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Report No: 74403-CN

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$100 MILLION EQUIVALENT

TO THE

PEOPLE'S REPUBLIC OF CHINA

FOR A

JIANGXI WUXIKOU INTEGRATED FLOOD MANAGEMENT PROJECT

February 7, 2013

China and Mongolia Sustainable Development Unit
Sustainable Development Department
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective May 31, 2012)

Currency Unit	=	RMB
RMB1.00	=	US$0.1587
US$1.00	=	RMB6.3

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

CEA	Consolidated Environmental Assessment
DRC	Development and Reform Commission
DSP	Dam Safety Panel
DSR	Dam Safety Report
EG	Expert Group
EIRR	Economic Internal Rate of Return
ESMP	Environment and Social Management Plan
FMS	Financial Management Specialist
FSR	Feasibility Study Report
ICR	Implementation Completion Report
MIS	Management Information System
MOF	Ministry of Finance
MTR	Mid-Term Review
MWR	Ministry of Water Resources
M&E	Monitoring & Evaluation
NCB	National Competitive Bidding
NDRC	National Development and Reform Commission
PAP	Project Affected People
PCR	Physical Cultural Resources
PIP	Project Implementation Plan
PMP	Pest Management Plan
PLG	Project Leading Group
PMO	Project Management Office
RAP	Resettlement Action Plan
SIL	Specific Investment Loan
SOE	Statement of Expenditure
TTL	Task Team Leader
WA	Withdrawal Application

Regional Vice President:	Axel Van Trotsenburg, EAPVP
Country Director:	Klaus Rohland, EACCF
Sector Director:	John A. Roome, EASSD
Sector Manager:	Mark R. Lundell, EASCS
Task Team Leader:	Liping Jiang, EASCS

CHINA
JIANGXI WUXIKOU INTEGRATED FLOOD MANAGEMENT PROJECT

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PAD DATA SHEET

CHINA

Jiangxi Wuxikou Integrated Flood Management Project

PROJECT APPRAISAL DOCUMENT

EAST ASIA AND PACIFIC

EASCS

Basic Information	
Date: February 7, 2013 ***Country Director:*** Klaus Rohland ***Sector Manager/Director:*** Mark R. Lundell / John A. Roome ***Project ID:*** P128867 ***Lending Instrument:*** SIL ***Team Leader(s):*** Liping Jiang	***Sectors:*** Flood Protection (100%); ***Themes:*** Water Resources Management (80%); Environment Policy and Institutions (20%); ***EA Category:*** A – Full Assessment
Joint IFC: None	
Borrower: The People's Republic of China Mr. Wu Jianjun, Director IF Division, Ministry of Finance Telephone: 86 10 68551124 / Email: Wujianjun@mof.gov.cn	
Implementing Agency: Jingdezhen City Water Affairs Bureau, Jingdezhen, Jiangxi Province	
Contact: Mr. Xiao Aiguo Telephone: 86 798 2670633	Title: Director of PMO Email: jdzwxk@163.com
Expected Project Implementation Period: Start Date: March 14, 2013 End Date: June 30, 2019	
Expected Effectiveness Date: August 31, 2013 Expected Mid-term Review Date: June 30, 2015 Expected Closing Date: June 30, 2019	
Project Financing Data (US$M)	
[X] Loan [ ] Grant [ ] Credit [ ] Guarantee	[ ] Other
For Loans/Credits/Others	
Total Project Cost: US$ 513.70 million	Total Bank Financing : US$ 100 million

Total Co- financing : None	Financing Gap : None

Financing Source	**Amount(US$M)**
BORROWER/RECIPIENT	
IBRD	100.00
IDA: New	
IDA: Recommitted	
Government	413.70
Financing Gap	
Total	513.70

Expected Disbursements (in USD Million)

Fiscal Year	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Annual	7	13	30	30	15	5
Cumulative	7	20	50	80	95	100

Project Development Objective(s)

The project development objective is to reduce the flood risk in the central urban area of Jingdezhen City through implementation of priority structural and non-structural measures, and contribute to establishment of an integrated flood risk management system for the City.

Components

Component Name	**Total Cost (USD Millions)**
1. Construction of Wuxikou Flood Control Scheme	114.86
2. Capacity Building for Integrated Flood Risk Management System	9.40
3. Implementation of Resettlement Action Plan	384.61
4. Project Management and Implementation Support	2.39

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 [X]
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [X]
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
1. Institutional Arrangement	X		Annually

Jingdezhen City to maintain an organizational structure throughout the period of Project implementation, which includes Project Leading Group, Project Management Office and Expert Group with composition, powers, functions, funds, staffing, facilities and other resources satisfactory to the Bank.

Name	Recurrent	Due Date	Frequency
2. Safeguards Implementation	X		Annually

Jingdezhen City to apply in the implementation of the Project and the Linked activities as relevant, the RAP, the RPF, the ESMP, the PMP and the DSR, all in a manner satisfactory to the Bank. Jingdezhen City to not amend, suspend, or waive any such plan or any provision thereof, without the prior concurrence of the Bank.

Name	Recurrent	Due Date	Frequency
3. Panel for Environment, Social and Resettlement and Dam Safety	X		Annually

Jingdezhen City to engage and retain the services of independent consultants to carry out external monitoring and reporting on implementation of the ESMP, RAP and RPF annually and implement the recommended measures in a prompt and efficient manner satisfactory to the Bank. Same applies to Dam Safety Panel on design reports & Dam Safety Plans

Name	Recurrent	Due Date	Frequency
4. Annual Reports	X		Annually

Annual Work Plan: Jingdezhen City to prepare and provide to the Bank for review and comments the annual work plan for implementation of the project, including activities drawn from the PIP, the ESMP, the RAP, the RPF, the PMP and DSR by November 30 of each year starting from 2013.
Monitoring and Evaluation Plan: Jingdezhen City to prepare and provide to the Bank the annual monitoring and evaluation plan for review and comments by March 31 of each year starting from 2014.

Name	Recurrent	Due Date	Frequency
5. Semi-Annual Reports	X		Semi-Annually

Jingdezhen City to monitor and evaluate the progress of the Project according to the agreed annual work plan and prepare Progress Reports for the Project, including activities drawn from the PIP, the ESMP, the RAP, the RPF, the PMP and DSR. Each such Project Report shall cover the period of one calendar semester, and be furnished to the Bank by March 15 and September 15 each year, starting on March 15, 2014.

Name	Recurrent	Due Date	Frequency
6. Mid-Term Review		June 30, 2015	

Jingdezhen City to, not later than June 30, 2015, review with the Bank (mid-term review) the progress made in the implementation of the Project, together with any recommendation the Borrower or the Bank may have on measures to be taken to ensure the efficient completion of the Project and to achieve the objectives thereof.			
Name	**Recurrent**	**Due Date**	**Frequency**
7. Procurement and Financial Management Information System		September 30, 2013	
Jingdezhen City to install and operationalize for use the Procurement and Financial Management Information System no later than thirty (30) days after the Effective Date, and thereafter apply the system in order to monitor the entire procurement process and financial transactions under the Project in a manner satisfactory to the Bank.			
Name	**Recurrent**	**Due Date**	**Frequency**
8. O&M Plan for Wuxikou Flood Control Scheme		December 31, 2017	
Jingdezhen City to prepare and furnish to the Bank for review and comment, at least six months prior to the completion of the scheme, a proposed operation and maintenance plan for such scheme, including institutional, technical and financial arrangements, and, thereafter, ensure the prompt implementation of each such plan, taking into account the views of the Bank thereon.			
Name	**Recurrent**	**Due Date**	**Frequency**
9. O&M Plan for Flood Risk Management System		December 31, 2017	
Jingdezhen City to prepare and furnish to the Bank for review and comment, at least six months prior to the completion of the system, a proposed operation and maintenance plan for such system, including institutional, technical and financial arrangements, and, thereafter, ensure the prompt implementation of each such plan, taking into account the views of the Bank thereon.			
Name	**Recurrent**	**Due Date**	**Frequency**
10. Preparation and Implementation of Two Studies related to EA		April 30, 2016	
Jingdezhen City to initiate no later than three months after the effectiveness date, and to complete at least six months prior to filling up of the Project Dam reservoir, a study on comprehensive reservoir management and development plan, and a second phase study of cumulative impact assessment of the project in the entire Changjiang River Basin, and to prepare and implement an action plan based on the results of the two studies in a manner satisfactory to the Bank.			

Team Composition

Bank Staff

Name	Title	Specialization	Unit	UPI
Liping Jiang	Task Team Leader and Sr. Water Resources Specialist	Water Resources	EASCS	95593
Alessandro Palmieri	Lead Dam Specialist	Dam Design	OPCQC	151273
Satoru Ueda	Lead Water Resources and Dam Specialist	Water Resources	AFTWR	181034
Xiaokai Li	Sr. Water Resources and Dam Safety Specialist	Water Resources	EASIN	178594
Denis Jean-Jacques	Sr. Flood Risk Management Specialist	Environment	AFTEN	266183

Peter Leonard	Lead Specialist for Safeguards	Environment and Social	EASSD	277420
Markus Kostner	Sector Leader for Social Development	Social Development	EASER	21919
Zong-cheng Lin	Sr. Social Development Specialist	Anthropologist	EASCS	86232
Patricia Maria Fernandes	Gender Specialist	Social Development	EASER	332203
Juan D. Quintero	Lead Specialist for Safeguards	Environment	SASDE	56940
Syed Ahmed	Lead Counsel	Lawyer	LEGES	19010
Kishor Uprety	Senior Counsel	Lawyer	LEGES	73762
Feng Ji	Environment Specialist	Environment	EASCS	252836
Xin Ren	Environment Specialist	Environment	EASCS	333444
Yuan Wang	Procurement Specialist	Procurement	EAPPR	345592
Haixia Li	Financial Management Specialist	Financial Management	EAPFM	259270
Ruifeng Yuan	Project Costing Analyst	Project Costing	EACCF	298818
Qun Li	Sr. Operations Officer	Agricultural Economist	MNSWN	65341
Xin Chen	Operational Analyst	Operations	EACCF	77978
Lijun Zhang	Program Assistant	Economics	EACCF	355579

Non Bank Staff

Name	**Title**	**Specialization**	**City**
Xueming Liu	Sr. Financial and Economic Specialist	Economist, FAO	Rome, Italy
Si Zhiming	Sr. Dam Specialist	Dam Design	Beijing, China
Liu Shukun	Sr. Dam Break Specialist	Flood Modeling	Beijing, China
Fu Zengci	Sr. Flood Risk Management Specialist	Flood Management System	Beijing, China
Raja Lyer	Sr. Operations Advisor	Operations	Washington D.C.
Wang Yi	Social Development Specialist	Community Participation	Beijing, China

Locations

Country	**First Administrative Division**	**Location**	**Planned**	**Actual**	**Comments**
China	Jiangxi Jingdezhen City Water Affairs Bureau	Jingdezhen City, Jiangxi Province	X	X	

I. STRATEGIC CONTEXT

A. COUNTRY CONTEXT

1. Since the historic 1998 floods of the Yangtze River that claimed the lives of over 2,300 people, China's flood disaster prevention capacity and infrastructure has been improved and strengthened markedly over the past decade. Many reservoirs and dikes along the main rivers have been improved and reinforced.

2. With the improvement of flood control systems along the main rivers, flood disasters are occurring primarily along small and medium-sized rivers. During the past 10 years over 90% of the flood-related disasters occurred in small towns, cities and rural areas, caused mostly by landslides and flashfloods due to excessive rainfall. Floods in 2010 left over 2,690 people dead and 1,170 missing, and affected 140 million people and 7 million hectares of agricultural land across 28 provinces and regions. Direct economic losses are estimated to be around US$40 billion, mostly as a result of landslides and flashfloods in small and medium-sized river basins.

3. In late 2010, the State Council Standing Committee made a decision to prioritize and increase investments to improve planning, prevention, mitigation and response to floods in small and medium-sized rivers. Each province or municipality is required to resolve in five years outstanding issues/problems with weak segments of flood control and disaster mitigation systems in order to safeguard people’s lives and property, and maintain overall economic and social development.

4. In early 2011, the central government issued its first document on water resources issues entitled “Decisions on Accelerating Water Sector Reform and Development,” which proposed a strategy for establishing a comprehensive flood prevention system by 2020. The strategy requires that flood control systems of small and medium-sized rivers in areas most vulnerable to mountain flash flooding should be strengthened by the end of 2015 (the end of the 12th five-year plan, 2011-2015).

5. Jingdezhen City is a medium-sized industrial city in Jiangxi Province. According to the City’s Social and Economic Development Master Plan, the downtown population will increase from the present 0.48 million to 0.60 million by 2015, to 0.70 million by 2020, and to 1.20 million by 2050. The average annual GDP growth rate will be 13.4% from 2015 to 2020 and 8.8% from 2020 to 2030. Thus Jingdezhen City will develop rapidly in the near future, and economic losses from a big flood event will increase significantly unless the city’s flood management capacity is enhanced.

B. SECTORAL AND INSTITUTIONAL CONTEXT

6. A major flood protection system has been established in China, comprising important flood control structures and dikes along big rivers and main tributaries. However, comprehensive flood management along small and medium sized rivers is very complex due to China’s vast territory and the wide variety of issues and local conditions. Many flood control structures along small and medium sized rivers are poorly maintained, and measures to

effectively respond to regular flooding are absent. Current sector issues and challenges include: (a) inadequate investment; (b) inadequate land use planning; (c) poor O&M; (d) aging dams; (e) poor flood risk awareness; (f) slow disaster response and recovery; and (g) lack of countermeasures for more frequent flood events due to climate change. These issues and challenges will have to be dealt with during the implementation of the national strategy.

7. Jingdezhen City, an industrial and cultural center in Northeastern Jiangxi, is very vulnerable to river flooding with its low ground elevation and very little flood control infrastructure. A major challenge for Jingdezhen City is to reduce the risks of frequent floods from the Changjiang River, a medium-sized river flowing through the downtown areas of the City.

8. Flood losses are enormous and increasingly so in recent decades. The 20-year flood event in 1998 put 31 km2 under water for 94 hours and affected 354,000 people and over 2,000 production entities with an estimated direct loss of over US$354 million.

