ADB

Report and Recommendation of the President to the Board of Directors

Project Number: 37641
June 2006

Proposed Loan and Technical Assistance Grant People's Republic of China: Hunan Flood Management Sector Project

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 19 May 2006)

Currency Unit	–	yuan (CNY)
CNY1.00	=	$0.125
$1.00	=	CNY8.01

ABBREVIATIONS

AAOV	–	average annual output value
ADB	–	Asian Development Bank
CEMP	–	consolidated environment management plan
EA	–	executing agency
EAMF	–	environment assessment and management framework
EIRR	–	economic internal rate of return
EMDP	–	ethnic minority development plan
EMDF	–	ethnic minority development framework
EMP	–	environment management plan
FSR	–	feasibility study report
GDP	–	gross domestic product
H&S	–	health and safety
HEPB	–	Hunan Environmental Protection Bureau
HnPG	–	Hunan provincial government
IA	–	implementing agency
IEE	–	initial environmental examination
ICB	–	international competitive bidding
IFM	–	integrated flood management
JBIC	–	Japan Bank for International Cooperation
LCB	–	local competitive bidding
LIBOR	–	London interbank offered rate
LPMO	–	local project management office
M&E	–	monitoring and evaluation
NCB	–	national competitive bidding
O&M	–	operation and maintenance
PDMF	–	project design and monitoring framework
PDRC	–	Provincial Development and Reform Committee
PFCDRHQ	–	Provincial Flood Control and Drought Relief Headquarters
PFD	–	Provincial Finance Department
PPMO	–	provincial project management office
PPTA	–	project preparatory technical assistance
PRC	–	People's Republic of China
PWRD	–	Provincial Water Resources Department
RP	–	resettlement plan
TA	–	technical assistance
WB	–	World Bank

WEIGHTS AND MEASURES

ha	–	hectare
km	–	kilometer
km^2	–	square kilometer
m	–	meter
m^2	–	square meter
m^3	–	cubic meter

NOTES

(i) The fiscal year (FY) of the Government and its agencies ends on 31 December.
(ii) In this report, "$" refers to US dollars.

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LOAN AND PROJECT SUMMARY

Borrower	The People's Republic of China
Classification	Targeting classification: General intervention Sector: Agriculture and natural resources Subsector: Water resource management Themes: Sustainable economic growth, environment sustainability Subthemes: Developing urban areas, developing rural areas, and natural resources management
Environment Assessment	Category B
Project Description	The proposed Project supports the People's Republic of China's (PRC) and the Hunan Provincial Government's (HnPG) policies and plans for flood protection investments. Since 2000, the Ministry of Water Resources has been changing its policy and strategy from a flood-control approach to a river basin-based integrated flood management approach. The policy shift is economically and environmentally sustainable and aims to be socially inclusive. The Project will support the implementation of an area and time slice of Hunan's integrated flood-control program under the Hunan Provincial 11th Five-Year Plan (2006–2010), focusing on a comprehensive framework for flood control, management, and forecasting in the four mountainous river basins—Lishui, Xiangjiang, Yuanjiang, and Zishui. Flood protection works will be constructed for up to 35 subprojects. Nonstructural measures will be developed to strengthen hydrological monitoring, improve flood forecasting, and enhance flood warning systems. An advisory technical assistance (TA) will be provided to support sustainable flood management by assisting the Provincial Water Resources Department (PWRD) to plan and assess nonstructural aspects of flood management and strengthen capacity in plan implementation.
Rationale	Many cities and industrial centers in the PRC are adjacent to major rivers, resulting in a high proportion of the country's economic activity being at risk from periodic floods. Major floods and poor drainage (waterlogging) are the most frequent and severe form of natural hazard in the PRC. Floods are a recurrent natural hazard in Hunan Province. They may be localized in the four main rivers and their tributaries, or they may occur through cumulative effects on the Dongting Lake area. The Lishui, Xiangjiang, Yuanjiang, and Zishui rivers drain a total area of 179,000 square kilometers (km^2) (84% of the provincial area), and are home to 56.4 million people, or 84% of the provincial population. Improved management and control of floods in the middle and upper reaches of Hunan's four main mountainous river basins is considered urgent to secure economic growth and development in Hunan. Reflecting a recent strategic shift, HnPG's

flood management efforts under the Hunan Provincial 11th Five-Year Plan combine flood-control engineering measures with nonstructural flood management, forecasting, and emergency response systems in the four mountainous river basins and their flood-prone municipal and county-level cities. This is deemed to be a more cost-effective approach to public investment in flood protection and management.

Impact and Outcome

The overall impact of the Project will be to enhance sustainable and inclusive economic growth in flood-prone areas of Hunan Province. Priority municipal and country growth centers in the mountain river basins will be targeted to reduce investor concerns over floods, thereby facilitating an increase in investment in the industrial and commercial enterprises that drive urban and rural growth in the area. The Project's main outcome will be to permanently reduce flood risks in priority municipality and county-level cities along the middle and upper reaches of Hunan Province's four main river basins. The lowered risk of floods will reduce loss of life, reduce government expenditures on flood repairs and compensation, reduce private property losses, and increase overall investment and employment—which in turn will drive industrial and commercial growth.

Components and Outputs

The Project comprises three main components. First, nonstructural measures will strengthen river basin and provincial flood management, warning, and response systems. Second, structural measures will raise flood-control standards in priority locations as identified in HnPG's River Basin Flood Control Plan and the 11th Hunan Province Five-Year Plan. Construction of structural works will require resettlement of people and will demand careful management of temporary environmental impacts. Resettlement and mitigation of environmental impacts will be carried out in compliance with PRC regulations and Asian Development Bank (ADB) safeguard requirements. Third, provincial and local government project management systems will be established and domestic management and monitoring systems will be strengthened. An additional output will be implemented with the grant financed TA. Under this output, priority aspects of HnPG's provincial-level strategic plan will be developed or assessed, to support national policy developments in integrated flood management.

