



Environmental Monitoring Report

Project Number: 52025-001
Period: July - December 2022
Document Date: January 2023

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

Prepared by Zhaotong Project Management Office for for the Asian Development Bank

This environmental monitoring report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management or staff, and may be preliminary in nature.

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Asian Development Bank

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(#4 EMR)

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CURRENCY EQUIVALENTS

Currency Unit	–	Yuan (CNY)
\$ 1.00	=	CNY 6.9

ABBREVIATIONS

ADB	- Asian Development Bank	IA	- implementing agency
BOD	- biochemical oxygen demand	LPMO	- local project management office
CNY	- Chinese yuan	LRB	- Land and Resources Bureau
COD	- chemical oxygen demand	LIC	- loan implementation consultant
CRVA	- climate risk vulnerability	MEP	- Ministry of Ecology and Environment
CS-EMP	- construction site environmental management		- municipal solid waste
CSC	- construction supervision company	<i>mu</i>	- Chinese land unit (1 ha = 15 <i>mu</i>)
DEIA	- domestic environmental impact	NDRC	- National Development and Reform
EA	- executing agency	NPS	- nonpoint source
EEB	- Ecology and Environmental Bureau	OPF	- operator of project facility
EFMC	- eco-compensation fund	PIC	- project implementation consultant
EHS	- environmental, health and safety	PMO	- project management office
EIA	- environmental impact assessment	PRC	- People's Republic of China
EMP	- environmental management plan	REA	- rapid environmental assessment
EMS	- environmental monitoring station	SPS	- Safeguard Policy Statement
EPD	- Environmental Protection	TOR	- term of Reference
FSR	- feasibility study report	TRTA	- transaction technical assistance
GDP	- gross domestic product	WSC	- water and soil conservation plan
GHG	- greenhouse gas	WSP	- water supply plant
GPP	- garbage pyrolysis plant	WWTS	- wastewater treatment station
GRM	- grievance redress mechanism	YREB	- Yangtze River Economic Belt
GTS	- garbage transfer station	ZCG	- Zhaotong City Government

WEIGHTS AND MEASURES

°C	degree centigrade	m ²	square meter
dB	decibel	m ³ /a	cubic meter per annum
g	gram	m ³	cubic meter
ha	hectare	m ³ /d	cubic meter per day
km	kilometer	m ³ /s	cubic meter per second
km ²	square kilometer	mg/l	milligram per liter
kW	kilowatt	mg/m ³	milligram per cubic meter
L	liter	Mm	millimeter
L _{Aeq}	equivalent continuous A-weighted	T	metric ton
MW	megawatt	t/d	metric ton per day
m	meter	t/a	ton per annum

NOTE

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

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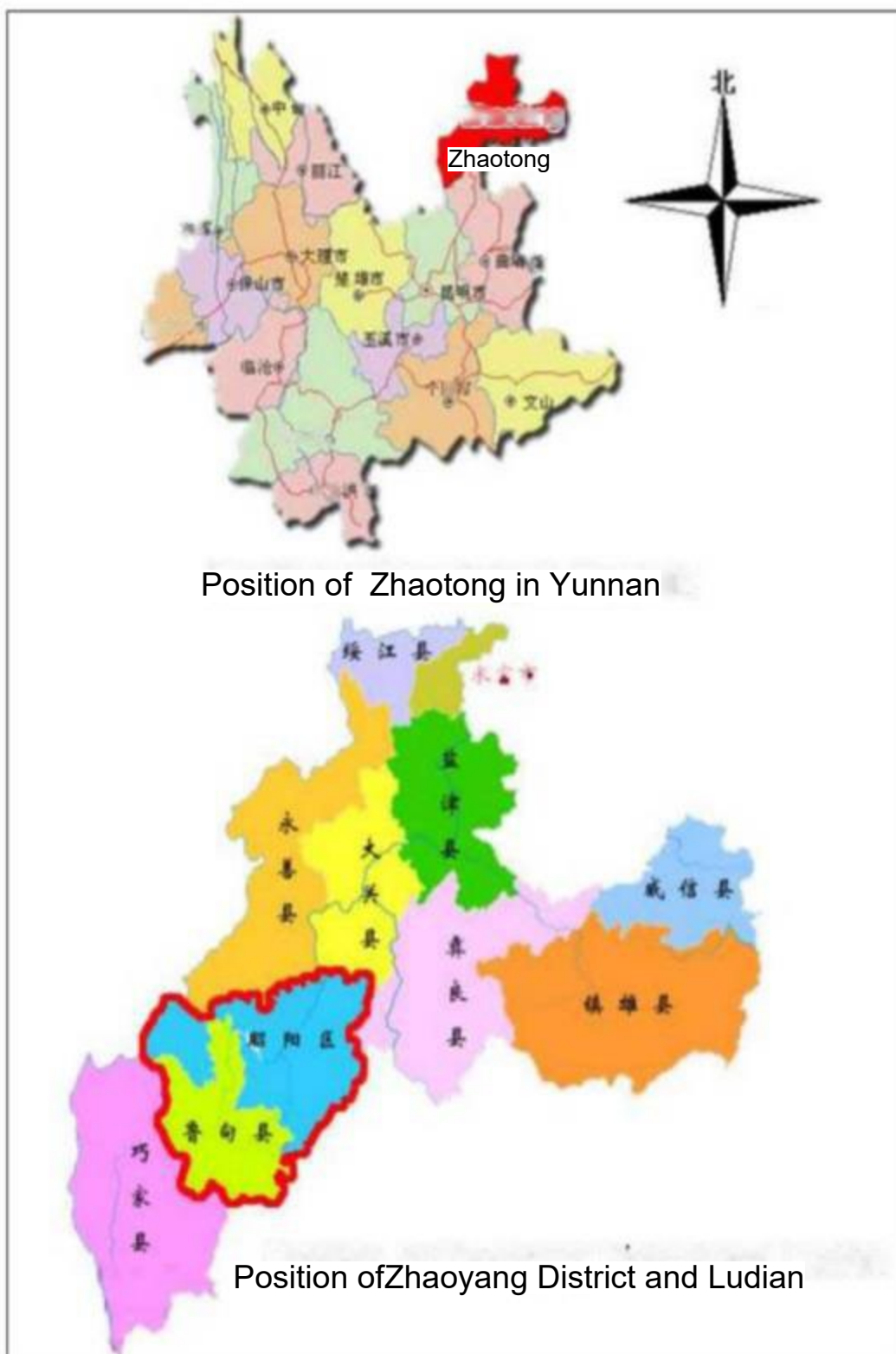
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Map 1: Overview of project components



Map 1 Location of Zhaotong City. The Project Area is located within Zhaoyang District (blue) and Ludian County (green).

PART I - BACKGROUND AND PROJECT PROGRESS

1. **General Introduction.** This report is the **THIRD** environmental monitoring report of Yunnan Sayu River Basin Rural Water Pollution Management and Eco-Compensation Demonstration Project (hereafter referred as ‘the Project’), covering the period from July to December 2022. This report is prepared by Zhaotong City Government (ZCG) based on site visits and information collected from the Project Management Office (PMO), Project Implementation Units (PIUs), and under technical assistance from the external environmental monitoring consultants. This environmental monitoring report is prepared in accordance with the project environmental management plan (EMP) including environmental monitoring program (EMoP). This report was reviewed by the PMO, prior to submission to ADB.

2. **Impact, Outcome and Output, and Environmental Screening/Categorization/Due Diligence.** Loan 3983 was approved by ADB on 29 September 2020 with the amount of \$100 loan from ADB ordinary capital resources. The loan agreements was signed on 21 December 2020, and loan effectiveness was declared on 14 April 2021. The physical completion of the project will be on 30 June 2026, and the loan is scheduled to be closed on 31 December 2026. The project is aligned with the following impact: quality of life and sustainable aquatic ecosystem in the Yangtze River Basin improved. The project will have the following outcome: condition of water resources and environment in the Sayu River Basin improved. The project has the following four outputs:

- **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 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.¹
- **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

¹ An “endline” survey aims to measure the effects at the end of the project.

embankments).

- **Output 3: Eco-compensation mechanism for the Sayu River Basin established.** This includes (i) the implementation of the horizontal eco-compensation agreement between the Ludian County Government (LCG) and the Zhaoyang District Government (ZDG) (footnote 12); (ii) the establishment and implementation of new town- and township-level horizontal ecocompensation mechanisms, consisting of six agreements; and (iii) the establishment and implementation of an eco-compensation fund that will contribute to sustainable water pollution management.

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.

While the horizontal eco-compensation agreements incentivize good upper basin management and cost-sharing between upstream and downstream governments, (i) they lack the 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 ecocompensation 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. 8). The eco-compensation fund will provide grants to relevant government agencies and private companies,² 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 ecocompensation agreements under Output 3 (para. 15); and (iv) management of the ecocompensation fund, excluding any civil works. The fund will be initially supported by the ZCG, LCG, ZDG, ADB, and a beneficiary,³ with the longer-term goal of collecting more funding from beneficiaries,⁴ 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.⁵ The EFMC will conduct screening of activities proposed for financing from the ecocompensation fund, following an environmental and social management system (ESMS, paras. 38-40). The Yudong Reservoir Water Resources Protection Committee Office (YWPCO) in the ZCG will open and manage an account for the eco-compensation fund; and manage the fund, following the decisions of the EFMC.⁶

² Private companies will operate a wastewater treatment plant or conduct solid waste management based on contracts with the ZDG or the LCG.

³ 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 Baoho hydropower station will be contributed to the fund every year from 2023. An ADB loan of \$5 million will be contributed to the fund during the project.

⁴ Beneficiaries will include downstream water and hydropower users, irrigation water users, and the business sector.

⁵ 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.

⁶ About 15 full-time staff of the YWPCO, which manages the fund for ecological restoration and remediation (para. 8), will manage the new eco-compensation fund.

- **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.

3. In compliance with ADB's Safeguard Policy Statement (SPS, 2009), the project is classified as Environment category A. An environmental impact assessment (EIA), including an environmental management plan (EMP), was prepared by the PMO under ZCG and disclosed on ADB's website. The EIA incorporated findings of the domestic feasibility study and domestic EIAs, climate risks and vulnerability assessment, biodiversity assessment, site visits, and consultations with stakeholders. The EIA includes (i) the environmental management plan (EMP), draft ESMS, and a project-specific grievance redress mechanism. The EMP will be applied to all project components, except the eco-compensation fund. For the eco-compensation fund, environmental and social safeguards will be managed under the ESMS. The environmental impact assessment, the EMP, and the ESMS are based on the domestic feasibility study and environmental assessment reports, site visits, and consultations with stakeholder. The ZCG, through the PMO and the EFMC, will be responsible for compliance with the EMP and the ESMS. The implementing agencies do not have experience with ADB's safeguard procedures; and so, the project design includes qualified safeguard staff and a training program. The project is expected to achieve significant environmental benefits, including (i) improved water quality through a reduction of water pollution sources and protection of water resources from pollution; (ii) improved designs and operational procedures for garbage pyrolysis plants (environmental and social assessments and safe management of pyrolysis by-products); (iii) reduced annual silt loads to the Sayu River; and (iv) the promotion of environmental management in the Sayu River Basin through the ESMS. Risks include (i) environmental and/or health impacts via air emissions from the garbage pyrolysis plants; (ii) improper management of leachate, slag, and/or flue ash from the garbage pyrolysis plants; and (iii) odors and leachate from garbage transfer stations. Mitigation measures and screening procedures to address these risks are included in the EMP and the ESMS, including measures for the safe treatment and disposal of flue ash, slag, and leachate; and the air and soil monitoring programs for early detection of environmental impacts..

4. **Value addition of ADB assistance.** 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-emissions 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 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 proposing of the project as a model for eco-civilization and awards.

5. **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.

6. 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.

