use category (e.g., from agricultural to other land use); and
 - demonstrate compliance with the SDAP and the GAP (see the PAM).
- (ii) The EFMC through the eco-compensation fund will encourage and favor activities which demonstrate the sustainable use of natural resources, including (a) wastewater management, solid waste management, activities for pilot eco-villages, operation and maintenance of the constructed wetlands, compensation for farmland-to-forest conversion, and promotion of low-emission agriculture under Output 1 of the project; (b) operation of the river protection model established under Output 2 of the project; (c) implementation of the horizontal eco-compensation mechanisms under Output 3 of the project; and (d) management of the eco-compensation fund.

- (iii) The eco-compensation fund will not fund any activities which:
- are listed in the ADB Prohibited Investment Activity List (ESMS-Appendix 2);
 - may cause significant and irreversible impacts to the environment, and which are classified as Category “A” or “B” for environment under ADB’s SPS;
 - are located in or next to a designated water source protection zone, protected area, cultural heritage site, or critical natural habitat;
 - involve large-scale landscape alteration (e.g., quarrying or terracing on slopes greater than 25 degree);
 - involve involuntary land acquisition impacts;
 - involve demolition of residential or private commercial buildings;
 - involve involuntary resettlement which meet the definition of ADB Category “A” or “B” for resettlement, and any involuntary resettlement issues from past land acquisition or existing facilities as defined under ADB’s SPS;
 - have significant impacts on vulnerable ethnic minorities (Category “A”) or issues of indigenous peoples or ethnic minority communities from past activities or existing facilities as defined under ADB SPS;² and/or
 - involve on-lending to other financial intermediaries or banking institutions.

E. Pre-readiness for Establishment of Environmental and Social Management System

11. Prior to establishing the eco-compensation fund, the EFMC shall issue a formal directive to integrate the ESMS into the EFMC’s operation procedures after ADB’s approval of it. The directive shall (i) officially recognize the ESMS as the EFMC policy; (ii) instruct the EFMC personnel that the ESMS steps are now part of the fund assessment and approval procedures; (iii) identify by name and position the managerial and review arrangements for steps and decisions taken while implementing the ESMS; (iv) confirm that breaches of environmental and social conditions will be treated promptly by the EFMC and that time-based corrective measures are implemented; (v) ensure dissemination of the ESMS documents to the EFMC personnel (including copies of the ESMS Workbook in the ESMS-Appendix 3 to use in the field); and (vi) require personnel of the EFMC personnel and environment and social officers of the PMO to attend project-supported training on implementation of the ESMS.

12. Application of the ESMS procedures is described in Section III.

² The due diligence during the preparation of the overall project has confirmed that the project area includes some natural villages of ethnic minority communities, for which an ethnic minority development plan has been prepared following ADB’s SPS requirements on indigenous peoples. The eco-compensation fund may support some activities in such villages.

III. IMPLEMENTATION OF ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM – SIX STEPS

13. This section describes six steps to implement the ESMS. The steps are conducted for all activities proposed for funding support under the eco-compensation fund. The six steps are A–screening, B–categorization, C–improving design of the activity for environmental and social benefits, D–assessment, E–safeguard implementation, and F–monitoring and reporting. Steps A to D are conducted as part of the due diligence before a proposed activity is approved for funding. Steps E to F are conducted during implementation of the activity. All steps are conducted by the EFMC and the environment and social officers of the PMO, working closely with the YWPCO and consultants. Information disclosure, public consultation, and participation of affected persons are key requirements under the PRC laws and ADB's SPS. Information disclosure and public consultation are included under Steps D to E.

14. The six steps are to be performed by the EFMC and environment and social officers of the PMO, except where stated otherwise. The steps are summarized in Figure ESMS-III.2.

STEP A: SCREEN TO IDENTIFY POTENTIAL IMPACTS

First filter – compliance with national and international laws and regulations

- A.1. Does the application include any activities prohibited under the PRC laws?
- A.2. Does the application include any activities on the ADB Prohibited Investment Activity List (ESMS-Appendix 2)?
- A.3. Does the applicant (or relevant proposing agency) have existing or pending lawsuits for violation of the PRC laws related to environment or land?
- A.4. If the answer is “yes” to any of the above: reject the application, or, invite the applicant to re-submit a proposal after it has been re-designed to meet compliance.
- A.5. If the answer is “no” to all of the above, continue with the next steps.

Second filter – environmental and social screening

- A.6. Meet with the applicant and conduct a site visit, as applicable.
- A.7. Complete summary information sheets parts 1 and 2 and worksheets 1-4 (for environment, land acquisition, resettlement, LURT, and ethnic minorities) in the ESMS-Appendix 3.
- A.8. Proceed to Step B. Note: do not proceed until Step A is fully completed.
- A.9. Document all applications, whether they pass Step A or not. Report them to the PMO.
- A.10. The YWPCO pays for the cost of Step A (i.e., mainly the work time of personnel of the EFMC and environment and social officers of the PMO).

STEP B: CATEGORIZE LEVEL OF POTENTIAL IMPACTS
--

- B.1. Use the information in Step A to identify the level of potential environmental and social impacts and the “impact category” of the activity, according to the PRC and ADB criteria.

First categorization – environment (PRC criteria)

- B.2. The PRC defines three classes of impact assessment and reporting (based on scale, investment level, and environmental sensitivity): environmental impact assessment (EIA) report (high potential impacts); environmental impact table (EIT; moderate potential impacts), and environmental impact registration form (EIRF; low potential impacts). See definitions in Table ESMS-A1.2 in ESMS-Appendix 1.
- B.3. Personnel of the EFMC and environment officer of the PMO will (or will request the applicant to) consult with the local ecological and environment bureau (EEB) for preliminary guidance on steps B.3–B.4 for environmental risk categorization. First, the applicant and EEB should use Table ESMS-A1.2 in ESMS-Appendix 1 to identify which category the application is within. Then, the EEB will apply the national standards (Table ESMS-A1.3 in ESMS-Appendix 1) to identify the risk level and environmental categorization for the proposed activities. The applicant should seek initial guidance from the EEB for the risk categorization and any comments and submit this information to the EFMC and environment officer.
- B.4. Proposed activities which will probably require an EIA report will be rejected due to potential risks, or invite the applicant to re-apply after the application has been re-designed to meet the EIT or the EIRF class. Activities classed as the EIT or the EIRF are preferred as they are expected to have lower environmental impacts.

Second categorization – environment (ADB criteria)

- B.5. ADB applies three impact categories to projects: A, B, or C. See definitions in Worksheet 1 of ESMS-Appendix 3. In Worksheet 1, complete the final column in the table. Assign the ranking A, B, or C to each potential impact relevant to the application.
- B.6. Using these results, circle the summary impact category underneath the table. Clearly state the reasons for this conclusion.
- B.7. Reject all applications for activities which are Category A or B, or invite the applicant to re-apply after the application has been re-designed to meet Category C.

Third categorization – involuntary resettlement

- B.8. ADB applies three impact categories to projects: A, B, or C. Screening and categorization standards are defined in Worksheets 2 and 3 in ESMS-Appendix 3. Use these worksheets to assess the activity category as A, B, or C.
- B.9. Reject all applications for activities which are Category A or B or if they involve any involuntary resettlement issues from past land acquisition or existing facilities. These include activities which cause physical displacement and/or economic displacement or losses which result from involuntary acquisition of land or involuntary restriction of land

use.

Fourth categorization – indigenous peoples (ethnic minorities)

- B.10. ADB applies three impact categories to projects: A, B, or C. Screening and categorization standards are defined in Worksheet 4 in ESMS-Appendix 3. Use these worksheets to assess the activity category as A, B, or C.
- B.11. Reject activities which are Category A or involve any issues of indigenous peoples or ethnic minority communities from past activities or existing facilities. Otherwise, invite the applicant to re-apply after the application has been re-designed to meet compliance.

Fifth categorization –land use rights transfer¹ issues

- B.12. Any activities that involve land with an existing or proposed LURT agreement will be reviewed by the EFMC and the PMO social officer. Use Worksheet 3 in ESMS-Appendix 3 to determine whether there are any issues or pending disputes. If the answer is “yes”, reject the application, or, invite the applicant to re-apply after all such issues have been legally settled and such evidence is provided in accordance with the LURT Framework in ESMS-Appendix 5.
- B.13. The YWPCO pays for the cost of Step B. This should mainly be the work time of the personnel of the EFMC social officer of the PMO to meet the applicant and conduct a site visit.

Endorsement by ZCG and ADB of the Proposed Risk Categorizations

- B.14. Report all information in Step B to the PMO and the YWPCO.
- B.15. For the first two applications under each new type of activity category, submit the screening documents and proposed risk categorizations to the PMO and ADB for endorsement. The PMO will provide the documents to ADB. Categories of activities include but are not limited to (i) wastewater management, solid waste management, activities for pilot eco-villages, operation and maintenance of the constructed wetlands, compensation for farmland-to-forest conversion, and promotion of low-emission agriculture under Output 1; (ii) operation of the river protection model established under Output 2; (iii) implementation of the horizontal eco-compensation mechanisms under Output 3; and (iv) management of the eco-compensation fund.
- B.16. Do not proceed with the application until the ZCG and ADB has provided feedback and endorsement on the application.
- B.17. Do not proceed to Step C until Step B is fully completed.

¹ See Section II.B for definition of “land use rights transfer”.

STEP C: PROMOTE ENVIRONMENTALLY RESPONSIBLE PRACTICES

- C.1. Worksheet 5 in ESMS-Appendix 3 identifies the types of activities the eco-compensation fund aims to support. Identify those relevant to the fund application. Improve design of the proposed activity to achieve design which meets the practices in Worksheet 5. Note: This step is primarily carried out by the applicant, in consultation with the PMO environment and social officers, consultants, and local government bureaus, as necessary.
- C.2. Personnel of the EFMC and environment and social officers of the PMO confirm that Step C.1 has been conducted.
- C.3. Report all information in Step C to the PMO and YWPCO.
- C.4. Do not proceed to Step D until Step C is fully completed.

STEP D: IMPACT ASSESSMENT, MITIGATION, AND APPROVAL

Environmental Assessment

- D.1. If the activity is ADB Category C for environment, the following is required: (i) preparation of the relevant PRC environmental assessment (EIT or EIRF; see Step C), if required; (ii) a brief environmental summary of the proposed activity and any risks; and (iii) a simple environment checklist to help manage potential impacts, if required. A sample checklist is given in ESMS-Appendix 4.
- D.2. Advise the applicant: (i) it is the responsibility of the applicant to arrange and pay for the EIT or the EIRF; (ii) for an EIT or an EIRF, the assessment must be prepared by an accredited EIA institute; (iii) the assessment will be submitted to the EFMC and the PMO environment and social officers for review; (iv) for the EIT or the EIRF, the contents will be in Chinese language and will be submitted to the local EEB for approval; and (v) for the environmental summary and simple environment checklist, if required, the content will be in English language and submitted to ADB for review and approval.
- D.3. All domestic EIA documents require the review and approval of the relevant bureaus, including the EEB.
- D.4. The applicant proceeds with preparation of the EIT or the EIRT; and environmental summary and simple environment checklist, if required. The applicant is responsible for all costs of preparing the documents, including any field surveys, monitoring, and public consultation (see below).

Social assessments and preparation of mitigation actions

- D.5. If the proposed activity involves the LURT, the applicant must prepare a LURT agreement in accordance with the LURT Framework and submit a copy to the EFMC and the PMO social officer. If the proposed land has been the subject of any previous land transfer, the applicant must submit the LURT agreement and related evidence to confirm that there are no pending disputes. Such due diligence will be done in accordance with the LURT Framework.

- D.6. If activities involve any of 17 ethnic minority villages in the project area, they should be implemented in accordance with the ethnic minority development plan (EMDP) prepared for these villages (ESMS-Appendix 6). The activities should be implemented in accordance with the SDAP and the GAP that are included in the PAM. For the actions in the EMDP, the SDAP, and the GAP that are relevant to the activities, the EFMC and the PMO social officer will ensure the applicant implements them and reports on results, with assistance from the PMO social officer and resettlement, social development, and gender specialists (consultants).
- D.7. Include all relevant requirements of the EMDP (if necessary), the SDAP, and the GAP in the conditions for implementation of the activity.

Information disclosure and public consultation and participation

- D.8. For all activities, regardless of impact category, check with the applicant if they have publicized the proposed project within the project area.
- D.9. If the answer is “no”, then inform the applicant that he or she must
- publicize the basic project details – location, activities, potential impacts, contact details for the applicant, the EFMC, and the PMO environment and social officers;
 - publicize these details for at least 10 days to enable the general public sufficient time to submit any verbal or written comments;
 - use disclosure materials and media which local communities near the project area can access, e.g., signboard or poster in the village, website;
 - at the end of the disclosure period, summarize any public comments received (by the EFMC, the PMO, and/or applicant); and
 - address these comments in line with the EIT, the EIRF, the SDAP, or the GAP.
- D.10. The applicant pays for the cost of the distribution materials.

Endorsement by the ZCG and ADB of the Documents

- D.11. The applicant reports all information on Step D to the EFMC and the EFMC shares the information with the PMO, and the YWPCO.
- D.12. The applicant obtains and verifies copies of relevant documents and approvals for the application:
- local EEB approval and requirements;
 - the EFMC approval of final design of the activity; and
 - ADB’s approval of activities.
- D.13. Do not proceed to Step E until Step D is fully completed.

