ADB

Report and Recommendation of the President to the Board of Directors

Project Number: 51005-002
August 2018

Proposed Loan
People's Republic of China: Chongqing Longxi River Basin Integrated Flood and Environmental Risk Management Project

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 31 July 2018)

Currency unit	–	yuan (CNY)
CNY1.00	=	$0.1467
$1.00	=	CNY6.8155

ABBREVIATIONS

ADB	–	Asian Development Bank
CMG	–	Chongqing Municipal Government
EMP	–	environmental management plan
FERM	–	flood and environmental risk management
GAP	–	gender action plan
GRM	–	grievance redress mechanism
IWRM	–	integrated water resources management
LIBOR	–	London interbank offered rate
O&M	–	operation and maintenance
PAM	–	project administration manual
PRC	–	People's Republic of China
YREB	–	Yangtze River Economic Belt

NOTE

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

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PROJECT AT A GLANCE

1. Basic Data

Project Number: 51005-002

Project Name	Chongqing Longxi River Basin Integrated Flood and Environmental Risk Management Project	**Department /Division**	EARD/EAER
Country	China, People's Republic of	**Executing Agency**	Chongqing Municipal Government
Borrower	People's Republic of China		

2. Sector

	Subsector(s)	ADB Financing ($ million)
✓ **Agriculture, natural resources and rural development**	Rural flood protection	45.00
	Water-based natural resources management	40.00
Water and other urban infrastructure and services	Urban flood protection	25.00
	Urban sanitation	25.00
	Urban solid waste management	15.00
	Total	**150.00**

3. Strategic Agenda

	Subcomponents
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns
	Natural resources conservation
	Urban environmental improvement

Climate Change Information

CO_2 reduction (tons per annum)	700
Climate Change impact on the Project	Medium

ADB Financing

Adaptation ($ million)	9.43
Mitigation ($ million)	4.65

4. Drivers of Change

	Components
Governance and capacity development (GCD)	Civil society participation
	Institutional development
	Institutional systems and political economy
	Organizational development
	Public financial governance
Knowledge solutions (KNS)	Application and use of new knowledge solutions in key operational areas
	Knowledge sharing activities
	Pilot-testing innovation and learning
Partnerships (PAR)	Civil society organizations
	Implementation

Gender Equity and Mainstreaming

Effective gender mainstreaming (EGM)	✓

5. Poverty and SDG Targeting

Geographic Targeting	No
Household Targeting	No
SDG Targeting	Yes
SDG Goals	SDG6, SDG11, SDG13

Location Impact

Rural	Medium
Urban	Medium

6. Risk Categorization: Complex

7. Safeguard Categorization

Environment: A **Involuntary Resettlement:** A **Indigenous Peoples:** C

8. Financing

Modality and Sources	Amount ($ million)
ADB	**150.00**
Sovereign Project (Regular Loan): Ordinary capital resources	150.00
Cofinancing	**0.00**
None	0.00
Counterpart	**228.67**
Government	228.67
Total	**378.67**

Source: Asian Development Bank

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the People's Republic of China (PRC) for the Chongqing Longxi River Basin Integrated Flood and Environmental Risk Management Project.

2. The project will help the Chongqing Municipal Government (CMG) maintain environmental sustainability, leading to improved living conditions in the entire Longxi River watershed, a Yangtze River sub-basin in the municipality. This will be achieved through the implementation of an integrated approach to manage flooding, the water environment, and ecology collectively with a well-balanced mix of structural and nonstructural interventions, including capacity building.

II. THE PROJECT

A. Rationale

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

4. YREB has benefitted from extensive development since 1990s, particularly in the delta area. Yet, economic growth in the middle and upper reaches of the Yangtze River Basin is lagging and below its potential capacity. The middle and upper reaches of YREB still face significant development challenges because of (i) slow transformation for green development and economic diversification; (ii) limited integration of waterways, ports, and intermodal logistics; (iii) increasing pollution and pressure on natural resources; and (iv) weak institutional coordination for strategic planning.[2] YREB faces a growing imbalance between economic achievements and the quality of the environment.

5. To address these challenges, the Government of the PRC formulated the YREB development plan 2016–2030,[3] which stipulated the prioritization of ecological protection and promotion of green development as the guiding principle for the YREB development.[4] In this connection, the Asian Development Bank (ADB) and the government have agreed to adopt a framework approach, providing about $2.0 billion of funding in the YREB during 2018–2020 to strategically program ADB's lending support for development initiatives in the YREB with priority given to the following four areas: (i) ecosystem restoration, environmental protection, and water resources management; (ii) green and inclusive industrial transformation; (iii) construction of an integrated multimodal transport corridor; and (iv) institutional strengthening and policy reform.