Project Investment Plan

The project investment cost is estimated at $497.4 million equivalent, including taxes and duties of $13.6 million equivalent. Financial charges during implementation (comprising interest during implementation) are estimated at $36.2 million. Physical and price contingencies for the core subprojects are estimated at $16.8 million.

Financing Plan

Source	Total	Percent
A. **Asian Development Bank**	**200.0**	**40.2**
B. **Government**		
1. Hunan Provincial Government	2.2	0.4
2. Municipal/County Governments	295.2	59.3
Subtotal (B)	**297.4**	**59.8**
Total	**497.4**	**100.0**

Source: Asian Development Bank estimates.

Loan Amount and Terms

A loan of $200 million from the ordinary capital resources of ADB will be provided under ADB's London interbank offered rate (LIBOR)-based lending facility. The loan will have a 26-year term, including a grace period of 6 years, an interest rate determined in accordance with ADB's LIBOR-based lending facility, a commitment charge of 0.75% per annum, and such other terms and conditions as set forth in the draft loan agreement. The front-end fee will be waived on the condition that the loan is approved before 30 June 2007.

Allocation and Relending Terms

The national government will relend the proceeds of the ADB loan to HnPG under the same terms and conditions of the original loan, including a 26-year loan term with a 6-year grace period. The interest rate will be at the same LIBOR-based rate paid by the PRC and will be subject to the same terms and conditions as the PRC loan. HnPG will onlend the proceeds of the loan to the local municipal and county governments to finance the foreign exchange cost of the subprojects. Onlending would be under the same terms and conditions as the onlending to HnPG, including a 26-year loan term with a 6-year grace period. The interest rate payable on the loan would be subject to the same LIBOR-based terms and conditions as the loan to HnPG.

Period of Utilization

Until 31 March 2013

Estimated Project Completion Date

30 September 2012

Implementation Arrangements

HnPG will be the Executing Agency for the Project. HnPG has established a project leading group, headed by the Vice Governor of Hunan Province, to oversee project preparation and implementation. Located in the PWRD, the provincial project management office (PPMO) will have day-to-day responsibility for project implementation. The PPMO includes representatives from the three main line agencies responsible for the Project—the Provincial Development and Reform Committee, Provincial Finance Department, and PWRD. The PPMO is responsible for directing project preparation activities, monitoring resettlement, managing environmental impacts, establishing baseline data to monitor project impacts, and assisting participating municipalities and counties in managing their subprojects. Participating municipal and county-level cities are the Implementing Agencies for the Project. Each participating municipality or county has set up a local project leading group and local project management

	office (LPMO) to coordinate aspects of project preparation and implementation in their jurisdictions.
Executing Agency	Hunan Provincial Government
Procurement	Equipment, materials, goods, and services for ADB-financed contracts will be procured in accordance with ADB's Guidelines for Procurement. Major contracts for equipment and materials valued at $1 million equivalent or more will be awarded through ADB's international competitive bidding (ICB) procedures. Smaller packages for equipment and materials valued at under $1 million equivalent will be procured following national competitive bidding (NCB) procedures. Civil works contracts estimated to cost $10 million or more will be carried out using ICB procedures, while those costing less than $10 million equivalent will be carried out using NCB procedures in accordance with the PRC's Tendering and Bidding Law and related regulations. Shopping will be allowed for contracts valued at $100,000 equivalent or less. Foreign contractors may bid on contracts using NCB procedures.
Consulting Services	The Project will support provincial and local government capacity building in flood management for which training services will be contracted through specialist international and domestic institutions using the Consultants' Qualification Selection method. Under the Project, 69 person-months of domestic consulting services will be required and funded through counterpart funds.
Project Benefits and Beneficiaries	Existing flood protection in the mountain river basin municipal and county-level cities is mostly in the range of 1 in 2-year flood return period to 1 in 20-year flood return period.[1] The "with project" situation will raise the level of protection provided to a 1 in 20-year flood return period in the case of county-level cities, and to 1 in 50-year flood return period for municipal level cities, and up to 1 in 100-year flood return period for three key municipal cities. The direct impact of the Project will be to reduce flood risks to residents, businesses, and industries based in project protected areas[2] by constructing and upgrading structural works; reducing exposure to floods through property acquisition and resettlement from project protected areas; and reducing vulnerability to floods through nonstructural measures, including improved flood forecasting, warning and emergency response systems, and raised community awareness and preparedness in project areas. Employees and suppliers to project protected areas will benefit from reduced disruptions from floods. Indirect and unquantifiable impacts include reduced loss of life, avoidance of injuries, reduced hospitalizations, and fewer large-scale emergency evacuations—

[1] Flood protection for a 1 in 2-year flood return period are civil works designed to protect people, property and facilities against relatively low level floods events that occur on average once every two years. Flood protection for a 1 in 100-year flood return period are civil works designed to protect against major floods events that occur on average once every 100 years.

[2] Project protected areas are locations that would have a higher risk of flooding without the Project.

all of which will reduce the fiscal burden that flood disasters currently cause the Government.

Risks and Assumptions

Risks are grouped by project impact, outcome, and output. Impact risks are increased losses. Impact risks involve increased losses resulting from the population in flood protected areas ignoring continued flood risks above design standards, which could be exacerbated by additional migration into project protected areas. Outcome and output risks include: (i) heavy floods may exceed infrastructure design standards; (ii) incohesive implementation of structural and nonstructural components of the flood management strategy resulting from a lack of coordination between provincial and local government agencies; and (iii) insufficient counterpart budget funds for civil works, resettlement, and environment management at project start-up, which could delay implementation. Mitigation measures to address such risks are: (i) improve flood warning and emergency response systems to better prepare for floods; (ii) clearly define the roles and responsibilities of provincial and local government agencies, and ensuring that interagency coordination mechanisms are functional; and (iii) continuously monitor the financial position of municipalities and counties to ensure that they are prepared to meet annual fiscal requirements for project implementation.