STEP E: IMPLEMENT SAFEGUARD MEASURES

- E.1. For the approved activity, the EFMC will prepare a safeguard commitment letter (SCL). This will list all measures to be implemented by the applicant for mitigation, monitoring, and reporting from the EIA, the EMDP, the SDAP, and the GAP as relevant.²
- E.2. The applicant begins the activity, including the measures in the SCL.
- E.3. For any activities which involve hiring a contractor, the SCL and any relevant safeguard requirements identified in Step D must be included in (i) the bidding documents; (ii) tenders submitted; and (iii) the signed works contract between the EFMC and/or applicant with the selected bidder.
- E.4. For any activities which require infrastructure works, such works will be minimal and of a scale consistent with ADB's Category C for safeguards. For such works, if required under the PRC's Tentative Procedure of Project Completion Environmental Inspection and Acceptance for Construction Project (2017), within 3 months of completion, the EFMC and the beneficiary (if applicable) will (i) assess if the activity has been constructed in compliance with the environmental approval conditions; (ii) submit related documents to the Zhaotong City EEB; and (iii) upload required information onto the national project completion environmental acceptance platform. The EEB is responsible for supervision. If the activity is not compliant, the EFMC and/or the beneficiary of the activity will be required to take corrective actions. Without this, the works will not obtain final environmental approval and cannot become operational.
- E.5. Support the environment and social officers of the PMO to implement the grievance redress mechanism (GRM) throughout the implementation stage (see Section V).
- E.6. Any changes to the design of the activity that may potentially cause negative environmental impacts or social issues will be screened and assessed and additional environmental and social monitoring and/or mitigation measures will be developed as needed.

STEP F: MONITORING AND REPORTING

- F.1. Monitor whether the applicants are implementing the measures in the SCL.
- F.2. Develop and maintain an internal recording system for the results of Steps A-F for each eco-compensation application and approved activity. This should be a simple database (e.g., in excel).
- F.3. For environmental safeguards, all activities will be only Category C for environment and are specifically intended to strengthen environmental management and water resources protection in the Yudong Reservoir Basin. Monitoring for environmental safeguard-related impacts is not anticipated to be needed. However, monitoring may be required to measure the results of the activity (e.g., reduction in use of chemical fertilizers). Such indicators will be designed as needed between the EFMC, the PMO environment officer, and agency

² Environmental impact mitigation measures for the other project components (i.e., Outputs 1, 2, and 4) are listed in the EMP (Appendix 1 of ADB-version EIA for the project). Some of these EMP measures may be applicable to activities under the eco-compensation fund. Social safeguard measures are listed in Step D.

that will undertake the activity, with technical input from local bureaus and consultants, as needed.

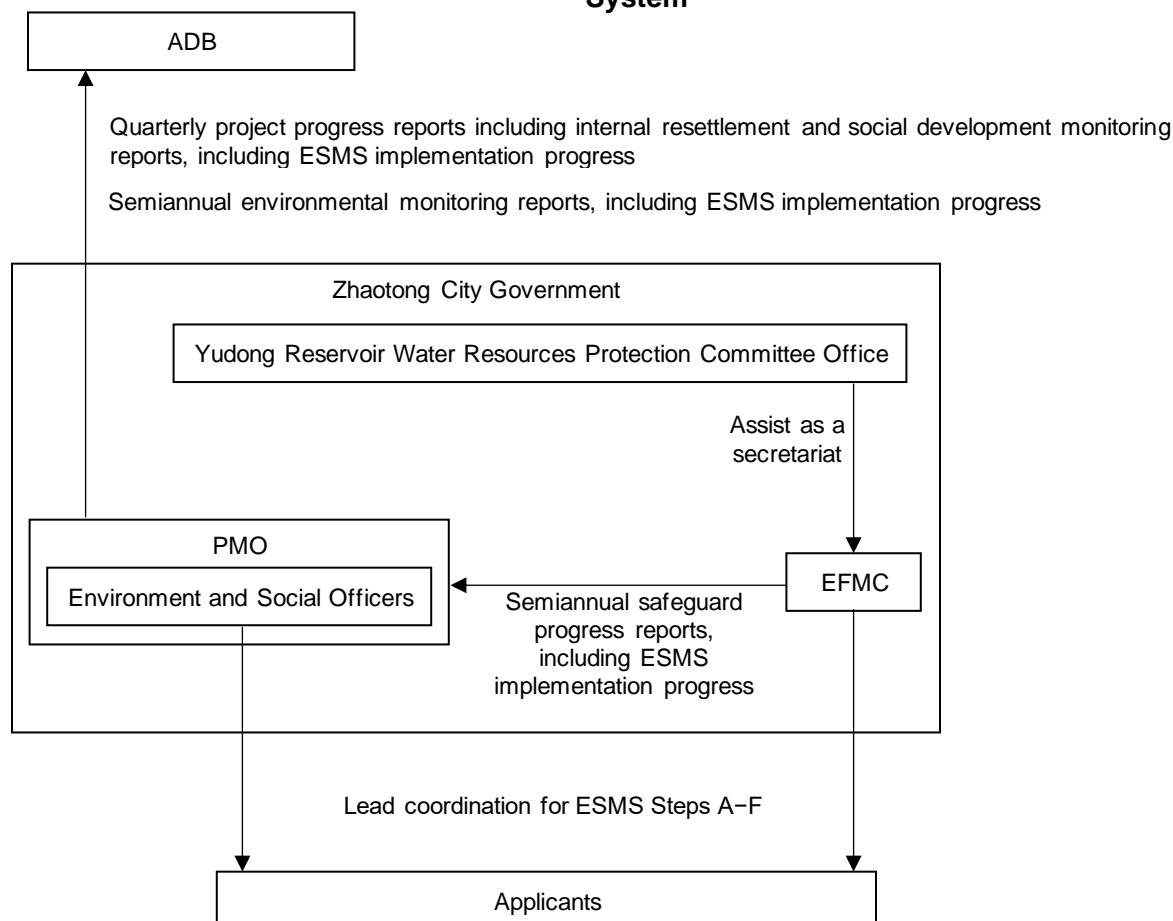
- F.4. For social safeguards, the PMO is responsible for monitoring of the EMDP, the SDAP, and the GAP implementation for the overall project. The resettlement, social development, and gender specialists in the team of consultants for project management support will help the PMO develop the monitoring and reporting mechanism.
- F.5. For environment and social safeguards, any monitoring conditions will be listed in the SCL.
- F.6. During at least the first 2 years of the project, the following agencies meet every 6 months, and then at least annually from year 4 onwards:
- the EFMC, the PMO, and the YWPCO meet to review progress against the contract conditions in the SCLs for approved activities; and
 - the EFMC, the PMO, the YWPCO, and relevant bureaus meet to review safeguard compliance of all the activities being supported and lessons learned.
- F.7. The EFMC submits semiannual safeguard progress reports to the PMO and the YWPCO, which includes progress of the ESMS implementation. A report for January–June shall be submitted by 31 July in the year latest and a report for July–December shall be submitted by 31 January in the next year latest.
- F.8. The PMO submits to ADB (i) quarterly project progress reports, including internal resettlement; and social development monitoring reports, including the ESMS implementation progress; and (ii) semiannual environmental monitoring reports, including the ESMS implementation progress. A semiannual environmental monitoring reports for January–June and July–December shall be submitted by 15 August in the year latest and by 15 February in the next year latest (i.e., 2 weeks after the EFMC submits its report to the PMO), respectively.
- F.9. The reporting procedure is shown in Figure ESMS-III.1.
- F.10. The YWPCO pays for the costs of internal ESMS monitoring and reporting and preparation of the reports.
- F.11. **Penalties.** In the event that agency, firm, contractor, or individual nominated to implement the activity does not comply with the conditions in the SCL, then penalties will apply. Such penalties will be identified during finalization of the ESMS and may include, but not be limited to, cancellation of any relevant works contract and replacement of a contractor (in the case of any civil works).

Table ESMS-III.1: Reporting Plan for Environmental and Social Management System

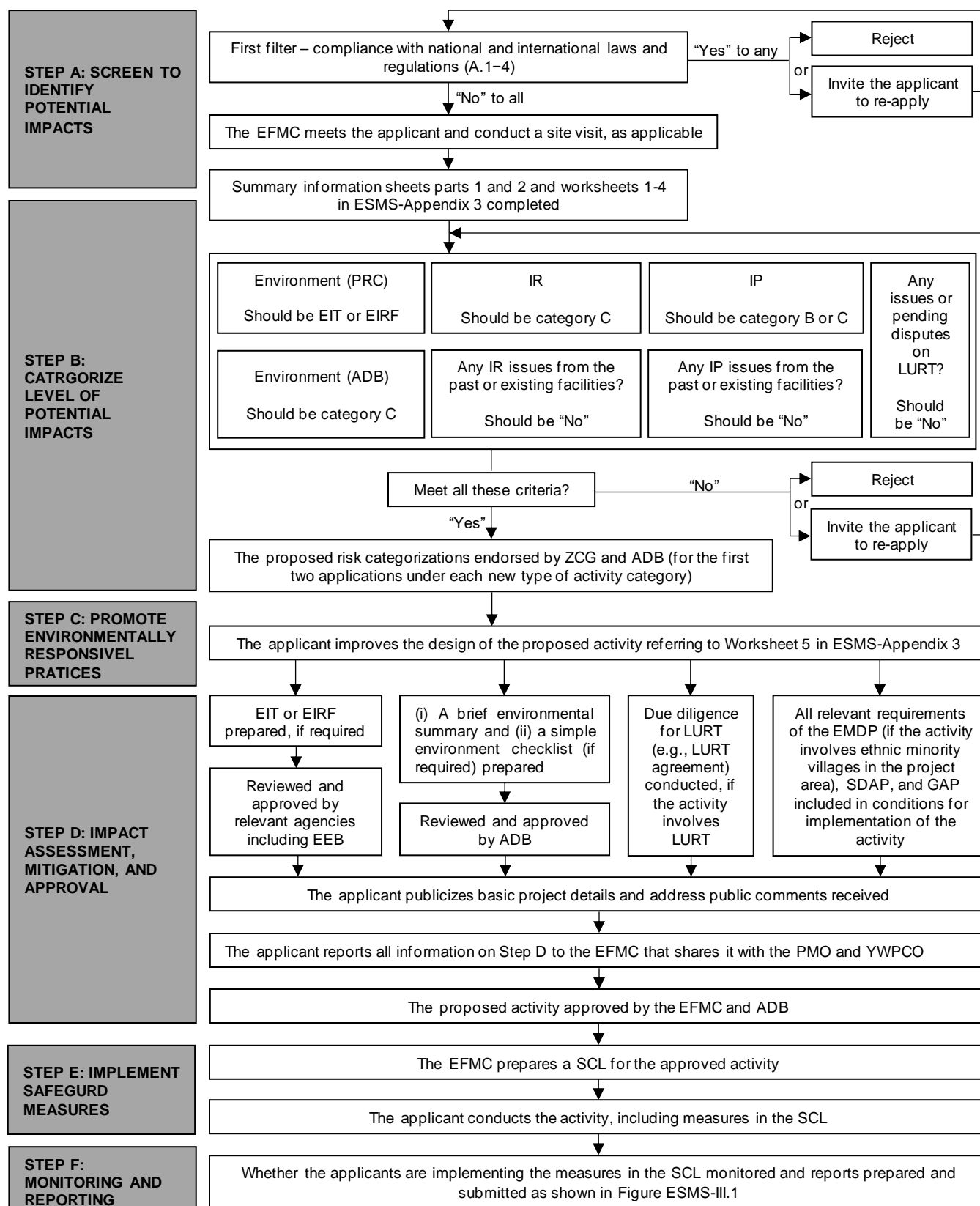
Report	Timing	Responsibility
Semiannual safeguard progress reports, including progress of the ESMS implementation	Semiannually. For January–June: by 31 July in the year For July–December: by 31 January in the next year	EFMC submits to the PMO and the YWPCO
Quarterly project progress reports, including internal resettlement; and social development monitoring reports, including the ESMS implementation progress	Internal resettlement and social development monitoring reports are updated semiannually. For January–June: by 15 August in the year For July–December: by 15 February in the next year	PMO submits to ADB. ADB reviews and discloses on ADB's website
Semiannual environmental monitoring reports, including the ESMS implementation progress	Semiannually For January–June: by 15 August in the year For July–December: by 15 February in the next year	PMO submits to ADB. ADB reviews and discloses on ADB's website

ADB = Asian Development Bank, EFMC = eco-compensation fund management committee, ESMS = environmental and social management system, PMO = project management office, YWPCO = Yudong Reservoir Water Resources Protection Committee Office.

Source: ADB.

Figure ESMS-III.1. Reporting Procedures for Environmental and Social Management System

ADB = Asian Development Bank, EFMC = eco-compensation fund management committee, ESMS = environmental and social management system, PMO = project management office.

Figure ESMS-III.2. Steps A–F of Environmental and Social Management System

ADB = Asian Development Bank, EEB = environmental protection bureau, EFMC = eco-compensation fund management committee, EIRF = environmental impact registration form, EIT = environmental impact table, EMDP = ethnic minority development plan, ESMS = environmental and social management system, GAP = gender action plan, IP = indigenous people, IR = involuntary resettlement, LURT = land use rights transfer, PMO = project management office, PRC = People's Republic of China, SCL = safeguard commitment letter, SDAP = social development action plan, YWPCO = Yudong Reservoir Water Resources Protection Committee Office, ZCG = Zhaotong City Government.