6. Since 1980, YREB has suffered over $0.3 trillion in direct economic damage from recurring floods, accounting for 75% of the total flood damage in the PRC. Most flood damage does not

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

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

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

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

come from the main stem river but from small to moderate-sized river sub-basins. YREB suffered from fatal floods in 2016 that caused $28 billion of economic damage, declaring emergencies at more than 3,300 locations. Of those, over 3,200 were reported on small tributaries that generally have lower standards of flood protection or where standards have not kept pace with the rapid rate of development or intensifying extreme rainfall events caused by global climatic changes. Since 1980, water pollution has risen by 73% mainly because of the direct discharge of domestic, industrial, and agricultural waste, making water unfit for consumptive and productive use. The upper and middle reaches account for 80% of YREB's total wastewater discharge and the tributaries have the worst water quality in the river basin.[5] The hydrological variability caused by rapid urbanization and industrialization has had a large contribution to water pollution and has increased flood frequency and magnitude. The enormity of the losses suffered during 2000–2017 merits a review of policies and practices in the PRC. Priority is yet to be given to improve water interception, water quality, flood risk mitigation, and ecological protection in upstream areas, mainly sub-basins, to ensure the water flowing downstream is clean and free of flood risk.

7. Chongqing Municipality, the largest urban area in the upper YREB, plays a critical role in environmental and conservation efforts in the region.[6] However, many rural towns and villages in Chongqing are left behind from overall development because of insufficient public infrastructure, continued flood disasters, worsening water pollution, and degraded ecological conditions. The traditional approach taken by CMG to flood control relies solely on structural measures, which are no longer feasible. The link between flood management, environmental degradation, and ecosystem sustainability needs to be addressed. An integrated approach is necessary to adapt to changing social, geophysical, and environmental conditions, leading to integrated flood and environmental risk management (FERM) as an approach to be adopted by the municipality.

8. Chongqing is a core part of the ecological conservation zone of the Three Gorges Reservoir, which plays a pivotal role in mitigating floods in the middle and lower Yangtze River reaches. However, Chongqing has suffered from seven fatal floods since 2007. Longxi River watershed is one of the worst flood-impacted areas, with only 10% of river reach protected by levees for less than 5-year return period floods.[7] The old concrete dams in Longxi River are no longer beneficial as they are filled up with sediment and their operation is not compatible with emerging FERM needs. The annual average flood damage in Longxi River watershed is about CNY1.71 billion, with fatal flooding in 2010, 2014, 2016, and 2017.

9. Chongqing produces 7% (1.5 billion tons) of household and 18% (355 million tons) of industrial wastewater in YREB annually—among the highest values per unit area in YREB. The annual average solid waste volume is more than 30 million tons in Chongqing, of which only 14% is being treated. Inadequate management of waste has resulted in poor water quality in Chongqing's rivers and lakes, which exceeds the national standard (class III) at various locations, specifically in the Longxi River watershed.[8] The fast-paced industrialization (50%) and urbanization (45%) rates along the Longxi River corridor, without proper planning, have put pressure on water resources. The floods formed many belts of floating rubbish in the Longxi River, which exacerbated flooding and water pollution. Despite the availability of treatment facilities, over

[5] YREB produces about 81% of the country's chemical fibers, 58% of pesticides, and 51% of fertilizers. Ministry of Ecology and Environment. 2013. *MEP Releases State of Environmental Quality of China in 2012*.

[6] Chongqing Municipality comprises 38 districts and counties over 82,400 square kilometers, and has a population of 33.7 million of which over 39% is rural.

[7] Longxi River Basin in Chongqing Municipality has an area of 2,966 square kilometers (about 30 kilometers long) with 2.1 million population. The river originates in Liangping District, passes through Dianjiang County, and merges with the Yangtze River in Changshou District. The basin is located about 200 kilometers north of Chongqing City.

[8] Up to class III water is suitable for drinking as per PRC's Environmental Water Quality Standard (GB 3838-2002).

40% of residents and 80% of industries in the watershed do not benefit due to the lack of sewer network. Unsustainable farming resulted in high sediment yield and poor water operation practices have worsen the water quality in Shuanggui and Sanhe lakes (small lakes) in the watershed. Water quality in Changshou Lake in the lower Longxi River watershed has also deteriorated because of eutrophication.

10. Wetlands account for 2.5% of the total area in Chongqing while green spaces make up 4.3%—the lowest in YREB. In the municipality, the Longxi River watershed suffers the most from human-induced ecological destruction. The hydrology and environment of the Longxi River watershed are modified through long-term human activities, including agriculture and small water infrastructure (e.g., barrages), which regulate river flows and habitat clearance. Since 1990, about 60% of the wetlands and 35% of the vegetated areas in this watershed have disappeared and over 41% of the land area has been exposed to water-induced soil erosion, resulting in reduced river conveyance, flooding, reservoir shrinkage, and water contamination. The climate change impact in the watershed is likely to (i) worsen the water quality because of increased temperature and decreased river flow, and (ii) increase floods as a result of increased rainfall intensity.