9. The strategy of Jingdezhen Municipal Government (JMG) is to build a "Combined City Dike-Reservoir System" for the protection of Jingdezhen City from a 50-year flood event of the Changjiang River: (a) the City Dike System – a separate and on-going government program which includes construction of dikes along river sections within the City to upgrade flood protection standard from a 10-year flood event to a 20-year flood event, and rehabilitating the city's urban drainage system up to a standard of maximum 24 hour storms in 20-year frequency will be completed by 2013; and (b) Wuxikou Flood Control Scheme, which includes construction of a flood control scheme upstream in Fuliang County to upgrade the flood protection standard for the City from a 20-year flood event to a 50-year flood event [1].

10. The Wuxikou Flood Control Scheme on the Changjiang River, which will provide necessary flood protection to Jingdezhen City, is the focus of the proposed project. The project has been included in Jiangxi Province's 12th Five-year Plan and the Feasibility Study Report (FSR) has been cleared by the Ministry of Water Resources (MWR) and was approved by the National Development and Reform Commission (NDRC) in July 2011.

C. HIGHER LEVEL OBJECTIVES TO WHICH THE PROJECT CONTRIBUTES

11. The proposed Jiangxi Wuxikou Integrated Flood Management Project (the Project) is aligned with the Bank's China Country Partnership Strategy (FY13-16 discussed by the board on November 6, 2012), and is closely related to Strategic Theme One: Supporting Greener Growth, Outcome 1.5 for Demonstrating Sustainable Natural Resource Management Approaches. The project would play an important role in the construction of essential water infrastructure and development of a flood risk assessment and management system to safeguard the livelihoods of the rural and urban poor.

[1] The operational rules of Wuxikou Flood Control Scheme could regulate flood discharges to not exceed 20-year flood when 50-year flood occurs upstream. The government will finance the city dikes and other dykes along the river downstream of the Wuxikou Flood Control Scheme.

12. The Bank would add through its knowledge of global good practice on development of flood risk management systems, focusing not only on infrastructure construction but also on flood risk mitigation measures. In addition, the recent successful experience and lessons from Bank supported projects in China, documented in the recently completed (and soon to be released as an Annex to the China Country Water Resources Partnership Strategy) Policy Note on Integrated Flood Risk Management - Key Lessons Learned and Recommendations for China, benefited the preparation of this project and will continue to do so during its implementation.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PROJECT DEVELOPMENT OBJECTIVE (PDO)

13. The project development objective is to reduce the flood risk in the central urban area of Jingdezhen City through implementation of priority structural and non-structural measures, and contribute to establishment of an integrated flood risk management system for the City.

B. PROJECT BENEFICIARIES

14. Project beneficiaries include: (a) communities and entities located in the central urban areas of Jingdezhen City, with a population of some 480,000; (b) the entire city will benefit from clean energy from the Wuxikou hydropower plant, and from more reliable water supply; and (c) the ecosystem and communities downstream of Wuxikou dam will benefit from assured environmental flow.

C. PDO LEVEL RESULTS INDICATORS

15. Achievement of the project development objective will be assessed through the following outcome indicators: (a) urban population vulnerable to one-in-fifty year floods; (b) economic value of fixed assets at flood risk in Jingdezhen city; and (c) total area subject to inundation by 1-in-50-year floods.

III. PROJECT DESCRIPTION

A. PROJECT COMPONENTS

16. The project would include the following components:

Component 1: Construction of Wuxikou Flood Control Scheme (US$114.86 million), which consists of the following three subcomponents:

(a) Construction of a concrete gravity dam on the main stem of the Changjiang River in Luoxi village, Jiaotan Township of Fuliang County about 40 km upstream of Jindezhen City with a maximum dam height of 46.8 m and crest length of 498.62 m, a gated overflow spillway with five gates and six bottom outlets, and a hydropower plant with a total installed capacity of 32 MW and annual power generation of 81,210 MWh.
(b) Acquisition and installation of electro-mechanical equipment of 5 radial gates (each of 12 mx6 m) for a 78 m wide surface spillway and 6 plane gates for the outlets (each of 12

mx9 m), two 15 MW and one 2 MW turbine-generator units, a switchyard and two transformers, and necessary equipment for the operation and maintenance of the dam.

(c) Implementation of the Environmental and Social Management Plan (ESMP).

(d) Carrying out of: (i) a comprehensive reservoir management plan development study to identify issues related to future monitoring and adaptive management of the implementation of the ESMP based on evaluation of environment performance; and (ii) a second phase cumulative impact assessment of the Project in the entire Changjiang River Basin.

Component 2: Capacity Building[1] for Integrated Flood Risk Management System (US$9.40 million), which consists of the following five subcomponents:

(a) Preparation of a master plan of integrated flood risk management for Jingdezhen City[2].

(b) Development of an integrated flood risk management decision support system, including a real-time flood forecasting and early warning system (modeling system) coupled with database, GIS and network technologies.

(c) Construction of a municipal flood control and dispatching center, including design study, building construction to facilitate efficient functioning of the municipal flood management system.

(d) Provision of equipment for a municipal flood control and dispatching center, including essential operation equipment to facilitate efficient functioning of the municipal flood management system.

(e) Carrying out awareness raising and community engagement activities in integrated flood management through, *inter alia*, carrying out of training and organizing seminars and workshops.

(f) Provision of specialized technical training for integrated flood risk management for the purpose of raising awareness and engaging different interest groups on risk management and mitigation.

Component 3: Implementation of Resettlement Action Plan (US$384.61 million to be fully financed by government): Carrying out of a program for the resettlement and rehabilitation of people affected by the implementation of the project, including:

(a) Investment in resettlement.

(b) Investment in special infrastructure.

(c) Reallocation of effected section of railway.

***Component 4: Project Management and Implementation Support (US$2.39million): Strengthening the capacity of Jingdezhen City to implement and manage the project through, inter alia*:**

[1] These interventions are the results of a screening process using the 'buying-down flood risks' screening matrix for this project, which is given in the Appendix to Annex 2. The Bank has provided a guidance note to the PMO for preparation of the TORs for subcomponents (a), (b), (d) and (e) and the FSR for subcomponent (c).

[2] The master plan will be prepared as a supplement to the existing Flood Control Plan of the City, which includes mostly the infrastructure construction plan.

(a) Provision of consulting services to enhance engineering design, construction supervision, dam safety and environmental and social management, including the formation and maintenance of a Dam Safety Panel of Experts
(b) Carrying out of capacity building activities through workshops, training and study tours.
(c) Establishment and operation of a monitoring and evaluation system, including a project management information system.
(d) Acquisition of office equipment and vehicles, and provision of operating resources.

B. PROJECT FINANCING

Lending Instrument

17. The lending instrument for the project will be a Specific Investment Loan (SIL) in view of the well-defined activities of the project, which have been fully appraised. The Borrower has selected a U.S. Dollar-denominated IBRD Flexible Loan based on a variable Reference Rate for the Loan Currency (6-Month LIBOR for USD) plus an additional variable spread. The loan will have a commitment-linked repayment in 25 year period, including a 6-year grace period, and level repayment of principal.

Project Cost and Financing

18. Tables below summarizes the project cost by component and by source of financing:

A SUMMARY OF COST/FINANCING PLAN BY COMPONENT (USD MILLION)

	Cost Including Contingencies	% of Total	IBRD Financing	% Financing
A. Construction of Wuxikou Flood Control Scheme				
Dam Main Structure Construction	80.58	15.7	54.80	68.0
Equipment and Installation	15.83	3.10	15.31	96.7
Metal-frame and Installation	12.89	2.50	12.47	96.7
Environment Protection & Water Conservation	5.56	1.10	5.38	96.7
Subtotal	114.86	22.4	87.96	76.6
B. Establishment of Integrated Flood Risk Management System				
Preparation of Master Plan for Integrated Flood Risk Management	1.20	0.23	1.20	100.0
Development of Flood Risk Management Decision Support System	1.59	0.30	1.59	100.0
Construction of Flood Control and Dispatching center	3.14	0.61	3.14	100.0
Equipment for flood control and dispatching center	2.49	0.48	2.49	100.0
Awareness Raising and Community Engagement	0.50	0.09	0.50	100.0
Specialized Technical Training for Flood Management Agencies	0.48	0.09	0.48	100.0
Subtotal	9.40	1.81	9.40	100.0
C. Implementation of resettlement action plan				
Investment on resettlement	273.32	53.20	0	0
Investment on Special Infrastructure	31.51	6.13	0	0
Reallocated of effected section of railway	79.78	15.53	0	0
Subtotal	384.61	74.86	0	0
D. Project Management and Implementation Support				
Institutional Capacity Building	2.09	0.4	2.09	100.0
Project Management Support	0.31	0.06	0.31	100.0
Subtotal	2.39	0.46	2.39	100.0
	511.26	99.53	99.75	19.5
Interest During Implementation	2.20	0.42	0.00	0
Front-end fees	0.25	0.04	0.25	100%
Total Financing Required	513.70	100.0	100.00	19.5

19. **Counterpart Funding**: Table below lists counterpart funds required from different financial sources. Jingdezhen City Government will ensure that counterpart funds are allocated by the different financial sources as indicated in the table.

Counterpart Funds Requirements (US$ million)

Project Components	Central Government		Jiangxi Provincial Government		Jingdezhen Municipal Government		Total Local Financing	IBRD	Component Cost	% of Total Cost
	Amount	Estimated Date for Fund Allocation	Amount	Estimated Date for Fund Allocation	Amount	Estimated Date for Fund Allocation				
A. Construction of Wuxikou Flood Control Scheme	26.90	Mid-Nov each year 2012-2017	0.00		0.00		26.90	87.96	114.86	22.36
B. Establishment of Integrated Flood Management System							0.00	9.40	9.40	1.83
C. Implementation of resettlement action plan	127.39	Mid-Nov each year 2012-2017	48.22	Mid-Nov each year 2012-2017	209.00	Mid-Nov each year 2012-2017	384.61	0.00	384.61	74.87
D. Project Management and Implementation Support							0.00	2.39	2.39	0.46
E. Financial charges during implementation					2.20		2.20	0.25	2.45	0.48
Total	154.29		48.22		211.20		413.70	100.00	513.70	100

20. **Retroactive Financing**: Retroactive financing will be allowed under the project for eligible expenditures, up to an aggregate amount not exceeding US$20 million for payments made up to within 12 months prior to the date of Loan Signing.

IV. IMPLEMENTATION

A. INSTITUTIONAL AND IMPLEMENTATION ARRANGEMENTS

21. Overall responsibility for flood management in Jingdezhen city rests with the City Flood Command Center, headed by the Mayor. The City Water Affairs Bureau serves as the Flood Control Office (and Technical Secretariat) of the Command Center. A River and Dike Management Bureau under the Water Affairs Bureau is responsible for managing the dike system and urban drainage. Hydrological and meteorological data collection, processing and analysis are carried out by the Hydrological Bureau and Meteorological Center, respectively.

22. Institutional arrangements for project implementation are summarized below:

(a) A Project Leading Group at the municipal level in Jingdezhen City, chaired by the Vice Mayor of Jingdezhen City, will be responsible for overseeing the overall implementation of the Project, making decisions on key Project issues and carrying out interagency coordination at the municipal level.
(b) A Project Management Office under the leadership of Municipal Government of Jingdezhen City will be responsible, *inter alia*, for project management and implementation, procurement and financial management, monitoring and evaluation of

the Project, as well as reporting on progress and implementation issues to the Project Leading Group.

(c) An Expert Group will provide technical support to the PMO.

(d) An Independent Panel of Experts for Environment, Social and Resettlement and Dam Safety will provide advice and guidance on the implementation of the safeguards aspects of the Project.

B. RESULTS MONITORING AND EVALUATION

23. The PMO will monitor project progress and results. An experienced institute will be contracted by the PMO for monitoring and evaluation including collection of baseline data and data on achievement of the key performance indicators listed in Annex 1.

24. The project will also develop and set up a web-based Procurement and Financial Management Information System (PROMIS) to automatically monitor procurement and financial transactions, cross-check data for errors, and alert authorities in a timely way. PROMIS will also provide consolidated data for intermediate result indicators.

C. SUSTAINABILITY

25. Project objectives are aligned with GOC strategic policies on flood protection, as well as those of the provincial, city and county governments. The city government has approved the strategy for integrated flood risk management for the Changjiang River Basin, which will serve as a guiding principle for preparation and implementation of the Master Plan for flood protection of Jingdezhen City. The provincial government is also fully committed to the concept and approach of integrated flood risk management and will extend the concept and approach to other medium and small river basins in the province to ensure sustainability.

26. The project is designed to be sustainable through capacity building of the government officials and specialists responsible for flood management; through including training and workshops, domestic and overseas study tours as well as on-job training in the areas of integrated flood management, financial management, procurement and M&E. O&M plans will be in place to ensure that the Wuxikou Flood Control Scheme and the Food Control Dispatching Center are well maintained and operated after their completion. The project also helps establish policies and regulatory and institutional frameworks for more environmentally sustainable integrated flood risk management for the city (e.g. the city government has approved the basin-wide strategy on integrated flood risk management for the city before project negotiations). These policies and frameworks, as well as operational rules of the project, will be reviewed, approved, and issued as official documents for implementation by Jingdezhen City on completion of the project, and will be extended to other parts of China as a good example for integrated flood risk.

V. KEY RISKS AND MITIGATION MEASURES

A. RISK RATINGS SUMMARY TABLE

Stakeholder Risk	Moderate
Implementing Agency Risk	
- Capacity	Moderate
- Governance	Low
Project Risk	
- Design	Moderate
- Social and Environmental	Substantial
- Program and Donor	-
- Delivery Monitoring and Sustainability	Moderate
Overall Implementation Risk	Substantial

B. OVERALL RISK RATING EXPLANATION

27. The overall implementation risk to achieving the PDO is substantial. The main risks are: (a) technical complexity of the engineering design; (b) integrated approach to flood risk management; (c) scale of resettlement activities and environmental impacts; and (d) failure to implement the agreed ESMP and RAP. Appropriate risk management measures are incorporated in project design and the Bank will provide on-going implementation support.

VI. APPRAISAL SUMMARY

A. ECONOMIC AND FINANCIAL ANALYSES

28. **Economic Analysis**. Cost benefit analysis was carried out to assess the economic viability of the project. The principal project economic benefits are derived from the reduction in the expected future flood losses. Flood frequency and loss data were used to estimate losses under the Without Project and With Project situations, and the difference provides the expected economic benefit (saved costs) of reduced flooding. The project ERR is estimated at 18%[1], indicating the project is economically viable and robust. No sensitivity test was conducted as the analysis excludes non-quantifiable benefits, which are significant; as such, the baseline ERR is considered the minimum return of the project.