IV. ECO-COMPENSATION FUND MANAGEMENT COMMITTEE AND SAFEGUARDS

A. Establishment of Eco-Compensation Management Committee and Safeguards

15. The ZCG, including the YWPCO, will lead the establishment of the EFMC. The chair of the EFMC will be the vice mayor of the ZCG and members will be Deputy Directors General of about 10 ZCG agencies, including Development and Reform Committee, Finance Bureau, Water Resources Bureau, the EEB, Housing and Urban–Rural Development Bureau, Agriculture and Rural Affairs Bureau, Forestry and Grassland Bureau, etc.

16. The EFMC will conduct screening of activities proposed for financing from the fund in accordance with the ESMS. The YWPCO will manage the fund, following decisions of the EFMC.¹ An account under the Zhaotong City Finance Bureau will be used for the fund. The account will be managed by the Finance Bureau, following decisions of the EFMC. The Zhaotong City Finance Bureau will disburse grants from the fund to recipients, based on the EFMC's decisions and at the YWPCO's request through either the Zhaoyang District Finance Bureau or the Ludian County Finance Bureau (and relevant town or township finance bureau, as necessary).

17. The specific operational procedures for the EFMC, including screening, selection, and approval procedures for activities, financial transfer mechanisms, and technical and financial reporting, will be established before the eco-compensation fund is established (scheduled in July 2021). The safeguard procedures described in this draft ESMS will be integrated into the fund operational procedures (Section IV.B).

18. The environment and social officers of the PMO who are responsible for overall implementation of the project safeguards (including the EMP, the EMDP, and resettlement plan) will also be responsible for the ESMS implementation. These two officers will work under the PMO for safeguards related to Outputs 1, 2, and 4 and for the EFMC for Output 3 (i.e., the ESMS). This arrangement is optimal as (i) implementation of the eco-compensation fund is not expected to involve significant environmental or social risks, given the fund's objectives and scope of activities to be supported by the fund, and the workload is expected to be relatively small; (ii) the GRM (described in Section V and the EMP) will be implemented for all project activities, including Output 3; and (iii) the composition of the PMO and the YWPCO is similar, and both are subject to overall guidance under the project leading group (Table ESMS-II.1). Coordination of all project safeguards by the environment and social officers of the PMO will ensure an integrated and holistic approach across the four project outputs; minimize work duplication; and maintain awareness of the ESMS progress by the project leading group, the ZCG, the implementing agencies, and other relevant bureaus.

19. During project implementation, the environment and social officers of the PMO will receive technical support and training from the project management support consultant team and ADB for the ESMS implementation, as well as for implementation of the EMP, the EMDP, resettlement plan, and the GRM.

20. Safeguard monitoring will be conducted by the environment and social officers of the PMO to ensure compliance with the safeguard conditions, if any, in the SCL for each approved activity.

¹ Fifteen full-time staff of the YWPCO who manages an existing fund for ecological restoration and remediation will manage the new eco-compensation fund.

The officers will conduct site visits and meetings with the agency to conduct the activity, as needed. The EFMC and applicants for the fund will facilitate meetings, as needed.

21. The PMO, the YWPCO, the EFMC, and ADB will review implementation progress for the eco-compensation fund as part of overall project progress monitoring, including in reports (Table ESMS-III.1). In the final year of project implementation, the PMO and ADB will assess overall success of the fund and the ESMS; and if required, identify next steps for continuation of the fund and the ESMS after project completion.

B. Integrating Environmental and Social Management System within the Fund Management procedures

22. To integrate the ESMS into the EFMC operational procedures, the ZCG or the YWPCO will issue a formal directive prior to establishing the eco-compensation fund (scheduled in July 2021). This directive will

- (i) officially recognize the ESMS as part of the EFMC operational structure;
- (ii) identify by name and position the personnel arrangements for steps and decisions taken for implementing the ESMS;
- (iii) establish procedures in the event that any safeguard conditions for approved activities are not complied with;
- (iv) confirm the working relationship between the EFMC, the YWPCO, and consultants;
- (v) ensure dissemination of the ESMS document to the EFMC and the YWPCO personnel;
- (vi) instruct the personnel of the EFMC and the YWPCO and the environment and social officers of the PMO to print copies of the ESMS Workbooks (ESMS-Appendix 3) to use in the field and for filling out as part of their duties; and
- (vii) commit to the training plan in the ESMS by facilitating attendance of the EFMC and the YWPCO personnel at training courses, as required.

23. The design of the eco-compensation fund and the ESMS operational procedures will be finalized and approved by the EFMC and ADB prior to the establishment of the eco-compensation fund.

24. In this time, the environment and social officers of the PMO and personnel of the EFMC and the YWPCO will be trained in the ESMS implementation.

25. Upon commencement of the eco-compensation fund, the EFMC and the environment and social officers of the PMO will commence the ESMS procedures Steps A–F (Section III of this ESMS).

26. Where design of an activity needs to be improved (Step C), personnel of the EFMC, environment and social officers of the PMO, and applicant will consult with technical personnel as needed (e.g., agricultural extension staff of the local agriculture bureau) to guide the re-design. After re-design, the application will progress step by step through the ESMS procedures as before.

V. GRIEVANCE REDRESS MECHANISM

27. **Grievance redress mechanism for overall project implementation.** The project includes a GRM to identify, address, and resolve any public concerns for environmental and/or social issues of the project activities. The GRM will be implemented for the life of the project and

will be applied to all project activities under all outputs, including the eco-compensation fund and the ESMS. The GRM comprises a series of steps to receive, document, and address the concerns of any affected persons. The GRM is accessible to all members of the community. Multiple entry points are available, as well as multiple ways to convey issues and/or grievances, including face-to-face meetings, written complaints, telephone conversations, e-mail, and social media.

28. The environment and social officers of the PMO, supported by other environment and social officers of the local PMOs (LPMOs) under implementing agency, will lead the coordination of the GRM. However, all project agencies and staff, including the EFMC, will be trained in the GRM and are expected to take an active role for implementing the GRM. At the PMO level, the environment and social officers of the PMO will establish a GRM tracking and documentation system; conduct daily coordination with the other environment and social officers of the LPMOs; arrange meetings and conduct site visits, as necessary; maintain an overall project GRM database; and prepare reporting inputs for quarterly project progress reports to ADB. At the LPMO level, the environment and social officers will instruct contractors and construction supervision companies on the GRM procedures; and coordinate with the local EEBs and other government agencies, as necessary. The PMO and the LPMO staff will be trained and supported by the environmental, resettlement and social development specialists (consultants).

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

30. If a complaint is received and filed, the environment and social officers of the PMO and the LPMO will identify if the complaint is eligible for management under the GRM. Eligible complaints under the GRM include those where (i) the complaint pertains to the project; and (ii) the issues arising in the complaint fall within the scope of environmental and/or social issues that the GRM is authorized to address. Ineligible complaints include those where (i) the complaint is not project-related; (ii) the nature of the issue is outside the mandate of the GRM (such as fraud or corruption); and/or (iii) other procedures would be more appropriate to address the issue. Ineligible complaints will be documented and provided to the relevant authorities and the complainant will be informed of these steps. The procedure and timeframe for the GRM are summarized in Figure EMP-1 for environmental issues and in EMDP and resettlement plan for specific social issues.

31. **Grievance redress mechanism for environment safeguards.** The following are the GRM steps for environmental safeguards:

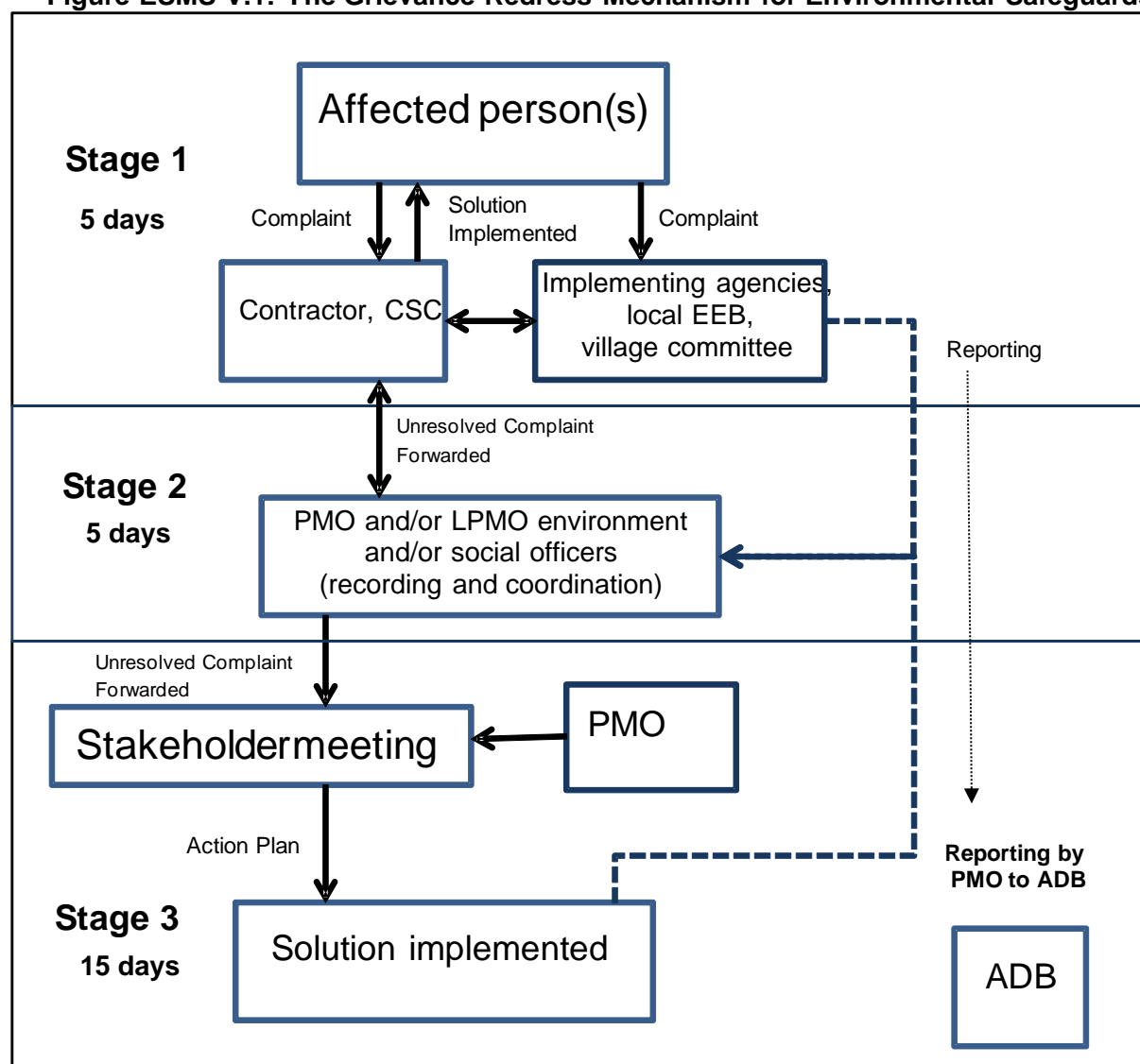
- (i) **Stage 1 (5 calendar days).** If a concern arises during construction or operation, the affected person may submit a written or oral complaint to the contractor (construction phase) or operator of the project facility (operation phase). The contractor will (i) respectfully acknowledge the issue and immediately stop the causal activity (e.g., on-site construction causing high noise levels to a nearby household); (ii) not resume the activity until the complaint has been resolved; (iii) inform the LPMO of the incident on the same day of the incident occurring and how the contractor has responded or will respond; (iv) give a clear reply to the affected person within 2 calendar days; and (v) as far as possible, resolve the problem within 5 calendar days from receiving the complaint. The contractor will keep the LPMO fully informed at all stages. The LPMO will inform the PMO, the local

village committee, and the EEB of the incident within 1 working day of being informed by the contractor; and subsequently keep these parties informed at all stages.

- (ii) **Stage 2 (5 calendar days).** If the issue cannot be resolved in Stage 1, after 5 calendar days, the LPMO, and/or the PMO will take over responsibility. Eligibility of the complaint will be assessed, and a recommended solution given to the complainant and contractors within 2 calendar days. If the solution is agreed by the complainant, the contractors, and/or facility operators (in operation) will implement the solution within 5 calendar days from the LPMO or the PMO taking over responsibility of the complaint. Written records will be made of all stages and outcomes. At the expiration of Stage 2, the PMO will inform ADB of the outcome.
- (iii) **Stage 3 (15 calendar days).** If no solution can be identified by the PMO and/or the LPMO; and/or the complainant is not satisfied with the proposed solution, the PMO and/or the LPMO will organize within 7 calendar days a stakeholder meeting (including the complainant, contractor, and/or operator of the facility; and the EEB, the LPMO, and the PMO). A solution acceptable to all shall be identified, including clear steps. The contractors (during construction) and facility operators (during operation) will immediately implement the agreed solution. All attempts will be made to fully resolve the issue within 15 calendar days. Written records will be made of all stages and outcomes. At the expiration of Stage 3, the PMO will inform ADB of the outcome.

32. The GRM does not affect the right of an affected person to submit their complaints to any agency they wish to, for example, the local village committee, community leaders, courts, the PMO, and the LPMOs; governments of Zhaotong City, Zhaoyang District, and Ludian County; and/or ADB.