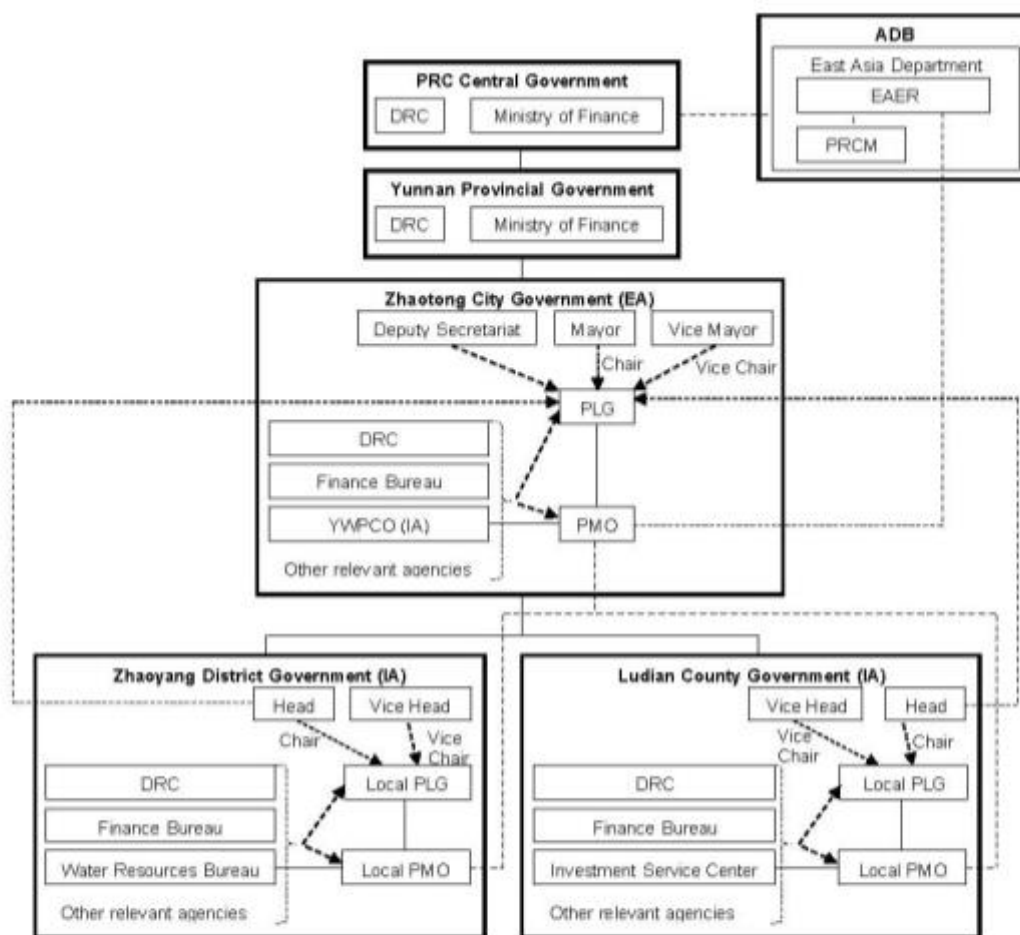
7. **Implementation Arrangement.** The ZCG will be the executing agency. A project leading group has been established in the ZCG under which a project management office (PMO) has been established. The implementing agencies will be the YWPCO, ZDG, and LCG. In the ZDG and LCG, a local project leading group has been established under which a local PMO has also been established. Since the ZCG, including the YWPCO, LCG, and ZDG, do not have experience with the ADB projects, adequate training will be provided to relevant staff, particularly for social and safeguard measures. The implementation arrangements are summarized in Table 3 and described in detail in the PAM. These will not be affected by the COVID-19 pandemic (para. 6).

Table 1 : Implementation Arrangements

Aspects	Arrangements		
Implementation period	November 2020-June 2026 (project completion date)		
Estimated completion date	30 June 2026		
Estimated loan closing date	31 December 2026		
Management			
(i) Oversight body	Project leading group Mayor, ZCG (chair) Vice mayor, ZCG (vice chair) Deputy secretary, ZCG, and representatives of relevant ZCG agencies (members)		
(ii) Executing agency	ZCG		
(iii) Key implementing agencies	Yudong Reservoir Water Resources Protection Committee Office, Zhaoyang District Government, and Ludian County Government		
(iv) Implementation unit	PMO in the ZCG, 31 staff Local PMO in Zhaoyang District Government, 36 staff Local PMO in Ludian County		
Procurement	Open competitive bidding (nationally advertised)	30 contracts	\$113,071,721
Consulting services	Individual consultant selection	9.00 person-months, 3 contracts	\$84,000
	CQS	41.00 person-months, 2 contracts	\$314,000
	QCBS	133.75 person-months, 2 contracts	\$1,802,000
Retroactive financing and/or advance contracting	Advance contracting and retroactive financing will apply to consultants. Retroactive financing will be subject to a maximum amount equivalent to 20% of the loan amount for eligible expenditures incurred before loan effectiveness, but not earlier than 12 months before the loan agreement is signed.		
Disbursement	The loan proceeds will be disbursed following ADB's <i>Loan Disbursement Handbook</i> (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB.		

ADB = Asian Development Bank, CQS = consultants' qualifications selection, PMO = project management office, QCBS = quality- and cost-based selection, ZCG = Zhaotong City Government.

Figure 1 Project Organization 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.

8. **Design and Project Scope.** Preliminary and detailed design for many subcomponents has been completed or is at advanced stages. **The project scope was reconfirmed** whilst some minor design optimization or adjustments during detailed design due to more detailed due diligence were acknowledged. No EIA or EMP updated is required by end of this reporting period.

9. **Project Progress as of 31 December 2022.** It started the construction of Leju Town Ecological River Restoration and Xinhe Wetland (C22-1), Sayu Town River Ecological Restoration (C22-2) , and Longshu Town Ecological River Restoration (C18) .The key project information to monitor implementation progress is as follows:

- (1) The preliminary approval has been completed. After many times of communication and coordination with the departments of development and reform, water conservancy, agriculture, forestry, natural resources, housing construction, ecological environment, etc., the project involved a river protection model + constructed wetlands to reduce non-point source pollution + integrated water management platform, promotion of low emissions The six preliminary reports on agriculture, establishment of quantifiable soil and water conservation models, pilot ecological villages, solid waste treatment, and sewage treatment have all been approved.
- (2) More than half of the bidding contract is completed. The project involves 32 contracts (20 for civil engineering, 5 for goods, and 7 for consulting services). Up to now, 16 projects have completed bidding and signed contracts (10 for civil engineering, 6 for consulting services), accounting for 50%, and 7 are under bidding.
- (3) The project construction has been completed relatively well. The construction of four projects including Longshu Town, Sayu Town, Leju Town Ecological River Restoration and Ludian County Low-emission Agriculture Projects started construction, with an investment of 125.43 million yuan and a completed investment of 96.5565 million yuan, accounting for 77%. Among them, the Longshu River Ecological Restoration Project (C18) completed 39,680 cubic meters of earth excavation, 64,482.901 cubic meters of stone support, and completed an investment of 54 million yuan; the Ludian County Promotion of Low-emission Agricultural Demonstration Project (C12) completed 32,909 cubic meters of earthwork excavation, 15,238 cubic meters of mortar blocks and stones, with an investment of 22.7 million yuan; Leju Town Ecological River Restoration Project (C22-1) completed 58,000 cubic meters of earthwork excavation, 28,000 cubic meters of stone support, and completed an investment of 7.191 million yuan; Sayu Town The ecological river restoration project (C22-2) completed 33,000 cubic meters of earth excavation, 17,000 cubic meters of stone support, and completed an investment of 13.3655 million yuan.
- (4) The consultation and security are completed according to the quality. Complete the review of the results of 3 independent consultants on social migration, environment and procurement, and 2 consulting teams on external environmental monitoring and external social migration monitoring. Completed the quarterly progress report of the 3rd phase of the project, the semi-annual report of the 1st phase of environmental management, the resettlement plan of 1 civil engineering project and the update of the environmental management plan of 12 civil engineering projects. Complete the 2nd phase of external monitoring report on environment and social resettlement. And
- (5) Capacity improvement is effectively completed. Through ADB online training, invited experts to offline training on bidding and procurement, contract management, financial management, project management, security management and other aspects of knowledge 8 times 60 hours, training more than 400 person-times in rotation, the comprehensive ability of project management personnel has been improved.

PART II - ENVIRONMENTAL MANAGEMENT

2.1 Changes/updates in Project Organization and Environmental Management Team

10. PMO, the IAs, have respectively designated qualified environmental personnel to coordinate EMP implementation. An environmental start-up consultant has been engaged in 2020 and the external environmental consultant in December 2021. No changes/updates in Project Organization and Environmental Management Team were identified during this reporting period, compared with the arrangement at appraisal.

Institutional Arrangements and Responsibilities for EMP Implementation

11. The Zhaotong City Government (ZCG), represented by the Zhaotong City Yudong Reservoir Water Resources Protection Committee (YRWRPC) is the executive agency of the project. At the city-level, ZCG has established the Project Leading Group (PLG) to provide policy guidance and coordination, and the Zhaotong City 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 environmental officer. There are two implementing agencies: the governments of Zhaoyang District and Ludian County. Each has established a local PMO (LPMO) to implement their project components and subprojects.

12. **Environment staff within PMO and LPMOs.** One full-time PMO environment officer (Ms. Xiong Yongying, +86 0870-3188811) and two district/county LPMO environment officers (one per implementing agency) were appointed. These personnel are responsible for coordination and implementation of the EMP. The PMO Environment Officer is responsible for overall EMP coordination. The officer works full-time for the project and takes 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 semi-annual 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 the loan implementation environment consultant. Each LPMO nominates one environmental officer and one social officer to check the overall implementation of environmental management provisions of the EMP, and to work in close coordination with the PMO Environmental Officer. The PMO Environment Officer and PMO Social Officer is also responsible for implementation of the environmental and social management system (ESMS).

13. **Loan implementation consultants.** PMO will engage a loan implementation environmental consultant (LIEC) and loan implementation social consultant (LISC), as part of the loan consultancy implementation services. The consultants will support the PMO to provide capacity building for, and coordination of, the EMP and ESMS implementation. The need to extend consultant support for the will be reviewed after about 24 months of project implementation.

14. The EMP implementation arrangements and responsibilities of governmental organizations are summarized in Table 2.

Table 2: Institutional arrangement for the EMP and Implementation Status

Agency	Environmental Management Roles and Responsibilities	Compliance status
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 	<ul style="list-style-type: none"> • In compliance
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 	<ul style="list-style-type: none"> • In compliance

Agency	Environmental Management Roles and Responsibilities	Compliance status
Zhaotong City Project Management Office (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 • Environment safeguards - all project outputs • Engage the LIEC; and, EMA for external environmental monitoring • Assign 1 PMO Environment Officer and 1 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), EMP, and ESMS • Prepare semiannual environment monitoring reports to ADB • Draft terms of reference for the PMO Environment Officer are in Appendix 2 • EIA and EMP - all project outputs except Eco-compensation Fund • (output 3) • Update EIA and/or EMP as needed, especially during the stage of detailed engineering designs • Ensure that the EMP, especially all relevant mitigation measures, are included in the detailed engineering designs 	<ul style="list-style-type: none"> • In compliance

Agency	Environmental Management Roles and Responsibilities	Compliance status
<p>Zhaoyang District Government Ludian County Government</p> <p>and their respective Local project management offices</p> <p>(all project outputs except Eco-compensation Fund under output 3)</p>	<ul style="list-style-type: none"> • Implement subprojects, including finance, administration, technical and procurement matters, monitoring, evaluation, safeguards • Coordinate with PMO for project implementation • Prepare tendering contracts; and submit bidding documents, bid evaluation reports and other documents to PMO • Recruit design institutes, contractors, CSCs; and manage contractors and suppliers • Submit withdrawal applications to finance bureau • Construction supervision and quality control • Assign LPMO environment officer (1 per LPMO). Draft terms of reference are in Appendix 2 • Incorporate EMP into bidding documents • Supervise and monitor EMP implementation and progress reporting to PMO 	
<p>Eco-compensation Fund Management Committee (to manage the eco-compensation fund under output 3)</p>	<ul style="list-style-type: none"> • Implementing agency for the eco-compensation fund (project output 3) • Establish, manage, and implement the fund and ESMS • Prepare semiannual environment monitoring reports to 	<p>In compliance</p>
<p>Project Facility Operators: under the two implementing Project Facility Operators - the city agencies, town / village governments, or district/county Housing and Urban-Rural Development Bureaus, Urban Construction and Investment</p>	<ul style="list-style-type: none"> • • With LPMOs, commission the constructed facilities - the garbage pyrolysis plants, garbage transfer stations, wastewater treatment stations, river embankments, and constructed • • Operate and maintain the completed facilities, including environmental management, monitoring and reporting responsibilities 	<p>Not yet due</p>
<p>"Start-up" environment safeguard consultant</p>	<ul style="list-style-type: none"> • Short-term national position to support PMO and LPMOs with start-up support for EMP and ESMS establishment while the LIEC 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 PMO to establish the GRM for the EMP and ESMS 	<p>In compliance</p>

Agency	Environmental Management Roles and Responsibilities	Compliance status
Loan Implementation Environmental Consultant	<ul style="list-style-type: none"> • Support the executing and implementing agencies in their tasks to coordinate and implement the EMP and ESMS • Provide ongoing training for EMP and ESMS implementation, including the EMP capacity building (Table EMP-6 of EMP) • Review the detailed engineering designs and assess whether the EIA and/or EMP requires updating • Support the updating of the EIA and/or EMP as needed • Review bidding documents to ensure that 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 	<ul style="list-style-type: none"> • Not yet due
External environment monitoring agency	<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 of EMP 	<ul style="list-style-type: none"> • In compliance
Contractors	<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 of EMP 	<ul style="list-style-type: none"> • In compliance
Construction supervision company	<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 	<ul style="list-style-type: none"> • In compliance
Asian Development Bank	<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, EMP, ESMS, social plans, and project administration manual 	<ul style="list-style-type: none"> • In compliance

ADB = Asian Development Bank, CSC = construction supervision company, EHS = environment, health and safety, EMA = environment monitoring agency, EMP = environment management plan, ESMS = environmental and social management system, GRM = grievance redress mechanism, LIEC = loan implementation environment consultant, LPMO = local project management office, PMO = Zhaotong project management office.