29. **Financial / Fiscal Analysis**. Table on Counterpart Funding Requirements in Section III indicates that some $413 million will be required as counterpart funds, primarily for implementing the resettlement action plan. Of this amount, the Central Government will provide about US$154 million, Jiangxi Province about US$48 million, and Jingdezhen Municipal Government some US$211 million. Jiangxi Province will repay the Bank loan, and Jingdezhen City will provide funds for O&M. Given the importance of the project from national, provincial, and municipal perspectives, and the fiscal capacity of these governments, these fiscal

[1] Details analysis, including assumptions and parameters are contained in a report on project economic analysis which is in the project files.

commitments are affordable. The estimated annual O&M costs of about $2 million are a very small fraction of the municipality's 2011 fiscal revenue, which was over $1 billion.

B. TECHNICAL

30. **Project design.** The project design has been guided by the principles of integrated flood risk management approach, and is consistent with the approved 'flood risk management strategy for Jingdezhen City'. It comprises structural measures (Component 1) and non-structural measures (Component 2) to form an integrated flood risk management system for Jingdezhen City. The non-structural measures will contribute to the optimal operation of flood hazard reduction infrastructure such as reservoirs, dikes and storm drainage works, and also enhance the flood resilience of the city and communities through reducing flood exposure and vulnerability.

31. **Option assessment.** The Wuxikou dam/reservoir has been identified as a high priority investment in the Chang/Rao River basin planning study of cascade options. Wuxikou reservoir was assessed against other alternatives as part of Jingdezhen flood control master planning and Wuxikou flood management project feasibility studies. These alternatives include city dikes only, tributary reservoirs with dikes, and Wuxikou reservoir with dikes. The construction of Wuxikou reservoir, in combination with the dikes (now almost completed) along critical sections of the city, was found to be the most cost-effective way of raising the level of flood protection of the city to 1-in-50-years. Options were assessed for dam location and reservoir sizing to optimize the techno-economic parameters and minimize resettlement and land acquisition, as well as environmental impacts. The selected dam design (a 46.8 m high and 498.62 m long concrete gravity dam with a total storage capacity of 474.7 MCM and installed capacity of 32 MW) is based on geological investigations, hydrological and hydraulic/structural analysis, socio-economic & environmental studies, and construction planning undertaken as part of the project feasibility study. It has been endorsed by the national technical authority and the Dam Safety Panel (DSP), and is acceptable to the Bank.

32. **Hydrological and structural safety.** The design flood and safety check flood for this high hazard dam were determined taking into consideration national design standards and international good practice. The design flood for the dam is 1-in-100-years; the structural safety of the dam is designed for 1-in-2,000-year flood. The free board of 1.2m above the safety check flood level provides additional protection.

33. **Connection of the project activities to climate adaptation.** In addition, a flood simulation model was developed during project preparation for dam failure analysis and also provided key information for economic analysis. This model could be used to simulate and analyze the impact of climate change with flood pattern change on the downstream areas including Jingdezhen City and its surrounding areas in the future.

34. **Dam operation.** The primary objective of the Wuxikou reservoir (dam) is flood control. Without compromising the objective, reservoir operating procedures will be finalized before the completion of the dam, also meet the objectives of water supply and power generation, as well as maintaining required environmental flow during the low water season.

35. **Dam safety plans.** Dam safety plans, including instrumentation plan, and the construction supervision plan have been prepared and reviewed by the DSP and the Bank. The operation, maintenance and surveillance plan, and the emergency preparedness plan will be respectively finalized six and twelve months prior to the first reservoir impounding. Dam construction and safety plans will be implemented under the supervision of qualified supervising engineers, the DSP and Jingdezhen water resources bureau. The main civil works contractors will be pre-qualified. The operational safety of Wuxikou Dam will be enhanced by the upgraded flood forecasting system and the decision support system.

C. FINANCIAL MANAGEMENT

36. The Bank loan proceeds, including overseeing the Designated Account (DA), will be managed by Jiangxi Provincial Finance Bureau (JPFB). The FM capacity assessment identified the following principal risks: (a) PMO financial staff does not have experience of Bank-financed projects; (b) timely contribution of counterpart funds is critical, since it accounts for approximately 80% of total project cost.

37. Mitigation measures to address the above risks include: (a) related guidelines and FM/disbursement training to the PMO during project preparation, with additional ad hoc training during project implementation; (b) counterpart funds confirmed by amount and source, and various departments to include a budget line for the project in their annual budgets to secure the required counterpart funds. With the implementation of these proposed actions, the financial management arrangements would satisfy the Bank's minimum requirements under OP/BP 10.02.

D. PROCUREMENT

38. Procurement under the project will be carried out by the PMO in accordance with a Procurement Manual reviewed by the Bank. The PMO will be responsible for all aspects of procurement including procurement planning, procurement cycle management as well as contract management. Three full-time procurement staff members have been designated and are in place. The procurement risk exists primarily because of lack of experience in procurement in Bank-financed projects on the part of the PMO and its procurement staff. All designated procurement staff have attended detailed procurement training provided by the Bank and organized by the PMO, and are required to attend Bank procurement training courses, as appropriate during the project implementation period. A procurement plan, acceptable to the Bank, has been prepared by the PMO for the initial18 months of project implementation. Further details on procurement are provided in Annex 3.

E. SOCIAL (INCLUDING SAFEGUARDS)

39. Positive social impacts of the project include: increased flood protection level in Jingdezhen City from twenty-year flood up to fifty-year flood; city residents would also benefit from the environmental flow of the Changjiang River during the dry season and hydropower to meet the peak demand. Because of dam construction and reservoir inundation, the project has potentially adverse impacts that are addressed in the EA/EMP, RAP and other safeguards documents.

40. **Resettlement at Dam Site and Reservoir**. The Wuxikou reservoir and dam construction would involve the requisitioning of a total of 33,009 mu of land for both reservoir inundation and the establishment of new settlements outside the reservoir area. 10,864 people (2,926 households) in 20 villages would be directly affected by the inundation. Zhitan town would be uprooted with 80 shops and 18 enterprises/institutes, including their 370 staff, and 1,024 rural people (382 households) would have to move out of the town. In addition, 5,240 people (1,497 households) outside the reservoir inundation area would also be affected by the land acquisition for the construction of new settlements and facilities for the reservoir resettlers. The total number of project affected people (PAP) as a result of the Wuxikou reservoir would be 16,104 people (4,423 households). Bank OP4.12 Involuntary Resettlement is thus triggered.

41. A social assessment (SA) was conducted to identify the social risks and impacts of Wuxikou Dam construction. SA results were incorporated into the EIA to guide project design and planning from both the social and environmental perspectives; social management measures were integrated in the ESMP. An extensive resettlement information dissemination campaign has been carried out, which was followed by repeated rounds of intensive consultation among PAP, as well as census, socio-economic surveys and impact inventory. PAP actively participated in the project preparation process, including impact survey, compensation discussion, relocation destination and new site selection. A RAP was developed to ensure the transparent and equitable impact compensation, and practical and sustainable rehabilitation of the PAP livelihoods.

42. **Linked Projects**. Wuxikou Dike Construction in the Jingdezhen City is a linked project, as it contributes to increasing flood protection in the city to one-in-fifty years. Dike construction comprises nine parts, the first five of which have been completed. These first five parts requisitioned 1041.77 mu of land (468.8 mu from collectives and 572.97 mu from the state), resettling 527 rural farmers (130 households) and 2048 urban residents (526 households); they also relocated 279 shops and 23 enterprises. Relocation of 413 urban households in two of the five parts started last year and is still in progress. The possible establishment of the transmission line for hydropower generated by the Dam might require land acquisition in the future, making it another linked project.

43. A Due Diligence Review (DDR) was conducted on the completed resettlement of the five parts of the Dike. The DDR confirmed that land acquisition and house demolition for these five parts of the Dike had been carried out in accordance with national laws and regulations and Bank policy requirements. The Bank will continue to monitor the remaining Dike resettlement implementation.

44. A Resettlement Policy Framework (RPF) has been developed in compliance with OP4.12 requirements for the remaining Dike construction work and for the potential impact by the transmission line. The RPF will guide RAP preparation for these activities.

45. The RAP, DDR and RPF are in compliance with OP4.12 requirements. All social safeguard instruments were disclosed locally on August 30, 2012 and were sent to the InfoShop on September 30, 2012.

46. **Gender Mainstreaming**. The Social Assessment included gender analysis and specific consultations were held separately with men and women. Information collected by the SA has been used for the development of a gender sensitive Resettlement Action Plan (RAP).

47. Component II (Sub-Component 5: Specialized technical training for integrated flood risk management) has been designed in a gender sensitive manner. Community education and awareness raising activities include specific outreach activities for women. Particular attention will also be given to ensuring that a balanced number of women and men are included in community facilitator teams.

48. Gender disaggregated indicators have been included in the Results Framework to assess the extent to which: (a) women have benefitted on par with men from flood prevention activities implemented; (b) community-based awareness raising activities on disaster risk have been effective in reaching women with critical information; and (c) women displaced by the project consider the resettlement measures adequate to meet their needs.

F. ENVIRONMENT (INCLUDING SAFEGUARDS)

49. **Environmental Assessment**. The project is classified as a "Category A" operation under Bank OP 4.01. The project triggers five Bank EA safeguards policies: Environmental Assessment; Natural Habitats; Pest Management; Physical Cultural Resources; and Safety of Dams.

50. Local people will benefit from the project in terms of reduced flood damage, improved water supply and electricity generation. The major environmental consequences of the project stem from the dam and the reservoir it will create.

51. The change in the river flow downstream of the dam will not have significant impacts on aquatic habitats. Minimum flow will be guaranteed at all times to provide sufficient water for downstream users as well as for ecological functions. The change of river morphology will affect or displace some species (e.g., Barbodes); however, none of these are protected species. The EA indicates that most of the fish species can adapt to the new conditions. The project is not expected to alter the existing migration pattern in the River, as long distance fish migration has not been identified in Changjiang River. However, it will contribute to the fragmentation of aquatic habitats and affect fish mobility. As an offset, a fish breeding station will be established: 300,000 young fish will be released in the river each year, and the effects of this activity will be evaluated by qualified scientific institutions. To improve fish diversity, 0.5-1.0 ton of fish will be caught downstream of the dam and released upstream each year.

52. The project will not flood any critical natural habitat. However, impacts on terrestrial biodiversity may occur as a result of increased workers and increased access to the watershed, thus increasing the vulnerability of flora and fauna in the area. The ESMP includes mitigation measures, training, and awareness dissemination to promote natural habitat protection. Regulatory aspects for natural habitat will be reinforced to prevent people from poaching wildlife.

53. The project will affect 662 ha of secondary and regenerated forest, mainly consisting of bamboo, pines and firs; these are common species in sub-tropical monsoon climate zones. The affected area only accounts for approximately 0.2% of the total forest area in Fuliang County. Compensation for the loss of vegetation and forest and compensation for farmers have been included in the ESMP and the RAP.

54. Some physical cultural resources (PCRs) will be flooded, including ancestral houses, ancient trees, and household graves. A PCR management plan has been prepared. Though minor, there would be some adverse impacts associated with the construction of resettlement sites. The siting of resettlement sites has been carefully evaluated. Mosquito and rodent control activities will be carried out during reservoir clearing to protect public health. In addition, resettled families will be provided plots to plant tea, ginseng, oil-tea trees, and bamboo. The management of pesticides and other hazardous chemicals, and a Pest Management Plan are included in the ESMP.

55. There will be large-scale construction activity in the dam site. These construction works and the associated infrastructure will result in adverse impacts, such as land acquisition, dust, noise, air quality, waste generation, soil erosion, and other aspects of work camp management. These will be mitigated or minimized through site-specific mitigation measures and environmental specification for contractors.

56. **Cumulative Impacts**. Combined with the existing hydropower facilities and a likely hydropower project, the proposed project could create cumulative impacts beyond its immediate area of influence, such as contribution to the fragmentation of aquatic habitats exerted by the development of cascade dams. A cumulative impacts study has been carried out, covering the broader project area. The Supplemental Environmental Impact Assessment Report (SEIA), Cumulative Impact Assessment report (CIA), and ESMP propose measures (e.g., aquatic habitats protection) to address identified cumulative impacts, further studies, and an adaptive management approach involving modifying programs based on monitoring and evaluation of their environmental performance. A Comprehensive Reservoir Management Plan (CRMP) Development Study will be carried out to identify issues related to future monitoring and adaptive management. The study outcome will be reviewed and approved prior to reservoir inundation. Terms of reference for the CRMP Development Study and for the second phase of the CIA study are included in the ESMP.

57. **Public Consultations and Information Disclosure**. In accordance with Bank Safeguard policies and Chinese regulations, public consultations were conducted from 2008 to 2012, including public consultation meetings and questionnaire survey, with project affected persons and other stakeholders. Opinions and concerns expressed have been taken into account in the EA process and in project design. The EA and the ESMP were locally disclosed in August 2012 through announcements in the local website and newspaper. The EA documents were sent to the Bank InfoShop for disclosure on October 5, 2012.

G. OTHER SAFEGUARDS POLICIES TRIGGERED (IF REQUIRED)

58. **Safety of Dams**. Bank policy on Safety of Dams (OP/BP 4.37) is triggered by the project because it supports the construction of a major dam at Wuxikou. An independent dam safety panel of experts (DSP) has been appointed to undertake necessary safety reviews of the design and dam safety plans for the Wuxikou dam. The DSP also reviewed the safety status, O&M procedures and management arrangements for 17 existing dams on the tributaries of the Changjiang River, and found these dams operationally safe. It provided satisfactory review reports with recommendations on improving the Wuxikou dam safety plans, and on enhancing the safety management of the existing dams. Arrangements included in the project implementation plan for managing dam safety are in accordance with Bank policy requirements.

Annex 1: Results Framework and Monitoring
China: Jiangxi Wuxikou Integrated Flood Management Project

Results Framework

Project Development Objective (PDO): The project development objective is to reduce the flood risk in the central urban area of Jingdezhen City through implementation of priority structural and non-structural measures, and contribute to establishment of an integrated flood risk management system for the City.