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

Figure ESMS-V.1: The Grievance Redress Mechanism for Environmental Safeguards

ADB = Asian Development Bank, CSC = construction supervision company, EEB = ecology and environmental bureau, LPMO = local project management office, PMO = project management office.
Source: ADB.

34. The GRM does not affect the right of an affected person to submit their complaints to any agency they wish to; for example, the local village committee, community leaders, the PMO, the ZCG, district and/or county governments, and/or ADB. At any time in the GRM, affected persons may also contact the local courts and/or ADB's East Asia Department. The GRM does not affect public rights under the PRC's Regulations on Letters and Visits (ESMS-Appendix 1), which requires a complaint acceptance mechanism at all levels of government and protects complainants from retaliation. If the complaint is still unresolved after all stages, the affected person and/or PMO may refer to the ADB Accountability Mechanism.²

35. All stages of the GRM are time-bound with maximum periods set for advising, finding, and implementing corrective actions. All complaints and processes are documented and reported to

² See: www.adb.org/accountability-mechanism

ADB through quarterly project progress reports, including internal resettlement and social development monitoring reports and semiannual environmental monitoring reports.

36. **Land use right transfer issues (four stages).** For grievances involving the LURTs, the following steps will be taken:

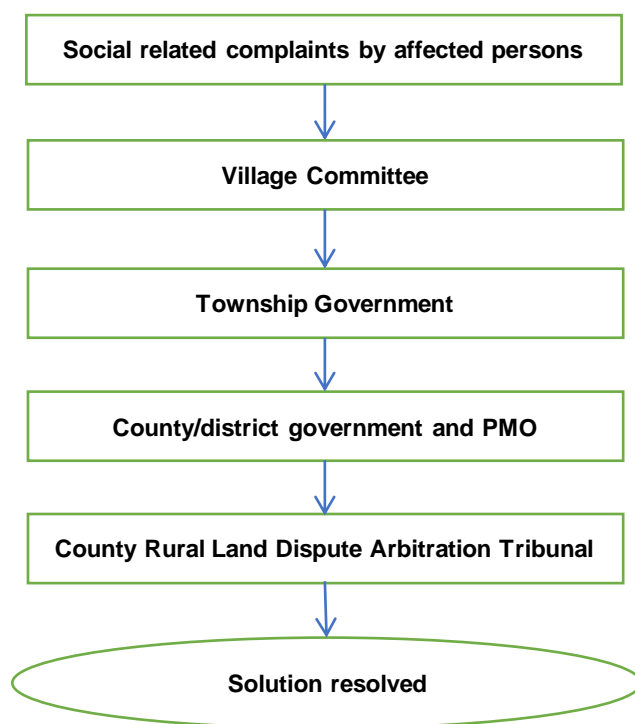
- (i) **Stage 1.** Complaints are submitted to the village committee. In case of an oral appeal, the village committee shall make a written record. The village committee shall decide to resolve the problem within 15 days.
- (ii) **Stage 2.** If the affected person is dissatisfied with Stage 1, they may file an appeal to the township government. The township government shall decide to resolve the problem within 15 days.
- (iii) **Stage 3.** If the affected person is dissatisfied with Stage 2, they may file an appeal to the county and/or district government, who shall resolve the issue within 20 days.
- (iv) **Stage 4.** If the affected person is dissatisfied with Stage 3, they may file for arbitration in the Rural Land Use Rights Transfer Disputes Tribunal for final resolution.

37. At each stage, the receiving agency will report the complaint, and progress resolving it, to the PMO. Relevant agencies will send consolidated reports on the GRM activity to the PMO for semiannual reporting.

38. Based on the PRC's Law on Mediation and Arbitration of Rural Land Contract Disputes, charges for disputes arbitration of rural land contracts are not allowed. Reasonable expenses will be paid by the local government.

39. **Ethnic minority safeguard issues (four stages).** For grievances involving ethnic minorities, the following steps will be taken:

- (v) **Stage 1.** If the affected persons are dissatisfied with the project, they can make either oral or written complaint to the village committee or cultural leaders; and if they use verbal complaints, the community committee or cultural leader should handle and record it. Complaints will be addressed within 15 days.
- (vi) **Stage 2.** If the complainant is not satisfied with the result of the first phase, he/she can appeal to the township government after receiving the result; and the township government should decide within 15 days.
- (vii) **Stage 3.** If the complaint is not satisfied with the result of the second phase, he/she can appeal to the PMO after receiving the result; the PMO should decide within 30 days.
- (viii) **Stage 4.** If the complainant is not satisfied with the results of any above phases, he/she can appeal to the government departments applying for administrative reconsideration after receiving the result.

Figure ESMS-V.2: Grievance Redress Mechanism for Social Safeguards

PMO = Zhaotong City project management office.

VI. CAPACITY BUILDING AND TRAINING

40. The project includes a training program (Table ESMS-VI.1) to build capacity of the EFMC, the PMO, including the environment and social officers; and the YWPCO for efficient implementation of the eco-compensation fund and the ESMS. Most training will occur within the first 2 years of the project. Training will be conducted by the environmental, resettlement, social development, and gender specialists (consultants), (Appendix 2 of the PAM), supported by other consultants.

Table ESMS-VI.1: Five-Year Training Program for Environmental and Social Management System

Trainees	Training	Trainer	Times per Year					Cost (CNY x10,000)
			Year 1	Year 2	Year 3	Year 4	Year 5	
EFMC, PMO, and YWPCO	Maintain and implement the ESMS	Consultants	OJT	tbc	tbc	tbc	tbc	tbc
	Maintain and implement the GRM		OJT	tbc	tbc	tbc	tbc	tbc
	Implement ESMS Steps A–F (screening, design, categorization, impact assessment); and inclusion of safeguards into contracts for the activity (mitigation, monitoring, reporting, the SDAP, the GAP, land transfer)		OJT	OJT	tbc	tbc	tbc	tbc
	ESMS monitoring and reporting—spread-sheet data, reporting to the EFMC; reporting by the PMO to ADB		OJT	2	tbc	tbc	tbc	tbc
	Introduction to environmental and social impact assessment in the waste management and water resources protection		OJT	4	2	tbc	tbc	tbc

Trainees	Training	Trainer	Times per Year					Cost (CNY x10,000)
			Year 1	Year 2	Year 3	Year 4	Year 5	
			OJT	OJT	tbc	tbc	tbc	tbc
	Introduction to best practices for waste management and water resources protection				tbc			In-kind support
	Midterm review of the ESMS – progress, challenges, lessons learned							

ADB = Asian Development Bank, CNY = Chinese yuan, EFMC = eco-compensation fund management committee, ESMS = environmental and social management system, GAP = gender action plan; GRM = grievance redress mechanism, OJT = on the job training, PMO = Zhaotong City project management office, SDAP = social development action plan, tbc = to be confirmed, YWPCO = Yudong Reservoir Water Resources Protection Committee Office.

Source: ADB.

VII. PROJECT ASSURANCES

41. The EFMC, the PMO, and the YWPCO will be subject to project-specific assurances to support efficient and timely project management. Refer to the loan and project agreements for the final wording of the assurances.

ESMS-APPENDIX 1: LEGISLATION AND POLICIES

Table ESMS-A1.1: Laws and Regulations of the People's Republic of China on Environmental and Social Issues Relevant to the Environmental and Social Management System

Laws, Regulations, and Standards	Relevance to Project
Environmental Protection and Planning and Land Use Management	
Environmental Protection Law (2015, amended)	Subprojects avoid any significant environmental impact.
Land Administration Law (2004, amended)	Subprojects comply with provincial, county, and local land use plans, which are made to protect and develop land resources.
Noise Pollution Prevention and Control Law (2018, amended)	Noise during construction and operation of the proposed subprojects to be mitigated or avoided.
Water Pollution Prevention and Control Law (2018, amended)	Water pollution during construction and operation of the proposed subprojects to be mitigated or avoided.
Air Pollution Prevention and Control Law (2018, amended)	Air pollution during construction and operation of the proposed subprojects to be mitigated or avoided.
Solid Waste Pollution Prevention and Control Law (2016, amended)	Solid waste pollution during construction and operation of the proposed subprojects to be mitigated or avoided.
Environmental Impact Assessment	
Environmental Impact Assessment Law (2018, amended)	Overarching law for the EIA, setting out procedures for the EIA and approvals needed before construction.
Management Regulation on Environmental Impact Assessment Categories of Construction Projects (2018)	Defines assessment and reporting requirements for three EIA classes, based on scale, investment level, and environmental sensitivity: comprehensive EIA report; environmental impact table; and environmental impact registration form. See Table ESMS-A1.2. All subprojects are expected to require environmental impact table or lower.
Regulation on Public Participation of Environmental Impact Assessment (2017)	Guideline and requirement for conducting public participation and consultation during the EIA of a project
Provisional Methods of Management of Projects Financed by International Financial Institutions and Foreign Governments (2005)	Project funds are sourced from an international organization (ADB), the provisions of this method apply for aspects of the EIA.
Technical Guideline for Environmental Impact Assessment: General principle (HJ 2.1-2016)	Guideline for conducting the EIA preparation. Provides information on the scope and content of the EIA.
Technical Guideline for Environmental Impact Assessment: Surface Water (HJ/T 2.3-2018)	Guideline for surface water pollution prediction and analysis for projects where wastewater discharge is a potential impact.
Technical Guideline for Environmental Impact Assessment: Atmospheric Environment (HJ2.2-2018)	Guideline for air pollution prediction and analysis for projects where gaseous emissions are a potential impact.
Technical Guideline for Environmental Impact Assessment: Acoustic Environment (HJ2.4-2009)	Guideline for noise level prediction and analysis for impact assessments.
Technical Guideline for Environmental Impact Assessment: Ecological Impact Assessment (HJ19-2011)	Guideline for ecological impact prediction and analysis for impact assessments.
Technical Guideline for Environmental Impact Assessment: Groundwater Environment (HJ 610-2016)	Guideline for groundwater pollution prediction and analysis for impact assessments.
Water	
Water Law (2016)	Regulation and management of water resources.
Environmental Quality Standard for Surface	Assigns a water quality class to waterbodies according

Laws, Regulations, and Standards	Relevance to Project
Water (GB 3838-2002)	to their use. There are five classes, ranging from I (drinking water) to V (industrial use only). Waterbodies in subprojects will be classed to assess the permitted use of the water and discharge of wastewater.
Environmental Quality Standard for Groundwater (GB/T 14848-2017)	Standards for groundwater quality which must be maintained.
Water Pollution Prevention and Control Law (2018, amended)	Enabling legislation for rules and regulations preventing water pollution.
Regulation on Pollution Prevention of Drinking Water Source (2010)	Sets aside areas adjoining drinking water sources to protect water quality. Subprojects should not be within or bordering these zones.
Measures on Monitoring of Pollutant Discharge Outlets Entering Rivers (2015, amended)	Environmental monitoring in the wastewater discharge outlet may be required for the subproject, if necessary.
Integrated Wastewater Discharge Standard (GB 8978-2002)	Requirements for wastewater discharge.
Water Quality Standard for Sewage Discharged into Municipal Sewers (CJ343-2010)	Wastewater should not be discharged to municipal wastewater treatment station if indicators exceed the limits in this standard.
Regulations for Water Extraction Permitting and Collection of Water Resource Fees (2017, amended)	Subprojects need to obtain water resource extraction permission from local water resources bureau before accessing water resources.
Soil	
Water and Soil Conservation Law (2010, amended 2011)	Provisions to combat soil erosion and land degradation in construction and agriculture.
Air	
Air Pollution Prevention and Control Law (2018, amended)	Enabling legislation for rules and regulations preventing air pollution.
Emission Standards for Odor Pollutants (GB 14554-1993)	Limits for odors from enterprises and activities.
Integrated Emission Standard for Air Pollutants (GB 16297-1996)	Limits for air pollutants emission from enterprises and activities.
Technical Guidelines for Fugitive Emission Monitoring of Air Pollutants (HJ/T 55-2000)	Guidance on how to predict and measure air pollutants for the EIAs.
Ambient Air Quality Standard (GB3095-2012)	Standards for ambient air quality of an area (urban, rural, industrial)
Solid Waste	
Solid Waste Pollution Prevention and Control Law (2016, amended)	Requirements for solid waste handling and disposal. To be used for management measures in subprojects.
Classification and Assessment Standards for Municipal Solid Waste (CJJ/T 102-2004)	Solid waste quality and contamination limits for a range of permissible disposal options.
Flora, Fauna, and Cultural Resources	
Wild Animal Protection Law (2018, amended)	Protection of listed fauna and flora. Subprojects must ensure they do not threaten any animals on the lists.
Cultural Relics Protection Law, 2011	Procedures to record, protect any relics found during construction.
Social Development/Safeguards	
Law on Protection of the Rights and Interests of Women (2018, amended)	Protection of employment, welfare, occupational health, and workplace equality of women; equal rights for allocation of farmland and approval of housing sites in rural areas. These rights endure after marriage or divorce.
Decree 431– Regulation on Letters and Visits (2005); Decree 34 – Measures on Environmental Letters and Visits (2006)	Codifies a complaint acceptance mechanism at all levels of government and protects the complainants from retaliation.