2.2 Training and Capacity Building

15. The PMO and implementing agencies have no previous experience with ADB-funded projects or safeguard requirements. The experience of individual staff within the city, the district and county EEBs for environmental management varies considerably. Domestic EIAs and project approvals generally include limited mitigation measures, but there is not yet a regulatory requirement in the PRC for EMPs of the scope required by ADB. Implementation of the current EMP represents a significant new task for the local agencies. During the project preparation phase, preliminary training on EMP implementation was provided by the TA Consultant, including roles and responsibilities of contractors and CSCs for EMP implementation, project impacts, and mitigation measures.

16. During implementation, a capacity building program is being 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; (iii) management of the Yudong Reservoir, including water quality protection, internal zoning, and watershed management. Training will be provided by the loan implementation consultants and Zhaotong City EEB, facilitated by the PMO and LPMOs. Trainees will include the PMO, implementing agencies, LPMOs, contractors, CSCs, and relevant local bureaus (including water resources, agriculture, forestry).

17. Systematic and practical site training to PMO, IAs to clarify institutional responsibilities for EMP implementation, and supervision were regularly communicated among project stakeholders during this reporting period, and such trainings were further conducted by the ADB PRC mission in August 2022. More systematic and practical site training to PMO, IAs and contractors, and such trainings are expected to be further conducted in Q1 and Q2 2023 to further clarify ADB funded project environmental requirements.

Table 3: Project Environment Training Program

Training program	Scope of Training	Trainer	Trainee	Time	Implementation status
Procurement and contract management (emphasize EMP implementation)	<ul style="list-style-type: none"> ADB procurement guidelines Bidding document and contract preparation, including EMP clauses Risk of improper procurement and mitigation measures and handling variation orders 	LIC	PMO, LPMOs, EFMC	2	done in May of 2022, Aug 2022

Training program	Scope of Training	Trainer	Trainee	Time	Implementation status
Implementation of EMP	<ul style="list-style-type: none"> • Roles, responsibilities, monitoring, inspection, reporting in EMP • Environment monitoring program; • Odor impact from GPPs, GTSS 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 	LIEC, EEB	PMO, LPMOs, EEB, other local bureaus	2	done in May of 2022, Aug 2022
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. 	LIEC, EEB	As above	2	To be done in 2024~~2026
Reservoir and watershed management	<ul style="list-style-type: none"> • Water quality protection; point and non-point pollution control • Land use planning 	LIC, EEB	As above	2	To be done in 2024~~2026
Climate change resilience	<ul style="list-style-type: none"> • Energy saving and GHG emission reduction • Carbon sink by revegetation and afforestation 	LIEC	LPMO, OPF WRB	1	To be done in 2024~~2026
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 		LPMO, OPF		To be done in 2024~~2026
Emergency preparedness and response planning	<ul style="list-style-type: none"> • Response mechanism e.g. for spills • Mitigation measures for hydraulic sectors 	Experts from EEBs	PMO, OPF, other	1	To be done in 2024~~2026

ADB = Asian Development Bank, CAB = civil affairs bureau, EMP = environment management plan, EEB = environment protection bureau, EFMC = eco-compensation fund management committee, GHG = greenhouse gas, GRM = grievance redress mechanism, LIC = loan implementation consultant, OPF = operator of project facilities, LPMO = local project management office, PMO = project management office, WRB = water resource bureau.

2.3 Relationships with Owner, Lender, etc.

18. **Interactions among Owner, Lender, etc.** The PMO, the IAs are responsible for management, coordination and execution of all activities funded under the loan and has overall responsibility for compliance with loan covenants. The scope of the project contractors/sub-contractors are to be determined. ADB oversee project sites regularly and give clear instructions for the project sites improvements with regard to environmental safeguards. PMO periodically provided ADB project environmental management trainings to the IAs.

PART III - ASSESSMENT OF READINESS

19. **Assessment of Project Readiness.** Before construction, the PMO assess the Project's readiness in terms of environmental management based on a set of indicators. This assessment demonstrates that environmental commitments are being carried out and environmental management systems are in place before construction starts, or suggest corrective actions to ensure that all requirements are met.

Table 4: Assessment of Project Readiness

Indicator	Measurement Methods	Measurement
Environmental Supervision in place	<ul style="list-style-type: none"> ➤ EMUs established before construction. ➤ LIEC and external EMA contracted. 	<p>Yes</p> <p>Partially(LIEC being hired and EMA in place)</p> <p>Yes</p>
Bidding documents and contracts with environmental safeguards	➤ Bidding documents and contracts incorporate the environmental loan assurances	Yes
	➤ Bidding documents and contracts incorporate the EMP mitigation and monitoring requirements	Yes
EMP financial support	➤ The fund from ADB is in place to support the EMP implementation	Yes
Contract documents	➤ Environmental requirements of EMP included in contract documents for civil works construction contractors	Yes
	➤ Contractor EMP developed and submitted to PMO and LIEC for review and approval	Yes

20. In accordance with the PRC Guideline on EIA Classification for Construction Projects (MEP, 2015), the domestic environmental assessment reports (DEAs) were prepared on the basis of individual components. The domestic safeguards documents were prepared in compliance with the PRC Law on Environmental Impact Assessment (2003), the Technical Guidelines for Environmental Impact Assessment (HJ/T2-93) and other relevant PRC regulations and guidelines. Progress of domestic EIA preparation, review and approval status are shown below:

21. **Environmentally Responsible Procurement.** The environmental requirements (including EMP) are incorporated into the Project specifications in the ready civil works contracts' bidding documents, and are also formed as part of the construction supervision companies' contractual requirements for the Project. Guidelines were set on environmental mitigation measures implementation and environmental monitoring based on EMP including community and occupational

health and safety.

19 安全和环境保护

19.1 承包商应对现场全部作业的安全负责。

19.2 承包商应根据有关的环境保护法规采取一切合理的措施来保护现场和邻近区域的环境，以避免由于其施工活动或作业所产成的污染、噪声或其它问题，从而对人员或公私财产造成损失或损害。

PART IV - COMPLIANCE ON THE EMP

4.1 The Project Environmental Management System, site-specific environmental management plan (SSEMP) and work plans

29. **SSEMP for the Project** was prepared by the contractors before commencement of the civil works.

4.2 Site Inspections and Audit

22. PMOs, PIUs and the construction supervision companies (CSCs) regularly and irregularly inspected the environmental status on the construction sites to check compliance status. Internal environmental monitoring was carried out by the contractors. As for environmental safeguards concern, the site visits and internal monitoring confirmed that mitigation measures during construction including dust controlling, construction site control, construction wastewater collection measures, the use of adequate safety equipment are satisfactory. Based on the EMP, potential environmental impacts of the Project and the mitigation measures during this reporting period are summarized in the **Appendix 1** and **Appendix 2**. The implementation status of the mitigation measures are summarized in the last columns of the tables for comparison with the designed mitigation measures stated in the EMP. In summary, the mitigation measures have to date been implemented effectively.

4.3 Non-Compliance Notices

23. Not yet applicable as no non-compliance was identified in this reporting period. For details see above **section 4.2**, and **Appendix 1** as well as **Appendix 2**.

4.4 Corrective Action Plans, if any

24. Same as above.

4.5 Estimated Budget for Mitigation and Monitoring

25. This section provides an estimate of the cost of EMP implementation. The cost comprises expenses for three categories: the mitigation measures described in Tables EMP-2 and EMP-3 of EMP; monitoring (Table EMP-5 of EMP); and training (Table EMP-6 of EMP). Costs are presented for the construction phase of five years and the first year of operation i.e. a total of six years. The costs do not include: (i) detailed design revisions and adjustments; (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 PMO and LPMO staff. Costs for mitigation measures and training are based on estimates in the DEIA and/or the experience of the TA consultants from other similar projects. All costs were

discussed with the DEIA Institute, PMO and IAs.

26. The total estimated cost for EMP implementation only accounts for about 1.2% of the total project investment (\$204.1 million including \$100 million ADB loan)..

Table 6. Estimated Cost for EMP Implementation for Five Years Construction and First Year Operation (xCNY10,000). Construction-phase costs will be paid by the contractors (as part of their contracts). Operational-phase costs will be paid by each ^ project implementing agency (IA).

Item	Unit	Unit cost	No. units	Total cost	Cost per year
Pre-construction phase					
1.1 Public consultation	Meeting, survey			2.0	
1.2 LIEC	Consultant PM			18.0	
Subtotal				20.0	
Construction phase					
2.1 Soil erosion and contamination				776	
2.2 Dust and air pollution control				115	
2.3 Noise and vibration				60	
2.4 Surface water pollution				186	
2.5 Solid waste				60	
2.6 Protection of flora and fauna				153	
2.7 Community health & safety				50	
2.8 Occupational health & safety				50	
Subtotal				1,450	
Operational phase					
3.1 Operation of exhausted gases treatment (GPPs and GTSSs)	CNY 1/yr				120.0
3.2 GPP ash transport and disposal	CNY 1/yr				5.23
3.3 Operation of the 26 rural WWTS	CNY 1/yr				32.4
3.5 Control Noise from pump stations	CNY 1/yr				8.0
3.5 Operation and maintenance of the 6 constructed wetlands	CNY 1/yr				10.0
3.6 Update and implement EMP	CNY 1/yr				0
Subtotal					175.63
4. Monitoring during construction (costs paid by each IA)					
4.1 Surface water quality	2 times/a	2.5	10	25	5.0
4.2 Construction wastewater including water quality downstream of reservoir	2 times/a	0.5	10	5.0	1.0
4.3 Ambient air	2 times/a	1.8	10	18	3.6
4.4 Noise	2 times/a	0.3	10	3.0	0.6
Subtotal		5.1		51	10.2
5. Monitoring during operation (costs to be paid by each IA)					
5.1 GPPs and GTSSs					
5.1-1 wastewater	4 times/a	0.5	4	2.0	2.0

Item	Unit	Unit cost	No. units	Total cost	Cost per year
5.1-2 Exhaust gas	4 times/a	4.0	4	16.0	16.0
5.1-2 Odor gas	4 times/a	3.0	4	12	12
5-1-3 Noise	4 times/a	0.1	4	0.4	0.4
5-1-4 Soil (GPPs)	1 time/a	2.4	1	2.4	2.4
5-1-5 Groundwater (GPPs)	4 times/a	1.0	4	4.0	4.0
5-1-6 Ambient air	1 time/a	4.0	1	4.0	4.0
Subtotal				40.8	40.8
5.2 Effluence from the WWTS	2 times/a	1.8	2	3.6	3.6
5.3 Aquatic ecosystem survey (river embankment works) ¹	1 time/a	20	1	20	20
5.4 Soil (Non-point pollution control component)	1 time/a	6.0	1	6.0	6.0
5.5 Vegetation survival (wetlands, rivers and afforestation)	1 time/a	10	1	10.0	10.0
Subtotal				80.4	80.4
Grand total (xCNY10,000)				1,757.03	
Grand total (xUSD10,000)				248.19	
Proportion of total investment (%)				About 1.2%	

¹ This 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 report.

4.6 Status Of Compliance With Major Loan Covenants and DMF (environmental safeguard, as of Dec 2022)

27. Compliance with major loan and project covenants. The status of the environmental safeguard related loan covenants which is summarized. Most of the major environmental safeguard related loan and project covenants under the project are “in compliance”, and some are not yet due for compliance.