11. Coordination among the upstream and downstream local governments in the Longxi River watershed has not yet been established because of a lack of participatory watershed development planning. The institutional capacity of local governments to implement FERM is still weak. To facilitate sustainable development and enhance livelihoods, accommodate growing population, and attract investments, CMG will support local governments in development planning and implementation. The integrated FERM plan and the implementation of critical measures are urgently required to promote sustainable development in the watershed, including infrastructure development, physical connectivity, and economic competitiveness. Since the watershed is in a less developed region, it can demonstrate environmentally sustainable growth model that can be replicated in other manageable watersheds in Chongqing, YREB, or the entire PRC.

12. **Strategic fit.** In January 2018, the National Development and Reform Commission announced the first batch of national priority river basin water environment and sustainable development pilot projects and identified the Longxi River Basin as one of 16 pilot river basins nationwide.[9] The Chongqing Development and Reform Commission adopted the pilot program in the form of the Longxi River basin development plan, 2018–2025, for which CMG considers this project a kickoff and benchmark for investment in FERM. The project also aims to revitalize the eco-compensation mechanism in the watershed by promoting upstream–downstream links, and will contribute to the PRC's goal of building a harmonious and prosperous society through environmentally sustainable growth. It is consistent with the PRC's Thirteenth Five-Year Plan, 2016–2020, which aims to realize "ecological civilization".[10] The project is aligned with the ADB country partnership strategy for the PRC, 2016–2020,[11] mainly the three major principles: (i) managing climate change and environment, (ii) supporting inclusive economic growth, and (iii) fostering knowledge cooperation. It is also consistent with (i) ADB's Water Operational Plan, 2011–2020, which emphasizes integrated water resources management (IWRM) with a focus on water-related disaster risk management;[12] and (ii) sustainable development goals 6, 11, and 13.[13]

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[9] Government of the PRC. 2018. *Longxi River Basin is Approved as the First National Pilot Basin*.

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

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

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

[13] United Nations. Sustainable Development Goals.

13. **Lessons.** The project adopts FERM, a cross-sector approach, in a river basin context.[14] At the technical level, the project design has incorporated lessons from international practices and previous ADB-financed projects and policy-oriented studies on IWRM and environmental and ecosystem improvement such as (i) promoting IWRM at river basin scale, prioritizing upstream–downstream and urban–rural linkages; (ii) promoting nature-based solutions; (iii) strengthening nonstructural measures with enhancement of the roles of communities and women; (iv) including operation and maintenance (O&M), and monitoring and evaluation with sustainable financial sources; (v) integrating FERM into regional planning; (vi) supporting institutional reforms contributing to FERM; and (vii) providing capacity development for project implementation.[15]

B. Impact and Outcome

14. The project is aligned with the following impact: environmental protection, rehabilitation, and management of the Yangtze River improved.[16] The project will have the following outcome: flood and environmental risk in the Longxi River watershed mitigated.[17]

C. Outputs

15. **Output 1: Flood risk management infrastructure constructed.** This will implement (i) flood preventive measures, including constructing embankments and transforming small barrages to gated structures; (ii) water retention measures, including a temporary flood retention area and installing flood diversion structures; and (iii) flood preparedness measures, including constructing shelters and emergency access roads.

16. **Output 2: Wastewater management and pollution control infrastructure developed.** This will implement (i) a wastewater management system, including installing a wastewater collection network; and (ii) water pollution control measures, including constructing a bio-shield (greenbelts) along the riverbanks to tap leached sediment and nutrients from farmlands, and installing solid waste collection bins along the riverbanks.

17. **Output 3: Ecological conservation facilities improved.** This will implement (i) wetland conservation, including restoring wetlands in existing lakes and rivers; (ii) ecological restoration, including landscaping, greening, and gardening along the river and lakes corridors; and (iii) soil and water conservation, including riverbank protection and erosion control.

18. **Output 4: Flood and environmental risk management capacity enhanced.** This will include (i) hydro-meteorological services, including establishing a flood footprint and accountability mechanism, developing and installing a watershed simulation model, and establishing a river monitoring system;[18] (ii) development planning and programming, including formulating a comprehensive FERM plan, drafting land use regulations, and formulating

[14] R. Osti. 2017. Strengthening Flood Risk Management Policy and Practice in the People's Republic of China: Lessons Learned from the 2016 Yangtze River Floods. *ADB East Asia Working Paper Series*. No. 11. Manila: ADB.

