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Report No: PAD1042

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$100 MILLION

TO THE

PEOPLE'S REPUBLIC OF CHINA

FOR A

CHONGQING SMALL TOWNS WATER ENVIRONMENT MANAGEMENT PROJECT

November 24, 2014

Water Global Practice
China, Mongolia and Korea Country Unit
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective April 2014)

Currency Unit	=	Renminbi (RMB)
RMB 6.1	=	US$1
US$	=	SDR 1

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

BP	World Bank Procedures
BOQ	Bill of Quantity
CDRC	Chongqing Municipal Development and Reform Commission
CMAO	Chongqing Municipal Audit Office
CMFB	Chongqing Municipal Finance Bureau
CPMO	Chongqing Project Management Office
CPS	China Country Partnership Strategy
CQM	Chongqing Municipal Government
CSCP	Chongqing Small Cites Infrastructure Improvement Project
CSWEP	Chongqing Small Towns Water Environment Management Project
CUEP	Chongqing Urban Environment Project
CURIP	Chongqing Urban and Rural Integration Project
DA	Designated Account
DC	Direct Contracting
ECOP	Environmental Codes of Practice
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPB	Environmental Protection Bureau
EPP	Flood Emergency Preparedness Plan
EIRR	Economic Internal Rate of Return
FYP	Five-Year Plan
FM	Financial Management
FMM	Financial Management Manual
GIS	Geographic Information System
GDP	Gross Domestic Product
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding

ICR	Implementation Completion Report
IP	Indigenous People
IPF	Investment Project Financing
IWRM	Integrated Water Resources Management
LIBOR	London InterBank Offered Rate
MIS	Management Information System
MOF	Ministry of Finance
NCB	National Competitive Bidding
NPV	Net Present Value
O&M	Operation and Maintenance
OP	World Bank Operational Policy
ORAF	Operational Risk Assessment Framework
PA	Project Agreement
PAD	Project Appraisal Document
PCR	Physical and Cultural Resources
PIU	Project Implementing Unit
PMM	Procurement Management Manual
QBS	Quality Based Selection
QCBS	Quality and Cost Based Selection
RAP	Resettlement Acton Plan
RPF	Resettlement Policy Framework
SA	Social Assessment
WWTP	Wastewater Treatment Plant

Regional Vice President:	Axel van Trotsenburg
Country Director:	Bert Hofman
Sector Director:	John A. Roome (through June 30, 2014)
Senior Global Practice Director:	Junaid Kamal Ahmad (from July 1, 2014)
Global Practice Director:	Jennifer J. Sara (from July 1, 2014)
Sector Manager:	Charles Feinstein (through June 30, 2014
Practice Manager:	Ousmane Dione (from July 1, 2014)
Task Team Leader:	Ji You

CHINA
Chongqing Small Towns Water Environment Management Project

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PAD DATA SHEET
China: Chongqing Small Towns Water Environment Management Project

Basic Information		
Project ID	EA Category	Team Leader
P133117	A - Full Assessment	Ji You
Lending Instrument	Fragile and/or Capacity Constraints [ ]	
Investment Project Financing	Financial Intermediaries [ ]	
	Series of Projects [ ]	
Project Implementation Start Date	Project Implementation End Date	
01-Jan-2015	01-Jul-2020	
Expected Effectiveness Date	Expected Closing Date	
25-May-2015	31-Dec-2020	
Joint IFC		
No		

Practice Manager/Manager	Senior Global Practice Director	Country Director	Regional Vice President
Ousmane Dione	Junaid Kamal Ahmad	Bert Hofman	Axel van Trotsenburg

Borrower: People's Republic of China

Responsible Agency: Chongqing Project Management Office

Contact:	Mr. Zhou Linjun	Title:	Director, Chongqing PMO for World Bank Project
Telephone No.:	86-23-63877677	Email:	chongqpmo@163.com

Project Financing Data (in US$ Million)					
[X]	Loan	[ ]	IDA Grant	[ ]	Guarantee
[ ]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	218.62	Total Bank Financing:	100.00
Financing Gap:	0.00		

Financing Source	Amount
Borrower	118.62
International Bank for Reconstruction and Development	100.00
Total	218.62

Expected Disbursements (in US$ Million)

Fiscal Year	2015	2016	2017	2018	2019	2020	2021
Annual	0.00	5.00	12.00	15.00	27.00	33.00	8.00
Cumulative	0.00	5.00	17.00	32.00	59.00	92.00	100.00

Institutional Data				
Practice Area / Cross Cutting Solution Area				
Water				
Cross Cutting Areas				
[ ] Climate Change				
[ ] Fragile, Conflict & Violence				
[ ] Gender				
[ ] Jobs				
[ ] Public Private Partnership				
Sectors / Climate Change				
Sector (Maximum 5 and total % must equal 100)				
Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Water, sanitation and flood protection	General water, sanitation and flood protection sector	85	100	
Water, sanitation and flood protection	Wastewater Collection and Transportation	15		
Total		100		
☐ I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.				

Themes		
Theme (Maximum 5 and total % must equal 100)		
Major theme	Theme	%
Environment and natural resources management	Water resource management	85
Environment and natural resources management	Pollution management and environmental health	15
Total		100

Proposed Development Objective(s)

The project development objective is to reduce flood risks and improve wastewater infrastructure services in selected counties of Chongqing Municipality.

Components

Component Name	Cost (US$ Millions)
Component 1: Flood management in Tongnan County	42.14
Component 2: Flood and wastewater management in Rongchang County	45.97
Component 3: Flood and wastewater management in Shizhu County	50.15
Component 4: Flood and wastewater management in Pengshui County	49.06
Component 5: Project Management and Implementation Support	5.74

Compliance		
Policy		
Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No [ ]
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [ ]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	**Yes**	**No**
Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04	**X**	
Forests OP/BP 4.36		**X**
Pest Management OP 4.09		**X**
Physical Cultural Resources OP/BP 4.11	**X**	
Indigenous Peoples OP/BP 4.10		**X**
Involuntary Resettlement OP/BP 4.12	**X**	
Safety of Dams OP/BP 4.37	**X**	
Projects on International Waterways OP/BP 7.50		**X**
Projects in Disputed Areas OP/BP 7.60		**X**

Legal Covenants

Name	**Recurrent**	**Due Date**	**Frequency**
Institutional Arrangements	**X**		

Description of Covenant

PA Schedule Section I A. Maintain the CPMO, the county PMOs, and county PIUs throughout implementation with qualified and adequate staff.

Name	**Recurrent**	**Due Date**	**Frequency**
Safeguard Instruments	**X**		

Description of Covenant

PA Schedule Section I C. Carrying out the project in accordance with the Environmental Management Plan, the Resettlement Action Plan, the Resettlement Policy Framework, and any Resettlement Action Plans prepared thereunder.

Name	**Recurrent**	**Due Date**	**Frequency**
Mid-term Review		June 30, 2017	

Description of Covenant

PA Schedule Section II A. 2. Carry out a Mid-Term Review of project implementation to make adjustments, as necessary, to achieve project objectives and to share experiences to date and lessons learned with others.

Name	**Recurrent**	**Due Date**	**Frequency**
Dam Safety Expert		July 1, 2015	

Description of Covenant

PA Schedule Section I C. 5(a). Hire and maintain throughout project implementation a Dam Safety Expert to (i) inspect and evaluate the status of the Dams, their appurtenances, and their performance history; (ii) review and evaluate the Dams' operation and maintenance procedures; (iii) review the qualifications of the designer for the overflow weirs to be rehabilitated under the Project, under terms of reference satisfactory to the Bank.

Name	Recurrent	Due Date	Frequency
Dam Safety Report	X	March 15 each year	

Description of Covenant

PA Schedule Section I C. 5(b). Submit a written report of findings and recommendations of the Dam Safety Expert for any remedial work or safety measures necessary to upgrade the dams, which is to be submitted to the Bank along with an action plan by Chongqing to address the findings/recommendations of the report.

Conditions

Source Of Fund	Name	Type
IBRD	Subsidiary Agreements	Effectiveness

Description of Condition

LA Article IV. Each of the project counties has entered into a Subsidiary Agreement with its respective County Project Implementing Unit.

Team Composition

Bank Staff

Name	Title	Specialization	Unit
Ji You	Urban Specialist	Task Team Leader (TTL)	GSURR
Xiaokai Li	Senior Water Resources Management Specialist	Co-TTL	GWAGR
Chongwu Sun	Senior Environmental Specialist	Environmental Safeguards	GENDR
Jian Xie	Senior Environmental Specialist	Environmental Economist	GENDR
Guoping Yu	Senior Procurement Specialist	Procurement Specialist	GGODR
Fang Zhang	Financial Management Specialist	Financial Management	GGODR
Meixiang Zhou	Social Development Specialist	Social Safeguards	GSURR
Ximing Zhang	Senior Water Resources Specialist	Dam Safety	GWADR
Huiying Guo	Program Assistant		EACCF

Non Bank Staff

Name	Title	City
Shaojun Chen	Senior Social Specialist	Nanjing
Gary Moys	Senior Environment Engineer, consultant	Paris
Ning Wu	Finance Analyst	Beijing
Rufei Zhang	Senior Urban Planner and Institutional Specialist	Shanghai

.

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
China	Chongqing Shi	Chongqing Shi		X	

I. STRATEGIC CONTEXT

A. Country Context

1. China is experiencing rapid urban growth, with 50 percent of the population currently living in urban areas; by 2020, this number is expected to be 70 percent. This rapid growth is creating pressures for cities to expand their public infrastructure, increase municipal services, and provide employment for residents and migrants. To relieve these pressures on the larger cities, the government's policy of a 'New Urbanization Agenda' is now focused on lower-tier and smaller-sized cities, in which the aim is to create conditions and facilities necessary to attract investments and to accommodate growing populations.

2. Chongqing Municipality (CQM), with an area of 82,400 km^2 and a total population of 33.3 million, has over 45 percent of its population living in rural areas. The CQM has a total surplus rural labor estimated at over 8.45 million people. The strategic challenges of urban-rural disparity, regional disparity, and income disparity at the national level are mirrored in Chongqing. There are also great disparities between the level of public infrastructure and quality of municipal services in the towns compared to the city, and the national government is implementing a strategy to "gradually narrow the gap in basic public services between urban and rural areas." The 12th Five-Year Plan (FYP) promotes the development of infrastructure to address the safety, adequacy, and sustainability aspects of drinking water, waste management services, and environmental pollution in rural areas. Back in 2007, Chongqing was selected by the central government as one of two pilot municipalities (the other being Chengdu Municipality) to promote urban-rural integration as part of the national strategies of Western Region Development, Urban-Rural Integration and Development prioritized in the country's 11th and 12th FYPs.

3. Chongqing's development strategy of "one circle and two wings"[1] defined a four-tier urban settlement system, including a metropolitan core (planned urban population of 9.3 million by 2020), four subregional central cities (planned populations of 0.5-1 million each), twenty-five county seat cities (planned populations of 0.2-0.5 million each), and around three hundred key towns. Compared with the scale of rural-to-urban migration, the receiving capacity of the metropolitan core and subregional cities is relatively limited. CQM has determined that the twenty-five county seats (all third-tier cities) will play a major role in relieving pressures by accommodating one-third of CQM's total urban population in the future. As a result, CQM is promoting the development of these county seats through a package of policy reforms and incentive policy instruments.

4. Substantial efforts and investments from the central, municipal, and local governments have been made or are scheduled, and encouraging outcomes have been achieved under various sectoral programs and initiatives to improve accessibility (for example, through highways and railways), river basin water environment management (sewage collection and treatment

[1] Chongqing Municipality consists of three subregions, including (a) one-hour drive time economic circle (consists of the 9 central districts that form the Chongqing metropolitan core and the 12 surrounding suburban districts and counties), (b) northeast wing of 11 remote counties located in the affected zones of the Three Gorges Reservoir, and (c) southeast wing of 6 counties in the mountainous areas.

investments), flood and soil erosion control, basic social service delivery, and rural poverty reduction in these county seats and scattered small cities. The pace of urban expansion in the county seats is expected to further accelerate under CQM's urbanization policies which are targeted at small cities and towns.

5. However, the growth and development of many county seats has been severely constrained by Chongqing's disadvantageous mountainous topography, in particular in the northeast and southeast wings, the two subregions included in the project. Typically located in deep river valleys and built on scattered, small pockets of scarce land available for urban construction, county seats in these areas of Chongqing are still exposed to relatively high risks of events such as river flooding, landslides, soil erosion, and water pollution. Reducing these risks is a high priority to ensure a sustainable basis for economic and social development.

6. The Bank's twin goals of ending poverty and boosting shared prosperity are well incorporated and reflected in the project design and prioritization of project interventions. The CQM is a challenging combination of a metropolitan central city and vast rural mountainous areas. Among the four project candidates, two counties supported by the project, Shizhu and Pengshui counties in the southeast are representatives of Chongqing's remote rural counties in the mountainous areas that are typically less developed and have a larger share of minority populations. Based on National Bureau of Statistics data, the Shizhu and Pengshui Counties had a per capita gross domestic product (GDP) in 2012 of RMB 22,621 (US$3,700) and RMB 16,019 (US$2,600), respectively, which are considerably lower than both the national and Chongqing's average of around RMB 38,500. As a result, these counties are officially considered to be poor and Shizhu and Pengshui are on the national and municipal poverty registers, respectively. Closing gaps in the provision of infrastructure services in these poor counties and ensuring basic service provision for low-income populations is considered a high priority for project support.

B. Sectoral and Institutional Context

7. Flood risk management in China has conventionally focused on structural measures along major rivers. More recently and as required by the Water Law, a more integrated approach that combines structural and non-structural measures such as flood forecasting, flood emergency response, and river basin planning is pursued. However, cross-sectoral issues such as land use planning, monitoring, information sharing, coordination between river basin authorities and local governments, and regulations for multipurpose reservoirs remain weak and a true risk-based flood management system is still in a pilot phase.

8. The CQM has an average annual rainfall of 1,025 mm, mostly concentrated between June and September. As a consequence, flooding of the Wujiang and Fujiang Rivers that flow through the project counties of Tongnan, Longchang, Shizhu, and Pengshui is frequent. For the most part, these counties are only protected against 1-in-10-year floods (10 percent chance of being exceeded in any one year), which is low given the government flood management regulations. Moreover, with the growing economy and population, and increasing risks from climate change, the vulnerability of these towns and their population to floods is increasing. According to the latest Chinese regulations, the flood control standards for county towns should be anywhere between 1-in-20 and 1-in-50-year floods, depending on the size of population. In view of the

special topography and local socioeconomic development levels, the Chongqing municipal government's strategy is to have all its counties upgrade its structural flood control standards to 1-in-20-year floods, and use non-structural measures to achieve higher standards up to 1-in-50-year floods. This approach is in line with risk-based flood management, but it requires dedicated efforts and investments in implementing essential non-structural measures.

9. Water pollution from increasing urban populations and intensifying industrial activities is also becoming a very important issue in many parts of the municipality, including several of the project counties. The municipality as a whole, located upstream of the Three Gorges Reservoir, lacks sufficient sewage collection and treatment infrastructure and capacity. The government is currently working to narrow the gaps with funding from different sources. The CQM's overall approach, as required under the Environmental Protection Law and Water Pollution Control Law, is to integrate strategic assessments, pollution reduction at source, and wastewater treatment and utilization.

10. The proposed project will support the implementation of an integrated river basin management approach to address water pollution and flood risks in the four project counties, as part of the municipality's rapid urban-rural integration investments. The project interventions have been included in the respective municipal and county governments' master plans and 12th FYP. In addition to the investments in structural and technical (non-structural) interventions, there is a strong need to strengthen water environment and flood management capacity at the county levels through technical assistance and training, including awareness raising and emergency preparedness, especially for new urban residents unaccustomed to flood risks.

C. Higher Level Objectives to which the Project Contributes

11. Water-related infrastructure, especially those for mitigating the risks of flooding, landslide, and soil erosion and for improving water pollution in small cities and towns, is of high priority to both national and municipal government. The CQM believes that investment needs for such basic infrastructure will be substantial in the coming years. Therefore, the CQM considered the proposed Chongqing Small Towns Water Environment Management Project (CSWEP) as a pilot to demonstrate innovative and practical approaches for water-related infrastructure construction in its small cities and towns and expects to disseminate and apply the best practices developed from the CSWEP in other small cities and towns of the municipality. The World Bank's involvement in the project would help the CQM to achieve this goal by introducing international best practices, especially in flood risk management and integrated approaches.