Technical Assistance

An advisory TA grant of $500,000 will be provided by the Government of Spain and administered by ADB. The objective of the advisory TA is to strengthen Hunan Province's capacity to execute annual planning and apply management systems for flood management, and to assist the Province in assessing needs and strategies in nonstructural aspects of flood management.


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HUNAN FLOOD MANAGEMENT SECTOR PROJECT
IN THE
PEOPLE'S REPUBLIC OF CHINA
HUBEI
LISHUI RIVER BASIN
Lixian
Shimen
Chili
Sangzhi
Dayung
Yuanjiang
DONGTING RIVER BASIN
Changde
29°00'N
Lingxi
CHONGQING
Pingxian
Xiangyin
Baojing
Yiyang
YUANJIANG RIVER BASIN
Jishou
Anhua
Ningxiang
Huanghuashi
CHANGSHA
Liuyang
Chengxi
Fenghuang
Xupu
ZISHUI RIVER BASIN
Xiangtan
Zhuzhou
Loudi
Xinhua
Lianyuan
Zhuzhou
Liling
JIANGXI
Lengshuijiang
Huaihua
Zhongfang
Zhijiang
Xinhuang
Qianyang
Shaoyang
Shuangfeng
Shaoyang
Youxian
Shaoyang
Longshui
Hengyang
Hengyang
GUIZHOU
Wugang
Qiyang
Daoxian
Yongzhou
XIANGJIANG RIVER BASIN
Leiyang
Jianghua
Hongjiang
Liyujiang
Xintian
Chenzhou
Ningyuan
Daoxian
GUANGXI
Jiangjong
Jiangjua
25°00'N
Provincial Capital
City/District
County
Subproject Site
Priority Subproject Site
National Road
Other Road
Railway
River
River Basin Boundary
Provincial Boundary
Boundaries are not necessarily authoritative.
GUANGDONG
N
0 25 50 75 100
Kilometers
110°00'E
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05-3866 HR

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan and technical assistance (TA) grant to the People's Republic of China (PRC) for the Hunan Flood Management Sector Project. The report also describes the proposed TA for Strengthening Flood Management Sustainability in Hunan Province, and if the Board approves the proposed loan, I, acting under the authority delegated to me by the Board, will approve ADB administering the TA.

II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES

2. In September 2004, Asian Development Bank (ADB) provided a project preparatory technical assistance (PPTA) to help the Hunan Provincial Government (HnPG) formulate the Project.[1] This report is based on findings of the PPTA, Government feasibility studies, findings of ADB missions, and discussions with Government officials, other aid agencies, and stakeholders. The project design and monitoring framework (PDMF) is included in Appendix 1.

A. Performance Indicators and Analysis

3. PRC's rapid economic growth in recent decades has been key in raising incomes and reducing levels of poverty. The country's economic transformation from a largely agrarian-based economy to an increasingly industrial economy has resulted in rapid urbanization. Major river systems such as the Yangtze river basin provide a range of key resources, including fertile floodplain soils, water for irrigation, navigation routes, and sources of hydroelectric power upon which sustained economic growth in PRC depends. Historically, trade, commerce, and industry—and, therefore, cities—have developed along major rivers such as the Yangtze. The Yangtze basin, in which Hunan Province is located, accounts for 40% of PRC's gross domestic product (GDP). Related growth and development increases the demands on river basin resources and their floodplains.

4. Over the past 20 years, Hunan Province has also experienced rapid economic growth and urban expansion. The Province's cities are centers of government, finance, business, education, transportation, agriculture, and manufacturing. They produce machinery, textiles, metals, chemicals, paper products, mineral products, medicine, and processed food. Hunan's rural areas produce rice, fruit, livestock, and cash crops. Provincial GDP in 2004 was CNY464 billion, representing 4% of national GDP, and has grown at 10.1% per year on average over the past decade. Rapid economic growth, especially in urban areas, is another reason for the steady increase of the urban population throughout the Province. The Province consists of 14 municipalities and has 66.3 million people (2003). Seventy percent of the municipal and county-level cities are in mountain river basin areas. In 2004, the proportion of urban population was 22.3% of the provincial total and is projected to increase to an estimated 33% by 2010. As of 2003, 4.1 million rural poor, or 6.1% of the provincial population, were living under the national poverty line of CNY900 per year. Under guidelines set by different municipal and county-level cities, about 1.3 million urban residents are deemed poor. Most of the poverty is concentrated in the western mountainous areas, which are characterized by poor infrastructure.

5. Hunan Province borders the middle reaches of the Yangtze River to the north, while its eastern, western, and southern areas are mountainous. The northern area, which accounts for 25% of the Province's total area, comprises Dongting Lake (covering about 7% of the Province)

[1] ADB. 2004. *Technical Assistance to the People's Republic of China for Preparing the Hunan Flood Management Project.* Manila.

and the low, flat floodplain of the Yangtze River. Hills in the central part of the Province provide a transition zone between the surrounding mountains and the Yangtze floodplain. The Li, Xiang, Yuan, and Zi rivers, collectively termed the “mountain rivers”, flow northward to deliver runoff from the mountainous areas to Dongting Lake, which drains into the Yangtze River. Appendix 2 describes the flood risks that threaten the river basin urban and rural populations.