[15] ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Chongqing Urban–Rural Infrastructure Development Demonstration Project II*. Manila; R. Osti. 2017. Embedding Community-Based Flood Risk Management in Investment: A Part-to-Whole Approach. *ADB East Asia Working Paper Series*. No. 12. Manila: ADB; Independent Evaluation Department. 2017. *Validation Report: Hunan Flood Management Sector Project in the People's Republic of China*. Manila: ADB.

[16] National Development and Reform Commission. 2016. *Yangtze River Economic Belt Development Plan, 2016–2030*. Beijing.

[17] The design and monitoring framework is in Appendix 1.

[18] A footprint is a measure of human impact in the basin, leading to an increase or decrease of flood and environmental risk. The accountability system refers to indicators that enable decision makers to assess the progress.

investment road maps in the watershed; and (iii) capacity development of local governments and communities, including climate-resilient community-based FERM that involves a flood early warning system and solid waste management, strengthening Longxi River coordination body in applying the river chief system, and updating reservoir operational guidelines.[19]

19. **Project features and value addition.** The project will add value by introducing innovative planning, design, and implementation methods by (i) formulating a comprehensive FERM plan for the watershed as a prerequisite for other development plans to adopt the "promote environment first" approach; (ii) demonstrating a nexus approach for the intertwined flood (water)-waste (environment)-ecosystem under FERM through the integration of structural and nonstructural measures; (iii) developing a FERM footprint and accountability system, considering urban–rural, and upstream–downstream linkages, and cumulative efforts rather than fragmented interventions in the basin; (iv) mainstreaming FERM in sector project planning and design to mitigate damage and reduce risks;[20] (v) introducing discontinuous embankment, with provisions for flood protection in critical locations and flood retention in other spaces; [21] (vi) providing a bio-shield against topsoil and nutrition leaching on farmlands; (vii) pilot testing a flash flood early warning system using high technology;[22] (viii) pilot testing community-based FERM; and (ix) strengthening institutional capacity, including a real-time decision support system in FERM to promote the river chief system.

D. Summary Cost Estimates and Financing Plan

20. The project is estimated to cost $378.67 million (Table 1). Detailed cost estimates by expenditure category and by financier are included in the project administration manual (PAM).[23]

Table 1: Summary Cost Estimates ($ million)

Item		Amount[a]
A.	**Base Cost**[b]	
	1. Flood risk management infrastructure constructed	234.69
	2. Wastewater management and pollution control infrastructure developed	28.21
	3. Ecological conservation facilities improved	37.82
	4. Flood and environmental risk management capacity enhanced	24.74
	Subtotal (A)	**325.46**
B.	**Contingencies**[c]	**39.91**
C.	**Financing Charges During Implementation**[d]	**13.31**
	Total (A+B+C)	**378.67**

Note: Numbers may not sum precisely because of rounding.

[a] Includes taxes and duties of $30.17 million. Such amount does not represent an excessive share of the project cost. The government will finance taxes and duties of $17.89 million through cash contribution. The balance of $12.28 million will be paid from the Asian Development Bank loan.

[b] In 2017 prices as of 15 March 2018.

[c] Physical contingencies computed at 5% for all expenditure categories. Price contingencies computed at average of 1.9% on foreign exchange costs and 2.4% on local currency costs; includes provision for potential exchange rate fluctuation under assumption of a purchasing power parity exchange rate.

[d] Includes interest and commitment charges. Interest during construction for the ordinary capital resources loan has been computed at the 5-year United States dollar fixed swap rate plus an effective contractual spread of 0.5% and a maturity premium of 0.1%. Commitment charges for the ordinary capital resources loan are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

[19] Under the river chief system being applied in the PRC, the heads of local governments are designated as river chiefs to be accountable for water and environmental management in their jurisdictions.

[20] The road design is flood-resistant, and the alignment is to prevent flood and support emergency response.

[21] Discontinuous embankment has several spillways that allow water to overtop and store in temporary retention area.

[22] Automated real-time hydrological observation, flood early warning, and emergency-response aided by mobile phone or radio, remote sensing including satellite observation, and geographic information system technologies.

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

21. The government has requested a regular loan of $150 million from ADB's ordinary capital resources to help finance the project. The loan will have a 26-year term, including a grace period of 5 years; an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based leading facility;[24] a commitment charge of 0.15% per year, and such other terms and conditions set forth in the draft loan and project agreements. Based on the straight-line method, the average maturity is 15.75 years, and the maturity premium payable to ADB is 0.10% per year. The financing plan is in Table 2.

Table 2: Summary Financing Plan

Source	Amount ($ million)	Share of Total (%)
Asian Development Bank		
Ordinary capital resources (regular loan)	150.00	39.6
Changshou District Government	86.69	22.9
Dianjiang County Government	71.07	18.8
Liangping District Government	70.92	18.7
Total	**378.67**	**100.0**

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

22. ADB will finance the expenditures in relation to civil works, equipment and materials, taxes and duties, project management, consulting services, and training. Taxes and duties are included in the base cost. The government will finance land acquisition and contingencies, O&M of the project, as well as remaining portions of the civil works. Climate mitigation is estimated to cost $4.65 million and climate adaptation is estimated to cost $11.23 million. ADB will finance 100% of mitigation costs and 84% of adaptation costs. Details are in the PAM (footnote 23).