Table 7 STATUS OF COMPLIANCE WITH COVENANTS

No.	Description	Reference	Status of Compliance
23	<p><u>Environment</u></p> <p>ZCG shall cause PMO to ensure that the preparation, design, construction, implementation, operation and decommissioning of the Project and all Project facilities comply with (a) all applicable laws and regulations of the Borrower relating to environment, health and safety; (b) the Environmental Safeguards; and (c) all measures and requirements set forth in the EIA, the EMP, and any corrective or preventative actions (i) set forth in a Safeguards Monitoring Report, or (ii) which are subsequently agreed between ADB and PMO.</p> <p>ZCG shall cause PMO to ensure that Works do not commence until the pre-construction environmental monitoring to establish a baseline for relevant sections in accordance with the EIA and EMoP have been completed.</p>	paras 2-3, Schedule, PA	Being complied with.
27	<p><u>Safeguards – Related Provisions in Bidding Documents and Works Contracts</u></p> <p>ZCG shall cause PMO to ensure that all bidding documents and contracts for Works contain provisions that require contractors to:</p> <p>(a) comply with the measures relevant to the contractor set forth in the EIA, EMP, EMoP, EMDP and RP (to the extent they concern impacts on the respective affected people under the Environmental Safeguards, the Indigenous Peoples Safeguards and the Involuntary Resettlement Safeguards), and any corrective or preventative actions set forth in (i) a Safeguards Monitoring Report, or (ii) subsequently agreed between ADB and PMO;</p> <p>(b) make available a budget for all such environmental and social measures;</p> <p>(c) provide PMO with a written notice of any unanticipated environmental, resettlement or ethnic minorities risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the EIA, EMP, EMDP and RP;</p> <p>(d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport</p>	para 8, Schedule, PA	Being complied with.

No.	Description	Reference	Status of Compliance
	<p>materials and construction; and</p> <p>(e) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.</p>		
28	<p><u>Safeguards Monitoring and Reporting</u></p> <p>ZCG shall cause PMO to do the following:</p> <p>(a) submit semiannual Safeguards Monitoring Reports to ADB in respect of implementation of, and compliance with, Environmental Safeguards and the EMP, and semiannually in respect of implementation of, and compliance with, Involuntary Resettlement Safeguards and the RP during construction and the implementation of the Project until the issuance of ADB's Project completion report, unless a longer period is agreed in the EMP or the RP, as applicable, and disclose relevant information from such reports to the respective affected people under the Environmental Safeguards and the Involuntary Resettlement Safeguards promptly upon submission;</p> <p>(b) if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the EIA, the EMP, the EMDP and the RP, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan;</p> <p>(c) no later than start of construction, engage qualified and experienced external experts or qualified consulting firm under a selection process and terms of reference acceptable to ADB, to verify information produced through the Project monitoring process, and facilitate the carrying out of any verification activities by such external experts; and</p> <p>(d) report any actual or potential breach of compliance with the measures and requirements set forth in the EMP, the EMDP and the RP promptly after becoming aware of the breach.</p>	para 9, Schedule, PA	Being complied with.
29	<p><u>Grievance Redress Mechanism</u></p> <p>ZCG shall cause PMO to ensure that a safeguards grievance redress mechanism acceptable to ADB is established in accordance with the provisions of the EIA, the EMP, the EMDP and the RP at the project management office, within the timeframes specified in the relevant EIA, EMP, EMDP and RP, to consider safeguards complaints.</p> <p>The grievance redress mechanism referred to in the preceding paragraph shall function to (a) review and document eligible complaints of Project stakeholders; (b) proactively address grievances; (c) provide the complainants with notice of the chosen mechanism and/or action; (d) be an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people at no costs and without retribution; and (e) prepare and make available to ADB as part of the Project progress report summary of (i) the number of complaints received and resolved; (ii) chosen actions; and (iii) final outcomes of the grievances.</p>	paras 10-11, Schedule, PA	Being complied with.

No.	Description	Reference	Status of Compliance
30	<p><u>Labor Standards, Health and Safety</u></p> <p>ZCG shall cause PMO to ensure that the core labor standards and the Borrower's applicable laws and regulations are complied with during Project implementation. ZCG shall cause PMO to include specific provisions in the bidding documents and contracts financed by ADB under the Project requiring that the contractors, among other things: (a) comply with the Borrower's applicable labor law and regulations and incorporate applicable workplace occupational health and safety norms; (b) do not use child labor; (c) do not discriminate workers in respect of employment and occupation; (d) do not use forced labor; and (e) disseminate, or engage appropriate service providers to 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 the local communities surrounding the Project area, particularly women.</p> <p>ZCG shall cause PMO to strictly monitor compliance with the requirements set forth in paragraph 12 above and provide ADB with regular reports.</p>	paras 12-13, Schedule, PA	Being complied with.
32	<p><u>Prohibited List of Investments</u></p> <p>ZCG shall cause PMO to ensure that no proceeds of the Loan are used to finance any activity included in the list of prohibited investment activities provided in Appendix 5 of the SPS.</p>	para 15, Schedule, PA	Being complied with.

28. Follow-ups to the DMF indicators related to environment are summarized as following.

Table 8 DESIGN AND MONITORING FRAMEWORK (updated status to 31 Dec 2022)

Impact the Project is Aligned with 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	Risks
Outcome Condition of water resources and environment in the Sayu River Basin improved	<p>. By 2027, monthly average total nitrogen in the Yudong Reservoir meets the Class III standard 10 times per year (2019 baseline: 9 times)^b –not yet started</p> <p>. By 2027, monthly average total phosphorus in the Yudong Reservoir meets the Class II standard 10 times per year (2019 baseline: 8 times)^c –not yet started</p>	a.–b. Zhatong City Water Resources Bureau's data	Ineffective environmental monitoring and enforcement by environmental authorities

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PART V – FIELD ENVIRONMENTAL SAMPLING AND TESTING RESULTS ASSESSMENT

29. **Arrangement of Field Environmental Sampling and Testing.** During this monitoring period, some civil works contracts were under construction. An external environmental consulting firm was engaged under ADB loan at end 2021. The first EMR was submitted at end Jan 2022, the second at end July 2022 and the third is expected to be submitted at January 2023. The schedule for future semiannual EMR submission was semiannually, i.e., every 31 January and 31 July, until completion of last civil works contract; and annually thereafter during commissioning, till the project completion report is issued.

30. 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 the EMA(s); and (iii) compliance monitoring - to be conducted by the LIEC, to ensure the EMP is being implemented.

31. The monitoring program (Table EMP-5 of EMP) 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.

32. Internal monitoring. During the construction phase, 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 PMO.

33. Compliance monitoring for EMP. The LIEC will review project progress and compliance with the EMP based on field visits, consultations with the PMO and LPMO environment officers, contractors, and CSCs, and review of the monitoring reports by the CSCs and EMA(s). 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 of EMP. 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. There is no set frequency for these inspections: the LIEC will make site visits as often as possible within the available budget, focused especially on periods of peak construction. The findings of the LIEC will be reported to ADB through the semi-annual environment monitoring reports.

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

by ADB to PMO to assist in report preparation.

35. Project completion environmental audits. Within three months after each subproject completion, or no later than a half year with permission of the local EEBs, environmental acceptance monitoring and audit reports of each subproject completion shall be: (i) prepared by a licensed environmental monitoring institute (usually, the institute is the municipal, district, or county environmental monitoring station under the municipal, district, or county EEB) in accordance with the PRC Guideline on Project Completion Environmental Audit (2001); (ii) reviewed for approval of the official commencement of individual subproject operation by environmental authorities; and (iii) reported to ADB through the semi-annual environment monitoring reports.

36. Quality assurance (QA) /quality control (QC) for compliance monitoring. To ensure accuracy of the monitoring, QA/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.

37. The results of the environmental monitoring will be compared with EMP requirements site management plans, and relevant PRC standards. Noncompliance will be highlighted in the monitoring reports. Monitoring results will be submitted to the PMO and then reported by the PMO to ADB in annual environmental monitoring reports (prepared with the support of the external monitor).

Table 9: Environmental Monitoring Program for “Internal” and “External” Monitoring.
See text for description of “compliance monitoring”.

Subject	Parameter	Location	Frequency	Implement	Supervise	Implementation Status
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 of EMP)	Visual inspection at all construction sites	1 time / week	Contractor, CSC,	PMO, LIEC	Implemented
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%	Construction site boundary	1 time / week minimum during peak construction levels at work sites	CSC, LPMO, LIEC	PMO, LIEC	Implemented
Solid waste	Garbage and construction wastes Contractor performance target: no uncollected waste at end works each day	Visual inspection at all construction sites and work-camps	Daily	Contractor, CSC, LPMO	PMO, EEB, Sanitation bureau	Implemented
Soil erosion and re-vegetation	Soil erosion intensity and survival rate of revegetation	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, LIEC	Implemented
	Re-vegetation of embankments and other areas,	Visual inspection along embankment sections and all revegetation areas	At least 2 times / year	Contractor, CSC,	PMO	Implemented
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	Implemented

2. External monitoring - by certified environment monitoring agencies						
Quality of sewage and discharge channels at work camps	pH, SS, NH ₃ -N, COD _{or} , petroleum	Domestic wastewater discharge at work-camps	2 times/year during construction	EMA	EPB, PMO	Implemented
Construction wastewater	SS, oil, pH	(i) 100 m upstream and 100 m downstream of river embankment works; (ii) at wastewater discharge points of all construction sites	2 times/year during construction	EMA	EPB, PMO	Implemented
Ambient air quality	TSP	All construction sites (at least 1 point upwind, 1 point downwind) and nearby sensitive receivers	2 times / year during construction	EMA	EPB, PMO, LIEC	Implemented
Noise	LA _{eq}	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	EPB, PMO, LIEC	Implemented
OPERATION PHASE - by certified environment monitoring agencies						
GARBAGE PYROLYSIS PLANTS - two						
Ambient air quality: flue gas emissions and/or odor ²	Flue gas emissions: NH ₃ , H ₂ S, HCl, CO, Hg, Cd, Pb, As, Cr, Cu, Mn, Ni, dioxins Odor: H ₂ H, NH ₃	Flue gas emissions: (i) at chimney outlet; (ii) 100 m downwind of each GPP Odor: at boundary of GPP	1 baseline sampling before operation (to complement EIA sampling in May 2019); then 4 times/year during operation	EMA	PMO, LPMO EEB	Not yet due
Soil quality	pH, Cd, Hg, As, Cu, Pb, Cr, Zn, Ni, dioxins	3 locations per GPP: (i) 1 point within GPP; (ii) 1 point 5 m outside GPP; (iii) 2 points within farmland between 113 and 146 m from GPP	1 time / year	EMA	PMO, LPMO EEB	Not yet due

Groundwater	Cu, Zn, Fe, Mn, Pb, Cd, As, Hg, Cr6+, pH, NH ₃ -N, total hardness, total dissolved solids, CODMn, sulfate, nitrate, nitrite, chloride, fluoride, volatile phenol, total bacterial count, total coliform group, petroleum	Groundwater near GPP (same sampling sites as those used in May 2019; EIA Section IV.G.b)	1 time / year	EMA	PMO, LPMO EEB	Not yet due
Noise	LAeq	Boundary of GPP	2 times / year (twice a day: 1 in day and 1 at night for 2 consecutive days)	EMA and OPF	PMO, LPMO, EEB	Not yet due
Garbage transfer stations - four						
Odor	H ₂ H, NH ₃	Boundary of GTS	4 times / year	EMA	PMO, LPMO, EEB	Not yet due
Noise	LAeq	Boundary of GTS	2 times / year (twice a day: 1 in day and 1 at night for 2 consecutive days)	EMA and OPF	PMO, LPMO, EEB	Not yet due
Wastewater treatment stations - spot testing (random selection) among the 44 stations						
Effluent from WWTS	COD _{or} , NH ₃ -N, TN, TP	At discharge outlet of WWTS	2 times / year. Will complement the auto-monitoring by sensors installed at discharge outlet of each WWTS	EMA	PMO, LPMO EEB	Not yet due
Noise	LAeq	Boundary of WWTS	2 times / year (twice a day: 1 in day and 1 at night for 2 consecutive days)	EMA and OPF	PMO, LPMO, EEB	Not yet due
Constructed wetlands - six						
Water quality downstream	pH, SS, DO, NH ₃ -N, oil, COD _{Cr} , Cr6+, BOD ₅ , TN,	50 m and 500 m downstream of the constructed wetlands	4 times / year	EMA	PMO, LPMO EEB	Not yet due
Subject	Parameter	Location	Frequency	Implement	Supervise	
of wetlands	TP, chloride, NO ₃ -N, total coliforms					Not yet due
Afforestation sites						
Soil and Vegetation	Plant survival and coverage	All re-vegetated sites	Spot check, twice a year	Forestry Bureau	Forestry Bureau	Not yet due

BOD₅ = 5-day biochemical oxygen demand; COD_{Cr} = chemical oxygen demand; CSC = construction supervision company; EMA = environmental monitoring agency; EMR = emergency response plan; EEB = ecology and environment bureau; HCl = hydrochloric acid, IA = implementation agency; LAeq = equivalent continuous A- weighted sound pressure level; NH₃-N = ammonia nitrogen; NO_x = nitrogen oxide; OPF = operator of project facility; PM₁₀ = particles measuring <10µm; LPMO = local project management office; PMO = project management office; SO₂ = sulfur dioxide; SS = suspended solids; TSP = total suspended particle.