12. The project is consistent with the *China Country Partnership Strategy (CPS) FY2013-2016* (discussed by the Board on November 6, 2012) and serves the two strategic themes defined in the CPS: Supporting Greener Growth and Promoting More Inclusive Development in China. More specifically, the project supports the expected outcomes called for in the CPS FY2013-2016: (a) enhancing urban environmental services; (b) demonstrating sustainable Natural Risk Management approaches and pollution management; (c) strengthening mechanisms for managing climate change; and (d) enhancing opportunities in small towns and rural areas.

II. PROJECT DEVELOPMENT OBJECTIVE(S)

A. Project Development Objective

13. The project development objective (PDO) is to reduce flood risks and improve wastewater infrastructure services in selected counties of Chongqing Municipality.

B. Project Beneficiaries

14. The direct beneficiaries of the project are the 16,000 residents of the county towns who are currently living in the areas that will have a higher level of flood protection and the 67,000 residents who will benefit from improved wastewater infrastructure services. In addition, due to the strong focus on non-structural measures, the project will have a positive impact for the entire population of 500,000 inhabitants living in the four project counties as well as the 330,000 migrants that are expected to move to these county seats in the next 10 to 15 years. The four project county governments will benefit from improved management practices and tools to more effectively manage their flood and wastewater assets.

C. PDO Level Results Indicators

15. The key results expected from the project will be measured through the following outcome indicators: (a) urban land area vulnerable to design floods protected (km^2, non-core indicator); (b) people benefiting from flood risk reduction (number, non-core indicator); (c) people provided with access to improved sanitation facilities under the project (number, core indicator). The latter two indicators are disaggregated by gender.

III. PROJECT DESCRIPTION

A. Project Components

16. The project investments were selected based on the integrated flood control plan for both the Wujiang and Fujiang Rivers and specific requirements for each county to reduce flood risks. A risk-based approach was followed in designing project interventions which combine structural and non-structural measures. This includes measures to improve communication at the regional level and strengthen preparedness and response at the local level. Similarly, for wastewater and water quality management, the project seeks to fill in key gaps in the wastewater collection and conveyance network and uses natural river bank and dike slope protection designs to maximize the project effects in local water resources protection and water environment improvement. Finally, the prioritized investments are divided into the following components according to jurisdictional responsibility:

17. *Component 1: Flood management in Tongnan County* (*RMB 257.1 million).* Construction of a 6.84 km river embankment with associated dike-top roads to raise the flood protection level for the new urban expansion area of Dafuba along the Fujiang River to 1-in-20-year floods.

18. Carrying out non-structural measures at the county level, including (a) strengthening flood early warning and emergency response capacity through provision of water level

monitoring and warning facilities; (b) upgrading flood risk mapping and dissemination, safety zoning, raising public awareness, and emergency response planning; and (c) improving land use management planning for flood affected areas.

19. *Component 2: Flood and wastewater management in Rongchang County (RMB 280.4 million).* Construction of a river embankment of 13.89 km along the Laixihe River upstream, along with associated dike-top roads and sewage/drainage pipe works (19 km) and improvement of one existing overflow weir on the same river. The river embankment would connect with flood protection works in the same county seat that was built under the Chongqing Small Cities Infrastructure Improvement Project (CSCP).

20. Carrying out non-structural measures at the county level, including (a) improving hydro-met monitoring and information management systems through the establishment of a local computer network with the required hardware and software, Geographic Information System (GIS) database and basic supporting facilities for data storage, processing, and communication; (b) strengthening the flood early warning and emergency response capacity through development of flood emergency response plans, capacity-building, and basic facilities at county, township, and village levels; and (c) upgrading flood risk mapping and dissemination, safety zoning, and raising public awareness.

21. *Component 3: Flood and wastewater management in Shizhu County (RMB 305.9 million).* Construction of a 4.84 km long river embankment along the Longhe River, upstream and downstream of a flood protection project for the county seat funded by a previous Bank loan project (CSCP), along with associated 1.9 km of dike-top roads; 16.1 km of sewage/drainage pipes (including wastewater collection pipes in the old urban area); and 5.74 ha of landscaping and improvement of certain existing overflow weirs on the same river.

22. Carrying out non-structural measures at the county level, including (a) improving hydro-met monitoring and information management systems through the establishment of telemetry gauging stations; (b) strengthening the flood early warning and emergency response capacity through development of flood emergency response plans, capacity-building, and basic facilities at the county, township, and village levels; (c) upgrading flood risk mapping and dissemination, safety zoning, and raising public awareness; and (d) developing a geographic information system for monitoring, operation, and maintenance of drainage and wastewater network facilities.

23. *Component 4: Flood and wastewater management in Pengshui County (RMB 299.3 million).* Construction of a river embankment of 4.69 km on the left side of the Wujiang River with associated dike-top road (4.76 km), which will raise the flood protection level of the county seat's new urban area to 1-in-20-year floods. This component also includes civil works for sewage collection and drainage pipes (4.69 km).

24. Carrying out non-structural measures at the county level, including (a) improving hydro-met monitoring and information management systems through the establishment of telemetry gauges and rainfall stations; (b) strengthening the flood forecasting and early warning capacity at the county level through the establishment and operationalization of a flood forecasting system with the required database, data processing, communication and flood forecasting software, and

hardware and facilities at the management center; and (c) upgrading flood risk mapping and dissemination, safety zoning, raising public awareness, and emergency response planning.

25. *Component 5: Project Management and Implementation Support (RMB 35.0 million).* Provision of project management and implementation support activities aimed at (a) enhancing the design, supervision, and certification of works carried out under the project; (b) strengthening the capacity of Chongqing at the municipal and county levels (including the Chongqing Project Management Office, Tongnan Longquan Hydro Construction & Development Company, Rongchang Hongyu Water Resources Development Company, Shizhu Urban Construction & Development Company, and Pengshui Hydro Investment & Construction Company) in the areas of project management, procurement and contract management, accounting and financial management, and environmental and social safeguards; and (c) strengthening capacity for operation and maintenance of urban flood and water environment management facilities at the county level through training and development of asset management plans. This component will also fund the incremental operation costs for the Chongqing Project Management Office (CPMO).

B. Project Financing

26. *Lending Instrument.* The proposed lending instrument for this project is an Investment Project Financing (IPF) loan. The borrower has selected a U.S. dollar denominated, commitment-linked variable spread loan based on six-month LIBOR plus an additional variable spread. The borrower has also selected all available conversion options, level repayment of principal, and a repayment period of 30 years, including a 6-year grace period.

27. *Project Cost and Financing.* The project cost is estimated at US$218.6 million (RMB 1.33 billion) of which US$100 million will be financed by the IBRD loan. The counterpart funding of US$118.62 million will be provided by the county governments. The estimated costs and Bank financing for different components are given in table 1.

Table 1 Project Cost and Financing

Project Component	Estimated Cost		IBRD US$ (million)
	RMB (million)	US$ (million)	
Component 1: Flood management in Tongnan County	257.1	42.1	17.86
Component 2: Flood and wastewater management in Rongchang County	280.4	46.0	23.40
Component 3: Flood and wastewater management in Shizhu County	305.9	50.2	27.61
Component 4: Flood and wastewater management in Pengshui County	299.3	49.0	25.14
Component 5: Project Management and Implementation Support	35.0	5.7	5.74
Sub-Total:	**1,177.7**	**193.0**	**99.75**
Contingency	89.8	14.7	
Interest During Construction (IDC), Commitment fee	64.6	10.6	
Front-end fee	1.5	0.3	0.25
Total:	**1,333.6**	**218.6**	**100.00**

C. Lessons Learned and Reflected in the Project Design

28. The current practice of flood control in Chongqing and China is typically focused on structural measures such as constructing embankment and dikes. Non-structural measures such as hydro-met monitoring and flood early warning are not fully explored and invested. Integrated flood risk management approaches that have been successfully applied in several projects worldwide and most recently in China in the Jiangxi Wuxikou Integrated Flood Management Project and the Qinghai Xining Flood Control and Watershed Improvement have been followed in the design of this project. Besides combining structural and non-structural measures to reduce flood risks, the project incorporated the concept of accepting floods as there always remains a residual risk of flooding. As a result, the project emphasized the importance of including flood forecasting and early warning systems, emergency response plans, and a focus on the most vulnerable groups such as elderly people, children, and women.

29. While this approach is relatively new in China, it is being tested in many other Bank-financed projects in China and worldwide. The results of these projects will provide valuable insights into the implementation of integrated flood risk reduction in a variety of developmental settings and a better understanding of critical issues in terms of cross-jurisdictional collaboration.

30. Based on its experience in the urban portfolio and in projects involving multiple towns and cities, the team has also tried to keep the design focused on the water sector and two subsectors: flooding and wastewater management. Project interventions were selected and prioritized based on river flood control plans, local master plans, and a solid cost-benefit analysis. In addition, infrastructure needs and asset management capacity were carefully assessed during project preparation to ensure sustainable use of project facilities.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

31. The Chongqing Municipal Government proposed a three-level institutional setup for project preparation and implementation of CSWEP, namely the municipal, county, and executing agency level. The Chongqing Government and the CPMO have previous experience in implementing Bank-financed projects—including Chongqing Urban Environment Project (CUEP), Chongqing Small Cites Infrastructure Improvement Project (CSCP), and CURIP—and a similar institutional arrangement is followed under this project, with the exception of abolishing the municipal and county leading groups.

32. At the municipal level, the CPMO will organize and coordinate project implementation on behalf of the Chongqing Municipal Government. Established under the Chongqing Municipal Development and Reform Commission (CDRC), the CPMO has full support from relevant sectoral agencies at the municipal level, including the Finance Bureau, Water Resources Bureau and Environmental Protection Bureau. These agencies will help provide guidance and will oversee project management and implementation. The CPMO, as the focal point of contact, will

monitor implementation progress, including procurement activities and consolidated project costs and prepare consolidated semiannual progress reports. It will be responsible for implementation of the technical assistance and capacity building component.

33. The CPMO will coordinate the relevant municipal-level agency's technical expertise to provide advice on technical issues, quality control, and program coordination. During implementation, the CPMO will recruit a consulting firm with experience in managing Bank projects for project management and contract supervision to support the CPMO and help ensure compliance of civil works with agreed design criteria and principles and monitor construction.

34. At the county level, a PMO within each county government has been established, chaired by a Deputy County Chief with members of related county government agencies. The county PMO will be responsible for providing guidance and overseeing project implementation of subprojects, coordinating mobilization of counterpart funding, and helping settle any critical issues encountered during project implementation.

35. At the executing agency level, project implementing units (PIUs) have been appointed by the county government for each investment activity, to carry out the day-to-day subproject preparation and implementation. All the PIUs are existing state-owned enterprises and are typically the investment and construction entities that the county government has set up under the county hydro bureau for capital investment in the water sector. Assets built under the CSWEP will be transferred to related public service units for operation and maintenance, such as the operation and maintenance (O&M) department under the county hydro bureau (for dikes and embankments) and the public utility division under the county urban construction bureau (for drainage/sewage pipelines and urban roads). These appointed O&M units will manage the assets on behalf of their county government.

36. Of the four project counties, the three counties of Tongnan, Rongchang, and Shizhu have implemented earlier Bank projects and the project PMOs and PIUs from the previous Bank projects have been retained, with necessary adjustments, to implement the new project. These three project counties have the requisite staffing and capacity to implement their subprojects. The county government of Pengshui has committed to further strengthen their county PIU capacity by bringing in more staff with rich project experience and technical background, providing training to staff, and imbibing learning from the other three counties' PIUs that are more experienced in implementation of Bank loan projects.

B. Results Monitoring and Evaluation

37. The monitoring and evaluation system for the project will monitor implementation progress and outcomes and will provide special monitoring for safeguards compliance. These tasks will be undertaken by internal and external teams respectively. The CPMO and county PIUs, supported by an implementation support consultant team, will undertake monitoring and reporting of progress and results (outputs and outcomes). Outcome indicators for the project and each component with baseline values and target values are provided in Annex 1. Progress toward achieving the targets of the indicators will be presented in the semiannual progress reports, which will be provided to the Bank. Specialized monitoring of the environmental management

plan and implementation of the resettlement action plan will be undertaken and reported by third parties (see Annex 3 for more details).

C. Sustainability

38. The Chongqing Municipal Government and the four project county governments are committed to managing flood risk and water environment and have included the project in their respective 12th five-year development investment plans. An integrated approach was adopted to combine structural and cost-effective nonstructural measures and to strengthen the synergy between this project and related government programs, with the aim to establish effective systems of flood and wastewater management in the project counties. As a result, the project can bring sustainable benefits to more people and at lower capital and O&M costs.

39. Detailed technical and economic analysis was conducted to ensure that the necessary resources and capacity will be available to build, operate, and maintain the project facilities. The capacity-building component will help strengthen the capacities of the administration authorities and O&M entities in sustainable use of the flood and wastewater management facilities.

V. KEY RISKS AND MITIGATION MEASURES

A. Risk Ratings Summary Table

40. The risk ratings are summarized in table 2 (see details in Annex 4):

Table 2 Risk Ratings

Risk Category	Rating
Stakeholder Risk	Moderate
Implementing Agency Risk	
- Capacity	Moderate
- Governance	Moderate
Project Risk	
- Design	Substantial
- Social and Environmental	Substantial
- Program and Donor	N/A
- Delivery Monitoring and Sustainability	Substantial
Overall Implementation Risk	Substantial

B. Overall Risk Rating Explanation

41. The overall project risk is considered to be substantial. The main risks are the following:

- *Inappropriate technical design of sub-projects in different counties.* Engineering works may not be complemented by cost-effective nonstructural measures and operated jointly with other stakeholders of the water/flood management system in the basins concerned.

- *Ineffective cross-sectoral and cross-boundary coordination which might undermine achievement of the PDO.* Adequate cross-sectoral and cross-boundary coordination are essential for implementing nonstructural measures such as monitoring, information sharing, and regulation of multipurpose reservoirs among different agencies.

- *Delays as a result of the extensive processes and procedures.* Delays could also be due to the lack of counterpart financing related to resettlement and land acquisition under the project.

42. The CPMO has mobilized the relevant sector agency's technical expertise (for example, Environmental Protection Bureau [EPB], Water Resource Bureau, and Flood Control Office) to review the quality and appropriateness of technical designs for all project counties. The Bank team has provided technical assistance and review of the feasibility study reports prepared by the local design institutes and project counties. The second risk is mitigated by establishing project PMOs at county levels to coordinate among government agencies at various levels and among operators of different water assets and by establishing a PIU in each project county with adequate authority and resources for cross-agency and cross-sector coordination during project preparation and implementation. The design and alignment of project-financed infrastructure has been optimized to reduce the need for land acquisition and house demolition. In addition, the team has worked closely with the counties to ensure counterpart financing is available and land acquisition process starts soon after approval.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

43. *Economic Analysis.* Economic justification together with technical and other evaluation criteria have been taken into account in project identification and preparation, and based on that a set of economic and financially viable investments have been selected for inclusion in the project. Based on the technical review and economic analysis, a number of investments were dropped from the project as they had limited impact and would not be cost-effective. In addition, economic consideration also played a role in deciding the scale of investment in some investment components, such as the diameter and length of water and sewerage pipes.

44. The main economic benefits of the proposed project include avoided flood damages, increases in amenity and land values, and water quality and health improvements owing to improved water environment infrastructure services. They are public goods and justify the use of government funds. Economic costs of the project are mostly capital investment costs (including associated resettlement and environmental mitigation costs as identified by environmental and social safeguard analysis) and O&M costs.

45. The costs of different project components are known. However, in some cases the data needed to estimate benefits is difficult to obtain. Therefore, a mix of cost-benefit analysis and cost-effectiveness analysis has been used for the economic analysis of the project. The economic analysis presented here is an example of social cost-benefit analysis. The costs are paid for by public funds and the benefits accrue to both individuals and society. The question posed is whether or not the net social benefits are positive—that is, whether the present value of benefits exceed the present value of costs.

46. Cost-benefit analysis is used to evaluate the economic viability of each individual flood control subcomponent in four counties. The category of flood control accounts for the bulk of the project investment. The results of the cost-benefit analysis show that all of these components are economically viable. The economic internal rates of return (EIRR) of the flood control components in four counties are 16.4 percent (Rongchang), 13.0 percent (Tongnan), 11.6 percent (Pengshui), and 13.2 percent (Shizhu), respectively.