PDO Level Results Indicators	Core	Unit of Measure	Baseline (2012)	Cumulative Target Values[1]						Frequency	Data Source	Data Collection	Description
				2014	2015	2016	2017	2018	2019				
PO-1: Percentage of urban population protected from 1-in 50-year floods (disaggregated by gender)	☐	% (male and female)	30%	30%	30%	40%	50%	70%	80%	Annually	Annual Report	Water Affairs Bureau/PMO	By independent consultant
PO-2: The flood protection level is increased from 20-year flood to 50-year flood	☐	Flood protection level	20-year flood	20-year flood	20-year flood	30-year flood	40-year flood	40-year flood	50-year flood	Annually	Annual Report	Water Affairs Bureau/PMO	By independent consultant
PO-3: Total area subject to inundation by 1-in-50-year floods	☐	km^2	35.58	35.58	35.58	20.58	10.58	5.58	3.56	Annually	Annual Report	Water Affairs Bureau/PMO	By independent consultant
Intermediate Result Indicators by Component													
Component I: Construction of Wuxikou Flood Control Scheme													
IO-1: Progress in dam construction	☐	%	0	20	50	70	80	90	100	Annually	Data collected on site	Water Affairs Bureau /PMO	By independent consultant
IO-2: Minimum environment flow and water supply[2] provided	☐	m^3/s	15	15	15	15	15	15	15	Annually	Annual Report	Water Affairs Bureau /PMO	By independent consultant
IO-3: Operation & Maintenance Plan for Wuxikou Flood Control Scheme gets approved by Jingdezhen municipal government	☐	Status	N/A	N/A	N/A	N/A	Preparation	Approved by June 30	Implementation	Annually	Annual Report	Water Affairs Bureau /PMO	By independent consultant
Component II: Establishment of Integrated Flood Risk Management System													
IO-4: Progress in Master Plan	☐	Status	No Plan	Prepara	Prepara	Prepara	Approv	Implem	Impleme	Annually	Data	Water Affairs	By

[1] The cumulative target value is indicative for scheduling implementation of the project.
[2] The 15 m^3/s includes the minimum environment flow 8.87 m^3/s, which are 10% of the annual average flow discharge of the Changjiang River, plus the flow discharges of 6.13 m^3/s for downstream water supply.

development and government review and approval				tion	tion	tion	ed by June 30	entation	ntation		collected on site	Bureau /PMO	independent consultant
IO-5: Progress in DSS establishment with quality control	☐	%	0	20	50	70	90	100	Impleme ntation	Annually	Data collected on site	Water Affairs Bureau /PMO	By independent consultant
IO-6: No. of people participating in the flood-risk management and answered the flood-risk awareness questionnaire (disaggregated by Gender)	☐	10,000 (male/femal e)	5/5	10/10	12/12	16/16	18/18	20/20	22/22	Annually	Annual Report	Water Affairs Bureau /PMO	By independent consultant
IO-7: Operation & Maintenance Plan for DSS gets approved by Jingdezhen municipal government	☐	Status	N/A	N/A	N/A	Prepara tion	Approv ed by June 30	Implem entation	Impleme ntation	Annually	Annual Report	Water Affairs Bureau /PMO	By independent consultant
Component III: Implementation of Resettlement Action Plan (NBF)													
IO-8: No. of people relocated with proper compensation and livelihood restoration	☐	Person	0	1,000	2,500	4,000	6,000	8,000	10,104	Annually	Annual Report	Water Affairs Bureau /PMO	By independent consultant
IO-9: No. of people whose land was levied and properly compensated	☐	Person	0	800	2,000	3,500	4,500	5,500	6,801	Annually	Annual Report	Water Affairs Bureau /PMO	By independent consultant
IO-10: Percentage of male and female displaced residents' reporting that conditions in resettlement sites are satisfactory	☐	%	0%	85% male 85% female	85% male 85% female	85% male 85% female	85% male 85% female	85% male 85% female	85% male 85% female	Annually	Annual Report	Water Affairs Bureau /PMO	By independent consultant
Component IV: Project Management and Implementation Support													
IO-11: No. of staff from PMO and related bureaus (including decision makers) attend trainings and study tours (both domestic and off-shore) and pass government test on project management and flood risk management.	☐	Person	0	20	40	50	60	60	60	Annually	Annual Report	Water Affairs Bureau /PMO	By independent consultant
IO-12: Management Information System (MIS) is well maintained and fully utilized to generate various reports	☐	Utilization Status	No	Yes	Yes	Yes	Yes	Yes	Yes	Annually	Annual Report	Water Affairs Bureau /PMO	By independent consultant

Annex 2: Detailed Project Description
China: Jiangxi Wuxikou Integrated Flood Management Project

1. The project is located in the Jingdezhen municipality of Jiangxi Province, in the middle reach of Changjiang river basin. Jingdezhen city (core urban areas of the municipality) has a population of 480,000 and is subject to frequent major river floods, with dire socio-economic consequences. The project seeks to reduce flood risk in the central urban area of Jingdezhen City through implementation of priority structural and non-structural measures. It will help increase the flood protection level from 1-in-20-year floods to 1-in-50-year floods, and contribute to the establishment of an integrated flood risk management for the city.

2. Wuxikou Dam, the key element of the project, will be located on the main stem of the Changjiang River and will be a part of the flood protection system for Jingdezhen City which is situated about 40 km downstream. The secondary purposes of the dam will be hydropower (32 MW, 81 GWh/year) and domestic water supply. The catchment area upstream of the dam site is 2,915 km2. The mean annual run off of the Changjiang River at Wuxikou is 2.81 billion m3, and the average discharge volume is 89 m^3/s. The main rainy season is from April to September.

3. The project development objective is to reduce flood risk in the central urban area of Jingdezhen City through implementation of priority structural and non-structural measures, and contribute to establishment of an integrated flood risk management system for the City.

4. The proposed Project has four project components as described below:

Component 1: Construction of Wuxikou Flood Control Scheme (US$114.86 million), which consists of the following three subcomponents:

(a) Construction of a concrete gravity dam of with a maximum dam height of 46.8 m and crest length of 498.62 m, of which the left and right portions with a total length of 271.52m are RCC (quantity: some 0.10MCM); a gated overflow spillway with five gates (length: 78 m) and 6 bottom outlets (length: 106 m); and a small hydropower plant (powerhouse dimensions: 66.12 m x 57.0 8m x 47.70 m) with total installed capacity of 32 MW and annual power generation of 81,210 MWh. The dam structure will create a reservoir of 474 MCM total storage capacity, of which 296 MCM will be for flood regulation.

(b) Provide electro-mechanical equipment and hydropower units: the electro-mechanical equipment include 5 radial gates for a 78 m wide surface spillway (each of 12 m x 6 m) and 6 plane gates for the outlets (each of 12 m x 9 m) as well as necessary equipment for dam operation and maintenance; the hydropower units include two 15 MW and one 2 MW turbine-generator units, a switchyard and 2 transformers.

(c) To support the implementation of the environmental and social management plan (ESMP): this is for implementing the environmental mitigation measures resulted from the environmental assessment for the dam.

(d) Carrying out of: (i) a comprehensive reservoir management plan development study to identify issues related to future monitoring and adaptive management of the implementation of the ESMP based on evaluation of environment performance; and (ii) a second phase cumulative impact assessment of the Project in the entire Changjiang River Basin.

Component 2: Capacity Building[1] for Integrated Flood Risk Management System (US$9.40 million), which consists of the following five subcomponents:

(a) *Preparation of master plan for integrated flood risk management (US$1.2 million).* The sub-component will develop a Master Plan (US$1 million) based on the Integrated Flood Risk Management Strategy of Jingdezhen City, draw upon international good practice, introduce risk-based flood management concept and approach, and address key aspects of flood risk management (ranging from risk reduction at source to protection and resilience/adaptation, e.g., risk mapping and land use zoning, to response and recovery). The master plan will identify problems, opportunities and constraints of flood risk management in the basin context; set goals and objectives; establish policies and priorities that govern overall effort; propose criteria and standards for evaluating systems' performance under future development scenarios; and develop a priority action plan. The sub-component will also support the implementation of the priority action plan to be launched after the Mid Term Review.

(b) *Development of integrated flood risk management decision system (US$1.59 million).* The sub-component will develop a real-time flood forecasting and early warning system (modeling system) coupled with database, GIS and network technologies. Based on this, an integrated flood management decision support system will be developed to enhance the flood risk management capacity of government agencies. In addition, optimal dispatching rules for Wuxikou Water Control Scheme will be prepared to achieve maximum flood control and additional benefits, e.g., water supply and hydropower generation. The optimal dispatching rules will be incorporated into the decision support system. The sub-component will enable the recruitment of an international consulting firm for the development of the Integrated Flood Risk Management Decision Support System.

(c) *Construction of municipal flood control and dispatching center (US$3.14 million).* The sub-component will finance the design study , and the construction of the Municipal Flood Management and Dispatching Center to facilitate the functioning of the municipal Flood Dispatching Headquarters, Flood Control Office, and for other flood management activities related to the implementation of the Integrated Flood Risk Management Strategy and Master Plan. The Center will include meeting rooms and facilities for joint decision making related to flood emergency response, stakeholder consultation, exhibition and public information, warehouse, and office rooms. The Center will become a national center of excellence for flood risk management. The sub-component will

[1] These interventions are the results of a screening process using the 'buying-down flood risks' screening matrix for this project, which is given in the Appendix to Annex 2. The Bank mission has provided a guidance note to the PMO for preparation of the TORs for subcomponents (a), (b), (d) and (e) and the FSR for subcomponent (c).

provide for: (i) recruitment of a consulting firm for the detailed design and equipment study of the Center, and preparation of bidding documents; and (ii) selection of a civil works contractor for the construction of the building.

(d) *Provision of equipment for municipal flood control and dispatching center (USD2.49 million).* The sub-component will provide funds to procure equipment for the Municipal Flood Control and Dispatching Center to facilitate the functioning of the municipal Flood Dispatching Headquarters, Flood Control Office, and for other flood management activities related to the implementation of the Integrated Flood Risk Management Strategy and Master Plan.

(e) *Awareness raising and community engagement in integrated flood management (US$0.5 million).* The sub-component will provide training, both on-job-training and specific technical training, and high level technical assistance in modern flood forecast technologies and DSS and overall flood risk management which will be arranged at home and abroad; and specialized seminars and workshops. The sub-component will be implemented through a consultant, who will prepare a detailed capacity building needs assessment, a training plan, and provide support for its implementation.

(f) *Specialized technical training for integrated flood risk management (US$0.48 million).* This sub-component will help raise awareness and engage different interest groups on the risks they face and the steps that they can take to reduce these risks. It will include: (i) an education and awareness raising campaign on flood risk management, which will reach all interest groups involved, with a particular attention to leaders and government officials at different levels, the general public (including the more vulnerable groups, e.g., low-income groups, women, children, aged and disabled people and businesses); (ii) pilots on community education and awareness raising on flood risk management, e.g., emergency preparedness, emergency response demonstration, flood risk maps and land use zoning , and river protection. Particular attention will be paid to ensuring that awareness raising activities take into account the specific needs of women in the community in terms of disaster prevention and response.

Component 3: Implementation of Resettlement Action Plan (US$384.61 million to be fully financed by government): Carrying out of a program for the resettlement and rehabilitation of people affected by the implementation of the project.

There are two sub-components under Wuxikou resettlement: reservoir resettlement and dam site resettlement, with a resettlement budget of RMB2, 444.51 million, of which the reservoir resettlement accounts for 98.3 percent ($380.88 million) and the dam site resettlement for 1.7 percent ($7.13 million).

Preparation of the resettlement component includes design and planning for resettlement management and implementation. A Resettlement Plan (RAP) has been developed to direct impact compensation and livelihood rehabilitation of PAP during the component implementation based on resettlement census, socio-economic surveys, and informed consultation among the PAP. Resettlement implementation personnel and organization

has been established in the PMO and the related county and township authorities, and internal and external resettlement monitoring agencies have been invited for M&E of the RAP implementation.

The RAP will be implemented in gender-sensitive manner: (a) that consultations with women have been undertaken to understand their requirements in terms of resettlement and especially livelihood restoration; and (b) where relevant, measures would be put in place to ensure that women have equal access to compensation provided (be it titles to land and/or cash compensation). Some measures usually applied are joint titling by husband and wife (where land for land compensation is used) and the requirement that the signature of both spouses is used for access to bank accounts where cash compensation is provided.

Component 4: Project Management and Implementation Support (US$2.39million): Strengthening the capacity of Jingdezhen City to implement and manage the project through, inter alia.

(a) Provision of consulting services to enhance engineering design, construction supervision, dam safety and environmental and social management.
(b) Carrying out of capacity building activities through workshops, training and study tours.
(c) Establishment and operation of a monitoring and evaluation system, including a project management information system.
(d) Acquisition of office equipment and vehicles, and provision of operating resources.