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

Parameters selected to measure potential odors and/or hazardous air emissions from heavy metals, acids (for flue gas emissions) and odors (from stockpiled waste). There are currently no national standards in the People's Republic of China for measuring emissions from garbage pyrolysis plants. The monitoring will help establish a baseline as well as detection of such hazards.

Overall monitoring map



C18 Ludian Longshu Construction Civil Works

Table Noise analysis results

Testing location	Test date	Test time	Equivalent sound level Leq (A)
			Test results
Site Boundary East	2022.09.12	Daytime (9: 00-9:45)	53
		No night construction	/
Site Boundary West	2022.09.12	Daytime (10: 00-10:45)	54
		No night construction	/
Site Boundary South	2022.09.12	Daytime (11: 00-11:45)	58
		No night construction	/
Site Boundary North	2022.09.12	Daytime (14: 00-14:45)	57
		No night construction	/
Nearby	2022.09.12	Daytime (15: 00-15:45)	45

sensitive		No night construction	/
Remarks	<p>Complied with</p> <p>(Daytime \leq 60 dB (a))</p>		

Table Surface water analysis results

Parameters	Test results		Applicable standards limits, Grade IV Standard of Environmental Quality Standards for Surface Water (EQSSW , GB 3838-2002)	Remarks
	2022.09.13			
	100 meters upstream of the construction section	100 meters downstream of the construction section		
Suspended solids (mg/L)	14	18	Not applicable	Complied with
pH	7.3	7.5	6-9	Complied with
Petroleum (mg/L)	0.18	0.12	0.5	Complied with
Remarks: When the detection result is lower than the detection limit, the detection result of this item is expressed as "<detection limit".				

Table Ambient Air Analysis Results

Parameters	Sampling location	Sampling time	Analysis results (mg/m ³)
TSP	Upwind 1 #	10:30-11:30	<0.001
	Downwind 2 #	10:30-11:30	<0.001
	Sensitive point 3 #	10:30-11:30	<0.001

Remarks	<p>Complied with</p> <p>Class II Standard of GB3095-2012</p> <p>TSP: 300)</p>
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C22 -1 for Sayu Construction Civil Works

Table Noise analysis results

Testing location	test date	Detection time	Equivalent sound level
			Leq (A) Test results
Site Boundary East	2022.09.13	Daytime (8: 00-8:45)	57
		No night construction	/
Site Boundary	2022.09.13	Daytime (9: 00-9:45)	59

West		No night construction	/
Site Boundary South	2022.09.13	Daytime (10: 00-10:45)	57
		No night construction	/
Site Boundary North	2022.09.13	Daytime (11: 00-11:45)	58
		No night construction	/
Remarks	Complied with (Daytime \leq 60 dB (a)) Category 2 Standards in Environmental quality standard for noise GB 3096-2008		

Table Surface water analysis results

Parameter	Test results		Applicable standards limits, Grade IV Standard of Environmental Quality Standards for Surface Water (EQSSW , GB 3838-2002)	Remarks
	2022.09.14			
	100 meters upstream of the construction section	100 meters downstream of the construction section		
Suspended solids (mg/L)	12	16	Not applicable	Complied with
pH	7.9	7.6	6-9	Complied with
Petroleum (mg/L)	0.26	0.18	0.5	Complied with
Remark:	When the detection result is lower than the detection limit, the detection result of this item is represented by "<detection limit".			

Table Ambient Air Analysis Results List

Parameter	Sampling location	Sampling time	Analysis results (mg/ m ³)
TSP	Upwind 1 #	14:00-15:00	<0.001
	Downwind 2 #	15:00-16:00	<0.001
	Downwind 3 #	16:00-17:00	<0.001
Remarks	<p>Complied with</p> <p>Class II Standard of GB3095-2012</p> <p>TSP: 300)</p>		

C22 -2 for Leju Ecological River Restoration and Xinhe Wetland Construction Civil Works

Table Noise analysis results

Testing location	test date	Detection time	Equivalent sound level L eq (A)
			Test results
Site Boundary East	2022.09.15	Daytime (8: 00-8:45)	57
		No night construction	/
Site Boundary West	2022.09.15	Daytime (9: 00-9:45)	59
		No night construction	/
Site Boundary South	2022.09.15	Daytime (10: 00-10:45)	58
		No night construction	/
Site Boundary North	2022.09.15	Daytime (14: 00-14:45)	57
		No night construction	/
Nearby Sensitive Points	2022.09.15	Daytime (15: 00-15:45)	46
		No night construction	/
Remarks	Complied with (Daytime \leq 60 dB (a))		

Table Surface water analysis results

Parameter	Test results		Applicable standards limits, Grade IV Standard of Environmental Quality Standards for Surface Water (EQSSW , GB 3838-2002)	Remarks _
	2022.09.15			
	100 meters upstream of the construction section	100 meters downstream of the construction section		
Suspended solids (mg/L)	13	28	Not applicable	Complied with
pH	7.6	7.7	6-9	Complied with
Petroleum (mg/L)	0.34	0.42	0.5	Complied with
Remark:	When the detection result is lower than the detection limit, the detection result of this item is represented by "<detection limit".			

Table Ambient Air Analysis Results

Parameter	Sampling location	sampling time	Analysis results (mg/ m ³)
TSP	Downwind 2 #	16:00-17:00	<0.001
	Upwind 1 #	16:00-17:00	<0.001
	Sensitive point 3 #	16:00-17:00	<0.001
Remarks	<p>Complied with</p> <p>Class II Standard of GB3095-2012</p> <p>TSP: 300)</p>		

38. **Assessment of monitoring results.** The air quality monitored has met *Environment Ambient Air Quality Standard (GB3095—2012, Grade II⁷)*. Noises at each construction site have met the requirement of relevant standards- *Emission standard of environment noise for boundary of construction site (GB 12523—2011)*. Water quality has met *Environmental Quality Standards for Surface Water (GB3838-2002)*, Grade IV .

Reporting Requirements

39. The PMO, with the assistance from LIEC, will prepare the EMP implementation section of the semi-annual project progress reports to be submitted to ADB. If any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the project that were not considered in the EIA and EMP are discovered, the PMO shall promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan. The environmental reporting

⁷ There are three grades of ambient air quality function areas: Grade II is for Residential, Commercial, Industrial and Rural Area.

requirements are described below and also summarized in Table 9.

Table 9: Environmental Reporting Plan

Report	From	To	Frequency of Reporting	Compliance status
A. Construction Phase				
Internal progress reports	CSC	LPMO	Monthly	In compliance
External reports	EMA	PMO, LPMOs	Semi-annual	In compliance
Environmental acceptance monitoring and audit reports	Licensed institute	EPB, PMO, LPMOs	Within three months component completion	Not yet due
Environmental monitoring report	PMO	ADB	Semi-annual	In compliance
B. Operation Phase				
EMP progress reports	PMO	ADB	Semi-annual	Not yet due

PART VI - CONSULTATIONS AND COMPLAINTS

Public Consultation

40. Three rounds of public consultation were conducted during project preparation (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 from dredged sediment. 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 LIEC.

Table 10: Public Consultation and Participation Plan

Organizer	Approach	Times/Frequency	Subjects	Participants	Implementation status
Construction					
PMO, LPMOs, LIEC	Questionnaire survey, site visits, informal interviews	Once a year during peak construction	Construction impacts; adjusting mitigation measures if necessary; feedback	Workers, residents in construction areas	In compliance. Done in Jun 2022 and Dec 2022 (see Appendix 4)
	Site-specific basis	At least one month before the start of construction at any new site	Anticipated risks - noise, odor, other; Procedures in the event of interruptions to water and wastewater services		In compliance. Done in Jun 2022 and Dec 2022 (see Appendix 4)
	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	Not yet due
Operation					
PMO, implementing agencies, OPF	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	Not yet due

	Public workshop	As needed based on consultations	As above	As above	Not yet due
	Public survey	At least once after 1 year of operation	Comments and suggestions	Project beneficiaries	Not yet due

Grievance Redress Mechanism

41. **GRM Training and Operation Status.** PMO/IAs' GRM system, including the focal point, procedures, timelines for different institutions involved, and so on, have been trained and will be gradually improved. In the reporting period, no compliance or grievance was received.
42. This project grievance redress mechanism (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.
43. 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 CSCs on the GRM procedures, and coordinate with the local EEBs and other government divisions as necessary. PMO and LPMO staff will be trained and supported by the LIEC and loan implementation social consultant.
44. The contact persons for different GRM entry points, such as the PMO and LPMO environmental and social officers, contractors, operators of project facilities, and 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.
45. If a complaint is received and filed, the PMO and 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-1.

- **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 two calendar days; and (v) as far as possible, resolve the problem within five calendar days from receiving the complaint. The contractor will keep the LPMO fully informed at all stages. The LPMO will: inform the PMO, local village committee, and Ecology and Environment Bureau of the incident within one working day of being informed by the contractor; and, subsequently keep these parties informed at all stages.

- **Stage 2 (5 calendar days):** If the issue cannot be resolved in Stage 1, after five calendar days, the LPMO and/or PMO will take over responsibility. Eligibility of the complaint will be assessed and a recommended solution given to the complainant and contractors within two calendar days. If the solution is agreed by the complainant, the contractors and/or facility operators (in operation) will implement the solution within five calendar days from the LPMO or PMO taking over responsibility of the complaint. Written records will be made of all stages and outcomes. At the expiration of Stage 2, PMO will inform ADB of the outcome.

- **Stage 3 (15 calendar days):** If no solution can be identified by the PMO and/or LPMO, and/or the complainant is not satisfied with the proposed solution, the PMO and/or PMO will organize, within seven (7) calendar days, a stakeholder meeting (including the complainant, contractor and/or operator of the facility, EEB, LPMO, 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, PMO will inform ADB of the outcome.

46. 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, PMO, LPMOs, governments of Zhaotong City, Zhaoyang District and Ludian County, and/or ADB.
47. The PMO and 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.