47. The wastewater management components have development targets that have been set by the local county government. These targets are based on their importance to public health and local residents' standard of living and more generally, the development of small towns. Due to the difficulty in drawing a direct link between proposed investments and water-borne diseases avoided and quantifying and monetizing the benefits of these components, the cost-effectiveness approach is used to ensure the selection of the least-cost design options to achieve the development targets.

48. Sensitivity analysis is conducted for the four flood control components. The results of the sensitivity analysis (under the assumption of a 10 percent decrease in economic benefit and/or a 10 percent increase in total costs) show that the investments for the components are economically robust.

49. Project costs will be shouldered by the local government and there will be no additional fees or charges imposed by the government on local people in the project counties. Therefore, there is no anticipated negative impact on local residents, including low-income households.

50. Monitoring indicators are proposed to capture the project implementation progress and re-evaluate the project results at supervision and ICR stages.

51. *Financial Analysis.* The financial capacity of the governments of Tongnan, Rongchang, Shizhu, and Pengshui Counties was assessed based on the financial data provided by each of the four project counties. The results show that the counterpart financing required for the project from each county will be less than 1 percent of the annual tax, non-tax, and transfer payments and that the governments do not need to rely on land transfers to cover the costs of the project (see Annex 6 for more information). Although limited information was provided on the indebtedness capacity of these counties, they all have resources to support the proposed project during implementation, especially in the early stages. A considerable amount of the counterpart financing will come from recurring transfers from the Municipal Water Resources Bureau to the counties for flood control activities.

B. Technical

52. Integrated urban water management approach is adopted, which combines structural measures and cost-effective non-structural measures. The project design is consistent with the respective river basin master plans and local land use plans. The flood protection design standard of 1-in-20 years adopted for the project counties of Shizhu, Tongnan, and Pengshui and 1-in-10 to 1-in-20 for Rongchang County is appropriate. The technical design of each component is optimized and in line with international good practices. Special attention and resources are devoted to the important non-structural measures such as investments in strengthening hydro-met monitoring networks, flood forecasting and early warning systems, flood emergency response, and flood risk mapping for improved long-term land use planning and management as well as water environment information management. These non-structural measures are determined on the basis of gap analysis to make sure that the essential measures are put in place. To ensure sustainability of project interventions, the capacity of flood and wastewater management will be strengthened in the course of implementation and proper arrangements made for operation and maintenance of the project facilities.

53. Different infrastructure components under the project, including dikes and river banks, dike-top roads, drainage networks, and wastewater collection, are designed according to the related technical standards of the Chinese government and the urban master plans and applicable sector development plans of the Chongqing municipal and project counties.

54. In addition, the project has been prepared following the approach adopted under previous Bank-funded projects in Chongqing (CUEP, CSCP, and CURIP) with enhancements made to improve design quality and reduce potential contract variations during implementation. During implementation, the CPMO will recruit a consulting firm with experience in managing Bank projects for project management and contract supervision to support the CPMO and help ensure compliance of civil works with agreed design criteria and design principles and monitor construction.

55. The CPMO will coordinate the relevant municipal level agency's technical expertise to provide advice on technical issues, quality control, and program coordination. This process will lead to more efficient designs.

C. Financial Management

56. The CPMO, established under the CDRC, has extensive experience with four Bank-financed projects and will be responsible for overall project management, monitoring, and coordination. The four PIUs are (a) Rongchang Hongyu Water Resources Company (Rongchang PIU); (b) Tongnan Longquan Water Affairs Construction and Development Company (Tongnan PIU); (c) Pengshui Hongyu Water Affairs Investment and Construction Company (Pengshui PIU); and (d) Shizhu Tujia Autonomous County City Construction Development Company (Shizhu PIU).

57. The PIUs are existing legally established entities and will be responsible for day-to-day project financial management (FM) related activities, including project accounting and financial reporting. The Bank loan proceeds, including overseeing the Designated Account, will be

managed by the Chongqing Municipal Finance Bureau (CMFB). Except for the Pengshui PIU, the other three PIUs have experience with Bank operations from previous Bank projects. The Bank FM assessment identified the PIU financial staff's lack of knowledge and experience in managing Bank-financed projects as the principal FM risk. To mitigate this risk, a Financial Management Manual (FMM) with detailed FM procedures, roles, and responsibilities, has been prepared and accepted by the Bank. In addition, the Bank has been providing extensive FM training, and the CPMO and CMFB who have experience with Bank-financed operations will arrange more extensive workshops and knowledge sharing. The FM arrangements were found to be satisfactory based on the Bank's requirements under OP/BP 10.00. See Annex 3 for additional information.

58. The residual project FM risk after mitigation measures is assessed as Moderate.

D. Procurement

59. The CPMO will organize, lead, and coordinate procurement activities for the whole project and provide guidance to the four PIUs in the project counties on all procurement-related aspects. The capacity assessment of the CPMO and different PIUs at the county level has been conducted by reviewing the project organization structure and functions, past experience of implementing agencies, staff skills, quality and adequacy of supporting and control systems, and the legal and regulatory aspects. The CPMO and all the four PIUs have been legally established with at least one designated procurement staff in each office. While the CPMO and the PIUs in the Rongchang, Tongnan, and Shizhu counties have experience with Bank-financed projects, the PIU and its staff in the Pengshui County do not have adequate experience with Bank projects and procurement procedures. The key procurement risks are delays in processing procurement by the Pengshui PIU and possible noncompliance. To mitigate these risks, a plan for procurement capacity strengthening and risks mitigation action for the project was agreed with the CPMO and the PIUs.

60. To build the capacity of the CPMO and PIU staff, the CPMO organized a procurement workshop from August 21-23, 2013, in Chongqing for all the CPMO and PIU staff under the ongoing projects and this new pipeline project. The procurement team from the Bank's Beijing office delivered the training. The CPMO will regularly organize training activities during project implementation, including training on anti-corruption guidelines, and the Bank will continue to provide support in strengthening the procurement and contract management capacity. In addition, project procurement staff will attend procurement training courses organized periodically by the Bank or other institutions acceptable to the Bank. Furthermore, procurement activities under the project will be guided by the project procurement manual, which has been prepared by the CPMO. The manual has been reviewed and found acceptable to the Bank.

61. A procurement plan, which describes procurement activities to be undertaken under the project (including contracts to be procured in advance of loan signing), has been prepared, reviewed, and agreed upon by the Bank. The procurement plan will be updated throughout the duration of the project—at least annually or as required—to reflect actual project implementation needs and submitted to the Bank for review. After negotiations, the initial procurement plan and all subsequent updates shall be published on the Bank's external website once the Bank has provided no objection. Further details on procurement are provided in Annex 3.

62. The procurement capacity and risk after mitigation measures are rated as Moderate.

E. Social (Including Safeguards)

63. The project will have positive social benefits on local communities and residents in all four project counties of Chongqing. The main social benefits will include opportunities for people to participate in the project implementation, access to improved flood management facilities, sewer and drainage networks, and increased land value in project areas after the construction of flood management infrastructure. As for the negative social impacts of the project, they could mainly be the result of land acquisition, demolition of houses and other ground structure, temporary traffic blocks and interruptions, business impacts to small shops along the streets, and so on.

64. *Involuntary resettlement.* The Bank's policy OP 4.12 is triggered because the project involves land acquisition and resettlement for the construction of project-financed infrastructure. The main civil works consist of river embankment rehabilitation and improvements and associated roads, sewers, and drainage pipelines. The project will have significant land acquisition and resettlement impacts in 14 villages and communities in 5 townships and subdistricts of the project counties. In total, 1,997 mu of land will be permanently acquired, including 1,289 mu of rural collective land (including 703 mu of cultivated land), and 708 mu of state-owned riverbank land. Besides, 585 mu of land will be temporarily occupied during the construction phase of the project, which includes 371 mu of cultivated land. The project will also require the demolition of about 23,352 m² of houses and other types of ground structures, which will affect 76 households, 3 enterprises, 2 shops, and 10 farms. A total of 1,493 households and 6,258 people will be affected by involuntary resettlement, including 46 vulnerable people from 15 households. There will be 244 people in 59 households that will be affected by both land acquisition and house demolition. To address local concerns and minimize negative impacts, a social assessment with wide consultation was carried out at each project site. A consolidated Resettlement Action Plan (RAP), which is available in both English and Chinese, was prepared summarizing the main content of each county-specific RAP that was prepared during project preparation. The RAPs established comprehensive mitigation measures, grievance redress mechanisms, monitoring and evaluation arrangements, institutional framework, and capacity-building activities. These documents were prepared in compliance with the Chinese legal and policy framework for land acquisition and house demolition as well as the Bank Safeguard Policy requirements in OP 4.12. No linked investments have been identified.

65. Although most resettlement impacts by the project were clearly scoped and investigated by appraisal and included in the approved RAPs, some impacts related to the installation of sewers and other pipelines could not be fully determined before project appraisal. Therefore, a Resettlement Policy Framework (RPF) was prepared to address possible temporary land acquisition in the future,

66. *Ethnic Minorities.* The screening for indigenous people based on the requirements of OP 4.10 confirmed that there are no indigenous people in the project area. The detailed social assessment, which includes social survey and analysis and broad consultations at each project site, confirmed the absence of indigenous people in the project area. Therefore, the Indigenous People Policy (OP 4.10) was not triggered. Although there are two ethnic minority groups, the

Tujia in Shizhu County and the Miao in Pengshui County, they mostly live in more remote rural areas, and project investments are in urban or peri-urban areas. The Tujia and Miao people living in these areas are fully integrated, both socially and economically, and are not disadvantaged in comparison with the local Han people. Therefore, they do not have the characteristics of indigenous people under the terms of OP 4.10. Nevertheless, based on the social assessment results, the needs and interest of the local people, including ethnic minorities, will be reflected in the implementation.

67. *Alternatives considered.* Comprehensive analysis of alternatives was conducted based on technical, economic, environmental, and social considerations. As a result of adapting the height and slopes of river embankments and the locations of paths and access roads, the demand for land was reduced by about 1,000 mu and much fewer structures and houses had to be demolished.

68. The project is not expected to have significantly irreversible social impacts. The negative impacts are mainly the result of land acquisition and house demolition during implementation. A range of mitigation measures have been proposed as a result of the Social Assessment (SA), including compensation at replacement values and livelihood restoration for people that will lose land or property. Priority is given to the low income and vulnerable groups at the project sites. Detailed mitigation measures have been agreed in the RAPs as well as the RPF to address the social impacts, and relevant clauses will be included in the bidding documents and contracts to ensure compliance and enforcement. The RAPs and RPF are an integral part of project implementation and will be monitored and evaluated by the PIUs and independent monitoring consultancy group.

69. *Institutional arrangements and capacity building.* The task team will continue to provide training and support to the local teams as required. The CPMO has considerable experience in implementing Bank-financed projects and will support the county teams directly. It has implemented many similar projects that have involved significant resettlement impacts. The county PIUs in Chongqing have good experience in coordinating the implementation of resettlement activities under domestic projects, and some have previous experience in implementing Bank-supported projects, with a good track record.

70. *Public consultations and information disclosure*. These were carried out in project areas through consultation workshops and dissemination campaigns. A consulting firm conducted extensive surveys, interviews, and meetings in affected areas with a representative sample of 20 percent of the people, organizations, and private enterprises at the project sites. Detailed information about the planned civil works, the location, and possible alternatives were shared during public consultation meetings. Some of the main concerns raised by people included issues related to land acquisition; availability and timely compensation of affected people; and timing, quality, and amenities of resettlement housing. Measures to address these concerns have been incorporated in the RAPs and SA, or alternatives designs were considered to mitigate the risks. The SA report and the RAPs were disclosed locally on March 28, 2014, and the RAPs, RPF were disclosed through the World Bank Infoshop on October 28, 2014.

71. *Gender and pro-poor development aspects.* During project preparation, the SA included gender analysis and gender-sensitive recommendations for actions. Gender-sensitive measures

will be taken to restore livelihoods for affected men and women during and after the project construction period. As the project sites include a few poverty counties and many poor villages, special attention will be given to the participation of the poor and vulnerable people, as well as both men and women, and their access to project facilities and services. Equal participation and gender responsiveness will be reflected in project activities such as training; compensation for losing land, houses, or other assets; and activities related to raising disaster risk awareness by ensuring a balanced proportion of women beneficiaries.

72. Gender disaggregated indicators have been included in the Results Framework to assess the extent to which women have equally benefitted from flood-prevention activities and received adequate compensation and resettlement measures to meet their needs.

F. Environmental (Including Safeguards)

73. Based on environmental screening, the Bank policy OP 4.01 - Environmental Assessment is triggered as the proposed project components will have some environmental, safety, and health impacts during construction and operation. This a Category A project according to OP 4.01, mainly because the location of some proposed components could be environmentally sensitive (for example, flood control and embankment in the Pengshui County's Wujiang River section and the Shizhu County's Longhe River section), though some impacts may be site-specific and few would be irreversible.

74. An Environmental Impact Assessment (EIA) was carried out for the proposed project components, and an environmental management plan (EMP) was prepared to determine the mitigation measures, environmental monitoring program, and necessary institutional arrangement as well as capacity building development. As a Category A project, an environmental assessment summary has been prepared and distributed to the Bank's Board. The documents have been prepared on the basis of Chinese legal and policy framework for environmental protection and management, master plans, and environmental plans as well as applicable Bank safeguard policies, including OP 4.01 - Environmental Assessment; OP 4.04 - Natural Habitats; OP 4.11 - Physical Cultural Resources; OP 4.37 - Safety of Dams; OP 4.12 - Involuntary Resettlement; and the World Bank Group's Environmental, Health, and Safety Guidelines.

75. *Environmental and social benefit.* The project will have significant benefits in terms of reducing flood risks and improving water management infrastructure and services. The project counties are located in mountainous regions and listed as poverty counties in Chongqing. The project will help reduce the impact of flooding on lives, assets, and income; increase the value of land; expand the access of people to basic services; and improve the quality of the environment and attractiveness of the counties. This will likely lead to an increase in investment and migration to project areas and an increased demand for environmental services such as water and wastewater. The proposed project fits well into an integrated development plan for towns as it will help investments and economic development in these counties while reducing risks and improving the quality of life for the local people.

76. The main negative environmental impacts are expected to be temporary during project construction phase, including dust, noise, and traffic interruption. A standalone EMP has been

prepared based on the findings of the EIA report. The EMP summarized the key environmental impacts and detailed the environmental management and supervision organizations/institutional arrangement and responsibilities, mitigation measures, training plan, monitoring plan, and budget estimates of EMP implementation. It includes sets of Environmental Codes of Practice (ECOPs) for contractors, which will be incorporated into bidding documents and contracts to ensure effective implementation.

77. *Alternative analysis and due diligence.* Alternatives that were analyzed as part of the feasibility study and EIA include (a) with and without project scenario; (b) different options for alignment and type of embankment; (c) alternatives for wastewater collection and treatment plan; (d) different dredging method to be used in construction; and (e) options for the disposal of dredged materials. Based on a comprehensive comparative analysis of alternatives, the most appropriate solution from a technical, economic, social, and environmental point of view was selected. The potential environmental impacts of increased wastewater collection and treatment at the wastewater treatment plants (WWTPs) and the disposal of sludge from project-financed facilities at the landfill were also extensively assessed. No major issues were found and all facilities complied with national environmental policies and regulations and can handle additional loads.

78. *Environment Management Plan.* An EMP was prepared, which includes guiding principles, relevant environmental standards, an environmental management framework, key environmental impacts, mitigation measures, ECOPs, an environmental monitoring plan, institutional arrangements, training and capacity building strategy, and estimated costs for the implementation of the EMP during construction and operation phase. The EMP also included specific measures to mitigate and minimize the impacts on the wetland in Tongnan, the cultural and historic relics in Tongnan and Rongchang County, and the chance-find procedures for archaeological and historic relics.

79. *Public Consultations and Information Disclosure.* Two rounds of public consultations were carried out during the EA process, which included surveys using public opinion questionnaires, focused group discussions, public meetings with key stakeholders and interviews with some project-affected persons. Issues raised during these consultations have been incorporated in the EIA and EMP. Furthermore, concerns and feedback received have been documented in the EA and relayed back to the affected people. The EIA and EMP documents and other project-related documents have been disclosed locally through websites (http://www.eiafans.com/forum.php) since March 8, 2014, and the most widely distributed local newspaper (*Chongqing Daily*) on March 9, 2014. The EIA and EMP have been disclosed through the Bank's InfoShop on October 28, 2014, and the Executive Summary of Environment Assessment on May 30, 2014.