Appendix to Annex 2
'Buying down' flood risks - Screening & Prioritizing FRM Interventions from Source to Receptor

Management Mechanisms and Tools		Key Measures	Status/Plan	Gaps and Actions Needed	Cost-effectiveness & Priority Level	Interventions under WFMP	Remarks
Flood Risk Management Institution	Flood management organization	Participatory Management organizations	Existing multi-stakeholder organizations are in general satisfactory	Inter-agency coordination is subjected to evaluation for IFRM.	Low cost and very high benefit, high priority	Existing organizations will be evaluated during project preparation and needed changes identified	Organizations Include policy and operational levels
	Flood risk management policy and regulations	Management Policy and Regulations	General management policy and detailed regulation (incl. financing mechanism) are in place	The policy and regulations need to be reviewed in light of the needs for IFRM.	Low cost and very high benefit, high priority	Existing policy and regulations will be reviewed during project preparation and necessary actions included under capacity-building activities of the Project.	
Flood Risk Management Strategy and Plan	Management information/ knowledge base	1. Management information system (Hydro met, Asset management, socio-economic database of city); 2. Flood risk assessment and mapping	1. Good Hydro met system in place; asset management system under development 2. Flood inundation maps exist.	1. Inter-agency data sharing requires enhancement 2. Flood maps with inundation depth, duration &locations not available, and flood risk assess to be conducted.	Low cost and high benefit, high priority	1. Data-sharing arrangements will be reviewed and needed actions taken; 2. Flood risk assessment & mapping will be included under the Project	Some rainfall stations in remote u/s areas, and flow stations on main tributaries to be added via government programs
	Strategy and Master Plan for FRM	1. Long-term strategy; 2. A Master Plan for Medium Term	1. No written management strategy; 2. A infrastructure oriented master plan exists and is being updated	1. A clear strategy based on 'live and build with flood' principle is needed; 2. Existing Master Plan needs to be upgraded into an integrated FRM Master Plan	1. FRM Strategy: low cost and high benefit, high priority 2. IFRM Master Plan upgrading: low cost and high benefit, high priority	1. A FRM strategy for JDZ City will be reviewed and improved during Project Preparation; 2. A Master Plan for IFRM in JDZ City to be upgraded under the Project	The Master Planning TA will be linked to the DSS development for FRM under the Project
Catchment	River watershed	Soil and water	Very good	Wuxikou reservoir	Medium cost and	No interventions is	

Management Mechanisms and Tools		Key Measures	Status/Plan	Gaps and Actions Needed	Cost-effectiveness & Priority Level	Interventions under WFMP	Remarks
Management		conservation	vegetation coverage with little land erosion in river catchment	construction effect on local watershed needs to be managed carefully	high benefit, medium priority	expected except environmental management plan	
	Urban watershed	Management practices to increase rainfall infiltration, reduce flood peak and land erosion	Urban development policies encourage greening of city landscape	Green and multiple function infrastructure needs to be promoted where appropriate	Medium cost and benefit, medium priority	Needs and measures for urban watershed management improvement will be reviewed under IFRM Master Plan	Jingdezhen is a hilly city with limited land area
Flood storage and regulation	River flood storage/regulation	1. Wuxikou reservoir construction on Changjiang River; 2. Utilization of existing tributary reservoirs (small/medium sized)	1. Wuxikou reservoir of 0.5BCM capacity in design stage; 2. Most tributary reservoir spillways are ungated	1. Wuxikou reservoir needed to raise protection level to 1-in-50-year flood; 2. Storage capacity of tributary reservoirs needs to be fully utilized for flood hazard reduction.	High cost and very high benefit, high priority due to its critical importance in flood risk reduction	The multipurpose Wuxikou reservoir will be financed by the project, with joint operation of tributary reservoirs; Environmental and social considerations are important factors in reservoir option assessment and design	Gate addition and dam heightening of tributary reservoirs to be included in medium-term Gov. programs to further increase protection level
	Flood Retention/detention	Construction of retention and/or detention basins and ponds	A number of lakes and ponds exist in the urban areas	Full utilization of existing ponds and lakes needs to be reviewed	Cost could be very high with limited benefits owing to local topography, low priority	The FRM Master Plan will examine possibility of expanding retention and detention capacity	
Local Flood protection	Dikes and polders	Construction of river dikes along key river sections	Construction of river dikes to protect core urban areas will be completed before 2012 flood season	Flood protection level can reach 1-in- 20-year flood with these dikes (greening measures included)	Relatively high cost and high benefit, high priority due to its critical function	The dike system will be reviewed as part of the physical flood defense system during Master Plan upgrading	
Flood/storm water drainage	River restoration	River channel normalization and	River channelized	The river sections to be dredged, with	Medium cost and benefit expected,	River dredging will be evaluated under the	River dredging will be

Management Mechanisms and Tools		Key Measures	Status/Plan	Gaps and Actions Needed	Cost-effectiveness & Priority Level	Interventions under WFMP	Remarks
		dredging	with bank protection in urban area; need for limited river dredging is investigated	benefits and costs need to be identified, and included in longer term plan.	relatively low priority	Master Planning activity.	undertaken by government program in medium term
	Storm drainage system	New construction of storm drainage facilities and upgrading of existing ones	Existing sewer system to be separated to storm &sewer systems; 5 of planned 9 storm pump stations built	Effectiveness of the planned separate sewer systems and the pumping stations are to be evaluated quantitatively.	Medium costs and benefits, high priority	Effectiveness of separate storm drainage system and pumping stations will be evaluated as part of the IFRM Master Planning task	Construction and upgrading are fully financed by the municipal government
Flood Resilience, Adaptation & Emergency Response	Land use management	Land use planning and zoning based on flood risk	Land use plan does not fully reflect flood risks	No guidelines for land use planning and development considering flood risk	Long cost, high priority (for medium term)	Land use zoning is to be included under the Project	Recommend-actions for land use planning& development to be included in upgraded Master Plan
	Flood adaptation	Water-sensitive development and management practices and beneficiary behavior to better use ecological service and increase flood resilience	Building design considers flood proofing measures, important works (e.g. power plant) being located away from high risk zone	Potential of more natural flood risk reduction and adaptation measures (incl. eco-system enhancement and such market mechanism as insurance) needs to be explored	Relative low and high benefit, relatively high priority	Further demand-side management measures will be considered under the updated Master Plan	Training on Green Water Defense approach to flood risk management will be provided
	Flood forecasting & early warning	Flood related Information gathering and transmission system	Real-time data transmission system is available (See above regarding hydromet system)	Existing hydromet system generally adequate for flood forecasting and early warning; additional rainfall stations in remote u/s areas, and	Relatively low cost and high benefit, high priority	Limited essential equipment may be financed under the Project	The planned construction will be financed by government through separate programs

Management Mechanisms and Tools		Key Measures	Status/Plan	Gaps and Actions Needed	Cost-effectiveness & Priority Level	Interventions under WFMP	Remarks
				flow stations on main tributaries needed			
		Decision-support system (DSS) for flood forecasting and early warning	Existing flood forecasting is based on a rainfall-stage relationship and a conceptual rainfall-runoff model	Current approach is inappropriate after Wuxikou Reservoir is constructed. A new DSS for flood forecasting and early warning to be established with reliable real-time data transmission and processing	Relatively low cost and very high benefit, very high priority	An IFRM DSS (including database, GIS, optimal reservoir joint operation scheme, flood forecast and early warning, flood damage analysis and a DSS platform) is to be included under the Project	
	capacity-building for flood risk management operations	Capacity building and training activities targeted at management and operation agencies	Regular training is provided, but mostly on engineering and general management aspects	Training and capacity-building for risk-based flood management and operation are lacking and much needed	Cost relatively low with high benefits, relatively high priority	Capacity building/training on IFRM for flood management agencies is part of the Project design	
	Emergency preparedness and response system	Emergency response organization and plan	An effective emergency response system in place and well functional	The existing system is generally effective, although Community tends to be reactive	Low cost and very high benefit, very high priority	A community-based flood response pilot is to be included under the Project to enhance community participation	EPP needs to incorporate risks associated with new dam & dikes
	Community awareness raising	Community awareness raising and education	Community awareness is relatively high due to frequent flood events	Much more can be done to enhance adaptation and emergency preparedness (going beyond emergency response)	Very low cost and high benefit, relatively high priority	Community awareness raising and education are included under the Project	Community awareness and education can lead to better flood preparedness and more effective risk management
Post-flood recovery	Post-flood recovery system	1. Damage/loss assessment;	The city has a functional post-	The existing recovery system is in general	Essentially; Cost and benefit depends	Training will be provided under the	

Management Mechanisms and Tools		Key Measures	Status/Plan	Gaps and Actions Needed	Cost-effectiveness & Priority Level	Interventions under WFMP	Remarks
		2. Post-disaster recovery planning and implementation	flood recovery system as proven in recent years' floods	satisfactory;	on damage, medium priority	project for flood damage/loss assessment	

Flood Risk = SUM (Flood Hazard Probability x Consequence of Flood Events); Consequence of flood events is a function of exposure and vulnerability

Annex 3: Implementation Arrangements
China: Jiangxi Wuxikou Integrated Flood Management Project

A. Project Institutional and Implementation Arrangements

1. Overall flood management responsibility in Jingdezhen city rests with the City Flood Command Center headed by the Mayor, with members from all related sector agencies (water affairs, hydrology, meteorology, agriculture and construction, etc.) and the army. The City Water Affairs Bureau serves as the Flood Control Office (and Technical Secretariat) of the Command Center. A River and Dike Management Bureau under the Water Affairs Bureau is responsible for managing the dike system and urban drainage. Hydrological and meteorological data collection, processing and analysis are carried out respectively by the Hydrological Bureau and Meteorological Center. Operating rules of flood control works are vetted by the flood control office located in the Water Affairs Bureau, and flood forecasting and early warning are the responsibility of the same office.

2. The necessary institutional arrangements have been made for project implementation and are summarized below, while the organizational chart is given in Appendix 1 to Annex 3.

(a) The Project Leading Group at the municipal level in Jingdezhen City, chaired by the Vice Mayor of Jingdezhen City and consisting of directors from the line government departments of the City, including, *inter alia*, the Finance Bureau, Development and Reform Commission, Water Affairs Bureau, Construction Bureau and Environmental Protection Bureau of the City, will be responsible for overseeing project implementation, decide on key Project issues and coordinate amongst agencies at the municipal level.
(b) The Project Management Office, under the leadership of Municipal Government of Jingdezhen City, will be responsible, *inter alia*, for Project management and implementation, procurement and financial management, monitoring and evaluation of the Project, as well as reporting on progress and implementation issues to the Project Leading Group.
(c) The expert Group will provide technical support to the PMO in Project management and implementation.
(d) The Independent Panel of Experts for Environment, Social and Resettlement and Dam Safety will provide advice and guidance on the implementation of the safeguards aspects of the Project.

B. Financial Management

3. The FM capacity assessment identified the following principal risks: (a) financial staff at the PMO does not have experience with Bank-financed projects; (b) timely contribution of counterpart funds is critical, since it accounts for approximately 80% of total project cost.

4. Mitigation measures to address the above risks include: (a) related guidelines and FM/disbursement training will be provided to the PMO and the Bank will provide *ad hoc* training during project implementation; (b) counterpart funds will be confirmed by amount and

source, and relevant departments will include a budget line for this project in their annual budgets to secure the required project counterpart funds. The residual financial management risk is assessed as Moderate.

5. **Budget**. The annual project implementation plan, including the funding budget and resources, will be prepared by the PMO. Budget for counterpart funds committed by local government will be reviewed and approved by local People's Congress and will be included in the sectoral budget. Based on the approved budget and implementation progress, the related finance bureau will provide government appropriations to the project. Budget variance analysis will be conducted on a semi-annual basis by the PMO and necessary actions will be taken to implement the project as planned.

6. **Funds Flow**. Bank loan proceeds will flow from the Bank into the project DA to be set up at and managed by JPFB. JPFB will be directly responsible for the management, maintenance and reconciliation of the DA activities. Supporting documents required for Bank disbursements will be prepared and submitted by the PMO through Jingdezhen municipal finance bureau (MFB) for review and verification before sending to JPFB for further disbursement processing. The reimbursed funds will flow from JPFB to MFB and finally to the PMO or contractors or suppliers.

7. **Accounting and Reporting.** The administration, accounting and reporting of the project will be set up in accordance with Circular No.13: "Accounting Regulations for World Bank-financed Projects" issued in January 2000 by MOF.

8. The PMO will manage, monitor and maintain project accounting records. The PMO will work with JPFB to prepare the consolidated project financial statements. The unaudited semi-annual project interim financial reports (IFRs) in accordance with the aforementioned Circular No.13 agreed with MOF will be furnished to the Bank by the PMO no later than 45 days following each semester (the due dates will be August 15 and February 15).

9. **Internal Control**. The related accounting policy, procedures and regulations were issued by MOF to uniformly align the financial management and disbursement requirements for all Bank financed projects.

10. **Auditing**. Jiangxi Provincial Audit Office (JPAO) has been identified as the auditors for the project. Annual audit report will be issued by JPAO. The annual audit report of project financial statements will be due to the Bank within 6 months after the end of each calendar year. The Bank will make them available to the public in accordance with Bank Policy on Access to Information.

C. Disbursements

11. 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 are documented in the Disbursement Letter.

12. The project will have a DA in US dollar, which will be opened at a commercial bank acceptable to the Bank and will be managed by JPFB. The ceiling of the DA is documented in the Disbursement Letter.

13. The Bank loan would be disbursed against eligible expenditures (taxes inclusive) as in the following table:

Disbursement Categories	IBRD Loan	
	Allocated Amount (US$, Million)	Percentage of Expenditures to be financed
Works	91.24	77%
Goods	3.03	100%
Consultants' services, training, workshops and study tour	5.48	100%
Front-end Fee	0.25	100%
Total	100	

14. Retroactive financing will be allowed under the project as stipulated in the legal agreement for eligible expenditures, up to an aggregate amount not exceeding US$20 million for payments made up to within 12 months prior to the date of Loan Signing.

D. Procurement

15. **Capacity Assessment.** The procurement capacity and risks assessment identified the possibility of noncompliance and delays in processing procurement as the key procurement risks. The main reasons are the PMO's lack of experience in procurement under Bank-financed projects and the differences between Bank procurement policies and procedures and domestic procurement regulations and procedures. A capacity strengthening and risks mitigation action plan, agreed with the PMO, includes the following measures: (a) procurement training provided by the Bank during project preparation; (b) preparation and implementation of a procurement and contract management training plan by the PMO to train procurement staff before and during project implementation; (c) preparation and issuance of a procurement manual by the PMO to standardize project procurement procedures and provide guidance to project staff; and (d) a Procurement Agent with experience in World Bank procurement procedures will be recruited by the PMO to assist with procurement planning and implementation. The overall procurement risk is rated 'moderate'.

16. **Applicable Guidelines**. Procurement will be carried out in accordance with the "*Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans And IDA Credits & Grants by World Bank Borrowers*" dated January 2011; "*Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*" dated January 2011; and the provisions stipulated in the Legal Agreement. NCB shall be carried out in accordance with the Law on Tendering and Bidding of the People's Republic of China promulgated by order of the President of the People's Republic of China on August 30, 1999 subject to the modifications stipulated in the Legal Agreement.

17. **Procurement of works**. Works procured under this project will include: (a) Construction of Wuxikou flood control scheme - a concrete gravity dam with maximum dam height of 46.8 m and a crest length of 498.62 m, flood handling structures and appurtenant structures; (b) construction of a power station with three turbines and generating units, with a total installed capacity of 32 MW and (c) construction of municipal flood control and dispatching headquarters building.

18. **Selection of Consultants**. Consulting services will include: (a) integrated urban flood risk management strategy for Jingdezhen city; and (b) development of an integrated flood management decision supporting system, etc. Universities and research institutes may be included in shortlists as a source of consultants, provided they possess the relevant qualifications and are not in a conflict of interest situation. In such cases, QBS or CQS (for small assignments) would be used, if the shortlist also includes consulting firms.

19. **Training and workshops.** Plans for training and workshops will be developed by the PMO, and included in annual project work plan. Expenditures incurred in accordance with the approved plans for training and workshops will be the basis for reimbursement.