6. High flood frequency, low levels of flood protection, and relatively high population growth rates in flood-prone areas contribute to the rising costs of floods. Flood damage in the Province was estimated at CNY0.76 billion in 1991, CNY1.87 billion in 1993, CNY3.09 billion in 1994, CNY5.0 billion in 1995, CNY5.61 billion in 1996, and CNY10.9 billion in 1998. The 1996 flood killed 130 people, while flashfloods in Loudi municipality in 2005 killed 77. Because of residential and workplace proximity to riverbanks and dependence on agriculture in floodplains, many people—predominantly the poorest people—are at risk from floods. Flood-related damage and disruption to mountain river-basin communities now rival the flood damage around Dongting Lake. Urban flood damage can reach 50% of the damage from flood events along mountain rivers. Floods limit economic growth in remote regions of the Province where growth already lags behind the provincial average.

B. Analysis of Key Problems and Opportunities

7. Despite major public investments in flood protection over the past 50 years, flood damage has increased. The challenge is to reverse that trend. The increase in flood damages, together with the occurrence in 1998 of major floods in the Yangtze and elsewhere in PRC, has prompted a review of policy and practice. Policy changes that favor an integrated flood management (IFM) approach are based on the recognition that floods cannot be completely controlled, structural works cannot completely eliminate flood risks, and escalating investment in flood prevention must be balanced with the acceptance of some residual risk.

8. Hunan Province has also placed emphasis on flood-control measures, particularly in the area around Dongting Lake, which is strategically important in managing floods in the Yangtze basin. In line with the national policy of improving flood management and easing the social and economic burden on the increasing number of people affected by floods, HnPG prepared its Flood Control Plan in 1999 as part of the overall Hunan Province Comprehensive River Basin Plan (see Appendix 2 for the components and further details of the Plan). The Plan includes a comprehensive framework for managing and mitigating floods along the four mountain rivers and around Dongting Lake, including the Municipal and County-level City Flood Control Plan. A province-wide analysis of the flood-prone areas undertaken by HnPG in 2003 concluded that, despite the relatively high level of flood damage experienced in the rural lower reaches of the mountain river floodplains and the area around Dongting Lake, greater impact could be achieved by implementing both structural and nonstructural measures in municipal and county cities located along the middle to upper reaches of the four mountain rivers.

9. HnPG is investing $626 million of local funds during 10th Five-Year Plan (2001–2005) to improve flood protection in cities across the Province. Of this, $476 million (76%) is allocated for cities in the Dongting Lake area and $150 million (24%) for cities in the mountainous areas, including $110 million for municipal cities and $40 million for county-level cities. HnPG's flood-control efforts under the Hunan Provincial 11th Five-Year Plan (2006–2010) will focus more on flood control, management, and forecasting in the four mountainous river basins—the Lishui, Xiangjiang, Yuanjiang, and Zishui—and their flood-prone municipal and county-level cities. Nonstructural measures to mitigate the onset of floods in the middle and upper reaches of the mountainous rivers and reduce the future need for flood protection works are to be developed.

10. The hydrological rationale for the priority shift is that floods in the upper and middle reaches of mountain rivers are shorter, sharper, and more sudden than in the lower floodplain areas, which tend to experience more prolonged floods. Land adjacent to the middle and upper reaches of mountainous rivers are typically inundated for no more than two or three days, but in that time water levels rise and fall dramatically. The economic rationale for shifting focus to cities in the middle and upper reaches of mountain rivers is that floods tend to have a greater relative impact on centers of economic growth, including municipal and county cities located along these rivers. Floods depress urban property values; disrupt key industrial, commercial, and government centers; and carry high recovery costs. This hinders industrialization of these cities and the functioning of market centers for rural output and surplus labor.

11. Hunan's Flood Control Plan emphasizes the use of structural flood protection works and risky reservoir reinforcement to reduce flood hazards, which are essential to improving security for those living and working within flood-prone areas. Nonstructural approaches, including data acquisition, flood forecasting, flood warning and response procedures, and water and soil conservancy are also increasingly used to reduce exposure and vulnerability to floods and need urgent completion or upgrading in Hunan. Consideration is also being given to moving people away from flood-prone areas instead of investing in expensive measures to protect them. However, the large population and lack of available land suitable for new development requires balancing structural and nonstructural measures. There is a need to explore more options for reducing flood risks and strengthening and unifying flood management throughout the Province in accordance with the Yangtze River Flood Control Plan, a basin-wide plan which covers the Yangtze River and its tributaries including Hunan's mountain rivers.

12. The development of flood protection measures for flood-affected cities is a local government responsibility. Consequently, national and provincial sources contribute only limited funding toward implementing approved measures. However, flood protection has become urgent in rapidly growing cities. Plans have been prepared for a range of structural and nonstructural works within city jurisdictions, but these plans need to be assessed within the overall framework of river basin development and in line with national policy on IFM. The Provincial Water Resource Department (PWRD) is responsible for evaluating proposed city flood management and confirms that they are compatible with the national flood management plan. Nevertheless, nonstructural flood-mitigation measures need further improvement at the local level.

13. With much experience in flood management around Dongting Lake and other areas, the Hunan PWRD and related agencies such as Hunan Hydro and Power Design Institute have the technical capacity to design and construct flood-control works. Hunan Province has experience in dealing with resettlement and environment management issues related to flood projects, including use of donor safeguard systems as required. In response to domestic and donor concerns on the application of social and environment safeguards, the PRC has strengthened related laws and regulations.[2]

14. **External Assistance.** Numerous international agencies have supported flood-control and flood management projects in the Yangtze River basin and the Dongting Lake area (see Appendix 5 for a list of recent externally supported projects). Japan Bank for International Cooperation (JBIC) is funding flood-control improvements at 23 urban centers around Dongting

[2] PRC safeguard laws include Law on Prevention and Control of Water Pollution (1996), Environmental Impact Assessment Law of the People's Republic of China (2002), Land Administration Law (1998), and State Council No. 28 Decree on Deepening Reform on Land Acquisition System and Reinforcement (2004).