E. Implementation Arrangements

23. The implementation arrangements are summarized in Table 3 and described in the PAM.

Table 3: Implementation Arrangements

Aspects	Arrangements		
Implementation period	December 2018–December 2023		
Estimated completion date	31 December 2023		
Estimated loan closing date	30 June 2024		
Management			
(i) Oversight body	Chongqing project leading group Executive vice mayor of Chongqing Municipal Government (chair) Representatives from the local development and reform committee, finance bureau, water resources bureau, environmental protection bureau, and construction bureau (members)		
(ii) Executing agency	Chongqing Municipal Government		
(iii) Key implementing agencies	Changshou District Government, Dianjiang County Government, and Liangping District Government		
(iv) Implementation units	Project management office in Chongqing Municipal Government, and project implementation units in Changshou District Government, Dianjiang County Government, and Liangping District Government (15 staff)		
Procurement	Open competitive bidding	23 contracts	$197.3 million
Consulting services	Quality- and cost-based selection, consultant's qualifications selection, and/or individual consultant selection	multiple contracts	$3.8 million
Retroactive financing and/or advance contracting	Advance contracting and retroactive financing will apply to the recruitment of consultants and urgent procurement of civil works and goods. Retroactive financing		

[24] The interest includes a maturity premium of 10 basis points. This is based on the above loan terms and the government's choice of repayment option and dates.

Aspects	Arrangements
	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 *Loan Disbursement Handbook* (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB.

ADB = Asian Development Bank.
Source: Asian Development Bank.

III. DUE DILIGENCE

A. Technical

24. The implementing agencies' domestic feasibility studies are technically sound, meet international standards, and provide sufficient information as to the design's feasibility. Licensed domestic design institutes prepared all project components, considering local geophysical, socioeconomic, and hydro-metrological conditions, as well as anticipated climate change risks (rated *medium–high*), in accordance with PRC design guidelines and local regulations. The project (i) considered technical alternatives (e.g., conventional dike or ecological embankments, fixing dams to retain water or small barrages to regulate water, continuous or discontinuous dikes, a stand-alone flash flood early warning system or centralized one) and their technical and economic viability; (ii) deliberated ways to promote a flood footprint and accountability system in the river basin, ensuring that the project will not just protect localities but also reduce 15.0%, 12.0%, and 2.5% of 20-year flood peaks from Liangping to Dianjiang, Changshou, and ultimately the Yangtze main river respectively; (iii) promoted the use of information and communication technology in IWRM; and (iv) optimized timescales for project implementation.

B. Economic and Financial

25. The economic analysis indicated that the project is economically viable, with an overall economic internal rate of return of 23.2% and an economic net present value of CNY3,209 million. The analysis also confirmed the economic viability of all subprojects, with economic internal rates of return of 11.1%–26.2%.[25] Sensitivity analysis indicated that the project is robust to negative scenarios examined, such as an increase in investment costs, benefits reduction, and an increase in O&M cost. The full economic benefits of the project are expected to be significantly higher, as some effects such as ecological benefits are not easily quantifiable. The financial analysis included assessment of (i) the financial sustainability of the project and (ii) the financial management capacity of the executing and implementing agencies. Financial sustainability was assessed based on the fiscal impact of (i) counterpart funding for the project; and (ii) incremental recurrent costs, including O&M expenditures. The implementing agencies—Changshou District Government, Dianjiang County Government, and Liangping District Government—substantially depend on state government funding. The analysis confirmed the financial sustainability of the project, with the fiscal impacts well within the government's projected revenue capacities.[26]

C. Governance

26. The financial management risk before considering mitigation measures is *moderate* mainly because of the moderate inherent risk, low–moderate control risk, and a relatively high

[25] Detailed Economic Analysis (available on request).
[26] The counterpart funding commitment and incremental recurrent costs are less than 2% of the projected revenue for Changshou District, Dianjiang County, and Liangping District governments.

level of financial management capacities. CMG, given its experience with donor-funded projects, including ongoing ADB projects, will take overall responsibility for the financial management of the project. CMG's sound financial management capacity is sufficient to support the implementing agencies for the financial management of the project. Measures to mitigate the identified financial management risks are in the financial management assessment.[27] The procurement risk assessment confirmed that the implementing agencies, which will conduct all procurement through a procurement agency, have adequate capacity to implement the ADB Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time). ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government, CMG, and implementing agencies. The specific policy requirements and supplementary measures are described in the PAM (footnote 23).