20. **Procurement Plan**. A procurement plan, acceptable to the Bank, has been prepared by the PMO for the initial18 months of project implementation. It will be made available in the project's database and on the Bank's external website. The procurement plan will be updated annually or as required to reflect implementation needs and improvements in institutional capacity.

21. **Frequency of Procurement Supervision**. Prior review supervision will be carried out through the World Bank office in Beijing. Procurement post reviews will be carried out by the Bank every 12 months. The procurement post review sampling ratio will be one out of five contracts.

22. **Prior-Review Thresholds**. The prior-review thresholds are indicated in the table below:

Procurement Thresholds

	Prior review thresholds (US$ million)	Procurement/selection method thresholds (US$ million)						
		ICB	NCB	SHOPPING	QCBS	QBS	CQS	SSS
Goods and Non-consulting Services	≥3.0 and first 2 NCB goods and non-consulting services contracts irrespective of value	≥3.0	<3.0	<0.1				
Works	≥15.0 and	≥25	<25	<0.2				

	first 2 NCB works contracts irrespective of value							
Consulting services	≥0.3 and first contract for each selection method for firms; ≥0.05 for individuals; All for SSS				--	--	<0.3	--

Note: (a) "--" refers to no threshold.

23. **Advance Contracting and Retroactive financing**. Part of civil works and consulting services are expected to be contracted in advance of the loan signing date and financed under retroactive financing. These contracts are included in the procurement plan and will be subject to prior review.

24. Tables below list civil works and consulting services contracts subject to international competition in the first 18 months of project implementation, as well as contracts expected to be financed under retroactive financing.

ICB Works Contract

Ref. No.	Description	Procurement Method	Pre-Qualification	Domestic Preference (Yes/No)	Review by Bank (Prior / Post)	Advance Contracting (Yes/No)
JDZ-WXK-TJ-01	Dam Works including flood handling structures and appurtenant structures	ICB	Yes	No	Prior	Yes

Consulting Services Contracts

Ref. No.	Description of Assignment	Selection Method	Review by Bank (Prior / Post)	Advance Contracting (Yes/No)
JDZ-WXK-ZX-01	Flood risk analysis and risk map drawing of Jingdezhen City	QCBS/QBS	Prior	No
JDZ-WXK-ZX-08	Flood control system	QCBS/QBS	Prior	No

Ref. No.	Description of Assignment	Selection Method	Review by Bank (Prior / Post)	Advance Contracting (Yes/No)
	development of Jingdezhen City			
JDZ-WXK-ZX-12	Flood risk management decision support systems integration of Jingdezhen City	QCBS/QBS	Prior	No
JDZ-WXK-ZX-5	Project Monitoring and Evaluation	CQS	Prior	Yes
JDZ-WXK-ZX-6	Project Management Information System	CQS	Prior	Yes
JDZ-WXK-ZX-17-24	8 Individual Consultants	IC	Prior	Yes

E. Environmental (including safeguards)

25. The project is classified as a "Category A" operation under Bank OP 4.01. The project triggers five World Bank EA safeguards policies: Environmental Assessment; Natural Habitats; Pest Management; Physical Cultural Resources; and Safety of Dams.

26. The package of EA safeguards documents for the project comprises five reports: (a) a domestic EA report; (b) a Supplemental EA report (SEIA); (c) a Cumulative Impact Assessment report (CIA); (d) a stand-alone Environment Management Plan and Social Management Plan; and (e) an Executive Summary of environment impact assessment. These documents provide background and technical information on expected impacts of the project; mitigation and compensation measures proposed; implementation arrangements, including institutional responsibilities, budgets and timelines; and monitoring and supervision plans to ensure compliance with commitments made by the project proponent.

Environmental Assessment (OP/BP 4.01), Natural Habitats (OP 4.04), Pest Management (OP 4.09), and Physical Cultural Resources (OP 4.11)

27. A comprehensive ESMP, acceptable to the Bank, has been prepared. Main issues addressed in the EIA, SEIA, and ESMP are summarized below.

28. **Analysis of Alternatives.** The EA includes a comprehensive review of the alternatives considered during the project feasibility study and project design, comparing them against technical, environmental and social criteria. Some engineering designs that do not have significant environmental and social impacts are not discussed in the EA, but are covered in the detailed feasibility and engineering studies. The alternative analysis consists of: (a) with and without project scenarios; (b) dam site options, with three sites evaluated; (c) water storage level options for reservoir operation; and (d) fish pass analysis.

29. **Construction Impacts**. Construction of the dam and ancillary infrastructure will cause potentially significant negative impacts on nearby villages and surrounding environment and

aquatic habitats. These include: proper management of two burrowing sites and two spoil disposal sites; river and drainage crossings; reduction of nuisances such as dust, noise, wastewater; increased traffic; safety concerns; and the presence of approximately 800 workers near small villages. A soil and water conservation plan has been prepared. Environmental and social specifications will be included in all bidding documents and contracts. Traffic management during construction will require strict controls to minimize disturbance to local villages. Training will be provided to workers and local people on protection of nature reserves.

30. **Downstream Impacts**. Annual downstream flows will not change much, although the reservoir operation will equalize the natural stream flow during the year to some extent. Minimum flow ($15m^3/s$) will be guaranteed to provide sufficient water for downstream users as well as for ecological functions during the impounding period and the operation stage.

31. Water release from the dam may decrease downstream temeratures by a maximum 2.4ºC and increase by maximum 3.3ºC. Temperature monitoring is included in the ESMP, based on which the project proponent will develop concrete management measures.

32. The project will not have significant impacts on the downstream Poyang Lake, as the annual flow of Changjiang River only accounts for 2%-3% of the total flows into the Poyang Lake.

33. **Water Quality**. Water quality in the reservoir may be harmed by the following: (a) decomposition of organic matter in the reservoir may create conditions of low oxygen and high nutrient levels; (b) non-point source pollution and sewage discharged from townships upstream; and (c) a weak and unstable tendency for thermal stratification in the reservoir. These impacts are manageable with the implementation of the mitigation measures and the monitoring plan in the ESMP. The water quality model shows that in 2015 the reservoir's COD, NH_3-N, TP will be 9.27mg/L, 0.084 mg/L, and 0.01mg/L respectively, meeting Class II standard (i.e., water suitable for use as a drinking water source).

34. **Forestry and Terrestrial Biodiversity**. The inundation of the reservoir, relocation of ~20km railway, construction sites, and the resettlement sites will affect 662 ha of secondary forest. A study by the Ecological Environment Center of Huazhong Normal University shows that impacts on forest and terrestrial biodiversity are not expected to be significant. The project will not have any significant impacts on critical forest areas or critical natural habitats. Forest affected by the project is secondary and regenerated forest mainly consisting of bamboo, pines and firs which are common sub-tropical species. The affected forest area only accounts for approximately 0.2% of the total forest area in Fuliang County. Compensation for the loss of the vegetation and forest, and compensation for farmers have been included in the ESMP and the RAP.

35. The reservoir will reduce the habitat for terrestrial animals, though the expanded water surface will benefit some species such as frogs, mandarin ducks, and otters, and possibly attract more birds to inhabit the reservoir. The impact of construction on natural reserves is not expected to be significant as the dam site is at least 6.5 km away from the natural reserves. Indirect impacts may occur as a result of workers, increased access to the watershed, and potential

tourism development after the dam becomes operational. To minimize potential adverse impacts, natural habitat patrols will be reinforced and the project will promote public education on wildlife protection.

36. **Aquatic Habitats, Fish and Fisheries**. Aquatic habitats are likely to be affected by dam construction and operation. Erosion and sediment loads may be increased by construction activities and clearing of reservoir area. Once construction is completed, the long term impacts on aquatic habitats and fish species will occur. Rapids and shallow areas upstream, which may be favored by some species, will be permanently submerged. The change in river morphology will affect or displace some economic fish species which are not able to adapt to the new conditions; however, analysis has shown that most of the fish species can adapt to the new conditions. The inundation will affect a river segment which was designated by Jiangxi Agriculture Bureau for the conservation of economic fish species, mainly Barbodes. As a measure to restore economic fish resources, the government has declared an 88.82 km river segment downstream of the dam as a conservation area to protect fish species such as Barbodes.

37. The project is not expected to significantly alter the existing migration pattern in the River, given that long distance fish migration has not been identified in Changjiang River due to the development of cascade dams. However, it will contribute to the fragmentation of aquatic habitats and affect fish mobility. Accordingly, mitigation measures, such as joint operation of cascade development, habitat protection, artificial fish pass, strengthened fishery administration, artificial fish multiplication, have been proposed in the project ESMP to minimize negative impacts.

38. **Physical Cultural Resources**. PCR surveys and public consultation by local cultural relics agencies and EA consultants show that PCRs which will be affected include:(a) a county level historical site (a Qing dynasty building used as a venue for a county congress conference in 1934); (b) three ancestral houses for Clan Zhang, Wu, and Yu; (c) 4,623 household graves; (d) six ancient trees (200-500 years); and (e) a community church, which was built about five years ago. There is a probability of chance finds of items of cultural significance during construction. The expected impacts on PCRs are considered insignificant with the implementation of a PCR management plan which is included in the ESMP.

39. **Drawdown Zone**. Water level of the reservoir will be changed from Elevation 56 m (1:50 return) to Elevation 50 m during the flood season each year. The formation of oscillation/drawdown zone and variation of shorelines may have adverse impacts on surrounding vegetation, landscaping, and cause soil erosion and potential geographic disasters. Mitigation measures (e.g., vegetation protection) have been included in the ESMP.

40. **Sedimentation**. The Changjiang River carries little sand (0.082 kg/m^3) and most of the sand will come into the river during the flood season and will be discharged downstream. Existing erosion and sedimentation patterns would not be significantly modified.

41. **Environmental Impacts of Resettlement**. Sixty resettlement sites have been selected, of which 34 sites are adjacent to their existing villages. To the maximum extent feasible, people will resettle within their traditional territories to minimize adverse social impacts. Each

resettlement site will be provided with adequate infrastructure, e.g., rural roads, water, electricity, roads, and waste management and sanitation facilities. In addition, Zhitan town will be submerged and residents and businesses will need to be relocated to a new site. The site and infrastructure design options have been selected based on a series of discussion with the affected communities.

42. Some relatively minor adverse impacts associated with the construction of the resettlement sites are expected. Mitigation measures have been included in the ESMP to avoid these adverse impacts: (a) proper siting and design; (b) buffer distance from the surrounding reserves; (c) training and awareness building provided to local people; and (d) strengthened law enforcement to prevent wildlife poaching.

43. **Pest Management**. Mosquito and rodent control activities will be conducted during reservoir clearing process to protect public health. In addition, resettled families will be provided with plots to plant tea, ginseng, oil-tea trees, and bamboos. Though the project will neither finance procurement of pesticides nor equipment for pesticides application, the management of pesticides and other hazardous chemicals is included in the ESMP through a Pest Management Plan.

44. **Cumulative Impacts**. Three cascade dams are in operation on the Changjiang River in Jiangxi Province. The Master Plan for the River Basin in Jiangxi Province indicates that one more hydroelectric project is planned at Jingdezhen. Combined with the existing hydropower facilities as well as the planned hydropower project, the Wuxikou project could create cumulative impacts beyond its immediate area of influence. A cumulative impacts study has been carried out covering the broader project area and identifies the most significant cumulative and downstream impacts. It proposes measures (e.g., aquatic habitats protection) to address identified cumulative impacts, including a Comprehensive Reservoir Management Plan study and the second phase of cumulative impact assessment study during project implementation.

45. **Construction/Upgrading of Rural Roads/Transmission Line**. Access roads will be built for the project, with potential impacts such as soil erosion, slope instability, dust, traffic safety, and increased access to nature reserves. In addition, a ~20km 110 kV transmission line will be built from Wuxikou to a 220 kV substation located in Fuliang County. The installation of transmission line will not affect any critical habitat. Potential impacts include land acquisition, vegetation clearing, soil erosion, magnetic radiation, safety concerns, and visual impact. Mitigation measures have been included in the ESMP.

46. **Impacts of Relocation of ~20km Railway**. The reservoir will flood a 19.51 km segment of Anhui-Jiangxi Railway. A 22.5 km alignment will be rebuilt along the edge of the reservoir. The relocation of this segment is part of a renovation scheme for the entire length of the railway line from Anhui to Jiangxi. The EA for the renovation scheme, which was approved by the Ministry of Environmental Protection in 2011, shows that adverse impacts mainly relate to construction activities, including land acquisition, soil erosion, loss of vegetation, and nuisance of noise, wastewater, and waste. The project will compensate the railway relocation. The Ministry of Railways will undertake the relocation in compliance with the ESMP to mitigate these construction-related impacts.

47. **Risk Management**. Key risks associated with the project are: (a) hazardous materials such as fuel and explosives at construction sites, and forest fires caused by construction activities; and (b) fuel leakage from boats or ships in the reservoir. The project has developed an emergency plan to mitigate and manage these risks.

Environmental and Social Management Plan

48. A stand-alone ESMP for the project has been developed based on the findings of the EIA and the SEIA. The ESMP describes the measures needed to minimize, mitigate or compensate for expected environmental impacts of the project. Mitigation measures will address impacts from workers camp and work force, health and safety issues, air and noise, borrow pits, disposal sites, physical cultural resources (including chance finds during construction), and compensatory measures for natural habitats, fish, among many others. The ESMP defines institutional responsibilities for the implementation of mitigation measures, and proposes capacity building activities (including training and technical assistance) and an adequate budget for the ESMP implementation. The ESMP specifies the following major mitigation measures:

- *Environmental Specifications for Contractors*. Environmental specifications will be included in all bidding documents and contracts for construction activities, including management of wastes, slope stability, erosion control, burrow pits, control of dust and nuisance, management of hazardous materials and wastes, de-commissioning of existing facilities, worker's camp management, health issues, community relations, chance find procedures, and environmental supervision during construction.
- *Fish Management*. As an offset to impacts on fish resources, a fish breeding station will be established. 300,000 young fish will be released in the river each year, and evaluation of this activity will be undertaken by qualified scientific institution(s). To improve fish diversity, fish pass measure-trapping and transportation will be implemented. Professional fishers will be organized to trap 0.5-1.0 ton/year of fish downstream and release them upstream of the reservoir. A monitoring program for fish resources will be carried out to evaluate the effectiveness of these measures.
- *Forestry and Terrestrial Biodiversity*. As compensation for the loss of vegetation and forest, re-vegetation and tree planting on un-forested sites will be carried out. A compensation fee will be paid to the local forestry agency for reforestation, where appropriate. Training and awareness dissemination will be promoted for natural habitat protection. Regulation of natural habitats will be reinforced to prevent wildlife poaching.
- *A Soil and Water Conservation Plan*. The plan details engineering measures and vegetation measures to manage potential soil erosion from the construction activities (e.g., dam site, disposal sites, access roads, burrow pits, and resettlement sites), together with monitoring requirements and estimated budget.
- *A Site Clearance Plan for the Reservoir*. The plan identifies the criteria for the removal of vegetation from selected areas of the reservoir, proposes removal techniques, and estimates associated costs. The plan will take into account the *Specification for Reservoir Basin Cleaning Designing (DL/T 5381-2007)* issued by government.
- *A PCR Management Plan*. The PCR Management Plan specifies: (a) mitigation measures, such as relocation of old buildings, ancient trees, household graves, and the rebuilding of a

community church; (b) monitoring arrangements; (c) capacity building and assistance of technical consultants and governmental agencies; (d) chance finds procedures; and (e) budget for the implementation of the PCR management plan. The PCR management plan also proposes protecting and documenting (e.g., photo, video) archaeological and historical artifacts found in the project areas.