Lake. The World Bank (WB) is funding a project to strengthen 142 kilometers (km) of dikes along the Yangtze River in Hunan Province, resettle 11,000 families, and conduct research into flood control and waterlogging to improve early flood warning systems and post-flood drainage. The WB has also funded the recently completed Jiangya Multi-purpose Project on the Loushui River, a tributary of the Lishui River. The Government of the Netherlands is funding a dredging project in Dongting Lake to improve water flow into and out of the lake. The Australian Agency for International Development is funding the Yangtze River Flood Control and Management Project, which is designed to improve flood forecasting, flood warning systems, and the operation of flood detention basins along the middle reaches of the Yangtze (including around Dongting Lake). External assistance for such projects along the mountainous rivers is, however, limited. Projects involving major construction works that affect people's livelihoods have generally followed the safeguard requirements of the different donors. While national safeguard systems are being strengthened, there is scope for replicating compatible donor systems and a need to monitor implementation.

15. **Lessons Learned.** ADB is providing support to two other flood management projects in the PRC.[3] The key lessons learned from these projects concern start-up delays and safeguard compliance. Start-up delays arose because of longer-than-expected approval of subproject feasibility study reports (FSRs), preliminary design reports, and land acquisition for resettlement. To reduce the time required for such approvals, the PRC's National Development Reform Committee has authorized provincial-level agencies to approve subproject FSRs, preliminary design reports, and land acquisition up to specified design and land area ceilings. Delays in fulfilling required procurement procedures can be avoided by reducing the number of procurement packages, engaging experienced tendering companies, and allowing post-facto procurement reviews where Executing Agency (EA) capacity is assessed as sufficient. Disbursement delays can be limited by using annual planning and reimbursement systems that align with the domestic budget cycle, and by permitting larger imprest accounts to accommodate civil works packages. Independent, regular, and systematic monitoring will help ensure safeguard compliance.

16. **Rationale.** Improved management and control of flood events in the middle and upper reaches of Hunan's four main mountainous river basins is essential to reducing public and investor concerns over floods and helping sustain economic development in Hunan. The Hunan economy is rapidly becoming more urbanized and industrialized. Many of the regional and district (county) cities and adjacent peri-urban areas are expanding rapidly as people migrate from rural areas to the cities looking for work and a chance to lift themselves out of poverty. However, most of these urban areas are adjacent to the four main rivers or their tributaries. Measures have been taken to protect “at-risk” communities, but the risk of floods remains high. As development continues in river catchments, the incidence of flooding is increasing along with the economic damage caused by these floods. A public investment priority of HnPG and municipal and county-level cities is to reduce the risk of floods by providing improved structural flood-control measures and nonstructural flood forecast, warning, and response systems.

17. **ADB's Role.** The national Government’s long-term development goal is to maintain steady economic growth and improve people’s living standards. To support the Government’s

[3] ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People’s Republic of China for the Songhua River Flood Management Sector Project*. Manila; and ADB. 2001. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People’s Republic of China for the Yellow River Flood Management Sector Project*. Manila.

strategy, ADB's operations focus on four strategic pillars.[4] This Project will promote sustainable economic growth by reducing investor concerns over flooding. This is expected to promote industrial development and employment in urban areas, and indirectly, develop rural areas by protecting urban market centers upon which rural markets depend. IFM promotes sustainable natural resource management. Through the Project, ADB will assist the Government in implementing policies and strategies in IFM in Hunan Province, and support HnPG in building local government capacity to implement its flood management projects and ensure proper safeguarding.

III. THE PROPOSED PROJECT

A. Sector Investment Approach

18. The Project supports the PRC's and HnPG's plans for flood protection investments as follows:

(i) **National Government Flood Management Policy.** Since 2000, the Ministry of Water Resources has promoted change from a flood-control approach to an IFM approach. The 1997 Flood Control Law and revised Water Law (2002) call for a balanced and integrated approach to managing natural resources in river basins—including flood control. At the provincial level, Hunan implements core national laws and policies as provincial measures.

(ii) **Provincial Flood Management Policy.** In line with national policy directives and strategy, the Hunan Province Comprehensive River Basin Plan addresses flood management through the Flood Control Plan. The two main components of the Flood Control Plan, are the River Basin Flood Control Plan and the Flood-Control Plan for the Dongting Lake Area. Sub-components of the River Basin Flood Control Plan include the Municipal and County-level City Flood Control Plan, the Nonstructural Measures Flood Control Plan, the Risky Reservoirs Reinforcement Plan, and the Water and Soil Conservancy Plan.

19. Specifically, the Project will support implementation of an area and time slice of Hunan's flood-control program under the 11th Hunan Provincial Five-Year Plan (2006–2010), which focuses on four mountainous river basins—the Lishui, Xiangjiang, Yuanjiang, and Zishui. The program prioritizes flood protection measures for 35 of the 94 flood-prone municipal and county-level cities, weighted by extent of the flood-prone area, frequency of flood occurrence, number of affected peoples, and value of the recurring damages and losses. HnPG has prepared initial designs and preliminary cost estimates for proposed subprojects in the 35 priority cities, presented in subproject FSRs prepared by the Hunan Hydro and Power Design Institute and affiliate organizations at the municipal level. Appendix 4 provides summary details of candidate subprojects. Based on HnPG's initial review of overall river basin flood management, a range of nonstructural measures will be developed to improve flood warning systems. The program also addresses ways to mitigate the onset of floods in the middle and upper reaches of the mountainous rivers (these measures will be implemented through agencies other than PWRD).

[4] The four pillars of the CSPU (2006–2008) are (i) promoting equitable and inclusive growth, (ii) making markets work better, (iii) improving the environment, and (iv) promoting regional cooperation.