D. Poverty, Social, and Gender

27. **Poverty and social.** The project is classified *general intervention* for poverty reduction. A total of 0.895 million residents in 19 project towns, including 4,450 urban poor and 16,268 rural poor people, will directly benefit from the project through strengthened flood risk management and better environment and ecological protection in the Longxi River watershed. An additional 1.909 million residents in the three project counties and districts will benefit indirectly from improved flood management and environment. The project will create 2,337 jobs during project implementation and 99 jobs during operation. A poverty and social analysis has been undertaken; and a social development action plan has been prepared. Key social design measures include (i) avoiding or minimizing adverse social impacts; (ii) enhancing social benefits, including targeted employment for women and the poor; and (iii) strengthening public participation and consultation during project preparation and implementation. Several consultation meetings with local residents and stakeholders were undertaken during project preparation, and additional consultation and participation measures are in the social development action plan and other relevant plans.

28. **Gender.** The project is classified *effective gender mainstreaming*, following ADB's Guidelines for Gender Mainstreaming Categories of ADB Projects.[28] It will benefit women, who constitute 48.7% of the direct beneficiary population, by empowering them and improving their income, living environment, and quality of life. A gender action plan (GAP) has been prepared based on gender analyses and local consultations to ensure gender mainstreaming under the project. The key measures in the GAP include (i) fair and equitable participation of women in decision making during project design and implementation, with at least 40% women participants; (ii) training and capacity building of staff of the executing and implementing agencies to implement the GAP and related measures; (iii) priority employment opportunities for women, with at least 30% during construction and 40% during operation; (iv) participation of women in awareness raising in flood and environmental management and public hearing on tariffs, with 50% women participants; (v) participation of women in decision making for the pilot community-based solid waste management program, with at least 40% women members in community groups; and (vi) ensuring women employees' rights and equitable access to sanitation facilities and health education (e.g., HIV/AIDS awareness) during construction. Key gender indicators have been included in the design and monitoring framework.

[27] Financial Management Assessment (accessible from the list of linked documents in Appendix 2).
[28] ADB. 2012. *Guidelines for Gender Mainstreaming Categories of ADB Projects.* Manila.

E. Safeguards

29. In compliance with ADB's Safeguard Policy Statement (2009), the project's safeguard categories are as follows:[29]

30. **Environment (category A).** An environmental impact assessment and environmental management plan (EMP) have been prepared following ADB's Safeguard Policy Statement and was disclosed on ADB's website on 20 March 2018. A grievance redress mechanism (GRM) has been prepared and comprises steps with time-based actions to ensure that any public concerns are quickly identified and addressed. The GRM will be operational within 60 days from the date of loan effectiveness. The Chongqing provincial management office and project management office environment and social officers will lead the implementation of the GRM. The procedures are described in the PAM and the EMP.

31. The project is expected to contribute significantly to municipal targets for environmental improvement, including improved water quality; improved flood control, reduced siltation, and avoided flood damage; and IWRM. Construction-related issues include the potential release of contaminants from polluted sediments during dredging or disposal, as well as short-term construction impacts such as dust and noise. Operational risks include altered hydrology and flow regime and inadequate O&M of the project facilities. The risk of indirect, cumulative, and/or induced impacts was assessed. Mitigation measures are described in the EMP and include procedures for the safe collection and disposal of the dredged sediments based on international best practice, and green embankment designs to improve water retention and use native plantings. Effective EMP implementation, together with the prescribed training, will result in residual impacts within the limits of the PRC standards defined in the EMP.

32. The project will contribute to climate change adaptation and mitigation, by increasing the resilience of the flood defense and environmental protection infrastructure in accordance with anticipated climate impacts on the hydrological values and on the selection of materials and locations, and by sequestering carbon through the revegetation components.

33. **Involuntary resettlement (category A).** Of 4,193 *mu* of land area, 1,773 *mu* is existing state-owned land; 1,585 *mu* of collective land will be obtained by land acquisition; 310 *mu* of land will be arranged through rural infrastructure land use; and 525 *mu* will be used through land use right transfer.[30] In addition, 527 *mu* of land will be temporarily used. A total of 32 households with 123 persons will be relocated. A total of 5,412 households with 18,000 persons will be affected by the project's land use, mostly infrastructure along the riverbanks. Three resettlement plans have been prepared in accordance with ADB's Safeguard Policy Statement and relevant laws and regulations of the PRC. These include adequate measures of compensation, resettlement, and rehabilitation for affected people. Consultations were undertaken with affected people and local stakeholders during project preparation, and they will be further consulted during updating and implementation of the resettlement plans. GRMs have been established and incorporated into the resettlement plans. The executing and implementing agencies will conduct internal monitoring and will engage an external monitoring agency to monitor the implementation of resettlement plans and submit semiannual monitoring reports to ADB.