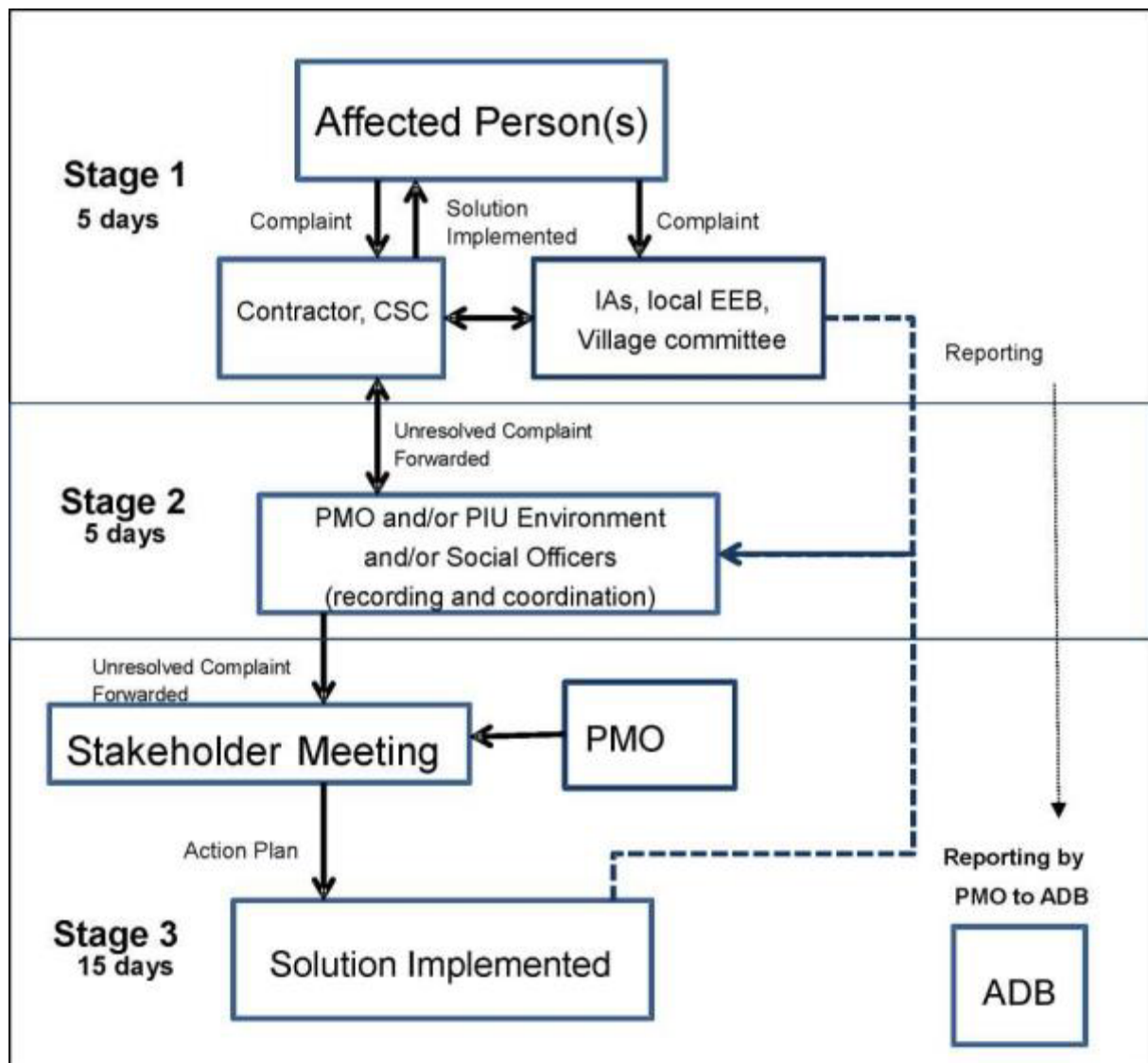


Figure 1: Operation Chart of the Grievance Redress Mechanism

ADB = Asian Development Bank, CSC = construction supervision company, EEB = ecology and environmental bureau, GRM = grievance redress mechanism, IA = implementing agency, PMO = project management office.

PART VII – CONCLUSIONS AND ACTION PLAN FOR THE NEXT PERIOD

7.1 Conclusions and recommendations

48. **Summary of Monitoring Results during This Reporting Period.** For the reporting period, the Project is at the implementation stage with four contracts under construction. Based on the environmental monitoring during this reporting period, it is found that the IAs have undertaken relevant environmental mitigation measures specified in the EIA/ EMP and project domestic EIA reports, and shown enough concerns on the possible negative environmental impacts due to the project implementation.

7.2 Action Plans for the Next Period

- The PMO confirmed that all PMO/IAs members and stakeholders of the project are safe as of Dec 2022. Considering the project geographic location and actual status, the unanticipated Covid-19 risks and impacts to the Project was insignificant. Although, COVID-19 prevention and control measures will be taken following the PRC government regulations and guidelines or international good practice guidelines as updated in the future .
- The fourth EMR will be submitted at end July 2023.

APPENDIX 1: IMPLEMENTATION STATUS SUMMARY OF EMP MITIGATIONS

Table A1: Potential Impacts and Mitigation Measures – General

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
A. DESIGN AND CONSTRUCTION PHASES					
Detailed design stage	Institutional strengthening for EMP Implementation and supervision	<ul style="list-style-type: none"> At least 1 month before construction: (i) reconfirm the full-time status of the PMO Environmental Officer; (ii) appoint at least one Environment Officer in each LPMO. At least 2 months before any construction, PMO engages LIEC. At least 2 months before any construction, provide training to all environmental staff for EMP implementation and supervision. Confirm that at least one certified EMA has been recruited for the project at least 2 months before any construction. Organize and conduct training on the project EMP for appropriate staffs of the PMO, IAs, LPMOs, contractors, and CSCs. 	PMO, LPMOs	PMO	Being complied with
	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 	PMO, LIEC	EEBs, ADB	Not applicable

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
		<p>used in any materials supported by the project.</p> <ul style="list-style-type: none"> • Check with the design institute and 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 Zhaotong and county EEBs and ADB for approval and disclosure. ADB will determine if the change is minor or major. 			
Construction Preparation	Environmental monitoring plan	<ul style="list-style-type: none"> • Prior to construction, the PMO or 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	Being complied with
	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. • Afforestation subcomponent will be designed by a combined team of an ecological specialist and forester, not only forestry specialist or infrastructure engineers. 	Design institute	PMO	Being complied with
	Bidding and contract documents	<ul style="list-style-type: none"> • Mitigation measures in the EMP are incorporated in all bidding documents. 	DIs, PMO, PMOs	LIEC, EPD, EPBs, ADB	Being complied with

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
		<ul style="list-style-type: none"> Bidding documents are sent to ADB for review. Prepare environmental contract clauses for contractors. 			
	EMP training	LIEC, or invited environment specialists and/or officials from EPBs provide training on construction environmental management, implementation, supervision, to contractors and CSCs, in accordance with the training plan in this EMP.	LIEC	PMO, EEB	Being complied with
	Establish GRM	<ul style="list-style-type: none"> Responsibility for GRM implementation is assigned to the PMO and LPMO Environmental Officers and Social Officers and is included in their terms of reference. PMO and LPMO personnel will be aware of, and trained in, the GRM, and will help support the environmental and social officers when necessary. Key contact details for the GRM (phone number, WeChat, address, email) will be provided on the PMO, IA and/or EPB public websites and information boards at construction sites. 	PMO, LPMOs	LIEC	Being complied with
	Site EMPs	<ul style="list-style-type: none"> Prior to any works, prepare site-specific EMP for individual construction sites 	Contractor	CSC	Being complied with
		<ul style="list-style-type: none"> Review and ensure site EMP complies with the measures in this EMP 	PMO, LPMO	LIEC	Being complied with
B. CONSTRUCTION PHASE					
Topography and Soils	Earthwork, soil erosion, soil contamination	<ul style="list-style-type: none"> 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 	Contractor	CSC, LPMO, PMO, EEB, WRB, LIEC	Being complied with

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
		<p>drainage.</p> <ul style="list-style-type: none"> • Limit construction and material handling, in particular 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. • 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. 			

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
		<ul style="list-style-type: none"> 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 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, LIEC	Being complied with
Noise	Noise generated from construction activities	<ul style="list-style-type: none"> Ensure construction machinery conform to 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 GTSSs, 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. Monitor noise at sensitive areas and consult villagers/residents at regular intervals (see Table EMP-5). If noise standards are exceeded, equipment and construction conditions shall be checked, and mitigation measures shall be implemented to rectify the situation. Conduct interviews with residents adjacent to construction sites to identify and resolve issues, including adjustment of work hours of 	Contractor	CSC, LPMO, PMO, LIEC	Being complied with

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
		<p>noise-generating machinery.</p> <ul style="list-style-type: none"> For about 1,341 households that will be within 40 m of construction works (EIA Section VI.C.5), particular attention will be provided. This will include: (a) 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; (b) 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; (c) 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 cleanup installations. Prior to any earthworks along rivers and channels, install sediment traps and curtains, to minimize sediment runoff. For embankments, sewer pipeline works by river banks, and afforestation sites by river banks, 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- 	Contractor	CSC, LPMO, PMO, LIEC	Being complied with

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
		<p>treatment systems for worker camps along with maintenance protocols.</p> <ul style="list-style-type: none"> Domestic wastewater from worker camps will be disposed in three ways: (i) for work sites near septic tanks in surrounding villages, domestic wastewater will be treated by the septic tanks before being used for irrigation; (ii) for work sites accessible to municipal sewerage systems, domestic wastewater will be discharged into the nearest sewerage system; (iii) 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 the concentration of suspended solids (SS) is less than 20 mg/L. Water quality (for pollutants such as SS, CODa, NH3-N and petroleum) in the project waterways will be monitored by 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. 	Contractor	CSC, LPMO, PMO, LIEC	Being complied with
		<ul style="list-style-type: none"> 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 			Being complied with

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
		<p>spoil (waste concrete, waste bricks and other solid waste) will be used for manufacturing building materials (permeable bricks and hollow wall material).</p> <p>CONTRACTOR PERFORMANCE TARGET: No uncollected waste at close of construction activities each day.</p>			
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 main stream 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 Yunnan Regulation for Landscaping Management: (a) the area of compensatory plantings will be double that of the area of vegetation that is cleared; and (b) a minimum survival rate of 80% of the planted vegetation is required. Survival rate will be monitored by the contractor and Zhaotong Forestry Bureau. • All planting activities, including re-vegetation, embankment construction, wetlands, landscaping, and rehabilitation of construction sites, will only use plant species which are (a) native (i.e. naturally occurring) to the Sayu River basin, and (b) 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 and sites, only sterile seedlings will be used to prevent the spread of weeds. 	Contractor	LPMOs, PMO, LIEC, Zhaotong Forestry Bureau	Being complied with

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
		<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 Chinese Academy of Sciences (19 species). To avoid pollution of the Yudong Reservoir and 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 cultural resources; If a new site is unearthed, work shall be stopped immediately and the PMO, 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, LIEC, cultural relic bureau	Not applicable
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 two 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 one (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, LIEC	Being complied with
Community and occupational	Community consultation, health, and safety	Community consultations Prior to any works, inform residents and businesses in advance through media, information boards, and direct consultations, of the construction	Contractor, CSC	CSC, LPMO, PMO, LIEC	Being complied with

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
health and safety		<p>activities, dates and duration of expected disruption. Especially for the communities within 40 m of works and who will be subjected to higher noise/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 CSC monitoring schedules and monitoring criteria as needed to reflect the updated contractor site management plans. Community health, safety, and minimizing disruption to daily life Prepare and implement a traffic control plan, for approval by local traffic management 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; For all works involving excavation along roads and easements which already have existing subsurface utilities (power cables, sewage pipes, water pipes, telecommunication cables):</p> <ul style="list-style-type: none"> • plan and coordinate the project sewage pipeline construction with the utility managers, • 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 			

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
		areas. <ul style="list-style-type: none"> • Ensure that all sites are secure, discouraging access through appropriate fencing. • Lock and secure all work sites to prevent unauthorized access. • Night-time (8:00pm - 6:00am) 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 PMO and EEB for approval. Establish emergency phone links with township hospitals. Maintain a first-aid base in each construction camp. • Establish a records management system for occupational accidents, diseases, incidents that: (a) includes a tracking system to ensure that incidents are followed-up; (b) can easily retrieve records; and (c) 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. • Safety communication. Publicize occupational health and safety matters to all project personnel. Install on-site signs and give regular training. • Train all workers in basic sanitation, health and safety matters, and work hazards. 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. • 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 	Contractor	CSC, LPMO, PMO, LIEC	Being complied with

Item	Potential impacts / issues	Mitigation measures	Who implements	Who supervises	Implementation status
		for hazardous waste, who will be responsible for the safe handling, transport, and disposal of the materials; (iii) such materials will only be disposed in a landfill site certified and designed to receive hazardous materials. CONTRACTOR PERFORMANCE TARGET: Camps clean, emergency response plans in place, and 100% of workers aware of emergency response procedures.			