Laws, Regulations, and Standards	Relevance to Project
Land	
Land Contract Law for Rural Areas (2019, amended)	Legislative requirements covering all land contract signing.
Law on Arbitration and Dispute over Management of Contracted Rural Land (2009)	Enabling law setting up an arbitration system for disputes in land transfers.
Administration Methods on Rural Land Use Rights Transfer, Ministry of Agriculture, 2005	Land use right transfers to follow this guideline.
Arbitration Rules of Disputes over Management of Contracted Rural Land, Ministry of Agriculture and State Forestry Administration, 2010	Provides rules and procedures for resolving disputes in cases of land use right transfer.
Provincial, county, and local land use plans	Plans to be consulted to ensure that proposed subprojects are not prohibited or constrained in the site locality and do not cause land use conflicts with adjoining uses.

EIA = environmental impact assessment.

Table ESMS-A1.2: Environmental Impact Assessment Requirements in the People's Republic of China

Type of Subproject	Environmental Impact Assessment Report	Environmental Impact Table	Environmental Impact Registration Form
Agricultural reclamation	Not applicable (N/A)	Affecting an environmentally sensitive area	Others
Agricultural base project (including medicinal herb base)	N/A	Affecting an environmentally sensitive area	Others
Economic forest base project	N/A	Involving raw material forest	Others
Park development	Very large-scale and large-scale theme park	Others	City park and botanic garden
Tourism development	Construction of cable car or cableway in environmentally sensitive area; maritime entertainment, sports, and landscape exploitation.	Others	N/A

Source: Directory for the Management of Different Categories of Construction Project Environmental Impact Assessment (2018).

Table ESMS-A1.3: Risk Thresholds for the Different Categories of Environmental Impact Assessment in the People's Republic of China

Project Type	EIA Report (approximately equivalent to ADB's Environment Category A)	EIA Form (approximately equivalent to ADB's Environment Category B)	No EIA (approximately equivalent to ADB's Environment Category C)	Sensitive Area^a
	Pharmaceutical			
Biochemicals/chemicals	All activities	Not applicable (N/A)	N/A	
Only formulate	N/A	All	N/A	
Herb processing	Has extraction process	Others	N/A	
Medi material	N/A	All	N/A	
	Textile and garment			
Fabric manufacture	Has dyeing, finishing, scouring, un-gluing, or silk reeling processes	Others	Knitting, weaving	
Garment manufacture	Has wet printing or dyeing, or washing processes	Others	New factory >1 million piece/year	

Project Type	EIA Report (approximately equivalent to ADB's Environment Category A)	EIA Form (approximately equivalent to ADB's Environment Category B)	No EIA (approximately equivalent to ADB's Environment Category C)	Sensitive Area^a
Husbandry				
Number of farm livestock ^b	>3,000 pigs; or >600 beef cattle, >500 cows; or >5,000 sheep; or >100,000 poultry; or in sensitive areas	Others	N/A	(1), (3), or eutrophicated waters under (2)
Livestock farms	>5,000 pigs or equivalent, or in sensitive areas	NA	<5,000 pigs	As above
Agroprocessing				
Slaughtering	>100,000 pigs/year, >10000 cattle, >150,000 sheep, or >10 million poultry	Others	N/A	
Hide processing	Tanning, curing	Others	N/A	
Dairy	Processing >200,000 tons/year (about 700 tons/day)	Others	N/A	
Vegetable oil production	>300,000 tons/year press or >100,000 tons/year refinery	Others	Mix and bottling	
Other agro-production	Monosodium glutamate, lemon acids, starch, lysine	others	Mix and bottling	
Juice, etc. production	Extract raw juice from fruits and vegetable	Others	N/A	
Garment	dyeing, wet printing, rinsing	>1 million pieces/year	N/A	
Grain, folder processing	>250,000 tons/year or has fermentation	Others	N/A	
Water and sanitation				
Industrial WWTP	All new or expansion of centralized industrial wastewater treatment	Others	N/A	
Sewage WWTP	All new or expansion to and above 100,000 m ³ /day	Others	N/A	
Energy sector				
Thermal power	All including CHP except gas-fired	gas-fired	N/A	
Biomass CHP	From garbage and sludge	others	N/A	
Hydropower	Installed capacity >1 megawatt, pumped storage, involve sensitive areas	others	N/A	(1), (2)
Heat only	Coal/oil-fired >65 steam tons/hour	others	N/A	

ADB = Asian Development Bank, CHP = combined heat and power, EIA = environmental impact assessment, m³ = cubic meter, N/A = not applicable, WWTP = wastewater treatment plant.

^a Sensitive areas include (i) natural reserve, scenic area, world natural and cultural heritage sites, and drinking water protection zone; (ii) basic farmland, basic grassland, forest park, geo-park, key wetland, natural forest, natural habitats for rare and endangered wild species, natural spawning, feeding, wintering and migrating ground for key aquatic species, natural fishing ground, water scarcity area, key area to control water and soil erosion, closure area to combat desertification, closed or semi-closed sea area, and eutrophication waters; and (iii) area dominated by residential, office, educational, academic, and health facilities or functions, designated cultural relics, or protected area with special historical, cultural, scientific, and ethnic significance.

^b If the current thresholds are considered by the executing agency and ADB to be inadequate for the project categorization purposes, this will be discussed; and the environmental and social management system procedures will be modified, as needed.

Source: ADB.

ESMS-APPENDIX 2: ASIAN DEVELOPMENT BANK'S LIST OF PROHIBITED INVESTMENT ACTIVITIES

The use of Asian Development Bank (ADB) funds is strictly prohibited for the following activities (ADB Safeguard Policy Statement, 2009):

1. Production or activities involving harmful or exploitative forms of forced labor¹ or child labor.²
2. Production of or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements or subject to international phase-outs or bans, such as (i) pharmaceuticals,³ pesticides, and herbicides;⁴ (ii) ozone-depleting substances;⁵ (iii) polychlorinated biphenyls⁶ and other hazardous chemicals;⁷ (iv) wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora;⁸ and (v) transboundary trade in waste or waste products.⁹
3. Production of or trade in weapons and munitions, including paramilitary materials.
4. Production of or trade in alcoholic beverages, excluding beer and wine.¹⁰
5. Production of or trade in tobacco.
6. Gambling, casinos, and equivalent enterprises.
7. Production of or trade in radioactive materials, including nuclear reactors and components thereof.¹¹
8. Production of, trade in, or use of unbonded asbestos fibers.¹² Note: See project-specific assurance (Section VII of the environmental and social management system) for use of asbestos.
9. Commercial logging operations or the purchase of logging equipment for use in primary tropical moist forests or old-growth forests.
10. Marine and coastal fishing practices, such as large-scale pelagic drift net fishing and fine mesh net fishing, harmful to vulnerable and protected species in large numbers and damaging to marine biodiversity and habitats.

¹ All work or services not voluntarily performed, i.e., extracted from individuals under threat of force or penalty.

² Employment of children whose age is below the host country's statutory minimum age of employment, or in contravention of the International Labor Organization Convention No. 138 "Minimum Age Convention" (www.ilo.org).

³ A list of pharmaceutical products subject to phaseouts or bans is available at <http://www.who.int>.

⁴ A list of pesticides and herbicides subject to phaseouts or bans is available at <http://www.pic.int>.

⁵ A list of the chemical compounds that react with and deplete stratospheric ozone, resulting in the widely publicized ozone holes, is listed in the Montreal Protocol, together with target reduction and phaseout dates. Information is available at <http://www.unep.org/ozone/montreal.shtml>.

⁶ A group of highly toxic chemicals. Likely to be found in oil-filled electrical transformers, capacitors, and switchgear dating from 1950 to 1985.

⁷ A list of hazardous chemicals is available at <http://www.pic.int>.

⁸ A list is available at <http://www.cites.org>.

⁹ As defined by the Basel Convention; see <http://www.basel.int>.

¹⁰ Does not apply to project sponsors who are not "substantially involved" in these activities, i.e., the activity concerned is ancillary to a project sponsor's primary operations.

¹¹ Does not apply to the purchase of medical equipment, quality control (measurement) equipment, and any equipment for which ADB considers the radioactive source to be trivial and adequately shielded.

¹² Does not apply to purchase and use of bonded asbestos cement sheeting where the asbestos content is <20%.

ESMS-APPENDIX 3: WORKBOOK FOR SCREENING AND CATEGORIZING ACTIVITIES TO BE FINANCED FROM ECO-COMPENSATION FUND

This workbook comprises one summary information sheet and five technical worksheets for environmental and social screening. The summary worksheet is to be filled out by the applicant for the use of the eco-compensation fund. The technical worksheets are to be filled out by the environment and social officers of the project management office and staff of the eco-compensation fund management committee (EFMC) in consultation with the applicant.

The workbook can be printed out and carried into the field by the environment and social officers of the project management office and staff of the EFMC, for site assessments and discussions with applicants. The workbook is retained by the EFMC in their records for each application.

Each activity to be financed from the eco-compensation fund should be recorded in a separate workbook. Complete the details below.

SUMMARY INFORMATION SHEET

PART 1 – To be filled in by applicant for the use of the eco-compensation fund

BASIC INFORMATION		
Name of applicant:		
Year started/registered:	{Applicable for private companies only}	
Location/full address:		
Nature and scope of business: (e.g., sales, production, research, and development)		
Designed production capacity: (Per year and/or per day. If not applicable, explain here)	{Applicable only if the applicant produces something}	
Actual production capacity or scale: (Per year and/or per day. If any difference with the designed capacity, explain here)	{Applicable only if the applicant produces something}	
Main production process(es): (Provide simple flowchart to show main input of materials, water, energy [heat, steam, or fuels], output of intermediate and final products, and wastes [gaseous, liquid, or solid])	{Applicable only if the applicant produces something}	
Main product(s): Briefly describe name, main usage, chemical, or biochemical composition	{Applicable only if the applicant produces something}	
Profile of employees	Male	
	Female	
	Total	
Other information (Provide any other information as relevant)		
PROPOSED APPLICATION		
Location of proposed activity: (Include: site name and full address; village; county; geographic coordinates of site)		
Amount of fund requested (CNY):		
Intended use of the fund:		

Area of production base (mu): (Write “not applicable” if the application does not involve a specific area of land)	{Not applicable if the fund is not used to produce anything}	
Designed (production) capacity: (Per year and/or per day. If not applicable, explain here)	{Not applicable if the fund is not used to produce anything}	
Technical process(es): (If applicable, provide simple flowchart to show main input of materials, water, energy [heat, steam, or fuels], output of intermediate and final products.)	{Not applicable if the fund is not used to produce anything}	
Main product(s) of sale or research and development: (Briefly describe name, main usage, chemical or biochemical composition)	{Not applicable if the fund is not used to produce anything}	
List the types of wastes the activity will generate, as relevant: (Estimate the amounts per year or per day if possible).	Gaseous emissions	
	Wastewater	
	Solid waste	
	Hazardous waste	
	Noise	
Planned method of waste management and disposal	Gaseous emissions	
	Wastewater	
	Solid waste	
	Hazardous waste	
Number of beneficiaries:	Farmer households	
	Farmers	
	Poverty households	
	Poverty people	
	Ethnic minority households	
	Ethnic minority people	
	Names of ethnic minority groups	
Other relevant information (Provide any other information as relevant)		
	Name and Signature of Fund Applicant:	
Date:		

PART 2 – To be filled in by the Eco-Compensation Fund Management Committee

Existing Business and Facilities (if applicable) of the Applicant	
Is the existing business and facilities of the applicant involved in activities and/or sectors which are prohibited, phased out, or discouraged by national, provincial, or local policy?	
Is the existing business and facilities of the applicant involved in activities and/or sectors which are prohibited, phased out, or discouraged according to the EFMC internal criteria?	
What environmental clearances or permits does the applicant have for the existing business and facilities (e.g., environmental impact assessments)? When were they obtained?	
Validity period and the issuing authority of environment related clearance, approval, and permits	Validity Period: Authority:

Activity for which financing is Requested	
What environmental clearance and permits are required domestically?	
Status of such clearance /permit:	Not started yet <input type="checkbox"/> In process <input type="checkbox"/> Received <input type="checkbox"/>
If received, provide validity and issuing authority	Validity period: Authority:
What environmental documents were prepared for domestic clearance? Has the EFMC received a copy?	
Other relevant information	
Name and Signature of the EFMC staff and/or the PMO environment or social officer	
Date:	

EFMC = eco-compensation fund management committee, PMO = project management office.

WORKSHEET 1: Rapid Environmental Assessment Checklist

1. Answer the first question ("Will it happen?") assuming that no mitigation measures will be conducted. The purpose is to identify potential impacts.
2. If the answer is "Yes" then fill out the next two columns, "is it irreversible?" and "can it be minimized?"
3. If the answer is "No" then place a "C" in the final column.
4. The first three columns ("Will it happen?", "Is it irreversible?", "Can it be minimized?") should be filled out by discussions with the applicant and a site inspection.
5. The final column refers to the ADB categories "A", "B", or "C" for environmental impacts. They are defined below. Use these definitions to decide on the category.

Category A. Activities likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. Impacts may extend beyond the sites for the activities. Environmental impact assessment, including environmental management plan is required. Examples: conversion of wetlands; activities in or next to protected areas; large-scale pollution of water resources.

Category B. Potential adverse environmental impacts are site-specific, few if any are irreversible. In most cases, mitigation measures can be designed more readily than for Category A activities. Initial environmental examination, including environmental management plan, is required. Examples: crop farming on land already used for the same crop type; farming which does not result in increased pressure on water resources.