G. Other Safeguards Policies Triggered

80. *Physical Cultural Resources (PCR).* Based on current information available, two national-level culture heritage sites in Tongnan and Rongchang Counties are within the project area. During the EA preparation, detailed screenings and surveys were conducted and local culture authorities were consulted. A PCR management plan is part of the EMP and includes appropriate mitigation measures.

81. *Safety of Dams.* The proposed project will not directly finance the construction and rehabilitation of any dams. However, the OP 4.37 - Safety of Dams policy is triggered by the project because some of the project-financed infrastructure will rely on proper operation of four existing upstream dams, namely Sankuaishi Dam in Tongnan County, Yutan Dam in Rongchang County, Wujiang-Pengshui Dam in Pengshui County, and Tengziguo Dam in Shizhu County. Those dams, which were built between 1976 and 2011, are between 7.8 m and 116.5 m in height, with 20 million cubic meters to 146 million cubic meters reservoir capacities. Failure of those upstream dams could cause extensive damage to or failure of some or all of the investments under the project. During project implementation, the Bank together with a Dam Safety Expert hired by the CPMO and the four project counties will monitor the safety status, operation and maintenance, and emergency preparedness of all these dams and supervise the implementation of further remedial work of these dams, if any, to ensure that the project complies with OP 4.37. During the implementation, the borrower will prepare an Annual Dam Safety Action Plan and provide relevant dam safety information to the Dam Safety Expert and the Bank. The borrower will also arrange field trips, when necessary, to review the safety status of the relevant dams and take the safety measures recommended by the Dam Safety Expert to improve the safety status, when necessary.

82. The project will finance the rehabilitation of four overflow weirs in Shizhu and Rongchang Counties. These overflow weirs are not covered by OP 4.37 - Safety of Dams. The Dam Safety Expert hired by the CPMO will review the qualification of the designer for the overflow weirs that need to be rehabilitated under the project, under terms of reference satisfactory to the Bank.

83. *Natural Habitats.* Through the EA process, screening and survey was conducted according to the Bank's OP4.04 - Natural Habitats policy and it was noted that there are no significant natural habitats in the proposed project areas. However, the survey confirmed that the Fujiang National Wetland Park is located in Tongnan County within the catchment area of Fujiang River. This park was established to demonstrate the construction of a wetland park oriented for scientific research and education and ecological tourism. Part of the proposed embankment in Tongnan will occupy land in the Class II area that is zoned for rational land use of the park. Therefore, the policy is triggered. The survey also indicated that there were no endangered species in the project areas. As part of the EA, the impacts were assessed and the mitigation measures are designed in the EMP.

ANNEX 1. RESULTS FRAMEWORK AND MONITORING

China: Chongqing Small Towns Water Environment Management Project

Project Development Objective (PDO): The project development objective is to reduce urban flood risks and improve wastewater infrastructure services in selected counties of Chongqing Municipality.

PDO Level Results Indicators	Core	Unit of Measure	Baseline 2014	Cumulative Target Values						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition)
				Year 1 2015	Year 2 2016	Year 3 2017	Year 4 2018	Year 5 2019	Year 6 2020				
Indicator 1. PO-1 The total urban area vulnerable to design floods protected	☐	km^2	0	0	0.050	0.380	1.591	1.961	2.161	Annually	Project progress report	PIUs of four project counties	Cumulative
Indicator 2. PO-2 People benefited from flood risk reduction (male/female)	☐	Number of people	0	0	1,600	4,000	8,000	12,800	15,900	Annually	Project progress report	PIUs of four project counties	Cumulative
Indicator 3. PO-3 People provided with access to "improved sanitation facilities" under the project (male/female)	■	Number of people	0	0	6,800	15,800	42,700	52,700	67,200	Annually	Project progress report	PIUs of Rongchang, Shizhu, and Pengshui	Cumulative
Intermediate Result													
Intermediate result indicator 1. IO-1.1. % of dike construction completed	☐	%	0	0	10	39	84	92	100	Semiannually	Project progress report	PIUs of four project counties	Cumulative
Intermediate result indicator 2. IO-1.2. % of sewage pipe construction completed	☐	%	0	0	20	55	86	95	100	Semiannually	Project progress report	PIUs of Rongchang, Shizhu, and Pengshui	Cumulative
Intermediate result indicator 3. IO-1.3. % of associated roads construction completed	☐	%	0	0	11	36	70	90	100	Semiannually	Project progress report	PIUs of four project counties	Cumulative
Intermediate result indicator 4. IO-2.1. Flood risk maps prepared and disseminated for awareness raising in all project counties	☐	Number of maps	0	0	0	0	1	2	4	Semiannually	Project progress report	PIUs of four project counties	
Intermediate result indicator 5. IO-2.2. Flood emergency preparedness plans developed and/or upgraded in all project counties	☐	Number of plans	0	0	0	0	1	2	3	Semiannually	Project progress report	PIUs of four project counties	
Intermediate result indicator 7. IO-2.4. People participated in flood risk awareness raising activities at project sites (male/female)	☐	Number of people	0	0	0	1,500	2,500	3,500	5,000	Semiannually	Project progress report	PIUs of four project counties	Cumulative

ANNEX 2. DETAILED PROJECT DESCRIPTION

China: Chongqing Small Towns Water Environment Management Project

A. Description of the Project Area

1. The World Bank has supported Chongqing's agenda of Reform and Urban-Rural Integration through assistance with highway connection improvements, sewage collection and treatment, flood control, water supply, and vocational education and health care services in Chongqing's small cities and rural areas under two previous Bank projects.

2. The four project counties, which are the candidates for the Bank's support under the CSWEP, represent a variety of local economic conditions, geographic features, and water environment challenges that county seats in Chongqing are facing. Among these four selected counties, Tongnan and Rongchang represent the western peripheral counties that are within Chongqing's 'one-hour driving time' economic circle. The other two counties, Shizhu and Pengshui in the southeast wing are representative of Chongqing's remote rural counties in the mountainous areas that are typically less developed and include a larger share of minority populations. The two counties are officially considered to be poor, on the state (Shizhu) and municipal (Pengshui) levels, respectively. Based on data from the National Bureau of Statistics, the per capita GDPs of Shizhu and Pengshui were only 58 and 46 percent of Chongqing's average municipal per capita GDP in 2012.

3. All these four county seats have experienced rapid urban growth over the last ten years. The pace of urban expansion in these four county seats will be further accelerated as a result of the CQM's urbanization policies targeted at small cities and towns. According to their master plans, these four county seats are expected to substantially expand in the coming decade. Total population and built-up area of these four county seats are expected to increase considerably in the coming decades.

Table 3 Total Population and Built-up Area

	2000		Existing		Planned			
	Total population (1,000)	Built-up area (km^2)	Total population (1,000)	Built-up area (km^2)	County seat total population estimate for 2020 (1,000)	County seat total urban area planned for 2020 (km^2)	Population protected at 2020 horizon (1,000)	Additional area to be protected from flooding (km^2)
Tongnan County seat	70-80	3-4	93	15.7	220	22.5	100	13
Rongchang County seat	100-110	16	227	21.8	348	35	30	8
Shizhu County seat	50-60	3	80	7.6	90	12.2	10	4
Pengshui County seat	70-80	4.3	100	5.5	172	21	18	14

4. Substantial efforts and investments from the central, municipal, and local governments have been made or are scheduled and encouraging outcomes have been achieved under various sectoral programs and initiatives to improve accessibility (for example, through highways or railways); river basin water environment management (sewage collection and treatment investments); flood and soil erosion control; basic social service delivery; and rural poverty[2] reduction in these county seats and scattered small cities.

5. Typically located in deep river valleys and built on scattered small pockets of scarce land available for urban construction, the growth and development of these county seats has been severely constrained by Chongqing's mountainous topography, in particular in the two subregions of the northeast wing and southeast wing. Given their topographic and geological conditions, county seats in Chongqing are exposed to relatively high risks of events such as river flooding, landslides and soil erosion, and water pollution (see table 4 for rising flood impacts in Pengshui and Tongnan Counties).

Table 4 Flood Impacts in Pengshui and Tongnan Counties

Damages and losses caused by recent floods in Pengshui County:		
Flood in 1982	1/3 of the county seat affected	Direct loss of RMB22 million
Flood in 2003	160,000 people affected (including rural population)	Direct loss of RMB70 million
Flood in 2010	470,000 people affected (including rural population)	Direct loss of RMB414 million
Damages and losses caused by recent floods in Tongnan County:		
Flood in 1981	650 injured, 3 killed	Direct loss of RMB5.7 million
Flood in 1998	Causality data not available	Direct loss of RMB328 million

6. The investments proposed by the CQM for these candidate project counties all aim to mitigate the risks of flooding and land erosion for the new urban areas (either recently developed or currently under development) in the county seats and improve water quality in those locations. The current proposed investments are also in line with the CQM government's master plan focused on:

- Supporting the CQM's efforts to promote the urban development of county seats (third-tier cites in Chongqing's urban system), which perform critical roles and have a great potential for facilitating the rural-to-urban migration from Chongqing's vast rural area.
- Prioritizing water-related investments needed in selected county seats for securing a managed urban expansion in a safe and sustainable manner. Investments include (a) hazard mitigation investment in river embankments against flooding, landslides, and soil erosion and (b) water pollution control and water resources management facilities.

[2] About 25 percent of villages in Chongqing's rural areas are poor. Chongqing has over 2,000 villages in its rural area that are officially designated as poor at the national or provincial level. These villages are scattered in 33 counties and districts which are part of Chongqing Municipality.

B. Chongqing Municipality Flood Management Strategy and Implementation Status

7. According to the government's flood management regulations, the protection standards for county seats and towns are from 1-in-20 to 1-in-50-year floods depending on the population size. For the semirural and rural areas of the county seat, a lower standard of flood protection is applied. In view of the special topography and local socioeconomic development levels, the Chongqing Municipal Government's strategy is to have its counties (including the four project counties) upgrade their physical defense system to protect against 1-in-20-year floods and use non-structural measures (including adaptation measures) to achieve actual protection levels between 1-in-20 and 1-in-50-year floods. This approach is in line with risk-based flood management, but it requires dedicated efforts and investments in implementing essential nonstructural measures.

8. As part of its efforts to strengthen the flood and drought management systems for different small and medium river basins in the municipality, the CMG has developed the municipal flood control/management master plan. (Note: The flood management plans for major rivers flowing through Chongqing Municipality, such as the Yangtze, Jialingjiang, and Wujiang Rivers, are developed by the Yangtze River Conservancy Commission.) To guide the implementation of the master plan, specific plans are developed for different counties (including project counties) in terms of hydro-met monitoring network and information management, flood and drought management, and hill torrent (or flash floods) disaster prevention and management. The government has also issued 'detailed guidelines for flood risk mapping' and 'guidance on impacts of water-related infrastructure investments on flood control'. On the basis of those plans, the CQM, with the central government's financial support, stepped up investments in recent years to improve the flood management systems, including non-structural measures of different basins.

9. The status of implementing these plans for non-structural measures in the four project counties are as given here:

(a) *Hydro-met monitoring network.* The CQM has built the key hydrological and rainfall stations in medium river basins while the counties have functional, basic hydro-met networks (with some gaps) and databases for river flood monitoring and hill torrent/flash flood monitoring and early warning. However, urban drainage information and hydrological data for interprovincial rivers are not readily available. Data sharing between water and meteorology sector agencies needs to be improved.

(b) *Flood forecasting and early warning system.* Pengshui County is now able to provide flood forecasting. Tongnan County can also provide flood forecasting services but with less accuracy due to lack of timely data sharing from the upstream Sichuan Province. For Shizhu County, the lead time of flood forecasting can only reach a few hours, while for Rongchang County; flood forecasting is yet to take place.

(c) *Flood risk mapping and Flood Emergency Preparedness Plan (EPP) development.* While flood risk mapping for the four counties are planned during the 12th Five-Year Plan period, funding is not secured. All counties have developed EPPs for flood risk

management with different levels of details. However, a sample review of the EPPs indicates that they require upgrading based on flood risk analysis and maps (part of the flood risk mapping task) and are yet to be fully operational.

10. To contribute to strengthening of flood management systems in the four counties, some non-structural measures were proposed and agreed upon to be included under the project. These measures are intended to fill in the essential gaps of the county flood risk management systems, including hydro-met monitoring networks, flood forecasting and early warning systems, flood risk mapping and emergency preparedness/response systems, and public awareness of flood risks.

11. Most of the non-structural measures relate to flood risk management, planning, and interventions in management capacity improvement for water environment management in Rongchang and Pengshui Counties. In Rongchang, rapid development of the livestock sector (for example, pig-raising) poses a significant pollution risk to the Longxihe River water and environment. The proposed identification of pollution sources, impact assessment, and subsequent management action plan could provide the county government and water/environment management authorities with the information needed for management and investment interventions. Similarly, improvement of the management information system for urban drainage and wastewater networks in Shizhu County will enable the concerned county management entities to better plan future investments and effectively manage the assets.

C. Project Approach

12. The project adopts an integrated low-impact development approach to water management in the urban areas of project counties. All project county seats, including expanded areas, are vulnerable to river floods and hill torrents. Each county identifies its priority investments based on gap analysis of the flood defense system and needs to establish a complete flood management system. A risk-based approach is then followed in designing project interventions which combine structural measures such as protection dikes, urban drainage facilities and cost-effective non-structural measures like hydro-met monitoring and flood early warning, and integrating supply-side management through interventions such as flood risk mapping and safety zoning and demand-side management such as flood emergency response and raising flood risk awareness. Similarly, for wastewater and water quality management, the project seeks to fill in key gaps in the wastewater collection and conveyance network and uses natural river bank and dike slope protection design to maximize the project effects in protecting local water resources and improving the water environment.

13. In the two project counties of Shizhu and Rongchang, river water flow in urban areas during the dry season is low and not sufficient to form an attractive water surface that the counties want to use for landscaping. Therefore, overflow weirs of around 2 to 2.5 meters height were constructed across the river to raise the water level and create a water surface or lake with a stable water level. In the project county of Rongchang, such a stone structure was built back in the 1980s in the river section where a historic old town is located. In Shizhu County, a group of concrete overflow weirs were built in the last decade in the river section of the town's central urban area to create a terraced water surface for a scenic waterfront. While contributing to the scenic appearance of the waterfront in the project towns, especially during the dry season, these

fixed structures built of concrete or stone do have some negative impact by constraining the water flow during flood seasons. This creates additional flooding risks for the county. An adaptable structure built of steel that can lie flat during the flood season to ensure free water flow is considered a better solution. Such structures serve the needs of both a scenic waterfront in the dry season and flood control in the wet season. As suggested by Chongqing Municipal Water Resource Bureau, replacing those existing fixed-structure overflow weirs with adaptable structures was included in the subproject of Shizhu and Rongchang. Supplementary to the key Bank loan investments for building new embankments and dikes, improvement to these existing overflow weirs could contribute to further building up the resilience of the two project counties against flooding risks. The qualification of the designer for the rehabilitation of these overflow weirs needs to be reviewed by the dam safety expert appointed for this project.

D. Project Components and Description

14. The project is divided into five components which are described in more detail.

Component 1: Flood management in Tongnan County (RMB 257.1 million)

15. Located on the right side of the Fujiang River and upstream to the densely built existing urban area of Tongnan County seat, Dafuba is the prime new urban expansion area of Tongnan County seat as defined in the Tongnan master plan and currently under development. Covering a land area of 13 km^2, Dafuba is expected to accommodate a total population of 130,000 residents by 2020, which will account for 26 percent of the total estimated population (500,000) of the county seat in 2020. While the old parts of the county seat are well protected against 1-in-20-year floods, Dafuba is currently vulnerable and exposed to frequent flooding hazards.

16. Project intervention under this component is to raise the flood-protection level for Dafuba from currently 1-in-3 to 1-in-6-year floods up to 1-in-20-year floods through construction of a 6.84 km river embankment with associated dike-top roads. This component also finances non-structural measures at county level, including (a) strengthening flood early warning and emergency response capacity through provision of water-level monitoring and warning facilities; (b) upgrading flood risk mapping and dissemination, safety zoning, public awareness raising, and emergency response planning; and (c) improving land use management planning for flood-affected areas.