CSC = construction supervision company, EEB = ecology and environment bureau, EMA = environmental monitoring agency; LIEC = loan implementation environment consultant, LPMO = local project management office (under project implementing agency), PMO = Zhaotong project management office

APPENDIX 2: THE PROJECT' S COVID-19 RESPONSES

Item	Good Practices	Who Implements	Who Supervises	Compliance status as of Dec 2022
Awareness materials	<ul style="list-style-type: none"> • Preparation of awareness materials on COVID-19 e.g., signs, posters • Installation of awareness signs at work sites, for visibility to workers and the general public 	Contractor	CSC, PIO, PMO, LIEC	In compliance
Detection Measures	<ul style="list-style-type: none"> • Control and document the entry/exit to the work site for both workers and other parties. • Prevent sick workers from entering the site through checking temperatures of workers and other people entering the site. Require self-reporting prior to entering the site. • All workers to self-monitor their health, possibly with the use of questionnaires, and take their body temperature regularly. • Thermal screening at the workplace to be considered only in the context of a combination of measures for prevention and control of COVID-19 at the workplace and along with risk communication. 	Contractor	CSC, PIO, PMO, LIEC	In compliance

Item	Good Practices	Who Implements	Who Supervises	Compliance status as of Dec 2022
Physical Distancing measures	<ul style="list-style-type: none"> • Keep a distance of at least 1 meter between workers and minimize physical contact, ensure strict control over external access, and queue management (marking on the floor, barriers). • Reduce density of people in the building (no more than 1 person per every 10 square meters), physical spacing at least 1 meter apart for workstations and common spaces, such as entrances/exits, lifts, pantries/canteens, stairs, where congregation or queuing of employees or visitors/clients might occur. • Avoid crowding by staggering working hours to reduce the congregation of employees at common spaces such as entrances or exits. • Implement or enhance shift or split-team arrangements, or teleworking. • Minimize the movement of local workers in and out of the site (e.g., avoid workers returning home to affected areas, or returning to site from affected areas). • Minimize the workers' contact with local community. 	Contractor	CSC, PIO, PMO, LIEC	In compliance
Respiratory measures	<ul style="list-style-type: none"> • All workers should wear a face mask. • If a worker is sick, they should not come to work if a member of staff or a worker feels unwell while at work, provide a medical mask so that they may get home safely. • Where masks are used, whether in line with government policy or by personal choice, it is very important to ensure safe and proper use, care, and disposal 	Contractor	CSC, PIO, PMO, LIEC	In compliance

Item	Good Practices	Who Implements	Who Supervises	Compliance status as of Dec 2022
Hand Hygiene measures:	<ul style="list-style-type: none"> • Regular and thorough handwashing with soap and water or hand hygiene with alcohol-based hand-rub (a) before starting work, before eating, frequently during the work shift, especially after contact with co-workers or customers, (b) after going to the bathroom, after contact with secretions, excretions and body fluids, after contact with potentially contaminated objects (gloves, clothing, masks, used tissues, waste), and immediately after removing gloves and other protective equipment but before touching eyes, nose, or mouth. • Hand hygiene stations, such as hand washing and hand rub dispensers, should be put in prominent places around the workplace and be made accessible to all staff, contractors, clients or customers, and visitors along with communication materials to promote hand hygiene 	Contractor	CSC, PIO, PMO, LIEC	In compliance
Cleaning and Disinfection	<ul style="list-style-type: none"> • Cleaning and Disinfection off all site facilities, including offices, accommodation, canteens, and common spaces: • Cleaning (soap, water, and mechanical action) to remove dirt, debris, and other materials from surfaces. Disinfection of dirty surfaces and objects only after cleaning. • Most common disinfectants – sodium hypochlorite (bleach) of surface at concentration 0.1% or alcohol at least 70% concentration for surfaces which can be damaged by sodium hypochlorite. • Priority disinfection of high-touch surfaces - commonly used areas, door and window handles, light switches, kitchen and food preparation areas, bathroom surfaces, toilets and taps, touchscreen personal devices, personal computer keyboards, and work surfaces. • Disinfectant solutions must always be prepared and used according to the manufacturer's instructions, including instructions to protect the safety and health of disinfection workers, use of personal protective equipment, and avoiding mixing different chemical disinfectants. 	Contractor	CSC, PIO, PMO, LIEC	In compliance

Item	Good Practices	Who Implements	Who Supervises	Compliance status as of Dec 2022
	<ul style="list-style-type: none"> • Provide appropriate PPEs to the cleaners. • Manage the waste as the medical waste and dispose of it in accordance with local regulations. 			
Response measures if workers found with COVID-19 symptoms	<ul style="list-style-type: none"> • Workers who are unwell or who develop symptoms consistent with COVID-19 to stay at home, self-isolate, and contact a medical professional or the local COVID-19 information line for advice on testing and referral (consider telemedicine and flexible sick leave policy). • Standard operating procedures to be prepared to manage a person who becomes sick at the workplace and is suspected of having COVID-19, including isolation, contact tracing and disinfection. • People who were in close contact at the workplace with persons with laboratory-confirmed COVID- 19 should be quarantined for 14 days from the last time of the contact in accordance with WHO recommendations. • Set out differentiated procedures for the treatment of sick persons, based on the case severity. Pay workers throughout periods of illness, isolation, or quarantine. • Set aside a part of worker accommodation for precautionary self-quarantine. • Establish communications with local medical services and refer sick workers to there. 	Contractor	CSC, PIO, PMO, LIEC	In compliance
Adjusting Work Practices and Manage Work Related Travels	<ul style="list-style-type: none"> • Consider changes to work processes and timings to minimize contact between workers (e.g., decreasing the size of work team, changing to a 24-hour work rotation). • Cancel or postpone non-essential travel to areas with community transmission of COVID-19. • Provide hand sanitizer to workers who must travel, advise workers to comply with instructions from local authorities where they are travelling, as well as information on 	Contractor	CSC, PIO, PMO, LIEC	In compliance

Item	Good Practices	Who Implements	Who Supervises	Compliance status as of Dec 2022
	<p>whom to contact if they feel ill while travelling.</p> <ul style="list-style-type: none"> Workers returning from an area where COVID-19 transmission is occurring should monitor themselves for symptoms for 14 days and take their temperature twice a day; if they are feeling unwell, they should stay at home, self-isolate, and contact a medical professional. 			
Communication and Contact with the Community	<ul style="list-style-type: none"> Carefully manage the relations with the community with clear and regular communication. Made aware of the procedures put in place at the site to address issues related to COVID-19. Practice social distancing with the local community. 	Contractor	CSC, PIO, PMO, LIEC	In compliance
Risk communication, training, and education	<ul style="list-style-type: none"> Provide posters, videos, and electronic message boards to increase awareness of COVID-19 among workers and promote safe individual practices at the workplace, engage workers in providing feedback on the preventive measures and their effectiveness. Provide regular information about the risk of COVID-19 using official sources, such as government agencies and WHO, and emphasize the effectiveness of adopting protective measures and counteracting rumors and misinformation. Special attention should be given to reaching out to and engaging vulnerable and marginalized groups of workers, such as those in the informal economy and migrant workers, domestic workers, subcontracted and self-employed workers, and those working under digital labor platforms. Train the workers on procedures in place by the project, and their own responsibilities in implementing them. 	Contractor	CSC, PIO, PMO, LIEC	In compliance

APPENDIX 3: IMPLEMENTATION STATUS SUMMARY OF CRVA

Key concerns in the CRVA	Implementation status as of Dec 2022	Follow-ups action plans needed?
1. Climate Risk Classification: The overall review for potential climate risk is: The climate risk screening identified the following risks which may affect the project : increase of frequency and extent of intense rain and floods; extreme changes in temperature leading to heatwaves, etc.; and increasing extent of droughts.. The risk of this project is assessed as <u>medium</u> ..	/	To be closely monitored and reported in future EMRs by further discussions with local DI, IAs and PMO.
2. Adaptation Activity		
Use more resistant pipes for wastewater collection.	Yes	To be closely monitored and reported in future EMRs by further discussions with local DI, IAs and PMO.
Increased the height of each manure collection tank by 20 cm.	Yes	
Expanded wetland area, added a drainage ditch, and added pumping systems.	Yes	
Use more resistant tree species and added pest monitoring and irrigation facilities for afforestation.	Yes	
Added efficient water-saving irrigation facilities and increased the height of ecological drainage ditches.	Yes	
Increased the freeboard of ecological embankments	Yes	
Strengthen monitoring	Yes	
Develop capacities of government staff and educate students for climate change.	Yes	
3. Mitigation Activity		
Install solar panels to 42 wastewater treatment facilities	Yes	To be closely monitored and reported in future EMRs by further discussions with local DI, IAs and PMO.
Construct two garbage pyrolysis facilities	Yes	
Construct wetlands	Yes	

Key concerns in the CRVA	Implementation status as of Dec 2022	Follow-ups action plans needed?
Conduct afforestation	Yes	

APPENDIX 4. PUBLIC CONSULTATION RECORDS

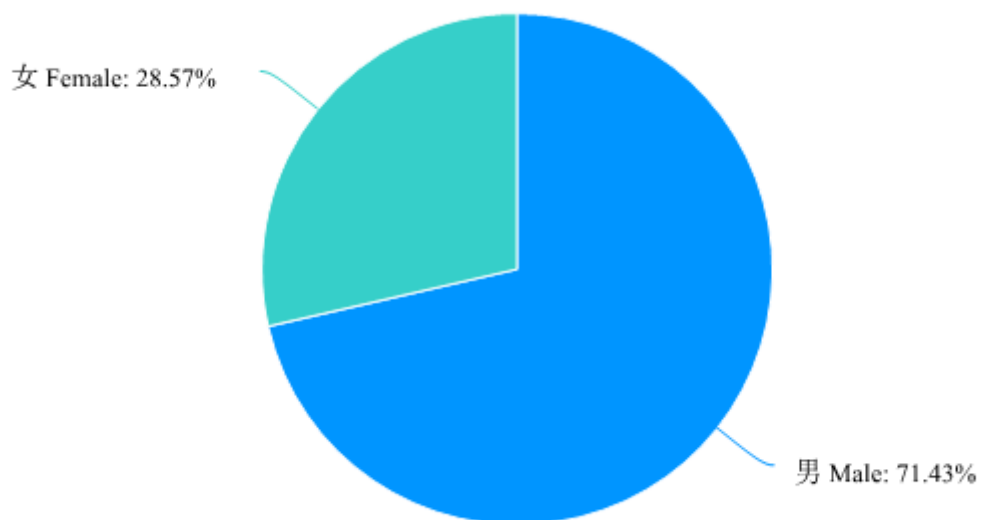
Note: The following questionnaire survey was undertaken via questionnaire through July to Dec 2022. The snapshot samples and the summary responses please see below.

第 1 题 您的姓名 Your name: [填空题]

序号	提交答卷时间
1	12 月 18 日 15:50
2	12 月 18 日 15:51
3	12 月 26 日 09:53
4	12 月 26 日 10:03
5	12 月 26 日 13:36
6	12 月 26 日 15:46
7	12 月 26 日 15:48

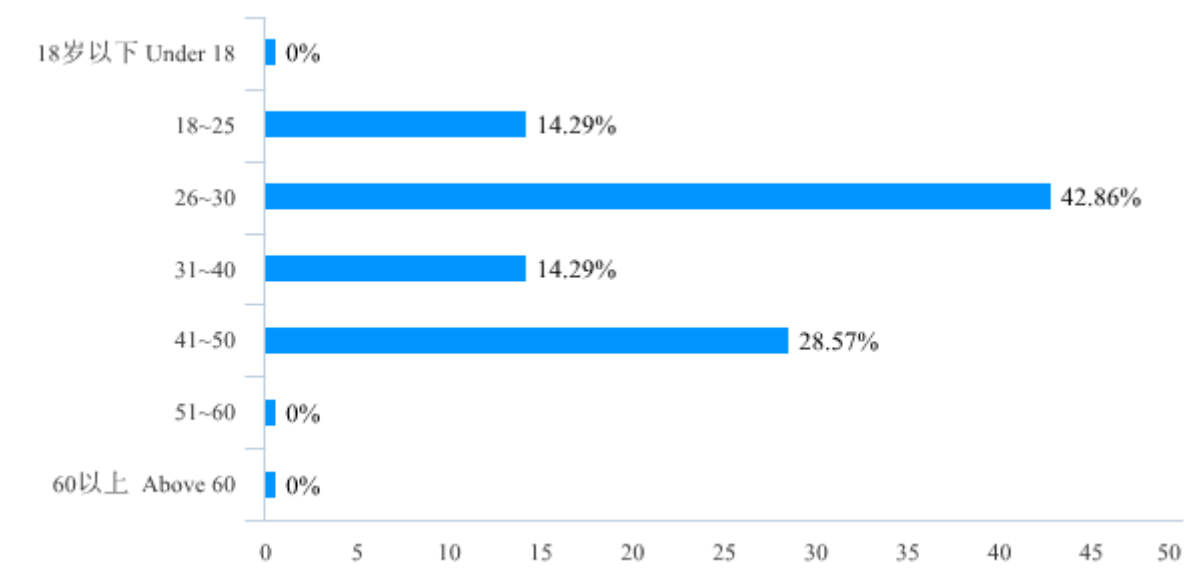
第 2 题 您的性别 Your gender: [单选题]

选项	小计	比例
男 Male	5	<div><div></div></div> 71.43%
女 Female	2	<div><div></div></div> 28.57%
本题有效填写人次	7	



第 3 题 您的年龄段 Your age group: [单选题]

选项	小计	比例
18 岁以下 Under 18	0	0%
18~25	1	14.29%
26~30	3	42.86%
31~40	1	14.29%
41~50	2	28.57%
51~60	0	0%
60 以上 Above 60	0	0%
本题有效填写人次	7	