B. Impact and Outcome

20. The proposed Project will be implemented using a sector approach, financing priority sub-projects of the Municipal and County-Level City Flood Control Plan as part of HnPG's River Basin and Flood Control Plan (see Figure A2 in Appendix 2). Representative subprojects were selected to assess the feasibility of project components. Eight of 35 draft subproject FSRs prepared by Hunan Hydro and Power Design Institute were selected and reviewed during project preparation. These covered technical, financial, economic, and social safeguards as well as environmental aspects. The selection of the representative subprojects (termed "core subprojects") was based on size of investment, represent geographic conditions in the four mountain watersheds, severity of environmental and resettlement impacts, severity and types of flooding, types of proposed flood protection measures, potential impact on indigenous peoples, and potential impact on poverty. Supplementary Appendix C provides details on the eight core subprojects. The remaining 27 draft subproject FSRs were prepared at the request of municipal and county governments by the Hunan Hydro and Power Design Institute and will be further developed based on the models provided in the eight core subprojects.

21. The Project's main impact will be to enhance sustainable and inclusive economic growth in flood-prone areas of Hunan Province. Priority municipal and county cities in the mountain river basins will be targeted to reduce investor concerns over floods, and promote increased investment in the industrial and commercial enterprises that drive urban and rural growth in the area. The Project's main outcome will be to permanently reduce flood risks in priority municipality and county-level cities along the middle and upper reaches of Hunan Province's four main river basins. The Project will lead to the construction of various structural works and will build the capacity of the provincial and local governments to manage a range of structural and nonstructural flood protection measures and warning systems. The lowered risk of floods will reduce private property losses in the project area, reduce loss of life, and increase overall investment and employment. In turn, lower risk and losses will drive industrial and commercial growth and reduce government expenditures on flood repairs and compensation.

C. Outputs

22. To achieve the expected impact and outcome, the Project comprises three main components. First, nonstructural measures will be implemented to strengthen river basin and provincial flood management, flood warning, and flood response systems. Second, structural works will be constructed to raise flood protection standards in priority locations, as identified in HnPG's River Basin Flood Control Plan. Construction or upgrading of structural works will require temporary and full resettlement of people in some project locations and management of temporary environmental impacts during construction. Third, provincial and local government project management systems will be strengthened. An additional output will be implemented with the grant financed TA. Under this output, selected non-structural flood management measures will be further assessed for relevance and feasibility in Hunan Province, to support national policy in IFM.

1. Nonstructural Flood Management Systems

23. Up to 35 municipal and county-level cities participating in the structural component of the Project will have their capacity strengthened in the following nonstructural areas: flood forecasting, flood warning systems, and flood emergency response and recovery. The nonstructural component will (i) establish or upgrade hydrological stations in related subproject locations and link these stations to the provincial data-acquisition system; (ii) improve data

management, flood forecasting, and flood event decision support systems for flood management in up to 35 subproject locations; and (iii) train staff in municipal and county-level cities to operate flood warning systems and plan for and manage flood emergencies. Flood forecasting and warning will be based on a river basin-wide integrated flood forecasting system planned by the Hunan Hydrology Bureau. Data acquisition systems and telemetry systems will be implemented by project area municipal and county governments, guided and supervised by the Hunan Hydrology Bureau, which will integrate systems into the existing provincial and state information system. Flood management measures will be integral to the overall river basin flood warning and decision making process operated by the Provincial Flood Control and Drought Relief Headquarters.

2. Structural Flood Protection, Resettlement, and Environment Management

24. The Project will provide structural flood protection works to increase protection standards for up to 35 flood-prone municipal and county-level cities in the mountainous regions of Hunan's four main river basins. The structural works will improve current flood protection standards to a 1 in 20-year-return flood period in county-level cities, in municipal cities to a 1 in 50-year flood return period in municipal level cities, and up to 1 in 100-year flood return period in three key municipal cities. The scale of floods, flood discharge levels, river water levels, and needed protection improvements in each city was determined by hydrologic and hydraulic analysis of available data on rivers and catchments. The Project will upgrade FSRs for each selected noncore subprojects in line with model FSRs prepared for the eight core subprojects during project preparation, prepare detailed engineering designs for all subprojects and, in line with PRC flood protection standards, rehabilitate and construct earth dikes and flood walls, upgrade and construct sluice gates, upgrade and construct pumping stations, and upgrade and construct diversion channels. Additional details of planned flood protection works for the 8 core subprojects and design standards for the noncore subprojects are provided in Appendix 4.

25. Some areas around the planned structural works, including river banks, are currently occupied by residents and businesses requiring land acquisition and resettlement. The Project will acquire land where needed to accommodate flood protection civil works, prepare and implement resettlement plans (RPs) to relocate, temporarily or permanently, affected persons. The Project will also prepare and implement environmental assessments and management plans for each subproject. Attempts have been made to minimize resettlement requirements, but if broad flood protection is to be attained, some disruptions to residents, businesses, and farmers are unavoidable. Accommodating construction works and relocating people from high-risk areas along rivers will require the acquisition of a total of 863 hectares of land in 35 cities. Up to 20,133 people will be relocated and 95 enterprises and 132 shops will be affected. Existing infrastructure facilities, such as power transmission lines, irrigation canals, and roads, will either be temporarily disrupted or partially realigned around the new flood protection works. Land acquisition, and resettlement and environmental management costs are included in the Project costs. Appendix 14 summarizes the resettlement framework, and Supplementary Appendix C (Part 2) provides detailed RPs for the eight core subprojects. An environmental assessment and management framework is presented in Appendix 16. Initial environmental examinations of the eight investment locations are provided in Supplementary Appendix C (Part 3). Implementation of safeguard measures will include capacity building of EA and Implementing Agency (IA) staff.