Component 2: Flood and wastewater management in Rongchang County (RMB 280.4 million)

17. The county seat of Rongchang is a representative rapidly growing small city in the peripheral rural region to the west of Chongqing central city. Driven by intensifying industrial development of agricultural product processing industries, in particular large-scale pig farming and pork processing, urban growth of Rongchang County seat is on a fast track. Rongchang County seat currently has 230,000 residents and will have a total population of 350,000 by 2020, as estimated in the local master plan.

18. Under a previous lending project (CSCP) the Bank supported Rongchang County seat with the construction of an embankment along the Laixihe River to protect the town's existing built-up area against 1-in-20-year floods. In line with the local master plan, this county seat is rapidly expanding upstream along the Laixihe River. The Rongchang County government applied for continued support from the Bank's CSWEP lending for additional investment in the embankment to raise the flood-protection level to 1-in-20 years for the town's urban extension corridor upstream along the Laixihe River. For the semirural and rural areas, the lower 1-in-10-year flood standard is applied.

19. Physical investment under this component include (a) construction of a 13.89 km river embankment connecting with the river embankment built under the CSCP and extending upstream to the neighboring heritage town of Lukong; (b) associated dike-top roads, drainage pipes, and sewers (19 km in length) for collecting wastewater from Lukong and the rural settlements along the river corridor and transferring the wastewater to an existing central WWTP for treatment (existing installed capacity of 25,000 m^3/d and an additional 25,000 m^3/d by 2015 with non-Bank funding); (c) improvement of one existing overflow weir in the same river. This component also includes non-structural measures at county level, including (a) improving hydro-met monitoring and information management systems through the establishment of a local computer network with the required hardware and software, GIS database, and basic supporting facilities for data storage, processing, and communication; (b) strengthening the flood early warning and emergency response capacity through development of flood emergency response plans, capacity-building, and basic facilities at county, township, and village levels; and (c) upgrading flood risk mapping and dissemination, safety zoning, and raising public awareness.

Component 3: Flood and wastewater management in Shizhu County (RMB 305.9 million)

20. The county seat of Shizhu is another small town that was supported by the Bank's previous CSCP lending project for the construction of a river embankment along the Longhe River to protect the town's existing built-up area. Shizhu County seat currently has 80,000 inhabitants and is expected to have a total population of 90,000 by 2020. Constrained by its mountainous topography, urban growth of the Shizhu county seat is limited to a few scattered land pockets along the deep river valley of the Longhe River. Basic infrastructure of flood protection, drainage, and wastewater systems are needed before these land pockets which are planned as new urban expansion areas can accommodate the new rural-to-urban migrants of another 10,000 people by 2020.

21. This component includes (a) construction of a 4.84 km river embankment along the Longhe River, upstream and downstream of the river embankment, which is funded by the previous Bank lending project of CSCP; (b) associated dike-top roads of 1.9 km; (c) sewage/drainage pipes of 16.1 km (including wastewater collection pipes in the old urban area) for collecting and transferring wastewater to an existing WWTP (existing installed capacity of 20,000 m^3/d with an additional 20,000 m^3/d by 2016 with non-Bank funding); (d) 5.74 ha of river bank landscaping; (e) improvement of certain existing overflow weirs in the same river. It also covers nonstructural measures at the county level, including (a) improving hydro-met monitoring and information management systems through the establishment of telemetry gauging stations; (b) strengthening the flood early warning and emergency response capacity through development of flood emergency response plans, capacity-building, and basic facilities

at the county, township, and village levels; (c) upgrading flood risk mapping and dissemination, safety zoning, and raising public awareness; and (d) developing a geographic information system for monitoring, operation, and maintenance of drainage and wastewater network facilities.

Component 4: Flood and wastewater management in Pengshui County (RMB 299.3 million)

22. The county seat of Pengshui is another representative case of small towns in Chongqing's remote mountainous areas that are typically less developed and severely constrained by mountainous topography. Pengshui County currently has 100,000 residents in its densely built urban area and is expected to have a total population of 172,000 by 2020. Dianshui Xincheng, a strip of land along the left side of the Wujiang River (on the opposite side of the river to the existing town) is the only space available to Pengshui County for accommodating urban growth and new rural-urban migrants (estimated to be 70,000 residents by 2020). Dianshui is therefore defined in the county's master plan as the new urban expansion area.

23. Physical investment under this component includes (a) construction of a river embankment of 4.69 km on the left side of the Wujiang River to raise the flood-protection level of Dinashui Xincheng up to a 1-in-20-year flood level; (b) associated dike-top road of 4.76 km, which also serves as the access from the county seat downstream to the logistic service hub that is being developed; and (c) civil works for sewage collection and drainage pipes (4.69 km). This component also supports nonstructural measures at the county level, including (a) improving hydro-met monitoring and information management systems through the establishment of telemetry gauges and rainfall stations; (b) strengthening the flood forecasting and early warning capacity at the county level through the establishment and operationalization of a flood forecasting system with the required database, data processing software, communication and flood forecasting software, and necessary hardware and facilities at the management center; and (c) upgrading flood risk mapping and dissemination, safety zoning, raising public awareness, and emergency response planning.

Component 5: Project management and implementation support (RMB 35.0 million)

24. Provision of project management and implementation support activities aimed at: (a) enhancing the design, supervision, and certification of works carried out under the project; (b) strengthening the capacity of Chongqing at the municipal and county levels in the areas of project management, procurement and contract management, accounting and financial management, and environmental and social safeguards; and (c) strengthening the capacity for operation and maintenance of urban flood and water environment management facilities at the county level through training and development of asset management plans. This component also funds the incremental operation costs for the Chongqing PMO.

ANNEX 3. IMPLEMENTATION ARRANGEMENTS

China: Chongqing Small Towns Water Environment Management Project

Project Institutional and Implementation Arrangements

1. The Chongqing Municipal Government proposed a three-level institutional setup for project preparation and implementation of the CSWEP, namely the municipal, county, and executing agency levels. The Chongqing Government and the CPMO have previous experience in implementing Bank-financed projects, including the CUEP, CSCP, and CURIP. A similar institutional arrangement is followed under this project, with the exception of abolishing the municipal and county leading groups.

2. At the municipal level, the CPMO will organize and coordinate project implementation on behalf of the Chongqing Municipal Government. Established under the CDRC, the CPMO has the full support of relevant sectoral agencies at the municipal level, including the Finance Bureau, Water Resources Bureau, and Environmental Protection Bureau. These agencies will help provide guidance and oversee project management and implementation. The CPMO, as the focal point of contact, will monitor implementation progress, including procurement activities and consolidated project costs. The CPMO will also prepare consolidated semiannual progress reports. It will be responsible for implementation of the technical assistance and capacity building component.

3. The CPMO will coordinate the relevant municipal level agency's technical expertise to provide advice on technical issues, quality control, and program coordination. During implementation, the CPMO will recruit a consulting firm with experience in managing Bank projects for project management and contract supervision to support the CPMO and help ensure compliance of civil works with agreed design criteria and principles and to monitor construction.

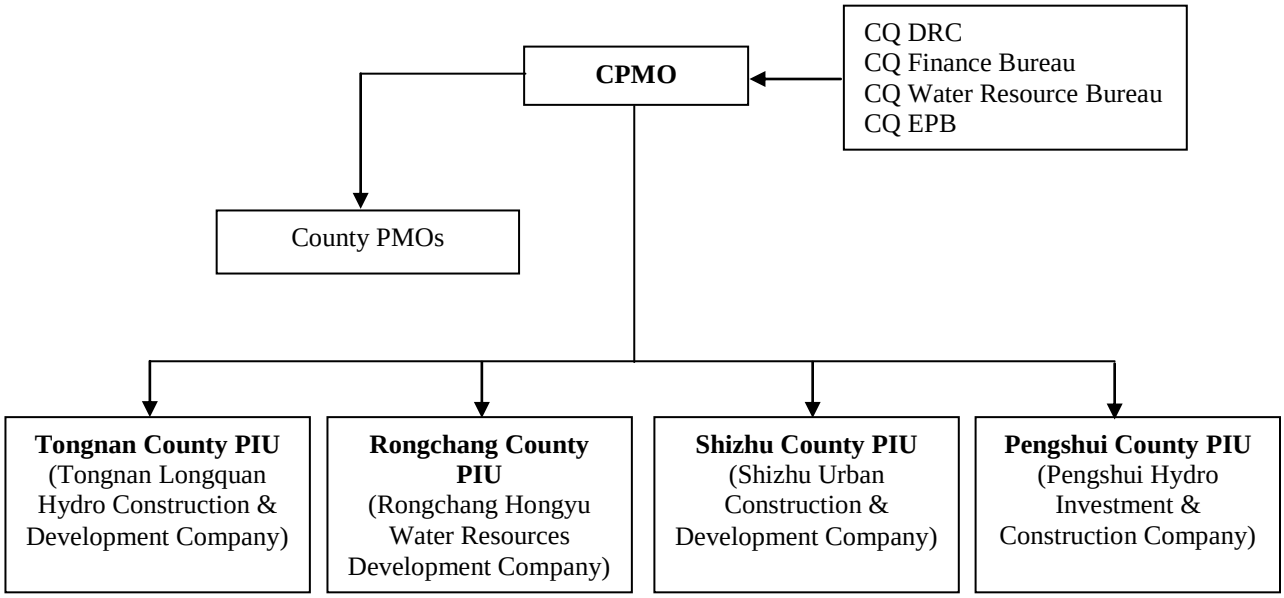
4. At the county level, a PMO has been established within each county government. This PMO is chaired by a Deputy County Chief and includes members of related county government agencies. The county PMO will be responsible for providing guidance and overseeing project implementation of the subproject, coordinating mobilization of counterpart fund, and helping settle any critical issues encountered during project implementation.

5. At the executing agency level, PIUs have been appointed by the county government for each investment activity, to carry out the day-to-day subproject preparation and implementation. All the PIUs are existing state-owned enterprises and are typically the investment and construction entities that the county government has set up under the county hydro bureau for capital investment in the water sector. Assets built under the CSWEP will be transferred for operation and maintenance to related public service units, such as the O&M department under the county hydro bureau for assets of dikes and embankments and the public utility division under the county urban construction bureau for assets of drainage/sewage pipelines and urban roads. These appointed O&M units will manage the assets on behalf of their county government.

6. Of the four project counties, Tongnan, Rongchang, and Shizhu have previously implemented Bank projects. The PMOs and PIUs from these Bank projects have been retained, with necessary adjustments, to implement the new project. These three project counties have appropriate staffing and capacity to implement their subprojects. The county government of Pengshui has committed to further strengthen their county PIU capacity by bringing in more staff with rich project experience and technical background, providing training to staff, and imbibing learning from the other three counties' PIUs that are more experienced in implementation of Bank projects.

7. During implementation stage, the CPMO will recruit the services of independent consultants to (a) certify compliance with agreed design criteria and principles and for independent construction supervision arrangements and (b) certify compliance of the agreed RAPs and EMPs with the Bank's environmental and social safeguards.

Figure 1 Organizational Arrangements for CSWEP Project Implementation



Financial Management, Disbursements, and Procurement

Financial Management

8. The FM capacity assessment concluded that the project FM arrangements satisfy Bank requirements and identified the following principal risk: lack of knowledge and experience in managing Bank-financed projects by PIU project financial staff.

9. To mitigate this risk, a Financial Management Manual (FMM) with detailed FM procedures, roles, and responsibilities has been prepared and accepted by the Bank. In addition, the Bank has been providing extensive FM training and the CPMO and CMFB who have experience with Bank-financed operations will arrange more extensive workshops and

knowledge sharing. The FM arrangements were found satisfactory based on the World Bank's requirements under OP/BP 10.00.

10. Overall, the residual project FM risk after mitigation is assessed as Moderate.

11. The CPMO, established under the CDRC, has extensive experience with Bank operations and will be responsible for overall project management, monitoring, and coordination. The four county PIUs, Rongchang, Tongnan, Shizhu, and Pengshui, arelegally established entities and will be responsible for day-to-day project FM activities, including project accounting. Fully staffed financial departments with adequate segregation of duties have been established in the four PIUs. These departments will do the project accounting and financial reporting. Through observation and review of the educational background and work experience of the staff identified for financial and accounting positions in the CPMO and the PIUs, the financial management specialist concluded that they are qualified and appropriate for the duties they are expected to assume.

12. *Budgeting.* The annual project implementation plan, including the funding budget and the resources, will be prepared by each implementing agency. The counterpart funds will come from county government budgets. These budgets will be reviewed and approved by its People's Congress and included in the sector budget. Based on the approved budget and implementation progress, the related finance bureaus will provide government appropriations to the project. Budget variance analysis will be conducted semiannually to inform management of significant variances from plan that may need corrective actions. The CPMO will be responsible for review, comment, and consolidation of the project plan and budget variance analysis for overall project monitoring and management. The Bank will work with the PIUs and CPMO to supervise the project budgeting system, to enhance budget preparation, and budget execution reporting during project implementation.

13. *Funds flow*. The Bank loan proceeds will flow from the Bank into the project Designated Account (DA) to be set up and managed by the CMFB, who will be directly responsible for the management, maintenance, and reconciliation of DA activities. Supporting documents required for Bank disbursements will be prepared and submitted by each PIU to county finance bureaus and then to the CPMO for review before sending to the CMFB for further disbursement processing. The CMFB will withdraw funds from the DA to reimburse the PIUs for payment of the Bank-financed portion that is paid first by the PIUs or to disburse the funds directly to contractors.

14. The World Bank Loan Agreement (LA) will be signed between the Bank and the People's Republic of China through the Ministry of Finance (MOF). The on-lending agreement will be entered into by the MOF and the Chongqing Municipal Government through the CMFB, which will be further on-lent to the four county governments through their respective finance bureaus. The funds will be passed to the PIUs for implementation of the project without any obligation for repayment. To that effect, subsidiary agreements will be signed between the PIUs and the respective county finance bureaus.

15. *Accounting and financial reporting.* The administration, accounting, and reporting of the project will be set up in accordance with Circular #13: "Accounting Regulations for World Bank

Financed Projects" issued in January 2000 by the MOF. The standard set of project financial statements has been agreed between the World Bank and the MOF.

16. Yongyou (User Friend) and Jindie (Golden Butterfly), the computerized accounting and reporting systems used nation-wide and assessed by the Bank, are adopted by the four existing PIUs. Separate project accounting profiles will be set up under the system according to the requirements of Circular #13.

17. The CPMO will be responsible for overall project management, monitoring, and coordination. The four PIUs will be responsible for day-to-day project FM-related activities, including project accounting and finances. Original accounting documents for project activities will be retained by the PIUs. The CPMO will consolidate the project financial report. The unaudited semiannual project interim financial reports (format in accordance with the aforementioned Circular #13 agreed with the MOF) will be prepared by the PIUs, consolidated, and furnished to the Bank by the CPMO no later than 60 days following each semester (the due dates will be September 1 and March 1), in a form and substance that is satisfactory to the Bank.

18. *Internal control.* Adequate financial management regulations for project level and entity level have been in place. In addition, the project-related accounting policy, procedures, and regulations were issued by the MOF and the FMM has been prepared and issued to standardize the project FM procedures.

19. *Audit.* The Chongqing Municipal Audit Office (CMAO) has been identified as the auditor for the project. The CMAO has extensive experience auditing Bank-financed projects. The annual audit report will be issued by the CMAO and will be due to the Bank within six months of the end of each calendar year. According to the Bank's policy on Access to Information, the audit reports for all investment lending operations for which the invitation to negotiate was issued on or after July 1, 2010, need to be made publicly available in a timely fashion and in a manner acceptable to the Bank. Audit reports will be made publicly available on the website of the provincial auditor. Following the Bank's formal receipt of the audited financial statements from the borrower, the Bank will also make them available to the public in accordance with the Bank's policy on Access to Information.

Disbursements

20. Four disbursement methods are available for the project: advance, reimbursement, direct payment, and special commitment. Supporting documents required for Bank disbursement under different disbursement methods will be documented in the Disbursement Letter issued by the Bank.

21. One segregated DA in U.S. dollars will be opened at a commercial bank that is acceptable to the Bank and will be managed by the CMFB. The ceiling of the DA will be determined and documented in the Disbursement Letter. The PIUs' withdrawal applications will be reviewed by county finance bureaus and then the CPMO and CMFB, which will reimburse funds to the PIUs for the Bank-financed portion that is paid first by the PIUs or disburse funds directly to the contractors. The ceiling of the DA will be determined and documented in the Disbursement Letter.