Category C. Activities likely to have minimal or no adverse environmental impacts. Environmental impact assessment or initial environmental examination not required. Environmental implications need to be reviewed. Examples: construction of small offices, financing, training, or planning activities.

Screening and Impact Questions	Will it happen? Y/N	If YES		ADB Category
		Is it irreversible? Y/N	Can it be minimized? Y/N	
Siting				
Is the activity in or next to (i) a cultural heritage site, (ii) a protected area, (iii) wetland, or (iv) special area for protecting biodiversity? If "nearby" any of these sites, state the distance (km) to the site boundary				
Is siting of the activity likely to be affected by climate conditions, including extreme weather-related events such as floods, droughts, storms, landslides?				
Potential Environmental Impacts				
Will the activity cause...				
• Damage to historical and/or cultural areas or physical cultural resources?				
• disturbance to precious ecology (e.g., sensitive, or protected areas)?				

Screening and Impact Questions	Will it happen? Y/N	If YES		ADB Category
		Is it irreversible? Y/N	Can it be minimized? Y/N	
• alteration of surface water hydrology of waterways resulting in increased sediment in streams affected by increased soil erosion at construction site?				
• deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?				
• increased air pollution due to project construction and operation?				
• noise and vibration due to project construction or operation?				
• generation of solid waste and/or hazardous waste?				
• use of chemicals?				
• generation of wastewater during construction or operation?				
In land leveling and other earthworks as necessary, will there be				
• construction dust and erosion?				
• loss of micro-habitat for local biodiversity?				
• changes to local drainage?				
In the upgrade or establishment of irrigation system, including wells, canals, pipes, and installation of quota irrigation systems; will there be				
• unsustainable use of local water resources?				
• water use conflicts?				
• cumulative impacts on limited water resources?				
For construction of livestock pens and other livestock structures, will there be problems with				
• location (too close to residences and/or waterways)?				
• construction impacts – dust, noise?				
• operational impacts – noise, odor				
In electricity use for machinery, greenhouses, pumps, ventilation; will there be				
• GHG emissions from electricity use?				
• GHG emissions and flue gas emissions from on-site electricity generator?				
In the establishment of on-site wells to process water and drinking water, will there be				
• unsustainable use of local water resources?				
• water use conflicts?				
• cumulative impacts on limited water resources?				
For handling, transport, and storage of materials and inputs of seeds, seedlings, fertilizers, and chemicals; will there be				
• application of chemicals and fertilizer not carefully managed - increased volumes enter soil and water?				
• noise, dust, pollution from haulage, handling, and storage of materials?				
• extensive residue of plastic mulch material in soil and water?				

Screening and Impact Questions	Will it happen? Y/N	If YES		ADB Category
		Is it irreversible? Y/N	Can it be minimized? Y/N	
• loss of crop diversity and self-sustaining household plots?				
In the collection, treatment, disposal, and/or reuse processes built as part of the facilities; will there be				
• pollution of land and rivers from wastewater disposal or via land application as liquid fertilizer?				

ADB = Asian Development Bank, GHG = greenhouse gas, N = no, Y = yes.

Source: ADB.

Overall Conclusion on Environment Category (circle one):

A

B

C

Reason for conclusion:

Notes

WORKSHEETS 2 – 4: Land Acquisition, Involuntary Resettlement, Land Use Rights, Ethnic Minorities

Does the activity to be financed from the eco-compensation fund involve physical changes to the land or changes to land user rights (land adjustment within the group or formal land use rights transfer to a third party)? If no, skip to Worksheets 4 and 5. If yes, proceed to Worksheets 2, 3, and 4.

Yes ☐ No ☐

What is the current status of land ownership and land use rights of the land to be used?

Ownership: state-owned farm ☐; collective land ☐

User rights: enterprise ☐; cooperative ☐; village and/or group ☐; or household ☐

WORKSHEET 2: Land Acquisition and Involuntary Resettlement Checklist

Involuntary Resettlement Issues from Past Acquisition or Existing Facilities

Involuntary Issues	Yes ^a	If “Yes”, Give Information	No
Are there any involuntary resettlement issues from past land acquisition?			
Are there any involuntary resettlement issues from existing facilities?			

^a If “Yes”, such activity should be excluded, e.g., if there are outstanding land acquisition and/or resettlement issues that would present legacy issues or risks to the project.

New Land Acquisition under Activity to be Financed from Eco-Compensation Fund

Probable Involuntary Resettlement Effects	Yes	If “Yes”, give number of affected persons and households	No
Will there be land acquisition for the activity? ^a			
Will there be loss of land use rights due to change in land use resulting from the activity (e.g., expanded village road)?			
Will there be residential house demolition causing loss of shelter to people due to land acquisition or construction activities?			
Will there be any temporary occupation of land that affects the land, housing, assets, or livelihoods and/or business of people?			
Will there be losses of crops, trees, graves, and fixed assets?			
Will people lose access to natural resources, communal facilities, and services?			
If land use is changed, will it have an adverse impact on social and economic activities?			
Will access to land and resources owned communally or by the state be restricted?			

^a Check if there will be land acquisition per local development planning (especially urban development planning).

Overall Conclusion on Involuntary Resettlement Category (circle one):

A

B

C

Note: An activity to be approved for Output 3 should be category C and any due diligence for prior land acquisition should confirm there are no remaining issues.

Reason for conclusion:

Notes:

WORKSHEET 3: Land Use Rights Transfer Impact Checklist

Will the activity to be financed from the eco-compensation fund require land use rights transfer (LURT) or is there a pre-existing LURT agreement? If yes, complete the forms below. If no, leave the forms blank.

Types of Activity ^a	Cooperatives Involved	Enterprises Involved	Production Bases Involved	HHs Involved	Farmland Area (mu)
Total					

HH = household.

^a Cropping, animal processing, etc.

Land Use Rights Transfer Agreement

New LURT Agreement	Yes	No	If No, Explain
Has the agreement been prepared in accordance with the LURT Framework in ESMS-Appendix 5?			
Has third party due diligence been conducted? If yes, give results.			
Has the agreement been endorsed by the Township Agriculture Station or higher authority?			
Has the agreement been signed by all affected households?			
Has the agreement been signed by at least 70% of spouses?			

Pre-Existing LURT Agreement	Yes	No	If No, Explain
Was the agreement prepared in accordance with the LURT Framework in ESMS-Appendix 5?			
Has third party due diligence been conducted? If yes, give results.			
Was the agreement endorsed by the Township Agriculture Station or higher authority?			
Has the agreement been signed by all affected households?			
Has the agreement been signed by at least 70% of spouses?			
Are there any outstanding issues? If yes, give details.			

ESMS = environmental and social management system, LURT = land use right transfer.

Overall Conclusion on the Land Use Rights Transfer Agreement

Agreement is in place and acceptable (in accordance with the LURT Framework) ☐

Agreement requires further due diligence ☐

Agreement requires resolution of outstanding issues ☐

Agreement is not acceptable (not in accordance with the LURT Framework) ☐

Reason for conclusion:

Notes:

WORKSHEET 4: Ethnic Minorities Impact Checklist

Will the activity to be financed from the eco-compensation fund involve any ethnic minority communities? If yes, complete the forms below. If no, leave the forms blank.

Name of ethnic minority:

Include consideration of (i) magnitude of impact (including customary rights for use and access to land and/or resources, socioeconomic status, cultural and communal integrity, health, education, livelihoods, social security, indigenous knowledge); (ii) the vulnerability of the affected community.

Ethnic Minority Issues from Past Activity or Existing Facilities

Involuntary Issues	Yes*	If "Yes", Give Information	No
Are there any ethnic minority issues from past activities?			
Are there any ethnic minority issues from existing facilities?			

*If "Yes", such activity should be excluded, e.g., if there are outstanding ethnic minority community-related issues that would present legacy issues or risks to the project.

New Impacts to Ethnic Minority Community under Activity to be Financed from Eco-Compensation Fund

Potential Impacts to Ethnic Minorities	Yes/No	If Yes, Give Information about Affected Ethnic Minority Community
Will the activity directly or indirectly benefit or target the EM community?		
Will the activity affect the livelihood systems of the EM community? (e.g., food production, natural resources management, crafts, trade, employment)		
Is there commercial development of the cultural resources and knowledge of the EM?		
Is there commercial development of natural resources (e.g., forests, river, reservoir) in customary lands under use that would impact the livelihoods or cultural, ceremonial, and/or spiritual uses by the EMs?		
Will the activity involve a pre-existing or new land use rights transfer agreement that are owned by the EM communities?		

Proposed Activities	No. of Villages	No. of EM Communities	EM Population	Beneficial and/or Adverse Impacts
1.				
2.				
3.				
4.				
5.				

EM = ethnic minority, No. = number.

Overall Conclusion on Indigenous Peoples Category (circle one):**A****B****C**

Note: The overall project should be categorized based on due diligence during the project preparation. Category A activities are not expected. Only Category B or C activities are expected.

Reason for conclusion:**Notes:**

WORKSHEET 5: Types of Activities Eco-compensation Fund Aims to Support

This worksheet aims to improve the technical design and operation of activities to be financed from the eco-compensation fund. The eco-compensation fund management committee will encourage and favor the following activities: (i) wastewater management, solid waste management, activities for pilot eco-villages, operation and maintenance of the constructed wetlands, compensation for farmland-to-forest conversion, and promotion of low-emission agriculture under Output 1 of the project; (ii) operation of the river protection model established under Output 2 of the project; (iii) implementation of the horizontal eco-compensation mechanisms under Output 3 of the project; and (iv) management of the eco-compensation fund.

Use the worksheet to identify which features below are most suitable for the activities. Instruct the applicant to work with personnel of the eco-compensation fund management committee and environment and social officers of the project management office to include these as relevant in the design of the activities.

Type of Activities	Details
Output 1: Water pollution sources in the Sayu River Basin reduced	
Wastewater management	- O&M of wastewater treatment plant and facilities constructed under the project
Solid waste management	- Garbage collection and O&M of garbage pyrolysis facilities constructed under the project
Activities for pilot eco-villages	- Payments to designated cleaning teams and designated environmental supervision groups - Educational subsidies to help outstanding students effectively continue their studies and provide rewards to outstanding middle school students to help them attend high-quality schools - Training on garbage classification, recycling, reduction of resource use and waste stream - Education at schools to promote garbage classification, recycling, reduction of resource use and waste stream
O&M of constructed wetlands	- O&M of artificial wetlands constructed under the project
Compensation for farmland-to-forest conversion	- Compensation for farmland-to-ecological forest conversion and compensation for farmland-to-perennial herb area conversion
Promotion of low-emission agriculture	- Training and education of farmers for reduction of fertilizer and pesticide - Subsidies to farmers to offset costs of more expensive high-efficiency and environment-friendly fertilizers - Demonstration of special and slow-release fertilizers - Experimental tests of disease-resilient crops; non-chemical physical pest control measures; new low-toxicity organic pesticides; and biological control measures, including subsidies to farmers who allow some portion of their fields to serve as the experimental sites - Experimental cropping to demonstrate a better use of climatic, soil, and light conditions to reduce fertilizer and improve crop resiliency to pest outbreaks and extreme climate conditions
Output 2: Water resources in the Sayu River Basin protected from pollution	
Operation of the river protection model	- Payments to river wardens to patrol rivers
Output 3: Eco-compensation mechanism for the Sayu River Basin established	
Implementation of the horizontal eco-compensation mechanisms	- Water quality monitoring at three water quality monitoring stations constructed under Output 2 of the project to judge whether (or not) the water quality targets set in the agreements were achieved - Rewards based on achieved water quality
Management of the eco-compensation fund	
Management of eco-compensation fund	- Payments to the YWPCO to support its management of the eco-compensation fund

O&M = operation and maintenance, YWPCO = Yudong Reservoir Water Resources Protection Committee Office.

ESMS-APPENDIX 4: ENVIRONMENTAL SITE INSPECTION CHECKLIST

Note: This form is designed for use by the environment officer of the project management office and staff of the eco-compensation fund management committee during site inspections and may not be exhaustive. Modifications and additions may be necessary to suit individual subproject activities and to address any specific environmental issues.

Location: _____
 Inspection Date: _____
 Inspection Time: _____
 Inspection by: _____

Inspection Item	Yes	No	N/A	Remarks (i.e., problem observed, possible cause of problem, and/or proposed corrective and/or preventative actions)
1. Has contractor appointed a construction supervisor and is the supervisor on-site?				
2. Is information pertaining to construction disclosed at construction site (construction period, contractor information, etc.)?				
3. Are chemicals and/or hazardous products and waste stored on impermeable surfaces in secure, covered areas?				
4. Is there evidence of oil spillage?				
5. Are chemicals stored and labeled properly?				
6. Is construction equipment well maintained? (any black smoke observed)				
7. Is there evidence of excessive dust generation?				
8. Are there enclosures around the main dust-generating activities?				
9. Does contractor regularly consult with residents to identify concerns?				
10. Is there evidence of excessive noise? If yes, describe location and equipment.				
11. Any noise mitigation measures adopted (e.g., use noise barrier and/or enclosure)?				
12. Is construction wastewater and domestic wastewater discharged to sewer systems (if possible), or are on-site treatment facilities (e.g., septic tank, portable latrine) provided?				
13. Is there any wastewater discharged to soil or surface water?				
14. Is the site kept clean and tidy? (e.g., litter free, good housekeeping)				
15. Are separated labeled containers and/or areas provided for facilitating recycling and waste segregation?				