34. **Indigenous peoples or ethnic minorities (category C)**. The project does not involve impacts on ethnic minority villages or communities that would trigger ADB's Safeguard Policy

[29] ADB. Safeguard Categories. https://www.adb.org/site/safeguards/safeguard-categories.
[30] A *mu* is a Chinese unit of measurement (1 *mu* = 666.67 square meters or 0.067 hectares).

Statement requirements on indigenous peoples. The scattered population of ethnic minority individuals in the project area is not expected to have adverse impacts from the project.

35. **Capacity for social and safeguard measures.** The executing agency has experience in implementing various projects, including several ADB-financed projects. However, the implementing agencies do not have experience with ADB-financed projects. To implement social and safeguard measures properly, (i) executing agency and implementing agencies will each appoint focal social and safeguard staff, (ii) project implementation support consultants will include social and safeguard specialists, (iii) staff of executing agency and implementing agencies will be provided with training on social and safeguard measures, and (iv) external monitoring experts will be recruited for external monitoring of resettlement plans and other relevant plans.

F. Summary of Risk Assessment and Risk Management Plan

36. Significant risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.[31]

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigation Measures
Delays in procurement caused by lack of experience of the implementing agency or experience with the new ADB procurement procedures	Chongqing project management office will engage an independent procurement consultant with significant experience in ADB projects to help in start-up. During project preparation, trainings on new ADB procurement procedures were organized.
Lack of adequate capacity in the Internal Audit Bureau	Contract external audit and inspection services.

ADB = Asian Development Bank.
Source: Asian Development Bank.

IV. ASSURANCES AND CONDITIONS

37. The government and CMG have assured ADB that implementation of the project shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the PAM and loan documents. The government and CMG have agreed with ADB on certain covenants for the project, which are set forth in the draft loan agreement and project agreement.

V. RECOMMENDATION

38. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of $150,000,000 to the People's Republic of China for the Chongqing Longxi River Basin Integrated Flood and Environmental Risk Management Project, from ADB's ordinary capital resources, in regular terms, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 26 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Takehiko Nakao
President

27 August 2018

[31] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with
Environmental protection, rehabilitation, and management of the Yangtze River improved (Yangtze River Economic Belt Development Plan, 2016–2030)[a]

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Outcome Flood and environmental risk in the Longxi River watershed mitigated	By end of 2024 within the project counties: a. Land in the Longxi River watershed protected from 10-year flood[b] increased to 600 ha, benefitting 895,000 people (2018 baseline: 0 ha) b. Water quality at outlet of the DaYu River meets class III standard[c] (2018 baseline: classes III–IV) c. 895,000 residents have used new public river-, lake-, and canal-greenways and recreational wetland park created (2018 baseline: 0)	a. CMG report, records, annual statistics, and periodic flood disaster surveys b. Municipal environmental protection bureau's annual monitoring reports c. CMG statistical yearbooks	Population projection in project area exceeds forecasts and exerts more pressure, such as a heavy pollution load, on the Longxi River
Outputs 1. Flood risk management infrastructure constructed	By end of 2023 within the project counties: 1a. 6 towns in Liangping County, 6 in Dianjiang County, and 7 in Changshou District are protected by 50 km, 44 km, and 69 km dikes from a 5-year to 20-year return period of flood (2018 baseline: 0) 1b. Soil erosion countermeasures implemented for 50 km long riverbank in Changshou District, 44 km long in Dianjiang County, and 60 km long in Liangping County (2018 baseline: 0) 1c. 1,457 positions for employment during construction and 56 positions for employment during operation created, with at least 30% of positions during construction and 40% during operations filled by women (2018 baseline: 0) 1d. At least six local communities are engaged to mitigate flood risks through their participation in the design and implementation of flood management infrastructure, including at least 40% women participants (2018 baseline: 0)	1a.–1d. ADB mission reports, quarterly project progress reports, and project completion report	Implementation delays caused by simultaneous implementation of many other projects by the executing agency
2. Wastewater management and pollution control infrastructure developed	2a. New 42.37 km sewer networks constructed in Changshou District benefitting 251,000 people (2018 baseline: 0) 2b. 51 ha greenbelt for nonpoint pollution constructed (2018 baseline: 0) 2c. 231 positions for employment during construction and 14 positions for employment during operation created, with at least	2a.–2d. ADB mission reports, quarterly project progress reports, and project completion report	The sewer connection to individual households is not completed on time