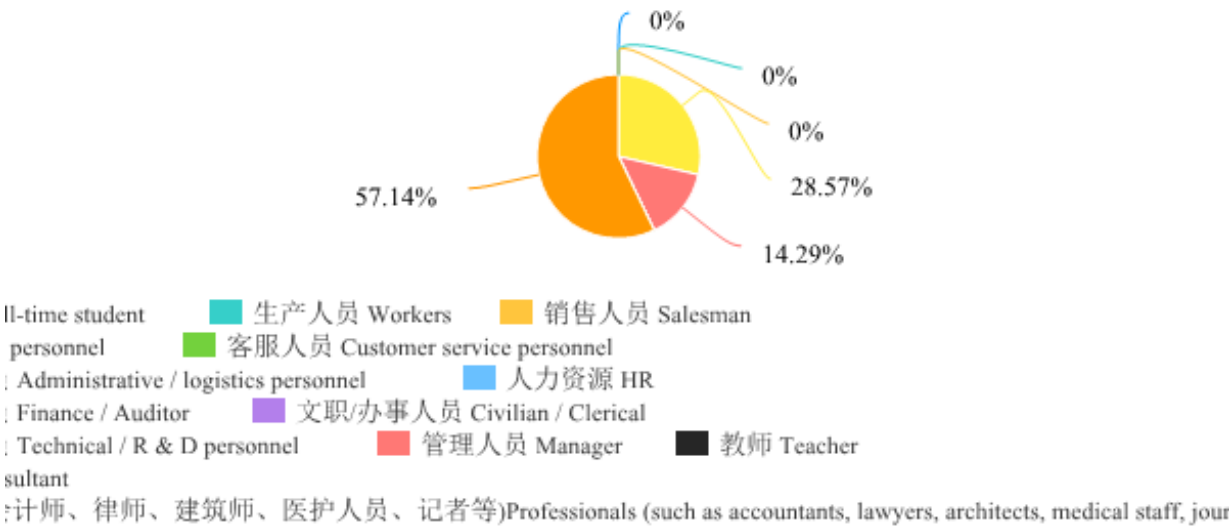
第 4 题 您所在单位或住址位置与项目之间关系（方向（东南西北）、离场界距离（米）） The relationship between your unit or residential address location and the project (direction , distance from the plant boundary (m)) [填空题]

1	12 月 18 日 15:50	西北 500m
2	12 月 18 日 15:51	西北 300m
3	12 月 26 日 09:53	北侧，距离 1KM
4	12 月 26 日 10:03	北侧 1 公里
5	12 月 26 日 13:36	离边界约 500m
6	12 月 26 日 15:46	200 米
7	12 月 26 日 15:48	300 米

第 5 题 请输入您的手机号码 Please input your mobile number: [填空题]

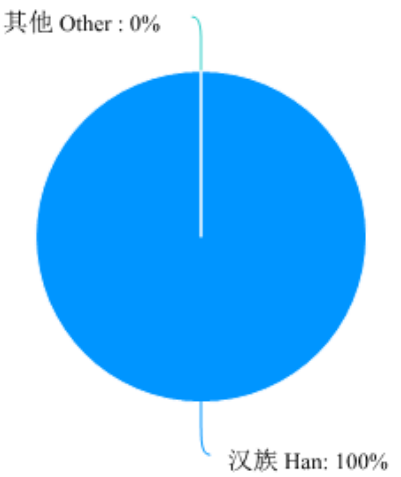
第 6 题 您目前从事的职业 Your current occupation: [单选题]

选项	小计	比例
全日制学生 Full-time student	0	0%
生产人员 Workers	0	0%
销售人员 Salesman	0	0%
市场 Marketing personnel	0	0%
客服人员 Customer service personnel	0	0%
行政/后勤人员 Administrative / logistics personnel	0	0%
人力资源 HR	0	0%
财务/审计人员 Finance / Auditor	0	0%
文职/办事人员 Civilian / Clerical	0	0%
技术/研发人员 Technical / R & D personnel	2	28.57%
管理人员 Manager	1	14.29%
教师 Teacher	0	0%
顾问/咨询 Consultant	0	0%
专业人士(如会计师、律师、建筑师、医护人员、记者等)Professionals (such as accountants, lawyers, architects, medical staff, journalists, etc.)	0	0%
其他 Other	4	57.14%
本题有效填写人次	7	



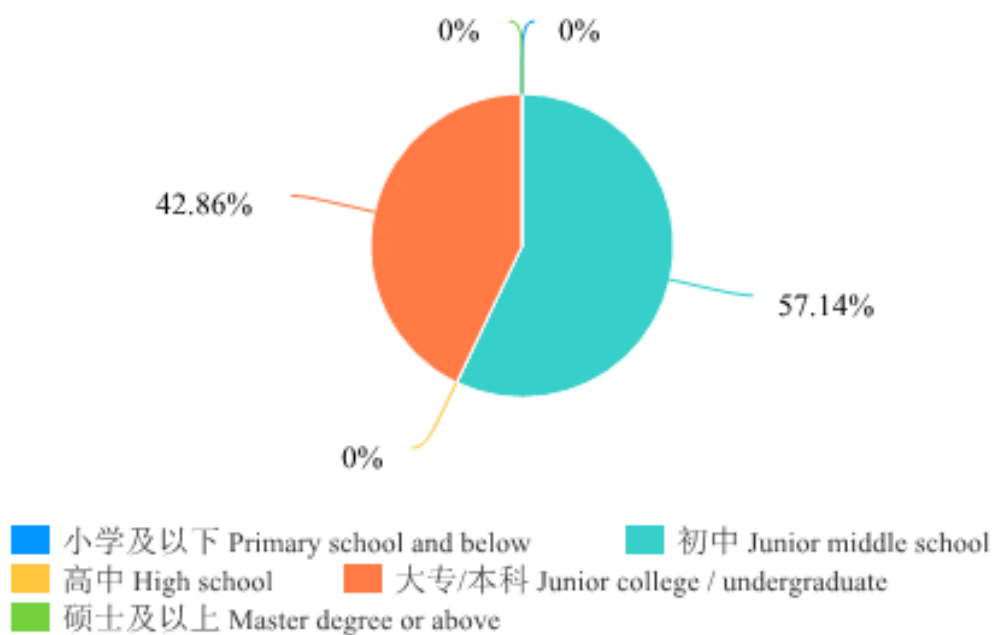
第 7 题 民族 Nationality [单选题]

选项	小计	比例
汉族 Han	7	100%
其他 Other	0	0%
本题有效填写人次	7	



第 8 题 文化程度 Education [单选题]

选项	小计	比例
小学及以下 Primary school and below	0	0%
初中 Junior middle school	4	57.14%
高中 High school	0	0%
大专/本科 Junior college / undergraduate	3	42.86%
硕士及以上 Master degree or above	0	0%
本题有效填写人次	7	



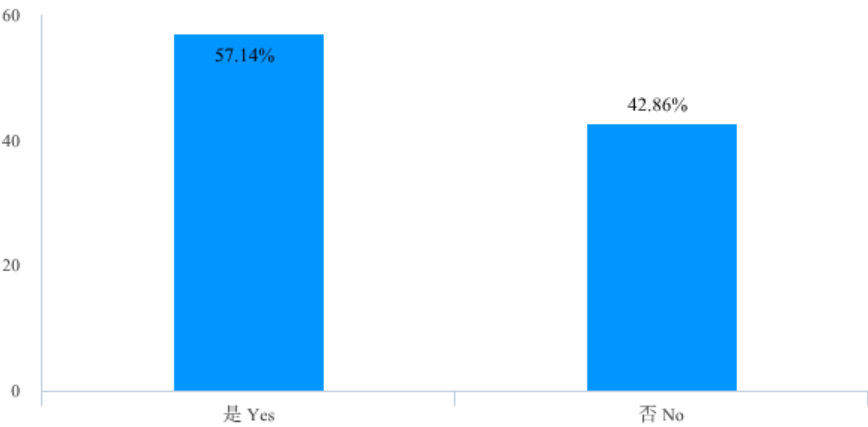
二、Question 讨论问题

第 9 题 Please specify the relevant subproject or contract name 请说明相关子项目或合同名称 [填空题]

1	12 月 18 日 15:50	Leju town
2	12 月 18 日 15:51	Longshu town
3	12 月 26 日 09:53	Longshu town
4	12 月 26 日 10:03	Leju town
5	12 月 26 日 13:36	Sayu town
6	12 月 26 日 15:46	Sayu town
7	12 月 26 日 15:48	Sayu town

第 10 题 Has contractor taken dust control measures, as necessary? 承包商是否在需要时采取了粉尘控制措施？ [\[单选题\]](#)

选项	小计	比例
是 Yes	4	<div><div></div></div> 57.14%
否 No	3	<div><div></div></div> 42.86%
本题有效填写人次	7	



第 11 题 Has noise or vibration from construction activities affected local residents' work or life?

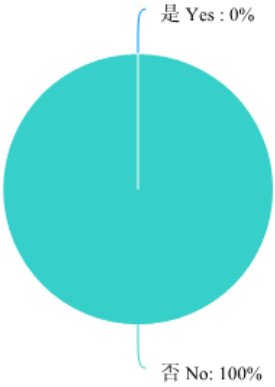
施工噪声/振动是否影响当地居民的正常工作/生活? [单选题]

选项	小计	比例
是 Yes	0	0%
否 No	7	100%
本题有效填写人次	7	



第 12 题 Did construction activities impact local water supply or drainage system? 施工活动是否影响当地的供水系统/排水系统? [单选题]

选项	小计	比例
是 Yes	0	0%
否 No	7	100%
本题有效填写人次	7	



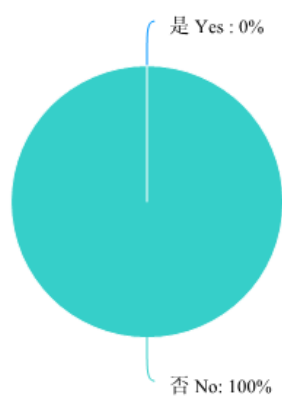
第 13 题 Did construction or domestic waste cause any negative environmental impacts 施工营地生活垃圾或建筑垃圾是否对环境造成影响？ [单选题]

选项	小计	比例
是 Yes	0	<div><div></div></div> 0%
否 No	7	<div><div></div></div> 100%
本题有效填写人次	7	



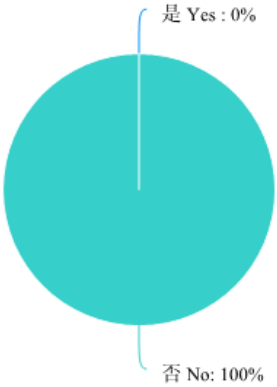
第 14 题 Was there any adverse ecological impacts from construction activities, including flora an fauna and soil erosion? 施工活动是否对当地生态环境（动植物、水土流失）有影响？ [单选题]

选项	小计	比例
是 Yes	0	0%
否 No	7	100%
本题有效填写人次	7	



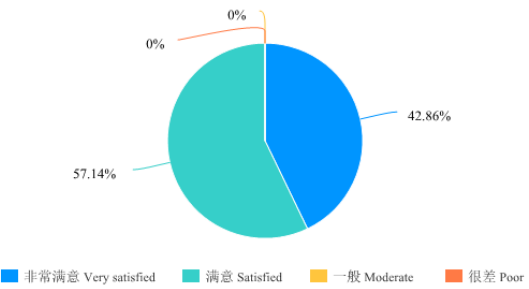
第 15 题 Was local traffic impacted during construction period?在施工期间当地/行人交通活动是否受到影响? [单选题]

选项	小计	比例
是 Yes	0	0%
否 No	7	100%
本题有效填写人次	7	



第 16 题 Overall opinions on the construction environmental management (excellent/good/normal/poor) 施工期的总体意见 (良好 / 满意 / 不太满意 / 差) [单选题]

选项	小计	比例
非常满意 Very satisfied	3	<div><div></div></div> 42.86%
满意 Satisfied	4	<div><div></div></div> 57.14%
一般 Moderate	0	<div><div></div></div> 0%
很差 Poor	0	<div><div></div></div> 0%
本题有效填写人次	7	



第 17 题 Were you aware of GRM? 是否知晓项目申诉解决机制? [单选题]

选项	小计	比例
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是 Yes	7	<div><div></div></div> 100%
否 No	0	<div><div></div></div> 0%
本题有效填写人次	7	



第 18 题 Any comments or suggestions? 您对本工程还有哪方面意见及建议? [填空题]

1	12 月 18 日 15:50	无
2	12 月 18 日 15:51	无
3	12 月 26 日 09:53	无
4	12 月 26 日 10:03	无
5	12 月 26 日 13:36	无
6	12 月 26 日 15:46	无
7	12 月 26 日 15:48	无