Inspection Item	Yes	No	N/A	Remarks (i.e., problem observed, possible cause of problem, and/or proposed corrective and/or preventative actions)
16. Are construction wastes and/or recyclable wastes and general refuse removed off site regularly?				
17. Have hazardous wastes been identified (such as asbestos, polychlorinated biphenyl)?				
18. Is safe supply of clean water and an adequate number of latrines provided for workers?				
19. Is personal protection equipment provided for workers?				
20. Are clear information and warning signs placed at construction sites?				
21. Are construction sites secure to discourage access?				
22. Are fire extinguishers and/or fighting facilities properly maintained and not expired? Escape not blocked and/or obstructed?				
23. Is there any evidence of damage to vegetation, habitats, or streams?				
24. Are disturbed areas properly re-vegetated after completion of works?				
25. Any other problems identified or observations made?				

N/A = not applicable.

 Date / Name and Signature

ESMS-APPENDIX 5: LAND USE RIGHTS TRANSFER FRAMEWORK

A. Main Principles

1. This land use rights transfer (LURT) framework aims to help the eco-compensation fund management committee implement the eco-compensation fund and qualified grantees to mitigate, monitor, and report potential negative impacts caused by the LURT. The LURT framework guiding principles are below.

- (i) Equality, voluntary, legal procedure, and fair compensation. Equality means both of parties have equal legal status. Voluntary means the transfer of land contracting management right must be completely voluntary for both parties, and one party shall not force another party to transfer or accept transfer of land. Legal procedure means that the LURT must be concluded per legal procedure with legal agreement. Fair compensation means the transferred land shall be compensated at negotiated market price.
- (ii) Unchanged ownership and agricultural use of transferred land. The LURT means transferring use right, not ownership; and therefore, ownership of transferred land shall remain unchanged. Yet, future users of transferred land shall not change the agricultural land use nature, i.e., shall not convert transferred land for non-agricultural uses.
- (iii) **Priority to fellow-community members.** Under the same conditions, priority shall be given to members of the collective economic organization (community) to obtain land use rights through transfer.
- (iv) **Government's direction and administration.** Department of agriculture of county government shall direct and administrate legal transfer of rural land.
- (v) **Conflict resolution through grievance redress mechanism.** The grievance redress system of the city, district, and/or county in the project area shall be used to resolute complaints and conflicts, if any.

B. Legal Framework

2. All subprojects must comply with the People's Republic of China (PRC) Rural Land Contract Law and Rural Land Management Right Transfer Management Method, other relevant policies of the Province and local governments, and the Asian Development Bank's (ADB) good practice on voluntary land use agreements. Key laws and policies are as follows.

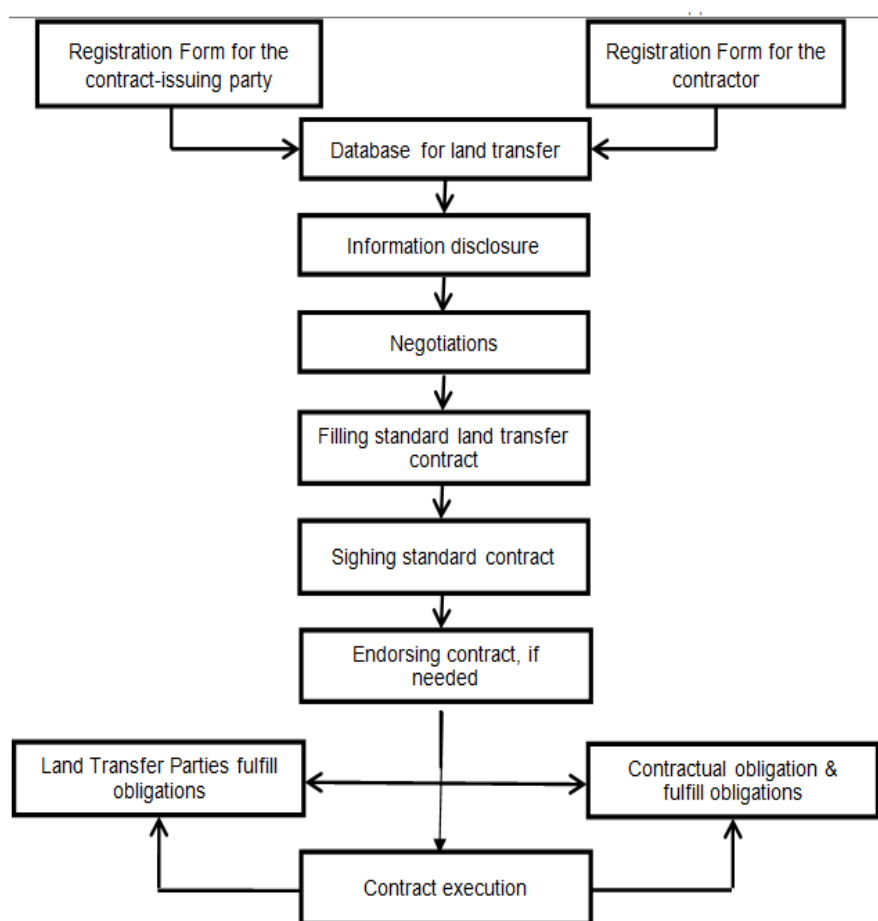
- (i) Law of the PRC on Land Contract in Rural Areas – no change of collective ownership and no change of agricultural land use (not allowed to convert farmland into construction land for establishment of permanent structures).
- (ii) Administration Methods on Rural Land Use Rights Transfer, Ministry of Agriculture of the PRC and relevant regulations of the Yunnan Province and Project district and/or county governments – the LURT duration without the land contract period, negotiated settlements between transferor and transferee, the LURT transfer per legal procedures, standard contract with endorsement by a third party if transferor and transferee feel necessary, official registration and documentation for LURT; and if necessary, endorsement of the contracts by the township agricultural station.

- (iii) The PRC's Law on the Mediation and Arbitration of Rural Land Contract Disputes, and relevant implementation methods of Yunnan provincial and Project district and/or county governments – mediation and arbitration of disputes per a bottom-up grievance redress mechanism (GRM).
 - (iv) ADB's Safeguard Policy Statement (2009) – requirements on involuntary resettlement does not apply to the LURT. The good practice on voluntary agreements include meaningful consultations, negotiated agreements, establishment and functioning of a GRM, record-keeping, and external monitoring.
3. In addition, the best practices in the project area also have good applications for the LURT under the project. Such practices include
- (i) the LURT period of 5–10 years, within the land contraction period (1998–2028);
 - (ii) the LURT rate (or land rental rate) calculated in equivalent output value of grain (wheat, rice), and this protects transferees from price fluctuations; and
 - (iii) endorsement of the LURT contract by the township agricultural station.

C. Legal Procedures of Land Use Rights Transfer

4. Legal procedures are as follows (also the following chart):
- (i) **Information collection.** Farmers with intention to transfer land present the details of the land, like location, area, usage, and reference price to village committee, which will then report to the township agricultural station. They can also entrust the contracted or intermediary organizations to transfer their land; and the letter of attorney will be issued by land transferee, illustrating the entrusted matters, authority, and deadlines, etc., with the signature of the principal.
 - (ii) **Information disclosure.** Township agricultural station, after collecting data, will sort out information about the LURT of different villages and establish a database. The sorted information will be disclosed timely by means of network, radio, newspapers, board, electronic display, etc. The township agricultural station will also report to the county (district) agriculture bureau for updating the LURT databases.
 - (iii) **Negotiation between transferor and transferee.** With the arrangement of township agricultural station, both sides negotiate about the LURT conditions and price based on the principle of equality, voluntariness, and mutual benefiting.
 - (iv) **Signing the land use right transfer contract.** When both parties agree on conditions and price, township agricultural station provides 4–5 copies of a standard contract (the fifth copy for endorsement, if needed), for both parties to sign. Township agricultural station also endorses the contract.
 - (v) **Endorsing the land use right transfer contract.** The township agricultural station endorses the contract.

- (vi) **Registration for the land use right transfer.** Township agricultural station registers the LURT information timely and exactly and submits the relevant materials to the county agriculture bureau for documentation.
- (vii) **Documentation.** County agricultural bureau documents all relevant materials for the LURT.
- (viii) **Supervising contract implementation.** Both parties should perform the contract positively, and township agricultural station supervises the contract execution. In case of conflicts or disputes, the township station will timely report to the county station; and the latter will inform relevant agencies synchronously.



Land Use Rights Transfer Procedure Chart

D. Institutional Arrangement and Responsibility

5. According to relevant laws and regulations, county agriculture bureau and township agricultural stations should manage and guide the rural LURT in their administrative areas.

- (i) **Responsibilities of municipal agriculture bureau.** (a) publicity rural LURT policies; (b) direct the LURT legally and orderly; (c) guide disputes arbitration and resolution; (d) strengthen and standardize the rural LURT; and (e) propose solutions to problems in the LURT, and develop a new mechanism for the LURT.

- (ii) **Responsibilities of county agriculture bureau.** (a) direct rural LURT and contracting; (b) set up a service center for the LURT, and establish information network platform on line trading and/or open trading of land to be transferred; (c) accept, manage, and guide the application from rural LURT agencies; (d) settle the disputes; and (e) provide consultation services for the LURT policies.
- (iii) **Responsibilities of township agricultural station.** (a) information collection, analysis, and disclosure, the LURT can be conducted by county or township; (b) providing a standard contract for parties who have reached agreements on contract conditions and terms, and assisting them to sign contract signing; (c) functioning as a third party to endorse the signed contract, if requested by the LURT or and transferee; (d) formulating a system for registering the rural LURT, and record the relevant information timely and exactly; (e) documenting the LURT materials; (f) investigating and rectify illegal LURT; (g) settling disputes about rural LURT; (h) guide and administrate the LURT legally; and (i) provide consultancy services.
- (iv) **Responsibilities of village committee.** (a) information collection and classification on the LURT to be reported to township agricultural station; and (b) assisting township in settling disputes.
- (v) **Responsibilities of district and/or county PMO.** (a) supervising contract execution; and (b) participating in conflict and/or dispute resolution at county level, if not resolved at township level.

E. Land Use Rights Transfer Contract

6. The LURT contract shall include the following clauses: (a) names and domiciles of two parties; (b) location, borders, area, and quality of the land for transferring; (c) term of transfer and dates of beginning and completion; (d) ways of transfer; (e) usage of land; (f) rights and obligations of two parties; (g) the LURT expense and method of payment; (h) handling of appurtenance and relevant facilities after expiry of contract; (i) liabilities for breach of the contract; (j) method of conflict resolution; (k) other clause that both parties thought necessary; (l) stamping of endorsing agency; and (m) date of contract conclusion.

7. Contract used in the project, as well as in Yunnan Province, is normative, which is prepared by the Yunnan Provincial Department of Agriculture and Animal Husbandry.

F. Measures to Safeguard Interests of Contract Parties

- 8. The following measures will be taken to safeguard the interests of contract parties:
 - (i) In case of severe damage of transferred land due to natural disasters or force majeure during the contract term, both parties can terminate or change the contract through negotiation; and the land shall be returned to the original users for cultivation. When there are specific contract provisions on severe damage of land, the provisions prevail.
 - (ii) Contract agreement regarding policy subsidies to farmers for grain production and production masteries.
 - (iii) At least 70% of the land leasing contracts will be signed by both husband and wife in case of involving individual households.

- (iv) Contract endorsement by township per request of contract parties, free of charge.
- (v) According to the PRC's Rural Land Contract Law and Rural Land Management Right Transfer Management Method and other relevant LURT laws and regulations of the Yunnan Province and districts and/or counties, the LURT duration shall be negotiated equally by both parties; but within the limit of the rural land contract.
- (vi) The LURT rate will be ensured according to land type, feasibility, grade, and condition of referential corps; or even the price of LURT in nearby villages. Taking farmer's interest into consideration, both transferor and transferee should set a time to renegotiate land price in case of the LURT for over 5 years. It is recommended to adjust the rate after 5 years.

G. Grievance Redress Mechanism for Social Safeguards

9. Where the LURT contract is based on negotiations and mutual agreement, complicated disputes are unlikely to occur. However, there might be some unexpected issues during and after land being transferred. According to Law of the PRC on the Mediation and Arbitration of Rural Land Contract Disputes, the project has set up a transparent and efficient grievance redress procedure to settle such disputes and defaults after the LURT. The GRM for social safeguards is described in Section V of the environmental and social management system.

ESMS-APPENDIX 6: ETHNIC MINORITY DEVELOPMENT PLAN (SUMMARY)¹

A. Introduction

1. This ethnic minority development plan (EMDP) has been prepared to ensure that ethnic minority people in the project area (Hui, Miao, and Yi) are able to participate in and benefit directly from the Yunnan Sayu River Basin Rural Water Pollution Management and Eco-compensation Demonstration Project, and that any adverse impacts that might affect them are either avoided or mitigated. The EMDP is based on relevant laws and regulations of the People's Republic of China (PRC), and in accordance with the Asian Development Bank's (ADB) Safeguard Policy Statement (2009).

2. The Government of the PRC has requested ADB to provide financial support for the proposed project. The objective of the project is to reduce pollutant emission in the upper reaches of the Sayu River Basin; and improve eco-environment in the basin through collection and treatment of rural wastewater and solid waste, control of nonpoint source pollution due to agricultural activities; establishment of pilot eco-villages; and a long term eco-compensation mechanism; as well as enhancing environmental protection education and raising public awareness in the project area. A total of 17 ethnic minority natural villages in 10 administrative villages are involved in the project. Two ethnic minority natural villages are included in the construction of pilot eco-villages: a Yi village and a Miao village. The EMDP is developed, focusing on the potential impact on the ethnic minority natural villages.