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
	30% during construction and 40% during operations filled by women (2018 baseline: 0) 2d. At least six local communities are engaged to mitigate pollution through their participation in solid waste and environmental management, including at least 40% women participants (2018 baseline: 0)		
3. Ecological conservation facilities improved	3a. Landscaping of 145 ha constructed in Longxi River watershed[d] (2018 baseline: 0) 3b. Wetland of 2.5 ha constructed in Longxi River watershed (2018 baseline: 0) 3c. 649 positions for employment during construction and 29 positions of employment during operation created, with at least 30% during construction and 40% during operations filled by women (2018 baseline: 0)	3a.–3c. ADB mission reports, quarterly project progress reports, and project completion report	
4. FERM capacity enhanced	4a. Localized flood warning systems with more than 2 hours of lead time in 50 villages along the Longxi River installed (2018 baseline: 0) 4b. FERM plan of Longxi River watershed issued by CMG (2018 baseline: Not applicable) 4c. Six communities conducted two evacuation drills in each based on the drafted contingency plans, with at least 40% women members (2018 baseline: 0) 4d. 400 participants from CMG and implementing agencies with 30% women have improved knowledge and understanding of climate change adaptation and environmental management through training workshops (2018 baseline: 0)	4a.–4d. ADB mission reports, quarterly project progress reports, and project completion report 4d. Survey of training participants	

Key Activities with Milestones

1. Flood risk management infrastructure constructed

1.1 Complete detailed engineering design and bidding documents by Q4 2019.
1.2 Implement the land acquisition and resettlement plan by Q3 2019.
1.3 Award contracts by Q4 2020.
1.4 Complete civil works, including (i) dikes, (ii) ecological protection of riverbanks including erosion control, and (iii) dredging of silted section of the rivers by Q2 2023.

2. Wastewater management and pollution control infrastructure developed

2.1 Complete detailed engineering design and bidding documents by Q2 2019.
2.2 Implement the land acquisition and resettlement plan by Q3 2019.
2.3 Award contracts by Q4 2019.
2.4 Complete civil works for sewer pipe installation by Q2 2023.

3. Ecological conservation facilities improved 3.1 Complete detailed engineering design and bidding documents by Q2 2019. 3.2 Implement the land acquisition and resettlement plan by Q1 2020. 3.3 Award contracts by Q4 2020. 3.4 Complete civil works for sewer pipe installation by Q2 2023. **4. Flood and environmental risk management capacity enhanced** 4.1 Complete detailed planning and design, and bidding documents by Q4 2020. 4.2 Install hydrological monitoring stations and data management systems by Q1 2020. 4.3 Calibrate and install river basin models by Q3 2020. 4.4 Draft FERM plan for Longxi River watershed by Q2 2020. 4.5 Implement community-based FERM by Q1 2022. 4.6 Improve the flood forecasting and early warning system in selected counties by Q2 2022. 4.7 Organize training programs on environmental risk management and climate change adaptation by Q2 2023.
Project Management Activities Recruit project management consultants by Q4 2018. Recruit capacity development consulting services by Q1 2019. Recruit an independent agency for external environmental and resettlement monitoring and evaluation by Q4 2018. Implement the environmental management plan and submit semiannual environmental monitoring reports to ADB from 2019 to Q1 2024. Monitor and evaluate project impact, outcome, and outputs using the project performance management system from 2019 to Q1 2024. Submit quarterly project progress reports from 2019 until Q1 2024. Carry out training programs, policy dialogue, study tours, and awareness raising campaigns from 2019 to Q1 2024. Submit the project completion report by Q1 2024.
Inputs ADB: $150.00 million (ordinary capital resources loan) District and county governments: $228.67 million
Assumptions for Partner Financing Not applicable

ADB = Asian Development Bank, CMG = Chongqing Municipal Government, FERM = flood and environmental risk management, ha = hectare, km = kilometer, Q = quarter.

[a] National Development and Reform Commission. 2016. *Yangtze River Economic Belt Development Plan, 2016–2030*. Beijing.

[b] Flood that statistically has a 10% chance of occurring in any given year.

[c] According to the GB 3838-2002 environmental quality standards for surface water in the People's Republic of China, water rated class III is suitable for drinking and swimming, class IV for general industrial and recreational use, and class V for agriculture and landscaping. Class V+ means that the water is unsuitable for any purpose.

[d] The proposed landscaping in the project includes planting trees, shrubs, or grass and altering the contours of the ground to provide flood protection as well as to improve the terrestrial ecology and promote ecotourism.

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=51005-002-3

1. Loan Agreement
2. Project Agreement
3. Sector Assessment (Summary): Agriculture, Natural Resources, and Rural Development
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Financial Analysis
8. Economic Analysis
9. Country Economic Indicators
10. Summary Poverty Reduction and Social Strategy
11. Risk Assessment and Risk Management Plan
12. Climate Change Assessment (Summary)
13. Gender Action Plan
14. Environmental Impact Assessment
15. Resettlement Plan: Changshou Subproject
16. Resettlement Plan: Dianjiang Subproject
17. Resettlement Plan: Liangping Subproject

Supplementary Documents

18. Financial Management Assessment
19. Climate Risk Analysis