22. The World Bank loan would be disbursed against eligible expenditures (taxes included) as in the following table:

Table 5. Expenditure Category and Amount

Category	Amount of the Loan Allocated (in US$)	Percentage of Expenditures to be Financed (incl. of Taxes)
(1) Works	89,830,000	85%
(2) Goods, non-consulting services, consultants' services, Training and Workshops, and Incremental Operating Costs	9,920,000	100%
(3) Front-end Fee	250,000	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 2.07 (b) of the General Conditions
(4) Interest Rate Cap or Interest Rate Collar premium	0	Amount due pursuant to Section 2.08(c) of this Agreement
TOTAL AMOUNT	**100,000,000**	

23. *Advance Contracting and Retroactive Financing.* Contracts to be procured in advance of loan signing have been identified in the agreed procurement plan for the project. All advance contracting is subject to the Bank's prior review. Payments made under contracts before loan signing will be eligible for reimbursement by the Bank within the limits specified in the Loan Agreement and only if the contracts were procured in accordance with Bank Guidelines. Withdrawals up to an aggregate amount not exceeding US$10 million may be allowed for payments that are made before the date of the Loan Agreement but on or after December 1, 2014, for eligible expenditures.

24. *Supervision plan.* The supervision approach for this project is based on its FM risk rating, which will be evaluated on a regular basis by the financial management specialist in line with the FMSB's FM Manual and in consultation with relevant task team leader. The initial FM supervision will focus on training financial staff and compliance with the Bank's FM and disbursement requirements as well as the quality and timeliness of project accounting and financial reporting.

Procurement

25. *Mitigation measures for procurement risks.* The procurement capacity and risk is rated moderate. The CPMO and all four PIUs have adequate experience in Bank-financed or domestic-funded projects and the capacity to carry out procurement. However, the PIU in Pengshui County lacks Bank project experience and may be weak in procurement and in maintaining procurement records according to the Bank's requirements. Measures have been agreed to enhance the PIUs' procurement capacity, further strengthen procurement management of the CPMO and the PIUs for the project, and mitigate the potential procurement risks :

(a) A procurement agent who has procurement experience in projects financed by the Bank or other multilateral financing institutions will be hired by the CPMO to assist the CPMO and the four PIUs in procurement of goods, works, and non-consulting services by International Competitive Bidding (ICB) and National Competitive Bidding (NCB). The procurement agent will be selected before the effectiveness stage of the project.

(b) A consulting firm with project management experience in projects financed by the Bank or other multilateral financing institutions will be also hired by the CPMO to assist the CPMO and the four PIUs in providing project management and technical support, such as reviewing bidding documents, including designs, technical specifications, and bill of quantities (BOQ); monitoring contract management, including progress, quality, variations, and other contract issues; and providing guidance and consulting services for financial management and procurement related issues.

(c) The CPMO and the four PIUs will send their procurement staff and other key staff to attend workshops on procurement and contract management under Bank-financed projects, including procurement of goods, works, and non-consulting services, as well as selection and employment of consultants.

(d) The Bank procurement specialist provided procurement training to the CPMO and the four PIUs during project preparation and will continue to do so during implementation of the project.

(e) A procurement management manual has been prepared by the CPMO, which has been reviewed and accepted by the Bank. The manual has been distributed to all implementing agencies to provide guidance on how to carry out the procurement under the project.

26. Procurement for the project will be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants" (January 2011, revised 2014), "Guidelines: Selection and Employment of Consultants Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" (January 2011, revised July 2014), and the provisions stipulated in the legal agreement.

27. *Frequency of procurement supervision.* In addition to the prior review supervision to be carried out by Bank offices, Bank procurement supervision missions and/or external auditors will conduct field visits to carry out annual post review of procurement actions. The post review sampling ratio will be one out of fifteen contracts.

28. *Procurement plan.* The CPMO has developed a procurement plan for those components that are to be procured by the CPMO and the PIUs for the whole project using the Bank template. It has been reviewed and approved by the Bank. The procurement plan will be available in the CPMO and will also be available in the project's database and on the Bank's external website during project implementation. The procurement plan will be updated, reviewed, and agreed with the Bank annually, or as required, to reflect actual project implementation needs.

29. *Procurement and selection methods and prior review thresholds.* Table 6 indicates the procurement and selection methods and prior review thresholds for goods, non-consulting services, works, and consulting services to be procured by the CPMO and the PIUs under the project.

Table 6 Thresholds for Procurement Methods and Bank Prior Review

Expenditure Category	Contract Value (US$)	Procurement Method	Bank Prior Review
Goods/IT Systems and Non-Consulting Services	>= 3 million	ICB	All ICB contracts
	>= 100,000 < 3 million	NCB Remarks: Where goods are not normally available from within China, the method of procurement will be ICB even if the contract value is less than US$ 3 million.	First 2 NCB goods contracts by each PIU irrespective of value and all contracts >= US$ 3 million.
	< 100 K	Shopping	None
	N/A	DC	All DC contracts
Works/Supply & Installation	>= 25 million	ICB	All ICB contracts
	>= 200,000 < 25 million	NCB	First 2 NCB works contracts by each PIU irrespective of value and all contracts >= US$ 15 million.
	< 200 K	Shopping	None
	N/A	DC	All DC contracts
Consultants	>= 300,000	QCBS, QBS	Firms: First contract for each selection method and all contracts >= US$ 300,000; Firms: All SSS contracts; Individual consultant: Only in exceptional cases; SSS for individual consultant: >= US$ 20,000
	< 300,000	QCBS, QBS, CQS	
	N/A	SSS	
	N/A	IC	

Notes: ICB: International Competitive Bidding.
NCB: National Competitive Bidding
DC: Direct Contracting
QCBS: Quality- and Cost-Based Selection
QBS: Quality-Based Selection
CQS: Selection Based on the Consultants' Qualifications
SSS: Single Source Selection
IC: Individual Consultant selection procedure
N/A: Not Applicable

Environmental and Social (Including Safeguards)

Environmental (including safeguards)

30. The Bank policy OP 4.01 - Environmental Assessment is triggered and the project has been classified as Category A due to the size and scale and the location of investments near environmentally sensitive areas. Most identified impacts are site-specific and few would be irreversible.

31. An EIA was carried out for the proposed project components. An associated EMP was prepared to mitigate and minimize the impacts, monitor implementation and compliance, present the institutional framework, and identify capacity development needs. As a Category A project, an EA summary was prepared and distributed to the Bank's Board. The documents were prepared according to the Chinese legal and policy framework and applicable Bank safeguard policies, including OP 4.01 - Environmental Assessment, OP 4.04 - Natural Habitats, OP 4.11 - Physical Cultural Resources, OP 4.37 - Safety of Dams, OP 4.12 - Involuntary Resettlement, and the World Bank Group's Environmental Health and Safety Guidelines.

32. *Environmental and social impacts*. The project will have significant benefits in terms of reducing flood risks and improving water management infrastructure and services. The project counties are located in mountainous regions and listed as poverty counties in Chongqing. The project will help reduce the impact of flooding on lives, assets, and income; increase the value of land; expand the access of people to basic services; and improve the quality of the environment and the attractiveness of the counties. This will likely lead to an increase in investment and migration to project areas and an increased demand for environmental services such as water and wastewater. The proposed project fits in well with an integrated development plan for towns as it will help investments and economic development in these counties while reducing risks and improving the quality of life for the local people.

33. The main negative environmental impacts, such as dust, noise, and traffic interruption, are expected to be temporary during the project construction phase. A standalone EMP has been prepared based on the findings of the EIA report. The EMP summarized the key environmental impacts and detailed the environmental management and supervision organizations/institutional arrangement and responsibilities, mitigation measures, training plan, monitoring plan, and budget estimates of EMP implementation. It includes sets of Environmental Codes of Practice (ECOPs) for contractors, which will be incorporated into bidding documents and contracts to ensure effective implementation.

34. During the EA, all projects areas were screened and surveyed for potential impacts on natural habitats and triggering of the Bank's policy OP 4.04. No significant natural habitats were found in the proposed project areas. However, the survey confirmed that Fujiang National Wetland Park is located along the Fujiang River in Tongnan County. This wetland park was established for scientific research, education, and tourism. Part of the proposed embankment in Tongnan will occupy the land categorized as Class II Area in the park. Therefore, the policy is triggered. The survey also indicated that there were no endangered species in the project areas. As part of the EA, the impacts were assessed and mitigation measures are designed in the EMP.

35. The Bank's OP 4.11 Physical Cultural Resources is triggered. Screening and consultation with relevant authorities confirmed that a number of project sites include historic, archaeological, and aesthetic buildings and sites that are listed on the Cultural Heritage Inventory and are protected at national and municipal level. These include Darong Bridge and Wanling Ancient Town in Rongchang County; Xujiaba Site—a tribe site with 4 tombs from the Shang and Zhou Dynasty—in Pengshui County; and the Dafo Temple and 32 family tombs in Tongnan County. The project will not directly impacts any of these sites, but some of the proposed embankment works are partially located in buffer areas.

36. *Alternative analysis.* Alternatives were analyzed as part of the feasibility study and EIA. These include (a) with and without project scenario; (b) different options for alignment and type of embankment; (c) alternatives for wastewater collection and treatment plan; (d) different dredging methods to be used in construction; and (e) options for disposal of dredged materials. Based on a comprehensive comparative analysis of alternatives, the most appropriate solution from a technical, economic, social, and environmental point of view was selected. The potential environmental impact of increased wastewater collection and treatment at the WWTPs and the disposal of sludge from project-financed facilities at the landfill were also extensively assessed. No major issues were found, and all facilities complied with national environmental policies and regulations and can handle additional loads.

37. *Environment management plan.* An EMP was prepared, which includes guiding principles, relevant environmental standards, environmental management framework, key environmental impacts, mitigation measures, ECOPs, environmental monitoring plan, institutional arrangements, training- and capacity-building strategy, and estimated costs for its implementation during construction and operation phase. The EMP also included specific measures to mitigate and minimize the impact on the wetland in Tongnan, the cultural and historic relics in Tongnan and Rongchang Counties, and the chance-find procedures for archaeological and historic relics.

38. A detailed environmental monitoring program was prepared as part of the EMP for monitoring environmental compliance during the construction and operation phases of investments. Parameters to be monitored include noise, dust, and water quality. Obligations of different parties are also clearly defined, and environmental monitoring reports will be included in project progress reports furnished by the PMO to the Bank.

39. *Institutional arrangement.* The CPMO will take overall responsibility to coordinate and oversee the implementation of the EMP, including management and supervision, training, and preparation of project progress report based on the reports and monitoring information from each project county. Each county PIU will be responsible for ensuring that mitigation measures and clauses are incorporated in the bidding documents and contracts, contractors comply with the agreed EMP, and qualified consultants are hired to support the environmental monitoring and supervision of contractors. This project benefited from the experience of six previous Bank projects in Chongqing. The main lessons learned on environmental management have been considered during preparation. Intensive training sessions were conducted to disseminate lessons and build the capacity of staff in relevant local agencies and implementing units.

40. *Public consultations and information disclosure.* Two rounds of public consultations were carried out during the EA process, which included surveys using public-opinion questionnaires, focused group discussions, public meetings with key stakeholders and interviews with some project-affected persons. Issues raised during these consultations have been incorporated in the EIA and EMP. Furthermore, concerns and feedback received have been documented in the EA and relayed back to the affected people. The EIA and EMP documents and other project-related documents have been disclosed locally through websites (http://www.eiafans.com/forum.php) since March 8, 2014, and the most widely distributed local newspaper (*Chongqing Daily*) on March 9, 2014. The EIA and EMP have been disclosed through the Bank's InfoShop on October 28, 2014.

41. *Safety of Dams*. The proposed project will not directly finance the construction and rehabilitation of any dam. However, the Safety of Dams policy (OP 4.37) is triggered by the project because some of the project-financed flood control infrastructure will rely on the proper operation of upstream dams, namely Sankuaishi Dam in Tongnan County, Yutan Dam in Rongchang County, Wujiang-Pengshui Dam in Pengshui County, and Tengziguo Dam in Shizhu County. These dams were built between 1976 and 2011 and vary from 7.8 m to 116.5 m in height and 1,460 to 20 million cubic meters in reservoir capacity. Failure of these dams could cause extensive damage or complete destruction of project-financed investment. During project implementation, the Bank team and a Dam Safety Expert, hired by the CPMO, will monitor the safety, operation, and maintenance of the dams and the emergency preparedness. The need for any further remedial work will also be monitored to ensure that the dams are operated properly and are safe.

Social (Including Safeguards)

42. *Involuntary resettlement.* The Bank's policy OP 4.12 is triggered because the project involves land acquisition and resettlement for the construction of project-financed infrastructure. The main civil works consist of river embankment rehabilitation and improvements and associated roads, sewers, and drainage pipelines. The project will have significant land acquisition and resettlement impact in 14 villages/communities in 5 townships and sub districts of the project counties. In total, 1,997 mu of land will be permanently acquired, including 1,289 mu of rural collective land (which includes 703 mu of cultivated land), and 708 mu of state-owned riverbank land. Besides, 585 mu of land will be temporarily occupied during the construction phase of the project, which includes 371 mu of cultivated land. The project will also require the demolition of nearly 23,352 m² of houses and other types of ground structures, which will affect 76 households, 3 enterprises, 2 shops, and 10 farms. A total of 1,493 households and 6,258 people will be affected by involuntary resettlement. This includes 46 vulnerable people from 15 households. Around 244 people in 59 households will be affected by both land acquisition and house demolition. To address local concerns and minimize negative impacts, a social assessment with wide consultation was carried out at each project site. A consolidated Resettlement Action Plan (RAP), available in both English and Chinese, was prepared summarizing the main content of each of the county-specific RAPs prepared during project preparation. The RAPs established comprehensive mitigation measures, grievance redress mechanisms, monitoring and evaluation arrangements, institutional framework, and capacity-building activities. These documents were prepared in compliance with the Chinese legal and policy framework for land acquisition and house demolition as well as the Bank's Safeguard Policy requirements in OP 4.12. No linked investments have been identified.

43. Although most resettlement impacts by the project were clearly scoped and investigated by appraisal and included in the approved RAPs, some impacts related to the installation of sewers and other pipelines could not be fully determined before project appraisal. Therefore, a Resettlement Policy Framework (RPF) was prepared to address possible temporary land acquisition in the future,

44. *Ethnic minorities.* Screening for indigenous people based on the requirement of OP 4.10 confirmed that there are no indigenous people in the project area. The detailed social assessment, which includes social survey and analysis and broad consultations at each project site, confirmed

the absence of indigenous people in the project area. Therefore, the Indigenous Peoples policy (OP 4.10) was not triggered. The Tujia are the majority population in Shizhu County, accounting for 72.3 percent of total local population, while the Miao are the majority population in Pengshui County, accounting for 61.9 percent of total local population. These ethnic minorities do not have the characteristics of indigenous people according to OP 4.10. Most of the project areas in these two counties are in urban or peri-urban areas without distinct ethnic minority communities, and the Tujia and Miao people are fully integrated, both socially and economically. These ethnic people have already been urbanized with urban-based livelihoods and completely integrated with the surrounding communities in the past few decades. No distinctive Tujia or Miao customs or ethnic cultural characteristics exist anymore and as a whole, these two ethnic groups are not disadvantaged in comparison with the local Han people. Nevertheless, based on the social assessment results, the needs and interests of the local people, including ethnic minorities, will be reflected in the project design and implementation.

45. *Alternatives considered.* Comprehensive analysis of alternatives was conducted based on technical, economic, environmental, and social considerations. As a result of adapting the height and slopes of river embankments and locations of paths and access roads, the demand for land was reduced by about 1,000 mu and much fewer structures and houses had to be demolished.

46. The project is not expected to have significantly irreversible social impacts. The negative impacts are mainly the result of land acquisition and house demolition during implementation. A range of mitigation measures have been proposed as a result of the social assessment, including compensation at replacement values and livelihood restoration for people who will lose land or property. Priority is given to the low-income and vulnerable groups at the project sites. Detailed mitigation measures have been agreed in the RAPs as well as the RPF to address the social impacts. Relevant clauses will be included in the bidding documents and contracts to ensure compliance and enforcement. The RAPs and RPF are an integral part of project implementation and will be closely monitored and evaluated.

47. *Institutional arrangements and capacity building.* The task team will continue to provide training and support to the local teams as required. The CPMO is very experienced in implementing Bank-financed projects and will support the county teams directly. It has implemented many similar projects that have involved significant resettlement impacts. County PIUs in Chongqing have considerable experience in coordinating the implementation of resettlement activities under domestic projects, and some have previous experience implementing Bank-supported projects, with good track record.