B. Project Description

3. The project has the following four major outputs or components: (i) Output 1: wastewater management and pollution control in the Sayu River Basin strengthened, including (a) waste management; (b) solid waste management; (c) pilot eco-villages to reduce emission; (d) wetlands construction to reduce nonpoint source pollution; (e) establishment of quantifiable soil and water conservation model; and (f) promotion of low-emission agriculture; (ii) Output 2: water resources management in the Sayu River improved, including (a) establishment of river protection model; and (b) establishment of smart water integrated management platform; (iii) Output 3: eco-compensation mechanism for the Sayu River Basin established; and (iv) Output 4: education, capacity, and public awareness for water pollution management strengthened.

4. The project will be implemented in two towns (Dashabao and Sayu) and three townships (Dazhaizi, Leju, and Sujia) of Zhaoyang District and three towns (Longshu, Shuimo, and Xinjie) of Ludian County of Zhaotong City of the PRC. The Miao natural village is located in Shuimo Town and the Yi natural village located in Xinjie Town of Ludian County.

C. Socioeconomic Characteristics

5. The primary economic activity of the households in the Sayu River Basin is agriculture. A significant number of households in the project area are dependent on agriculture, including planting and limited livestock (i.e., cattle and pigs) and poultry (i.e., chicken and ducks). The main products include potato and corn, and apple in some villages. The Miao and Yi residents also

¹ A full EMDP is available in the following link: <https://www.adb.org/projects/documents/prc-52025-001-ipp>

plant potato and corn and raise some pigs and cattle. The cattle are mostly used for agricultural production.

6. In addition to farming, migration of young people from villages within the project areas is high. Almost each household has one member working outside the village or township due to more job opportunities with higher wages in big cities and towns. They work in factories, offices, private companies, and business establishments.

7. The leading sources of income of the household heads based on the baseline socioeconomic survey conducted in July 2019 include the following: 1st rank is farming (37%), followed by temporary non-farm jobs (29%); 3rd rank is wage with relatively steady jobs (12%); 4th is from government subsidies (4%) or relatives' support (4%); and 5th is self-employment such as operation of small shops and/or businesses (4%).

8. At the regional level in 2018, Yunnan Province has a total population of 47.71 million people, and rural population of 25.59 million people. The per capita gross domestic product (GDP) was Chinese yuan (CNY)37,136, per capita disposable income of urban residents in the province was CNY33,488, and the per capita net income of rural residents was CNY10,768.

9. Zhaotong City has a total population of 5.54 million people, and rural population of 3.69 million people. The per capita GDP was CNY15,910, per capita disposable income of urban residents in the city was CNY27,632, and the per capita net income of rural residents was CNY9,474.

10. Zhaoyang District has a total population of 0.845 million people, and rural population of 0.439 million people. The per capita GDP was CNY30,544, per capita disposable income of urban residents in the district was CNY31,870, and the per capita net income of rural residents was CNY10,520.

11. Ludian County has a total population of 0.419 million people, and rural population of 0.301 million people. The per capita GDP was CNY13,559, per capita disposable income of urban residents in the county was CNY26,299, and the per capita net income of rural residents was CNY9,553.

12. Shuimo Town, where a Miao natural village will be engaged as a pilot eco-village by this project, has a total land area of 270.94 square kilometers. The town governs 10 village committees, 82 natural villages, 169 village groups, and 8,523 households with 35,267 people of Han, Miao, and Yi nationalities. The highest altitude of the town is 3,315 meters, and the lowest altitude is 1,680 meters. There are 89,265 *mu* of arable land, and 2.5 *mu* of arable land per capita; the forestry land area of the town is 88,635 *mu*. Shuimo Town is an agricultural town, and the main grain producing area and animal husbandry town in Ludian County. The main agricultural products are corn, potato, alfalfa seeds, and oats; and the livestock industry has cattle and pigs.

13. Xinjie Town, where a Yi natural village will be engaged as a pilot eco-village by this project, has a total land area of 113.1 square kilometers, with 33,508 *mu* of arable land; 15,000 *mu* of pasture grass; 3,734.1 *mu* of garden land; and 85,000 *mu* of forest area. The highest altitude is 2,976 meters, and the lowest altitude is 2,078 meters. The town has jurisdiction over 5 villager committees, 94 villager groups, 4247 households with 18,896 people, and is inhabited by four ethnic groups: Han, Hui, Miao, and Yi. The main agricultural products are corn, rice, and potatoes,

supplemented by a small amount of oats and soybeans; and the livestock industry has yellow cattle and pigs.

14. The out-migration rate is high in the project areas, especially among the younger and productive ages (especially 40 years and below). The younger generations are not attracted to farming as the primary source of income. They prefer to work or look for jobs in factories and shops and/or commercial and manufacturing establishments located in urban areas.

15. Participation of women in economic activities within the project areas in various sectors is high. Women are active in farming (corn, potato, apple, etc.); and raising livestock and poultry, working as cleaners in the townships and villages; and other kinds of unskilled labor. Women also work in government agencies and organizations. There are more men employed in higher positions compared to women. However, the number of women in various sectors is high.

D. Poverty and Social Assessment in the Project Areas

16. In the project area, the total poor population in the target poverty alleviation system (2015) was about 86,174 rural persons, accounting for 32.25% of total population. By end of 2018, more than 70,000 of the poor people got rid of poverty. The remaining poor, accounting for less than 6%, will get rid of by end 2020.

17. Main reasons which caused the rural poverty include (i) unbalance development between urban and rural areas, (ii) plateau area with limited agricultural production, (iii) mountain areas with poor transportation, and (iv) low productivity due to low skill and technique ability.

18. According to the survey, the poverty situation of the ethnic minority people in the project area is similar to that of the total residents. Poor ethnic minority residents account for 5%–6% of all ethnic minority residents. All policies related to poverty alleviation to ethnic minority residents are the same to Han people.

19. In long history of Zhaotong City, generally, the Han people live on plain lands; the Hui people on both sides of roads; the Yi people on mountain slope area; and the Miao people on the top of mountains. The livelihood means and income levels vary among these ethnic groups due to the geographic conditions and living environment. Therefore, in general comparison, the Miao people have the lowest living standards; and followed by the Yi people. In many cases, the Hui people's living standards, who are good at business, are better than the Han people. The Miao people have rich folk oral literature, such as ancient songs, poems, love songs, and so on. The Miao people also dance well, and the reed dance is the most popular.

E. Additional Social Assessment in the Project Areas

20. During the on-site survey and the conversation with the leaders of the village and the Miao and Yi natural villages, it was found that the sanitary conditions of the public places in the village are relatively poor. Some residents' houses are close to pigpen and cowshed, and chickens and ducks are free-range. Solid waste in villages are not collected and treated well, and small ponds and rivers near the villages are dirty. Ethnic minority residents expressed their support on the project for improvement of sanitary environment of communities and water environment near villages. They said the current environment is not good for their health, especially for elders and children. They like to do some work for the project to increase their income. Consultations with ethnic minority residents were conducted during the social survey and project design, and

measures to solve sanitary environment and water environment of the villages were incorporated into the project design.

F. Project Benefits and Impacts

21. The project will be aligned with the following impact: quality of life and sustainable aquatic ecosystem in the Yangtze River Basin improved (Yangtze River Economic Belt Development Plan, 2016–2030). The project will have the following outcome: condition of water resources and environment in the Sayu River Basin improved.

22. The project implementation will improve the current collection and management of household waste in the ethnic minority communities. The domestic sewage will also be collected and treated. The feces of livestock raised by the local families can also be treated in a hygienic manner, which will improve the overall living environment and sanitation environment of ethnic minority communities.

23. Through the pilot ecological construction in a Miao natural village and a Yi national village, the infrastructure of the two villages will be improved comprehensively, including water supply; sewage treatment; domestic garbage management; and streets, cultural activity center, village appearances, etc. In addition, by strengthening the communication and education of ecological environmental protection, the environmental protection awareness of community residents and students will be improved; and the ecological and environmental protection will be sustainable. The construction of an ecological pilot village will improve the living environment of the residents of these two ethnic minority villages and improve the quality of life.

24. During the project implementation, local residents need to be hired to conduct necessary civil works. Therefore, ethnic minority families with surplus labor force have opportunities to participate in the project construction; and thereby, increasing household income. For those who do temporary work outside the home, they can also increase their income locally by participating in the project construction, without going out to work. After the project is completed, it is necessary to recruit workers to operate and maintain the facilities built by the project. Therefore, ethnic minority residents have opportunities to obtain stable employment positions and increase wage income.

25. In the construction of the ecological pilot village, certain design and construction contents with ethnic minority characteristics can be considered. For example, in the construction of streets and village appearances, the traditional cultural characteristics of the ethnic minority and the content related to the intangible culture inheritance can be considered. It will be conducive to the construction and development of ecological villages and will also have positive help for the future development of tourism in ethnic minority villages.

26. The project will compensate or provide subsidies to residents who have potentially impacted by the project due to agricultural farming structure changes and aquaculture production in construction of water conservation zones through the construction of sustainable eco-compensation mechanisms. This may also cause a certain loss of agricultural income due to ecological protection for ethnic minority families in the project area. Such losses to ethnic minority families were fully assessed, and necessary measures were incorporated into the eco-compensation mechanisms to provide timely compensation and/or subsidy during the preparation of resettlement plan for the project.

27. The project construction will require permanent land acquisition, temporary land occupation, or occupation of cultivated land through land use right transfer, etc. If ethnic minority families are involved, it may result in a decrease in household income. The scope and compensation standards and measures for land use impacts have been described in details in the resettlement plan of the project; and any land acquisition and land-related losses of the residents, including ethnic minorities in the project area, will be compensated in line with the principle of full replacement value as described in the resettlement plan.

28. The project area has begun to collect fees for household waste management since 2018. The fees paid by ethnic minority families are the same as those of Han families, and there is no special subsidy to the ethnic minority residents. Any change in the standard of garbage fees (usually an increase in the charge fees) and the possibility of collecting sewage treatment fees in the future will increase the living expenses of ethnic minority families. Therefore, in any public hearing meetings about the fees, representatives of ethnic minority residents will be present; and their opinions will be considered.

29. The project construction will involve changes in agricultural cultivation methods, such as replacing chemical fertilizers with organic fertilizers or soil-based formula fertilizers; or adjusting planting structures, which may affect the farmers' planting skills; or increase cost of agricultural production. Therefore, it is agreed to provide skills training for these farmers, including ethnic minority farmers. All involved farmers (including ethnic minority labors) shall have the opportunity to participate in such training; and such training shall be free to farmers.

G. Consultation and Disclosure

30. The ethnic minorities, including the Miao and Yi people in two natural villages of pilot eco-villages under the project, have been consulted about the likely positive and adverse impacts of the project. They expressed their support and are willing to participate in the project so that they can benefit directly. Further consultation and community mobilization activities will be conducted during project implementation. The EMDP is uploaded to the ADB website and distributed to ethnic minority natural villages.

Various methodologies were used in data gathering and in conducting consultations with various stakeholders. Public consultations and meetings with the townships and/or village officials, women, farmers, ethnic minorities, and other stakeholders were conducted in the project areas, starting April to July 2019. Consultants engaged for project preparation have conducted several consultations with concerned government agencies and/or bureaus in Zhaotong City, Zhaoyang District, and Ludian County; township governments, village leaders, women, farmers, and farmers collectives; and the Hui, Miao, and Yi ethnic minority groups. The ethnic minority consultations were conducted by the consultants for resettlement, social development, and gender engaged for project preparation (national and international consultants).

H. Action Plan

31. The action plan for ethnic minority villages is summarized in Table 9 in the EMDP, showing the activity, indicators and/or targets, responsible implementing agency, timing, and budget source.

I. Implementation Arrangement

32. The Zhaotong City project management office (PMO) will be responsible for supervising and monitoring the EMDP implementation. The Zhaoyang District and Ludian County LPMOs will be responsible for implementing the EMDP with assistance from the social development specialist in the project management support consultant team to be hired by the PMO during project implementation. The Zhaotong City Ethnic Minority and Religious Affairs Office and its township offices will provide support, coordinate, advise, and review progress of the EMDP implementation. Implementation arrangements for the EMDP are integrated into the specific project activities. Other key agencies for implementation include the Development and Reform Committee; the ecology and environment, education, and finance bureaus; the All China Women's Federation; and other concerned agencies.

J. Cost and Financing Sources

33. The costs of the EMDP actions are either included as (i) part of the project budget, or (ii) part of routine administrative expenses of respective authorities. A total of cost is about CNY26,126,000.

K. Monitoring and Evaluation

34. Internal monitoring of the EMDP is required to ensure the plan is implemented properly. The objective of the monitoring is to assess whether the EMDP actions have been implemented effectively. The EMDP will be monitored and reported to ADB through quarterly project progress reports. The social development specialist in the project management support consultant team will work with the PMO to set up an appropriate internal monitoring system and assist with the preparation of reports.

35. In addition, external monitoring and evaluation (M&E) will be performed semiannually by an external agency (together with the external M&E of land acquisition and resettlement) until project completion. External M&E reports (for ethnic minority development, land acquisition and resettlement, social development, and gender development) will be submitted semiannually to the PMO and ADB.