3. Project Management and Capacity Building

26. Construction of major flood-control works and management of flood response require qualified and experienced personnel. The Provincial Project Management Office (PPMO) has prior experience in implementing WB and JBIC flood management projects, but newly established local project management offices (LPMOs) need capacity building support for the implementation of their subprojects. The Hunan PPMO and its respective line agencies—the Provincial Development and Reform Committee (PDRC), PWRD, and the Provincial Finance Department (PFD)—will ensure that municipal and county LPMOs and their associated line agencies follow consistent policies, strategies, and regulations, and that relevant staff have the necessary project management skills. An annual plan and management framework consistent with HnPG's domestic planning and budgeting systems will be implemented to strengthen provincial–local government coordination, project monitoring, and implementation.[5] The PPMO, with support from domestic consultants, will detail a training and human resource development plan for key line agencies at project start-up. Training will be delivered centrally or locally by domestic trainers. The PPMO will supervise and monitor the training activities. Key provincial and local government managers will receive additional domestic or international short-course training to enhance overall project managerial capacity.

4. Support for Flood Management and Planning

27. In addition, an advisory TA support will provide capacity building in annual planning and management systems in support of project management, and will assist in assessing nonstructural aspects of flood management. HnPG's flood management program under the 11th Hunan Provincial Five-Year Plan consists of flood control and drainage in the Dongting Lake area, city flood control, flood-control reservoirs, river channel regulation, rehabilitation of unsafe reservoirs, flood control and nonstructural warning systems for farmland along the low river banks, flash-flood disaster prevention and warning, and soil and water conservation. Appendix 2, Table A2.1 summarizes the current status and planned future provincial actions in line with the national flood management strategy. Two areas supporting nonstructural aspects of flood management in Hunan Province were identified as priorities to be supported by the TA: (i) a needs assessment for further developing flood warning systems, and (ii) the feasibility of introducing flood insurance. The TA will be provided to PWRD and results used for the current 11th Hunan Provincial Five Year Plan and in preparing the Hunan Provincial 12th Five Year Plan.

D. Special Features

28. The Project will be the first ADB loan project in the water sector for Hunan Province. The Project is embedded in Hunan Province's River Basin and Flood Control Plan. This is the first ADB-supported flood management project in which the national Government has given subproject approval authority to the provincial government. This is expected to accelerate project start-up approvals, improve provincial ownership of the Project, and provide an opportunity for ADB's support to be more closely aligned with PRC's planning and budget systems. An annual plan based management and monitoring system based on domestic systems will be further developed to strengthen EA and IA planning and management, and to facilitate ADB's regular review of subproject planning and implementation. Advisory TA support

[5] The Project's proposed management and monitoring system was developed as part of the TA delivered through ADB. 2004. *Technical Assistance to the People's Republic of China for the Hunan Flood Control Project.* Manila (TA 4324-PRC), and through the Cooperation Fund for the Water Sector Pilot Demonstration Activity: Hunan Flood Management Project Management and Monitoring System.

for field-based review and for preparation of RPs and initial environmental examination is expected to increase capacity to address safeguards. The Project will assess further development needs in nonstructural areas.

E. Project Investment Plan

29. The project investment cost is estimated at $497.4 million equivalent, including taxes and duties of $13.6 million equivalent. Financial charges during implementation (comprising interest during implementation) are estimated at $36.2 million. Cost estimates by project component are summarized in Table 1 below, and the summary financing plan is presented in Table 2. Detailed cost estimates and assumptions are provided in Appendix 6.

Table 1: Project Investment Plan
($ million)

Item	Amount
A. Base Cost	
1. Nonstructural Flood Management Systems	11.4
2. Structural Flood Protection, Resettlement, and Environmental Management	
a. Core Subprojects	120.4
b. Noncore Subprojects	267.1
3. Project Management	
a. Provincial Project Management	3.6
b. Local Project Management	28.3
4. Taxes and Duties	13.6
Subtotal (A)	**444.4**
B. Contingencies	
1. Core Subproject Physical Contingencies	12.0
2. Core Subproject Price Contingencies	4.8
Subtotal (B)	**16.8**
C. Financing Charges During Implementation	**36.2**
Total	**497.4**

Source: Asian Development Bank estimates.

F. Financing Plan

30. The Government has requested a loan of $200 million from ADB's ordinary capital resources to help finance the Project. The loan will have a 26-year term, including a grace period of 6 years, an interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, a commitment charge of 0.75% per annum and such other terms and conditions as set forth in the loan agreement. The Government has provided ADB with (i) the reasons for its decision to borrow under ADB's LIBOR-based lending facility on the basis of these terms and conditions, and (ii) an undertaking that these choices were its own independent decision and not made in reliance on any communication or advice from ADB. The financing plan is shown in Table 2. Counterpart funds from the municipal and county governments will be sourced from various sources, including the flood-control security fund, the local quota for city flood-control works, the urban maintenance and construction charge, land

sale and development, and national and budget transfers. The affordability analysis of local governments of the eight core subprojects is provided in Appendix 17. An attached advisory TA will be provided to support the strengthening of flood management sustainability, for which the Government of Spain has agreed to make untied grant funds of $500,000 available.

Table 2: Financing Plan
($ million)

Source	Total	%
A. **Asian Development Bank**	**200.0**	**40.2**
B. **Government**		
1. Hunan Provincial Government	2.2	0.4
2. Municipal/County Governments	295.2	59.3
Subtotal (B)	**297.4**	**59.8**
Total	**497.4**	**100.0**

Source: Asian Development Bank estimates.