48. *Public consultations and information disclosure.* These were carried out in project areas through consultation workshops and dissemination campaigns. A consulting firm conducted extensive surveys, interviews, and meetings in affected areas with a representative sample of 20 percent of the people, organizations, and private enterprises at the project sites. Detailed information about the planned civil works, location, and possible alternatives were shared during public consultation meetings. Some of the main concerns raised by people included issues related to land acquisition; availability and timely compensation of affected people; and timing, quality, and amenities of resettlement housing. Measures to address these concerns have been incorporated in the RAPs and social assessment, or alternative designs were considered to

mitigate the risks. The social assessment report and the RAPs were disclosed locally on March 28, 2014, and the RAPs, RPF were disclosed through the Bank's InfoShop on October, 2014.

49. *Gender and pro-poor development aspects*. During project preparation, the social assessment included gender analysis and gender-sensitive recommendations for action. Gender-sensitive measures will be taken to restore the livelihoods of affected men and women during and after the project construction period. As the project sites include a few poverty counties and many poor villages, special attention will be given to the participation of the poor and vulnerable people, both men and women, and their access to project facilities and services. Equal participation and gender responsiveness will be reflected in project activities such as training; compensation for losing land, houses, or other assets; and raising disaster risk awareness by ensuring a balanced proportion of women beneficiaries.

50. Gender disaggregated indicators have been included in the Results Framework to assess (a) the extent to which women have equally benefitted from flood-prevention activities and received adequate compensation and resettlement measures to meet their needs and (b) the effectiveness of reaching women with critical information through flood risk awareness raising activities.

Monitoring and Evaluation

51. Annex 1 lists the outcome and intermediate outcome indicators with target values for the entire project and each component. The CPMO will be responsible for implementing the project progress and results monitoring activities and submitting periodic monitoring reports to the Bank, including the semiannual project progress reports and annual reports on compliance with performance indicators and covenants. The CPMO will hire a project management consultancy firm to help with project monitoring and evaluation, including tracking implementation progress, overseeing project work, assessing the achievement toward the PDO based on the results indicators, and reporting to the Bank.

52. In addition, an external agency will be engaged by the CPMO to carry out independent monitoring of the EMP and RAP implementation in the four project counties.

ANNEX 4. OPERATIONAL RISK ASSESSMENT FRAMEWORK (ORAF)

China: Chongqing Small Towns Water Environment Management Project

Risks

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1. Project Stakeholder Risks

1.1 Stakeholder Risk	**Rating**	**Moderate**			
Risk Description: The project is expected to have wide support from key stakeholders. The governments of project counties in particular have shown strong interest and commitment to the project, which has been included in their respective master plans and 12th FYP. However, the project counties seem to be more interested in the construction of structural works under the project than in considering and implementing non-structural measures. This may, to some extent, affect the full achievement of the PDO. There are pressures within the local governments of many project counties to move quickly toward implementation. This may shorten the time needed for quality preparation and introduction of new ideas and innovations. Under pressure to move quickly, project counties may select specific component investments from the proposed project package of Bank financing and start implementation with their own funds. Replacing those project components may slow down overall project preparation. This poses a risk of delay for the implementation of other project components.	**Risk Management:** Provide best practices of integrated and risk-based flood management to the local governments of project counties, and encourage the project counties to learn from other Chinese cities that have successfully addressed flooding risks in cost-effective and sustainable ways.				
	Responsibility: Both	**Status:** Not yet due	**Stage:** Both	**Recurrent:** ☑	**Due Date:**	**Frequency:** CONTINUOUS
	Risk Management: Enhance communication with local governments. Bank requirements have been explained clearly since project inception and a reasonable timetable for project preparation has been agreed with the clients. Clients have identified project components in the context of this timetable.				
	Responsibility: Both	**Status:** Not yet due	**Stage:** Both	**Recurrent:** ☑	**Due Date:**	**Frequency:** CONTINUOUS

2. Implementing Agency (IA) Risks (Including Fiduciary Risks)

2.1 Capacity	**Rating**	**Moderate**				
Risk Description: The CPMO is considered to be one of several highly experienced and well performing clients of the Bank in China. Three of the four project counties have also successfully implemented Bank lending projects in the past. However, for the county with no prior experience of working with the Bank, preparing and implementing a sizable Bank-funded cross-sectoral project presents a challenging task for the county PIU. Poor capacity of local implementing agencies may affect project quality and also delay project preparation and implementation. The counterpart funds, which account for 40% of estimated project costs, are expected to be provided by the project counties. Given the disparity of financial capacities among the four project counties, lack of counterpart funds may have significant negative impact on the achievement of project objectives.	**Risk Management:** Capacity building of county PIUs has been addressed during project preparation by (a) the municipal PMO and the county PIUs shared their Bank project experiences with the fourth county (Pengshui County); (b) providing Bank training during project preparation missions, to the county PIUs on the practices, requirements, and guidelines for Bank project preparations and implementation; and (c) including a capacity-building component in the project.					
	Responsibility: Both	**Status:** Not yet due	**Stage:** Both	**Recurrent:** ☑	**Due Date:**	**Frequency:** CONTINUOUS
	Risk Management: A project financial management manual will be prepared and circulated to all project financial staff to guide their daily work. Additionally, financial management training will be arranged to provide the required knowledge for managing project funds. An annual project audit will be conducted as an external monitoring mechanism to safeguard project funds and assets.					
	Responsibility: Both	**Status:** Note yet due	**Stage:** Both	**Recurrent:** ☑	**Due Date:**	**Frequency:** CONTINUOUS
	Risk Management: To mitigate potential risks in procurement and contract management, the following initial actions will be taken: (a) during project preparation, the CPMO organized a workshop for all the county PIUs and employers, including designated procurement staff from the CPMO, PIUs, and employers, among others, during which the Bank team delivered training on Bank requirements for procurement and contract management; (b) a procurement manual has been prepared by the CPMO; (c) a procurement agent with Bank procurement experience will be hired before Board approval; and (d) a project management consulting firm will soon be hired by the CPMO, when the project becomes effective, to review the bidding documents and assist the CPMO with contract management, among other things.					
	Responsibility: Client	**Status:** Not yet due	**Stage:** Both	**Recurrent:** ☑	**Due Date:**	**Frequency:** CONTINUOUS
	Risk Management: Counterpart funds will be confirmed in the local governments' annual budgets before and during project implementation.					
	Responsibility:	**Status:** Not yet due	**Stage:** Implementation	**Recurrent:**	**Due Date:**	**Frequency:** CONTINUOUS

	Client			☑		
2.2 Governance	**Rating**	**Moderate**				
Risk Description: Performances of sector administrators for water-related infrastructure (such as the environmental protection bureaus, water resources bureaus, and flood control offices) at municipal and project county levels are adequate. However, PIUs may lack ownership and accountability to properly maintain and operate the non-structural elements established under the project.	**Risk Management:** The Bank team assessed the PIUs commissioned by project counties for each component regarding their corporate governance, implementation capacity, and ownership of project components.					
	Responsibility: Bank	**Status:** Completed	**Stage:** Preparation	**Recurrent:** ☑	**Due Date:**	**Frequency:**
	Risk Management: Coordination by the PMOs at the county level will support the PIUs in securing the full utilization and sustainability of project outcomes (both structural and non-structural).					
	Responsibility: Client	**Status:** In progress	**Stage:** Both	**Recurrent:** ☑	**Due Date:**	**Frequency:** CONTINUOUS
3. Project Risks						
3.1 Design	**Rating**	**Substantial**				
Risk Description: Inappropriate technical design of subprojects in different counties is a challenging technical risk. Inappropriately designed flood management works may lead to reduction in river flow cross section and transfer of flood risk to other parts of the basin. Engineering works may not be complemented by cost-effective non-structural measures and operated jointly with other parts of the water/flood management system in the basins concerned. Multifunctional structures such as flood-protection dikes might be over-designed and not focused on fulfilling the primary functions. There is also a tendency for local design institutes to overestimate project costs, which normally leads to loan savings toward the end of project implementation.	**Risk Management:** The Bank team and the CPMO will work with the counties to ensure they engage qualified and specialized design institutes to help the subproject counties prepare their subprojects. During the project identification mission, one county was requested to replace their consulting firm with a more qualified design institute to undertake the project feasibility study. The Bank team undertook stringent scrutiny of project cost estimation during the project appraisal and encouraged the local design institutes to refer to market prices instead of purely following the governmental cost quota system.					
	Responsibility: Client	**Status:** Completed	**Stage:** Preparation	**Recurrent:** ☑	**Due Date:**	**Frequency:**
	Risk Management: The Bank team and CPMO agreed a technical review mechanism at the municipal level involving experts from relevant sector agencies (for example, EPBs, water resource bureaus, and flood control offices) to be established in the early stages of project preparation for quality assurance of all components.					
	Responsibility: Client	**Status:** Completed	**Stage:** Preparation	**Recurrent:** ☑	**Due Date:**	**Frequency:**

<table>
<tr><td></td><td colspan="6">Risk Management:
The Bank team will assist with knowledge transfer to help county PIUs develop necessary technical skills.</td></tr>
<tr><td></td><td>Responsibility:
Bank</td><td>Status:
In progress</td><td>Stage:
Both</td><td>Recurrent:
☑</td><td>Due Date:</td><td>Frequency:
CONTINUOUS</td></tr>
<tr><td>3.2 Social and Environmental</td><td colspan="6">Rating Substantial</td></tr>
<tr><td rowspan="2">Risk Description:
The project is likely to have significant environmental impacts, both positive and negative. The project will involve acquiring land on a limited scale and relocating some existing buildings. As a result, some communities will be affected.</td><td colspan="6">Risk Management:
The implementing agencies are required to dedicate staff to manage the project’s safeguard problems, including coordinating preparation of environmental assessment and resettlement action plan documents. Throughout project preparation, the capacity of the implementing agencies and project management offices were strengthened through targeted training and working alongside experienced consultants. Further, qualified firms that are familiar with the Bank’s safeguards policies and experienced in Bank-funded projects will be engaged to carry out the monitoring of environmental assessment and resettlement action plan implementation.</td></tr>
<tr><td>Responsibility:
Both</td><td>Status:
In progress</td><td>Stage:
Both</td><td>Recurrent:
☑</td><td>Due Date:</td><td>Frequency:</td></tr>
<tr><td>3.3 Program and Donor</td><td colspan="6">Rating Low</td></tr>
<tr><td rowspan="2">Risk Description:
This project will be implemented as a free-standing project independent from other donor activities. There are no risks associated with program dependency or donor coordination.</td><td colspan="6">Risk Management:</td></tr>
<tr><td>Responsibility:</td><td>Status:</td><td>Stage:</td><td>Recurrent:</td><td>Due Date:</td><td>Frequency:</td></tr>
<tr><td>3.4 Delivery Monitoring and Sustainability</td><td colspan="6">Rating Substantial</td></tr>
<tr><td rowspan="2">Risk Description:
Some related and supplementary investments beyond the Bank-funded works are necessary for the full-capacity operation and utilization of assets created under this project. Delay of these city-funded investments for associated works, such as the WWTP and sewer connections in Shizhu, Rongchang and Pengshui and the remaining segment of river embankment downstream in Tongnan, may affect the full-capacity operation of the newly built facilities at delivery.</td><td colspan="6">Risk Management:
The project has been designed as contained packages to include necessary associate elements. The PIUs will make significant efforts to coordinate with project counties regarding the implementation of those associate civil works that were not able to be included as part of the project packages. The team will also carry out more intensive supervision during project implementation.</td></tr>
<tr><td>Responsibility:
Both</td><td>Status:
In progress</td><td>Stage:
Both</td><td>Recurrent:
☑</td><td>Due Date:</td><td>Frequency:</td></tr>
</table>

4. Overall Risk
Overall Implementation Risk: Substantial
Risk Description: Based on the initial assessment of the main risks identified during project preparation and the mitigation measures highlighted in the ORAF, the overall risk rating for project implementation is rated as Substantial.

ANNEX 5. IMPLEMENTATION SUPPORT PLAN

China: Chongqing Small Towns Water Environment Management Project

Strategy and Approach for Implementation Support

1. Implementation support is based on the risks and mitigation measures specified in the ORAF and on client needs, namely, to provide technical guidance and troubleshooting where the client is weak in capacity and where substantial risks lie, for example, in implementation and performance of non-structural measures, environmental monitoring, and procurement. Support will be provided in the form of supervision mission, targeted training, and special visits by Bank specialists or consultants.

Implementation Support Plan

2. *Capacity.* Implementation capacity of the PIUs at county level, in particular in the project county of Pengshui, is relatively weak. Bank implementation support will focus on assisting the client in strengthening implementation capacity, particularly in financial management and procurement, immediately following project start-up. Frequent supervision early on during the first half of the implementation period is expected to help for compliance with Bank financial management and procurement policies and procedures.

3. *Procurement.* Implementation support will focus on ensuring that (a) the procurement agent is performing effectively; (b) PIU staff are fully familiar with and adhere to the Procurement Management Manual (PMM); and (c) planned procurement training is provided to all procurement staff in a timely manner. In addition, the Bank's procurement specialist will carry out prior and post reviews of procurement transactions and monitor the implementation and updates of the procurement plan.

4. *Financial management.* The Bank team will supervise the implementation of the identified and agreed actions for strengthening the PIUs' financial management and will pay specific attention to the timely provision of the required counterpart funds. The FM specialist will ensure that counterpart funds committed by the four project counties will be included in their annual budgets. Standard provision on interim financial reporting and external audit and their compliance will be monitored.

5. *Design.* Specific technical expertise on integrated water resource management, risk-based flood management, hydro engineering, civil engineering and wastewater management, O&M, and financial aspects will be mobilized during regular semiannual supervision missions. The challenges associated with the detailed design and implementation of nonstructural measures will be monitored by the Bank's technical specialists during routine supervision.

6. *Governance.* Implementation support will focus on (a) continuous and strengthened communication with project stakeholders at the Chongqing municipal level and with the four project county governments to maintain a high degree of client ownership and commitment to the project, particularly when the leadership changes; (b) regular and on-demand supervision

with particular emphasis on ownership, commitment, accountability, and decision-making; and (c) regular contact with Chongqing on its own financed infrastructure projects which are closely linked with the investment under the project.

7. *Social and environment.* Social and environmental risks will be mitigated through the development of EIA/EMP/RAP with support from experienced consultants. Bank social and environmental safeguard specialists will ensure that the required safeguard documents are specific, comprehensive yet practical, and achievable. The Bank will ensure that sufficient training is provided on safeguards and that adequate resources are allocated for monitoring the implementation of the EMPs/ECOPs/RAPs. The Bank will review external monitoring reports on safeguards implementation and carry out intensive site visits during implementation support missions for a first-hand assessment of compliance with Bank safeguards requirements. The Bank will follow up with meetings at the appropriate level to resolve issues identified.

8. *Use of country-based staff.* Most of the Bank task team is based in the China country office in Beijing to ensure rapid and effective response to the borrower's needs for implementation support.

9. *Resources and skills required.* Formal supervision and site visits covering all aspects of project implementation will be carried out semiannually, and will be supplemented by need-based visits by small groups. A mid-term review will be carried out no later than June 2018 to evaluate progress and make necessary adjustments. Estimated inputs from different specialists in different stages of project implementation are outlined in Table 7.

Table 7 Supervision Input

Time	Focus	Skills Needed	Resource Estimate - Staff Weeks (SWs)
First twelve months	• Task and team leadership	• TTL	10
	• Technical support/ Detailed designs	• Technical skills	4
	• FM and procurement	• Bank policies	8
	• Safeguards	• Bank policies	4
	• M&E framework and baseline data	• Technical skills	2
12-48 months	• Task and team leadership	• TTL	28
	• Technical support / Project quality / sustainability	• Technical skills	20
	• FM and Procurement	• Bank policies	22
	• Safeguards	• Bank policies	20
	• M&E	• Technical skills	6

Table 8 Skills Mix Required

Skills Needed	Number of Staff Weeks (SWs) Each Year	Number of Trips	Comments
TTL/civil engineering	10	3	Bank staff
Water resource/flood risk management	8	3	Bank staff/consultants
Hydro engineering	3	2	Bank staff/consultants
Wastewater management/storm water engineering	3	2	Bank staff/consultants
Urban road engineering	2	2	Bank staff/consultants
Bank safeguard policy	6	2	Country-office based
Bank FM policy	3	2	Country-office based
Bank procurement policy	3	3	Country-office based

ANNEX 6. ECONOMIC AND FINANCIAL ANALYSIS

China: Chongqing Small Towns Water Environment Management Project

1. The project will bring various economic benefits to urban-rural integration development and populations in and beyond the project areas of Chongqing Municipality, especially to those living in and near the small towns of the selected four counties. The types of investments include flood control, river channel rehabilitation, and wastewater collection and treatment. They will provide public goods to local residents and the investments justify the use of public funds.