- *A Pest Management Plan.* The plan includes measures for mosquito and rodent control, proposes training for resettlers on management of pesticides and on integrated pest management.

49. A key element in the ESMP is the "adaptive management" approach, which involves modifying programs based on monitoring and evaluation of their environmental performance. A Comprehensive Reservoir Management Plan Development Study (CRMP) will be carried out to identify issues related to future monitoring and adaptive management. The study will be completed during the dam construction period, and its outcome will be reviewed and approved prior to reservoir inundation to ensure that other components in Changjiang River Basin are properly integrated with the new reservoir operational conditions. Terms of reference for the Comprehensive Reservoir Management Plan Development Study are included in the ESMP.

50. **Due Diligence**. Jingdezhen government's strategy to protect Jingdezhen city from fifty-year return period floods of Changjiang River consists of the Wuxikou dam and the city dike system which is financed by government. Construction of about half of the City Dyke has been completed. The SEIA include a due diligence review, which identified the potential adverse impacts to be mainly related to construction activities, which could be readily mitigated by good construction practices. The due diligence confirms that there are no environmental liabilities and the relevant national laws/regulations have been met. In addition, the SEIA also includes a due diligence on a sanitary landfill which will receive solid waste generated by the project. The due diligence confirms that the performance of the landfill is in compliance with relevant environmental regulations.

Public Consultations and Information Disclosure

51. In accordance with Bank requirements and Chinese regulations, public consultations were conducted from 2008 to 2012, including public consultation meetings and questionnaire survey, with project affected persons and other stakeholders (village association, local cultural relics agency, and local forestry bureau). Their opinions and concerns have been taken into account in the EA and in project design. The EA and the ESMP were locally disclosed on August 29, 2012 through announcements published on the local website and newspaper. The EA safeguard documents were sent to the Bank InfoShop for disclosure on October 5, 2012.

F. Social (Including safeguards)

Wuxikou Reservoir Resettlement

52. The Wuxikou reservoir and dam construction triggers OP4.12 Involuntary Resettlement as it would requisition 33,009 mu of land for reservoir inundation and establishment of new settlements outside the reservoir area. This includes: 25,113 mu of land to be inundated by the

reservoir; 910 mu for dam construction; 4,648 mu for the resettlement new sites outside the reservoir area; 315 mu for a resettled new town; and 2,023 mu for reconstruction of special facilities like roads, railway, piers, stations, etc. A total of 16,104 people (4,423 households) would be affected, including 10,864 people (2,926 households) in 20 villages, of whom 9,804 people would be relocated by house demolition in villages and town. 5,240 people (1,497 households) outside the reservoir inundation area would be indirectly affected by land acquisition (without relocation) for the construction of new settlements and facilities for reservoir resettlers. In addition, 80 shops and 18 enterprises/institutes would be relocated from Zhitan town, the only town in the reservoir area to be uprooted together with the 18 inundated villages.

53. A social assessment (SA) was conducted upstream and downstream of the reservoir area to identify social risks and impacts of Wuxikou Dam construction. The SA results were incorporated in the EIA to guide project design and planning from both social and environmental perspectives; in addition, social management measures were integrated in the ESMP.

54. The RAP has set up the compensation approaches and livelihood rehabilitation measures for the PAP. There would be 60 resettlement new sites: 34 in reservoir area, and 26 outside the reservoir area. Slightly under half the resettlers would have to move out to other townships through intensive environmental carrying capacity assessment and the corresponding detailed cropping pattern design, several farming production models were designed for each of affected villages and households, so as to enable resettlers' living standards to be restored or improved. Resettlement implementation will be managed by resettlement personnel of PMO and Fuliang County Resettlement Office, in cooperation with local line agencies. An external resettlement monitoring mechanism is included in the RAP for an objective assessment of resettlement implementation.

The Linked Project: Resettlement for the Wuxikou Dike Construction

55. The Wuxikou Dike Construction in the Jingdezhen City is a linked project, as it is complementary to the Wuxikou Dam, to provide the City flood protection of one-in-fifty years.. The Dike is divided into nine parts, and for the first five parts 1041.77 mu of land (468.8 mu from collectives and 572.97 from the state) was requisitioned, resettling 527 rural farmers (130 households) and 2048 urban residents (526 households); 279 shops and 23 enterprises were also relocated. Resettlement of 413 urban households for two of the five parts started in 2011, but has not yet been completed. In addition, the possible construction of a 24 km 110 kV transmission line from Wuxikou to a 220 kV substation located in Fuliang County could require land acquisition and resettlement, and would also be a linked project.

56. In accordance with the requirements of OP4.12, a Due Diligence Report (DDR) has been prepared to review land acquisition and resettlement caused by the first five parts of the City Dike construction. A Resettlement Policy Framework (RPF) has also been prepared to address land acquisition and resettlement for the remaining four parts of the Dike, as well as for the transmission line. The RPF is in compliance with OP4.12 requirements and will guide RAP preparation for these activities.

The DDR confirmed that land acquisition and house demolition for the five parts of the Dike had been carried out in accordance with national guidelines and is acceptable to the Bank. The Bank will continue to monitor the remaining Dike resettlement implementation.

57. All social safeguard instruments - the RAP, SA, DDR and FPF - were disclosed locally in a newspaper, the PMO website, and in the county library on August 30, 2012 and in the InfoShop on September 30, 2012.

G. Safety of Dams (including safeguards)

58. The project finances the construction of a 46.8 m high multipurpose dam with a reservoir capacity of 474.7 million cubic meters mainly for flood storage and regulation. There are 17 existing dams on the tributaries of the Changjiang River and upstream of the project areas, most of which have been rehabilitated in recent years.

59. A Dam Safety Panel of Experts (DSP) has been appointed and convened to undertake safety review of these existing dams and the Wuxikou Dam. Dam safety review reports prepared by the DSP with recommendations for enhancing Wuxikou Dam design, improving safety management of existing dams and upgrading/finalizing the dam safety plans, have been reviewed by the Bank and are acceptable.

60. The following actions have been have been included in the project:

(a) *Wuxikou Dam.* Qualified contractors/suppliers and supervision engineers will be ESMPloyed to construct the dam and to supervise construction. The PMO will maintain the DSP throughout the project period to carry out dam safety review. Dam safety plans, incorporating the DSP recommendations, will be adhered to during project construction and subsequent operation.
(b) *17 existing dams*. Most of the identified deficiencies have already been rectified, and the remaining actions will be taken in 2013.

61. During project implementation, the Bank, together with DSP, will supervise implementation of the dam safety action plans to ensure compliance with OP 4.37.

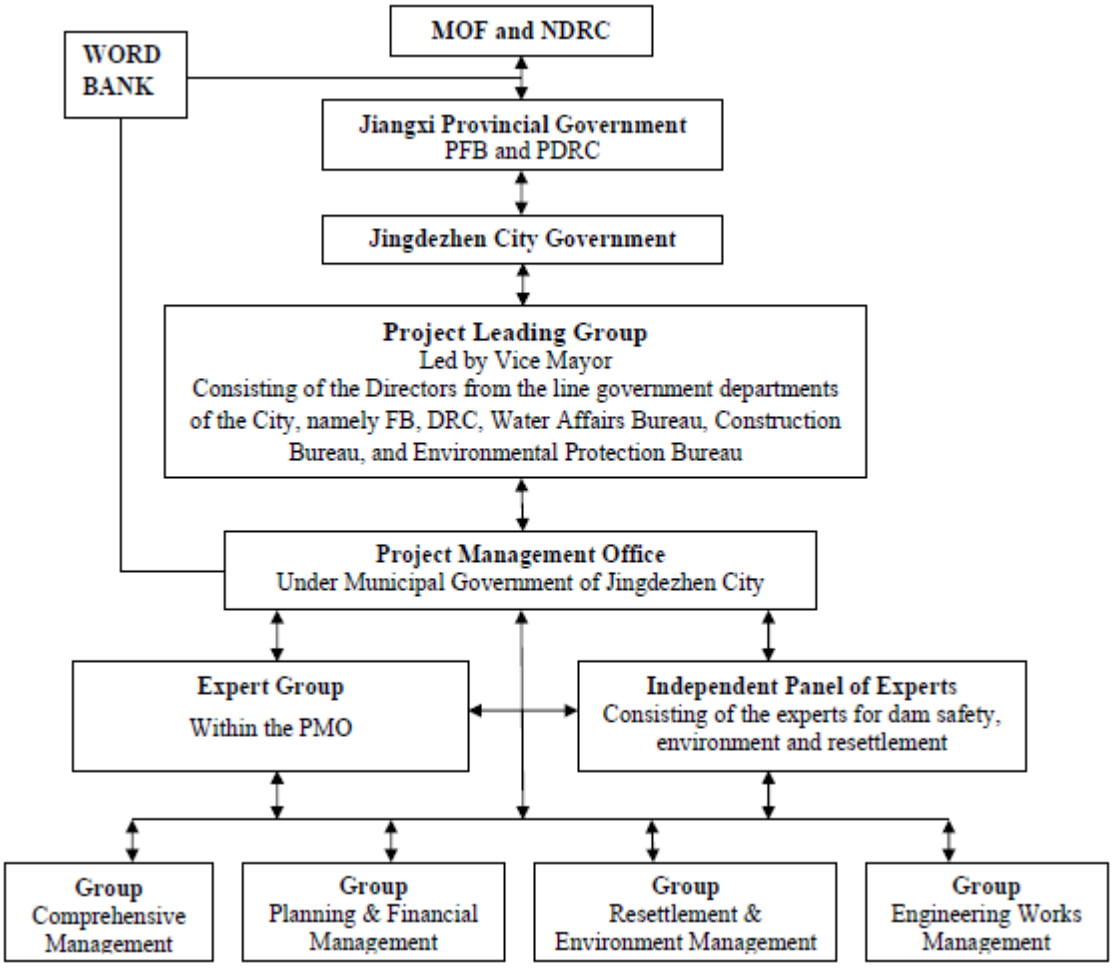
H. Monitoring & Evaluation

62. Project results will be monitored and evaluated internally and externally. The PMO will monitor project progress and results. An experienced institute will be contracted by the PMO for data collection, monitoring and evaluation, including collection of baseline data for the key performance indicators.

63. The project will also develop and set up a web-based procurement and financial management information system (PROMIS) which will automatically monitor procurement and financial transactions, and will cross-check data for errors and alert authorities in a timely manner. PROMIS will also provide consolidated data for intermediate result indicators.

64. A baseline M&E report was completed before project negotiations and an M&E report will be submitted to the Bank for review annually during project implementation. A mid-term review (MTR) report of the project will be prepared and provided to the Bank before June 30, 2015, and an Implementation Completion Report (ICR) upon project completion in June 30, 2018.

Appendix 1
Organizational Chart for Project Management and Implementation



Appendix 2
Agreed Actions for Dam Safety

No.	Dam Name	Location	River	Completion Date	Dam Height (m)	Reservoir Capacity ($\times 10^4 m^3$)	Dam Type	Rehab. Date	Management Authority	Outstanding Issues	Timed Action Plan
1	Aoxi Hydropower Station	Luxi Township, Qimen County, Anhui	Main stream of Chang River	2006	7.5	491	Rubber dam	Built in 2006	Anhui Qimeng County Water Resource Bureau	Damage to the bag of the rubber dam	The owner plans to replace the rubber dam with a shutter dam in 2013.
2	Zhangshukeng Hydropower Station	Zhoujia Gang, Fuliang County, Jiangxi	Main stream of Chang River	2008	5.5	790	Shutter dam	Built in 2008	Jiangxi Fuliang County Water Affair Bureau	(Under normal operation)	Emergency preparedness plan upgraded in April 2012.
3	Yushan Hydropower Station	Yushan Town, Changjiang District, Jingdezhen	Main stream of Chang River	1987	22.2	2300	Barrage	Rehabilitated in 2006	Port and Waterway Brach Bureau of Jingdezhen, Jiangxi	(Under normal operation)	Emergency preparedness plan upgraded in April 2012.
4	Yutian Reservoir	Xianghu Town, Fuliang Town, Jiangxi	South River of Chang River	1959	22.4	2260	Homogeneous dam	Rehabilitated in 2004	Xiangxi Jingdezhen Water Affair Bureau	Damage to seepage monitoring instruments	Replace seepage monitoring instruments before April, 2013.
5	Jinxi Reservoir	Ehu Town, Fuliang County, Jiangxi	East River of Chang River	1975	25.9	361	Homogeneous dam	Rehabilitated in 2012	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments, and undertake completion acceptance before April 2013
6	Zhanchong Reservoir	Sanlong Township, Fuliang County, Jiangxi	West River of Chang River	1974	16.8	106	Earth dam with inclined core	Rehabilitated in 2012	Jiangxi Fuliang County Water Affair Bureau	Inadequate safetyb monitoring instruments	Add dam displacement and seepage monitoring instruments, and undertake completion acceptance before April 2013
7	Chengjiashan Reservoir	Gongqiao Town, Fuliang County, Jiangxi	North River of Chang River	1976	14.2	120	Homogeneous dam	Rehabilitated in 2011	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments
8	Xichong Reservoir	Hongyuan Town, Fuliang County, Jiangxi	West River of Chang River	1974	23.2	667	Homogeneous dam	Rehabilitated in 2009	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments, and update the O&M Plan and EPP
9	Panxi Reservoir	Sanlong Township, Fuliang County, Jiangxi	West stream of Chang River	1958	11.1	120	Homogeneous dam	Rehabilitated in 2012	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments, and undertake completion acceptance before April 2013
10	Xiaomaiwu Reservoir	Ehu Township, Fuliang County, Jiangxi	East stream of Chang River	1980	32.5	177	Homogeneous dam	Rehabilitated in 2011	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments

No.	Dan Name	Location	Basin	Completion Date	Dam Height (m)	Reservoir Capacity ($\times 10^4 m^3$)	Dam Type	Rehabilitation Date	Management Authority	Outstanding Issues	Timed Action Plan
11	Shantianwu Reservoir	An Town, Fuliang County, Jiangxi	South stream of Chang River	1977	25.8	497	Homogeneous dam	Rehabilitated in 2009	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments
12	Fangkeng Reservoir	Jiaotan Town, Fuliang County, Jiangxi	Jiangxi River of Chang River	1977	20.3	120	Central core earth dam	Rehabilitated in 2012	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments, and undertake completion acceptance before April 2013
13	Mayuanwu Reservoir	Wanggang Township, Fuliang County, Jiangxi	East stream of Chang River	1978	18.1	143	Central core earth dam	Rehabilitated in 2011	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments
14	Dabeiwu Reservoir	Zhuangwan Township, Fuliang County, Jiangxi	East stream of Chang River	1978	27.8	563.8	Earth dam with inclined core	Rehabilitated in 2009	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments
15	Baicaiyuan Reservoir	An Town, Fuliang Town, Jiangxi	South stream of Chang River	1979	14.2	115	Homogeneous dam	Rehabilitated in 2011	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments
16	Dawu Reservoir	Xianghu Town, Fuliang County, Jiangxi	South stream of Chang River	1979	16.5	139	Earth dam with inclined core	Rehabilitated in 2009	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments
17	Huxing Reservoir	Ehu Town, Fuliang County, Jiangxi	East Stream of Chang River	1964	14.5	272.2	Homogeneous dam	Rehabilitated in 2009	Jiangxi Fuliang County Water Affair Bureau	Inadequate safety monitoring instruments	Add dam displacement and seepage monitoring instruments
18	Wuxikou Reservior		Main stream of Chang River	2016	46.8	47400	Concrete dam	To be built	Jingdezhen Municipality		Implement Construction Supervision Plan and Instrumentation Plan, and Finalize OMS Plan and EPP 6 and 12 months respectively before 1st reservoir impounding

Annex 4: Operational Risk Assessment Framework (ORAF)
China: Jiangxi Wuxikou Integrated Flood Management Project

<table>
<tr><td>Project Stakeholder Risks</td><td>Rating</td><td colspan="3">Moderate</td></tr>
<tr><td rowspan="2">Description :
The city government has demonstrated strong ownership and commitment to the project, and has prepared the project in an efficient manner. Project affected persons and other stakeholders were consulted as part of the social assessment and during the preparation of the EA. All stakeholders have been supportive of the project. However, the project involves significant land acquisition and resettlement and has substantial environmental impacts.</td><td colspan="4">Risk Management: The PMO will continue consultations with stakeholders and disseminate project information throughout the project. The Bank will monitor feedback from stakeholders during missions and through review of reports.</td></tr>
<tr><td>Resp: Client and Bank</td><td>Stage: Implementation</td><td>Due Date :
Recurrent</td><td>Status:
In progress</td></tr>
<tr><td colspan="5">Implementing Agency Risks (including fiduciary)</td></tr>
<tr><td>Capacity</td><td>Rating:</td><td colspan="3">Moderate</td></tr>
<tr><td rowspan="2">Description :
The Bank has provided on-going technical support to the project agencies on the integrated flood management approach being adopted. The Bank has also provided training on Bank requirements on fiduciary and safeguards matters.

National, provincial, and municipal governmental have committed to provide the substantial counterpart funds required for project implementation. The O&M funding requirements are well within Jingdezhen’s capacity.</td><td colspan="4">Risk Management :
Project design includes support to the PMO on design and construction supervision. An Expert Group to provide technical support to the PMO and an independent expert panel has been established to monitor and review the environment, resettlement and dam safety safeguards. Procurement and FM manuals are in place to enable staff to carry out these functions to Bank requirements. Training will be provided to FM and procurement staff on an as required basis during project implementation. Bank missions will assess the capacity of project agencies to implement the project satisfactorily on an on-going basis, and will provide support as required.

Bank missions will monitor the timely provision of the required counterpart funds.</td></tr>
<tr><td>Resp: Client</td><td>Stage: Preparation & Implementation</td><td>Due Date :
September 25, 2012</td><td>Status:
Completed</td></tr>
<tr><td>Governance</td><td>Rating:</td><td colspan="3">Low</td></tr>
<tr><td rowspan="2">Description :
Jingdezhen has a well-established organizational set-up for flood management. Flood protection is an important provincial and Jingdezhen priority and there is strong ownership and support for the project within the government structure. A standard structure, comprising a Project Leading Group and a PMO has been established for project management and implementation.</td><td colspan="4">Bank missions will maintain an on-going dialogue with Government agencies, in particular the PMO, to ensure that there is good understanding of the project objectives, design, and implementation arrangements and provide guidance in resolving any emerging issues. The Bank will also monitor audit and other reports to ensure that fiduciary controls are in place and are effective.</td></tr>
<tr><td>Resp: Client and Bank</td><td>Stage: Implementation</td><td>Due Date :
Recurrent</td><td>Status:
In progress</td></tr>
<tr><td colspan="5">Project Risks</td></tr>
<tr><td>Design</td><td>Rating:</td><td colspan="3">Moderate</td></tr>
</table>

<table>
<tr><td>Description :
The integrated flood risk management approach adopted by the project is new to Jingdezhen. However, the Bank has provided technical guidance during project preparation.</td><td colspan="4">Risk Management :
The project provides consulting support to the PMO for design, construction supervision, Dam Safety, technical expert group, etc. Bank missions will continue to provide technical guidance on integrated flood risk management.</td></tr>
<tr><td></td><td>Resp: Client and Bank</td><td>Stage: Implementation</td><td>Due Date :
Recurrent</td><td>Status:
In progress</td></tr>
<tr><td>Social & Environmental</td><td>Rating:</td><td colspan="3">Substantial</td></tr>
<tr><td>Description :
The project will have substantial environmental impacts and will involve significant land acquisition and resettlement. The project agencies have prepared acceptable safeguard documents, including the due diligence report. The Bank has provided safeguards training during project preparation.</td><td colspan="4">Risk Management :
Training on safeguards will be provided to PMO staff during project implementation on a regular basis. An experienced independent expert group on environment, resettlement and dam safety has been engaged to help PMO to monitor implementation of ESMP, RAP and Dam Safety Plan. Internal and external safeguard monitoring reports will be furnished on a periodic basis to Government and to the Bank. The Bank will review the reports, conduct site visits and discuss safeguard issues with the expert group, the PMO, and municipal leaders to ensure that the safeguard documents are implemented effectively.</td></tr>
<tr><td></td><td>Resp: Client and Bank</td><td>Stage: Implementation</td><td>Due Date :
Recurrent</td><td>Status:
In progress</td></tr>
<tr><td>Delivery Monitoring & Sustainability</td><td>Rating:</td><td colspan="3">Moderate</td></tr>
<tr><td>Description :
Project design includes construction supervision consulting support to enable effective contract management to ensure quality, timely completion, minimization of contract variations, and effective budget management.

During project preparation, the Bank provided intensive training to PMO staff on M&E and guidance in designing the M&E system. An experienced institute will be contracted for M&E. A web-based procurement and financial management system will be established.

The city government will establish the Wuxikou Hydropower Engineering Management Bureau to undertake the operation and maintenance of the Wuxikou reservoir after it is handed over for operations. The Bureau will receive the required funds for O&M (estimated to be quite small in relation to Jingdezhen’s revenues) from the municipal budget. However, funding for O&M has sometimes been a problem in China.

The Flood Risk Management System established under the Project may not be scaled up to other river basins.</td><td colspan="4">Risk Management :
The PLG will keep track of contract management through oversight of the PMO and their consultants. The Bank will review progress and other reports, carry out site visits, and discuss issues with appropriate levels in the project management structure and provide guidance in resolving the issues.

The PLG will review project reports, including M&E reports, on a regular basis, identify issues and resolve them in a timely manner. The Bank will review progress reports and discuss issues with the PLG, the PMO, and the various consultants, and provide guidance in their resolution.

The final O&M Plan will be prepared prior to project completion. The extension plan for scaling up the Flood Risk Management System to other river basins in Jiangxi will also be prepared during project implementation. Bank missions will review the progress of work in both these areas, and provide guidance in completing them satisfactorily and for their adoption.</td></tr>
<tr><td></td><td>Resp: Client and Bank</td><td>Stage: Implementation</td><td>Due Date :
Recurrent</td><td>Status:
In progress</td></tr>
<tr><td colspan="2">Overall Risk Rating</td><td colspan="3">Substantial</td></tr>
<tr><td colspan="5">Description:</td></tr>
</table>

The overall implementation risk of the project is rated as substantial. The main risks of the project are: (a) technical complexity of the engineering design; (b) unfamiliarity of integrated approach to flood risk management; and (c) scale of resettlement activities and impact of structural measures on the environment.

Considerable guidance has been provided to the PMO by Bank specialists in different professional areas, and the following actions have been successfully taken: (a) EA, CIA, ESMP, RAP, social assessment and dam safety plans prepared; (b) concrete gravity dam selected in order to improve dam safety and stability; (c) basin-wide strategy for integrated flood risk management approved by city government; (d) development of integrated flood risk management included as a project component; and (e) MIS for procurement and financial management developed.

Appropriate mitigation measures have been included in the project design to manage implementation risks.

Annex 5: Implementation Support Plan
China: Jiangxi Wuxikou Integrated Flood Management Project

Strategy and Approach for Implementation Support

1. The strategy for implementation support is based on the ORAF at the PAD stage, which identifies the risks to achieving the project development objectives and the agreed risk management measures. The strategy will be reviewed based on periodic assessments of the risks and the appropriateness of the mitigation measures.

2. **Capacity Constraints**. Bank implementation support will focus on measures to strengthen the capacity of the PMO to implement the project. The Bank will confirm that agreed specialist staffing (especially dam engineering, integrated flood risk management, procurement, financial management, and safeguards staff) are in place. It will also confirm that the agreed intensive training program on project management, integrated flood risk management, financial management, procurement, and safeguards is provided to project staff, and will offer such programs on a supplemental basis when required.

3. **Delivery Quality.** The Bank will carefully monitor the development of the integrated flood risk management system, in addition to the construction of Wuxikou Flood Control Scheme, to ensure that non-structural measures developed under the project play an important role in minimizing the social and economic losses during major flood events. Through periodic site visits and review of progress and other reports, the Bank will monitor satisfactory implementation of the various project contracts. It will monitor the satisfactory implementation of the M&E system through review of progress reports, and discussions with the PMO and their consultants. The Bank will also confirm that the final O&M plans are finalized before completion of the project and the adequate institutional, staffing, and funding are in place. It will also maintain a dialogue with Jiangxi agencies regarding dissemination of the non-structural measures flood management measures of the project throughout the province.

4. **Financial Management**. . Financial management specialists will join Bank implementation support to review the implementation of budgeting, funds flow, accounting and reporting, and internal controls, and will provide the required guidance to the Finance Bureaus, the PMO, and FM staff. They will also review the IFRs and audit reports and follow-up on any important issues that arise from these reports. Training will be also provided to FM staff by the Bank before commencement of project implementation.

5. **Procurement.** The procurement specialist will monitor the implementation of the Procurement Plan in compliance with the Procurement Guidelines and the loan agreement. The procurement specialist will also carry out prior and post reviews at the office and through site visits as part of periodic regular implementation support missions and special procurement missions. The Procurement Specialist will confirm that updates of the Procurement Plan are acceptable, and will provide specialized procurement guidance and training as and when required. In coordination with the FM specialist, the

Procurement Specialist will monitor the implementation of PROMIS and its utilization by the PMO.

6. **Safeguards**. The Bank will provide implementation support to, and carefully monitor the implementation of mitigation measures for the safeguard policies triggered by the project, in particular the ESMP, the RAP, and the Dam Safety Plan. Environmental, social, and dam safety experts will visit project sites on a regular basis and help resolve any issues relating to compliance with the agreed safeguard documents with the PMO and the consultants, and if necessary, through meetings with municipal leaders. In addition, they will review internal and external monitor reports to confirm compliance with approved safeguards documents.

Implementation Support Plan (ISP)

7. In order to provide effective implementation support, the Bank team supporting the project will be almost entirely based in Beijing. It will be supplemented by Washington based experts when necessary, as well as national and international consultants. The Bank will conduct, on average, two implementation support missions each fiscal year. In addition, specialists will make short visits to project sites as and when necessary. Table below indicates expected focus of implementation support during the different phases of the project and the skills needed.

Main Focus in Terms of Support to Implementation

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First twelve months	• Financial Management and disbursement training and FM supervision	Financial Management and Disbursement	• FM specialist 0.5 SW Disbursement Officer 1 SW	
	• Procurement Training and Workshops	Procurement	• Procurement Specialist 1 SW	
	• Safeguards Training	Environment, social and dam safety Safeguards	• Environment, social and dam safety specialists 2 SWs each	
	• Project Concept and Approach Training	Flood Risk Management	• 3 SWs	
12-48 months	• Financial management &disbursement and procurement review and support	FM and DS	• FM specialist 1-2 SW annually Disbursement Officer 2 SWs annually	
	• PROMIS application to monitor the procurement and financial and disbursement process	Procurement	• Procurement specialist 2 SWs annually	
	• ESMP, RAP and Dam	Environment,	• Environment, social and	

	Safety Action Plan implementation	social and dam safety Safeguards	dam safety specialist 2 SWs each annually	
	• Implementation of structural and non-structural measures	Water resources management and flood risk management specialists	• Three SWs each annually	
	• Project implementation Support	Task team Leadership	• 3 SWs annually	

MAP IBRD CHN_38990
Geographic Map of Jiangxi Wuxikou Integrated Flood Management Project