2. Economic and other evaluation criteria have been taken into account in project identification and preparation, and based on that, a set of economic and financially viable investments have been selected for inclusion in the project. For example, an early project proposal included a package of investments in Liangping County. The investments related to water environment improvement of a large reservoir neighboring a new development area, including building sewage collection pipes around the reservoir, constructing wetland, landscaping, and lake dredging. Technical reviews and initial economic analysis showed that the investments would have very limited contribution to water environment improvement in the main rivers in the proposed project areas and that the proposed investments would not be cost-effective. Therefore, this component was dropped. In addition, economic considerations also played a role in deciding the scale of investment in some components, such as the diameter and length of water and sewage pipes.

Economic Benefits and Costs Identified

3. The economic benefits and costs of the project have been identified and quantified to the extent possible.

4. *Economic benefits.* The main identified economic benefits of the project include avoided flood damages, increases in amenity and land values, and water quality and health improvements owing to improved water environment infrastructure services. Water quality improvement in the project areas will also indirectly benefit people living downstream of the river systems. The demonstrated effect of the project should bring about long-term benefits to small city/town development in Chongqing Municipality and similar regions in China.

5. *Economic costs.* The economic costs of the project are mostly capital investment costs (including associated resettlement and environmental mitigation costs as identified by the environmental and social safeguard analysis) and O&M costs.

6. Based on the nature of investment and affected areas, the project investments are categorized into flood control, wastewater collection and treatment, and other small standalone investment such as reforestation and landscaping. Economic analysis is conducted for each investment category and by the project county.

Valuation Methods Used

7. The economic costs and benefits of each investment category are quantified to the extent possible. For flood control investment in the four project counties, where economic benefits can be quantified and monetized fairly easily, cost-benefit analysis is used to quantitatively examine the economic viability of the investments. Hedonic valuation methods, such as land value increases due to infrastructure development and environmental enhancement, are used to quantify and monetize the economic benefits of environmental and amenity improvement to project beneficiaries. Sensitivity analysis is also conducted to test the robustness of the results of the cost-benefit analyses.

8. For the wastewater management category, economic benefits such as better health and quality of life and better water environment are difficult to quantify and monetize as the investments are usually too modest in size to establish causal links between them and health and environmental improvements. In these cases, cost-effectiveness analyses are carried out to ensure the selection of the least cost options for achieving the given development target.

Economic Analysis

A. Flood Control

9. The project includes four subcomponents, that is, flood control infrastructure in Rongchang County, Tongnan County, Pengshui County, and Shizhu County. Cost-benefit analyses have been conducted for each of these subcomponents using the same methodology. A detailed description of the economic analysis of the Rongchang County flood control subproject component is presented here as an example. The results of the other three counties are briefly summarized in a table at the end of this section.

Economic Analysis of Rongchang County Flood Control Component

10. *Project objectives and brief description.* The primary objective of the component is to support investments to reduce flooding risk and potential water logging in selected areas of Rongchang County, including a dike of 13.89 km along the Laixihe River upstream to protect part of the county seat from 1/5 (one-in-five years) to 1/20 (one-in-twenty years) floods. The objective will be achieved by improving water environment infrastructure services, including flood control and water environment management capacity.

11. *Economic benefits and costs identified.* The component will generate a variety of economic benefits to local residents in Rongchang County, especially in the areas along the Laixihe River and in the old town of Changzhou Township (the upstream segment) and Changyuan Township (the downstream segment) of Rongchang County, both of which have frequently been inundated by river flood and storm water backlog. Economic benefits are mainly avoided flood damages, water quality and health improvements, and higher quality of life.

12. *General assumptions, basic data, and valuation methods used.* The economic analysis assumes that market prices for the main elements of costs and benefits have little variance from

their economic values. Therefore, shadow prices and conversion factors were not applied. The project duration is assumed to be 30 years (the designed life of the dike and drainage systems) plus 5 years for the construction period.

13. Flood control benefits are based on historic flood damages and projected trends for flood losses avoided due to the project. While the public is supportive of the project, no willingness-to-pay survey was conducted for this study. The economic benefits of amenity and environmental quality improvements to local residents were measured indirectly and approximated by (a) the increased value of the land along the river sections protected by the project and available for future development and (b) the increased value of houses from avoided water logging in the old county seat.

14. *Quantifying economic benefits.* Two main types of economic benefits have been monetized in the analysis, including avoided flood damages and increased amenities. Other benefits (such as improved accessibility due to dike-top roads) are not measured and included in this analysis. The estimates of avoided flood damages are based on property values; economic losses due to floods in the past; projected increases in economic growth, population, and property values; and the share of the project investment in county-wide flood control investments.

15. *Avoided flood damages.* The project, together with ongoing efforts of the county in flood protection, will significantly increase the county's flood protection standards along the Laixihe River and its tributaries and improve drainage in the nearby townships. Based on the statistic data of Rongchang County, the first year economic loss avoided by flood control after the project completion is estimated at RMB 18.81 million and thereafter, the annual growth rate of the value due to flood control is 2 percent.

16. *Environmental and amenity improvement benefits.* The flood management and drainage improvement investments in Rongchang County will also significantly improve the aesthetic value and sanitation conditions of the areas along the river and in the county seat and improve amenities and living standards of the people who live there. These benefits, however, are not directly available in monetary terms. A hedonic approach was used in the analysis, which estimated the change in the value of lands and houses affected by the project and then used it to approximate the economic benefit of the amenity and quality of life improvements.

17. According to the land value data provided by Rongchang County Land Resources Bureau, especially the land price of an area in which the county recently implemented river channel rehabilitation and landscaping, the transaction price of representative land parcels (mostly for residential use) in the nearby river bank sharply increased from RMB 0.8 million per mu (15 mu = 1 hectare) before rehabilitation to RMB 1.8 million per mu, nearly quadrupling land value, with a net increase of RMB 1.0 million per mu.

18. The increase in land value at selected sites is attributable to river embankment and environmental improvements only, without double counting of avoided flood damages because the sites are outside the flood zone but directly benefit from environmental improvement. To be further conservative in benefit estimation by deducting the location and road accessibility factors, the average land value increase was estimated at RMB 0.45 million per mu. In accordance with

the data provided by the County Land Resources Bureau and Urban Planning Bureau, the area on both sides of the river affected by the project and planned for future residential development is 1,589 mus. After implementation of the project, the land value increase in the project area would be RMB 715.05 million. Based on the local land use plan and economic development projection, it will take 15 years to complete land development and the development pace was projected at 50 percent of the total during the first five years, 30 percent during the second five years, and 20 percent during the last five years, respectively.

19. *Economic costs.* These consist of capital investment costs and O&M costs. It is estimated that the total capital cost of this subcomponent (construction of five years) amounts to RMB 242.1 million at present value. Total O&M costs are estimated at RMB 56.9 million at present value. The capital investment of the project includes associated resettlement and environmental mitigation costs.

20. *Results of the cost-benefit analysis.* The economic analysis results are shown in Table 9. The economic internal rate of return (EIRR) of the project is 16.4 percent, the net present value (NPV) is RMB 194.7 million, and the benefit-cost ratio is 1.65. The EIRR is above the acceptable level.

Table 9 Costs-Benefits Analysis of the Flood Control Component of Rongchang County (Million RMB)

Benefit/Cost (million RMB)	Present Value (at 8%)	2015	2016	2017	2018	2019	2020	2028	2032	2033	2037	2043	2048	2049
Benefits														
Avoided flood damage	174.9	0.0	0.0	0.0	0.0	0.0	18.8	22.0	23.9	24.3	26.3	29.7	32.7	33.4
Land value increase	318.7	0.0	0.0	0.0	0.0	0.0	79.0	42.9	28.6	28.6	0.0	0.0	0.0	0.0
Subtotal	493.6	0.0	0.0	0.0	0.0	0.0	97.8	64.9	52.5	52.9	26.3	29.7	32.7	33.4
Costs														
Capital Investment	242.1	9.6	96.1	79.9	81.0	40.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Operating & Maintenance	56.9	0.0	0.0	0.0	0.0	0.0	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Subtotal	298.9	9.6	96.1	79.9	81.0	40.9	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Net economic flows	194.7	-9.6	-96.1	-79.9	-81.0	-40.9	90.4	57.5	45.0	45.5	18.9	22.2	25.3	26.0
EIRR	**16.4%**													
B/C ratio	**1.65**													

21. *Results of sensitivity analysis.* To further test the robustness of the analysis, a sensitivity analysis was conducted (shown in Table 10) with the assumption of a 10 percent increase in capital costs, a 10 percent decrease in claimed economic benefits, and a combined scenario. The results, shown in Table 10, suggest a pretty robust EIRR. For instance, in the case of 10 percent increase in capital investment, the aggregate EIRR is reduced from 16.4 percent to 14.7 percent. The combined scenarios still yielded an aggregate EIRR of 12.9 percent, which means that the investment is economically acceptable even in the case of unfavorable variation in project costs and benefits.

Table 10 Sensitivity Analysis of the Flood Control Component of Rongchang County

	Base case	10% increase in capital investment	10% decrease in main benefit	Combined case
NPV (million RMB)	194.7	164.8	145.4	115.5
EIRR	16.4%	14.7%	14.5%	12.9%
B/C Ratio	1.65	1.50	1.49	1.35

Summary of economic analyses of the flood control components of the other three counties

22. Cost-benefit analyses have been employed for the other three flood control components in the counties of Tongnan, Pengshui, and Shizhu. As shown in Table 11, the results of the analyses indicate that all the three components are economically feasible. Sensitivity analysis results further indicate that the three proposed investments are robust, with their EIRRs above 8 percent even in the assumed cases of a 10 percent increase in total costs and a 10 percent reduction in total benefits.

Table 11 Cost-Benefit Analysis of the Flood Control Components of the Other Three Counties

Components	**NPV (million RMB)**	**EIRR**	**BCR**	**Sensitivity Analysis (assuming 10% cost increase and 10% benefit reduction)**		
				NPV (million RMB)	**EIRR**	**BCR**
Flood control in Tongnan County	74.5	13.02%	1.29	16.12	9.05%	1.06
Flood control in Pengshui County	89.83	11.63%	1.45	28.21	9.07%	1.19
Flood control in Shizhu County	141.03	13.23%	1.40	85.22	11.29%	1.24

B. Wastewater Management

23. This category includes two subcomponents of wastewater collection pipeline construction in two counties: (a) wastewater pipelines in Shizhu County and (b) wastewater pipelines in Rongchang County. As the health benefits of these components are difficult to quantify and monetize, cost-effectiveness analyses have been conducted for each of them to ensure the selection of the least cost option which delivers the desired outcomes. A relatively detailed description of cost-effectiveness analysis of different processes for pipeline building in Rongchang County is presented here as an example. Similar analytical approaches are adopted for the economic analyses of the other wastewater collection component in Shizhu County to ensure the selection of the least-cost design options to achieve the development targets.

Cost-effectiveness Analysis of Rongchang County Wastewater Management Component

24. The objective of this component is to obtain comprehensive management of the existing water environment by building interception sewer pipelines combined with flood control embankment construction in Rongchang County. The estimated total investment of this component would amount to RMB 23.48 million. The completion of the proposed subcomponent would contribute to improvements in the environment and in the living standard of local residents.

25. *Economic costs and benefits.* The main economic benefits of this component are improvements in health and quality of living of the local population, increased productivity, and reduced pressure on the local aqua system (including underground water sources in the project areas). Compared with the 'no project' scenario, completion of this component has considerable benefits although most of the benefits are difficult to quantify in monetary terms.

26. The costs of the component consist of capital investment costs, O&M costs, and the costs of environmental management during construction. As most of the benefits are difficult to quantify and monetize, cost-effectiveness analyses have been conducted to identify the least-cost options.

27. Eventually, three technical options were considered for this project: (a) pumping station and pipelines, (b) wastewater treatment plant and pipelines, and (c) expansion of the existing wastewater treatment plant and pipelines. From the investment cost perspective, the investment for the first option is estimated at RMB 21.86 million, RMB 23.58 million for the second, and RMB 27.9 million for the last option.

28. *Results of the cost-effectiveness analysis.* The unit cost of building a pumping station and pipelines is less than other two options. Therefore, the first technical option has been recommended for the wastewater management component in Rongchang County.

Impact on the Poor

29. The flood control investments will be shouldered by the local government and there will be no additional fees or charges imposed by the government on local people in the project counties. Therefore, there is no anticipated negative impact on local residents, including low-income households.

County's Fiscal Analysis

30. During project preparation, the team assessed the fiscal status of each of the project counties and discussed the financing plans for each subproject. The counterpart funds will be raised from earmarked transfers from the central government and contributions from the county governments. The project counties agreed to provide the necessary funds to implement the project in case the earmarked funds from central government were not available.

31. To better understand the past and current situation, each county finance bureau provided financial statements over 5 years, from 2008 to 2013. The financial statements of local governments show that the major government revenues include tax and non-tax revenues and transfer payments from provincial and central governments. The government revenues for the years of project implementation were projected based on the average increase rates over the past 5 years (2008-2013), with 10 percent discount every year.

Table 12 Breakdown of Fiscal Revenue (Average 2008-2013) by Project County (in RMB 1,000)

	Rongchang		**Shizhu**		**Tongnan**		**Pengshui**	
Tax revenues	**692.96**	**17%**	**382.35**	**14%**	**1,905.37**	**70%**	**383.84**	**16%**
Non-tax revenues	**754.00**	**19%**	**156.11**	**6%**			**193.03**	**8%**
Transfer payments	**1,510.44**	**38%**	**1,635.45**	**61%**	**798.31**	**30%**	**1,751.57**	**73%**
Tax-sharing arrangements	69.20	2%	45.07	2%	798.31	30%	37.22	2%
General transfer	717.48	18%	791.02	30%			845.54	35%
Earmarked funds	723.76	18%	799.37	30%			868.80	36%
State bonds	**168.63**	**4%**	**18.28**	**1%**			**18.28**	**1%**
Savings from last year	**868.39**	**22%**	**474.34**	**18%**			**39.64**	**2%**
Transfer from other revenues	**5.52**	**0%**		**0%**				**0%**
Total Revenues	**3,999.93**	**100%**	**2,666.52**	**100%**	**2,703.69**	**100%**	**2,386.35**	**100%**

32. Local government contributions to the project were compared with the projected government revenues and the results show that the local government would have the capacity to provide counterpart funds for the implementation of the project. Table 13shows the current and project fiscal revenues, based on the average performance of each county over the last 5 years (2008-2013). The results show a solid increase of these recurring over the years and the counties also agreed to use transfer grant from the Chongqing Municipal Water Resources Bureau for flood control along tributaries of the Yangtze River to co-finance this project.

Table 13 Government Revenue Projection and Project Contributions by Year (in RMB 1,000)

	2014	2015	2016	2017	2018	2019	2020
Government Revenues							
Rongchang	6,355	8,449	11,142	14,974	20,028	26,745	35,886
Shizhu	4,514	6,028	7,997	10,586	13,953	18,221	23,649
Tongnan	10,348	13,950	18,552	24,504	32,002	41,397	53,042
Pengshui	3,780	5,595	9,666	21,093	53,774	139,310	380,050
Government Contribution to Project							
Rongchang	-	17.21	28.69	28.69	28.69	28.69	17.21
Shizhu	-	57.59	95.98	95.98	95.98	95.98	57.59
Tongnan	-	64.57	107.61	107.61	107.61	107.61	64.57
Pengshui	-	53.01	88.34	88.34	88.34	88.34	53.01
% of Government Revenues							
Rongchang	-	0.2	0.3	0.2	0.1	0.1	0.0
Shizhu	-	1.0	1.2	0.9	0.7	0.5	0.2
Tongnan	-	0.5	0.6	0.4	0.3	0.3	0.1
Pengshui	-	0.9	0.9	0.4	0.2	0.1	0.0

ANNEX 7. MAP OF PROJECT LOCATIONS

China: Chongqing Small Towns Water Environment Management Project