31. The Government will re-lend the proceeds of the ADB loan to HnPG under the same terms and conditions as the original loan, including a 26-year loan term with a 6-year grace period and a 20-year loan repayment period (see Appendix 10 for the flow of funds and onlending arrangements). The interest rate will be at the same LIBOR-based rate paid by the Government of the PRC, and will be subject to the same terms and conditions as the PRC loan. HnPG will on-lend the proceeds of the loan to the local authorities to finance the foreign exchange cost of the subprojects. On-lending will be under the same terms and conditions as the on-lending terms to HnPG, including a 26-year loan term with a 6-year grace period and a 20-year loan repayment period. The interest rate payable on the loan will be subject to the same LIBOR-based terms and conditions as the loan to HnPG. The local authorities will bear the foreign exchange risk. The financial management assessment concluded that local government borrowers can afford the Project with either existing or incremental budget allocations (see Appendix 17 and Supplementary Appendix I).

G. Implementation Arrangements

1. Project Management

32. HnPG will be the EA for the Project (see Appendix 9 for the project organizational chart). The participating municipal and county-level cities are the IAs for the Project. A project leading group has been established by HnPG to oversee project preparation and implementation, headed by the vice governor of Hunan Province. The PPMO will have day-to-day responsibility for project implementation. The PPMO will operate out of the PWRD office in Changsha and will have primary responsibility for coordinating and directing subproject implementation. The PPMO includes representatives from the three main agencies responsible for the Project—the PDRC, PFD, and PWRD. The PPMO is also responsible for directing project preparatory activities, assisting LPMOs to plan and manage their subproject works, setting up and managing finances, monitoring the resettlement planning and environment management activities, and establishing project monitoring systems. Each participating municipality or county has set up a local project leading group and an LPMO to coordinate aspects of project preparation and implementation in their jurisdictions.

2. Subproject Preparation and Selection

33. **Subproject Preparation.** In addition to the eight subproject FSRs reviewed and revised during the PPTA, the Hunan Hydro and Power Design Institute at the request of participating municipalities and counties and with guidance from the PPMO, will finalize FSRs for each of the

remaining 27 subproject candidate locations. Each FSR will include a situation assessment, rationale, scope, technical analysis and description, cost estimates and financing plan, implementation arrangements, financial and economic analysis, and social and poverty impact assessment. The LPMO will review the report, hold public consultations where resettlement or short-term negative environmental impacts are expected to occur during the construction period, and request changes before providing the PPMO with authorization for further processing in line with domestic requirements and procedures agreed upon with ADB.

34. **Selection Criteria.** The Hunan PDRC, in consultation with the PPMO, will appraise subprojects in accordance with the criteria detailed in Appendix 3. For the subproject to be approved it must fulfill the following: (i) the subproject is a priority investment in the Hunan River Basin Flood Control Plan; (ii) the design minimizes costs; (iii) the design minimizes detrimental environmental and social impacts and ensures that people who are adversely affected by civil works construction are compensated and rehabilitated according to PRC laws and ADB resettlement policies; (iv) the local government can afford it; (v) the local government demonstrates firm commitment to the investment through provision of budgetary resources to meet counterpart funding requirements during the construction phase—including resettlement costs and loan repayments—and provision of budgetary resources to meet operations and maintenance costs during subsequent phases; (vi) beneficiaries demonstrate commitment to the investment through their willingness to pay and contribute to the cost of development during the construction period; and (vii) the internal economic rate of return exceeds 12%. Data and information to apply the selection criteria are provided in each subproject's social and poverty impact assessment, initial environmental examination, economic analysis, and financial analysis.

35. **Subproject and Safeguard Plan Approvals.** The eight core subproject FSRs prepared under the PPTA will be the standard to which the remaining noncore subprojects FSRs will be finalized by Hunan Hydro and Power Design Institute, and endorsed by the LPMOs. Both core and noncore subproject FSRs will be submitted to the PDRC for approval, in compliance with domestic PRC requirements, prior to loan effectiveness. HnPG will submit all noncore subproject FSRs to ADB for review and approval on a no-objection basis. Noncore subproject FSRs will be submitted in line with proposed annual work plans and in advance of contract bidding. ADB's subproject planning and design review will occur during the mid-year project reviews. The subproject preparation, review, and approval process is provided in Appendix 11. ADB's final approval of financing of each subproject is subject to post-facto review and confirmation that implementation is in accordance with the Hunan River Basin Flood Control Plan, subproject selection criteria, and ADB policies. The approved resettlement framework, the ethnic minority development framework, and the consolidated environment management framework provide the basis for preparing noncore subproject RPs, ethnic minority development plans (EMDPs), and initial environmental examinations. Prior to commencement of land acquisition, HnPG will submit to ADB for approval all RPs and EMDPs following processes described in Appendixes 14 and 15. HnPG will submit subproject initial environmental examinations to ADB for review and no-objection approval following the process described in Appendix 16.

3. Implementation Period

36. The proposed works for the 35 candidate subproject locations are scheduled for completion over five dry seasons (the dry season usually runs from approximately September to April). Works will take between 2 and 5 years to complete. Project implementation is expected to take 6 fiscal years once the loan becomes effective in the third quarter of 2006. The

implementation schedule for the 35 subprojects is shown in Appendix 8. HnPG is targeting the 2006–2007 dry season for works start-up on the eight core subprojects, including subproject predesign and preparatory works, site preparation, and materials stockpiling. It has requested retroactive financing and advanced action procurement to commence these works. Retroactive financing will be allowed for reasonable expenditures incurred under the Project before the Effective Date but not earlier than 21 August 2005. The project implementation period will be from about September 2006 to about September 2012. For locations requiring 5 years, start-up must be no later than September 2006; for locations requiring 4 years, start-up must be no later than September 2007; and for locations requiring 3 years, start-up must be no later than September 2008. Nonstructural development activities are expected to be implemented in the Project's first 3 years.

4. Procurement

37. Equipment, materials, goods, and services for ADB-financed contracts will be procured in accordance with ADB's *Guidelines for Procurement*. Major contracts for equipment and materials valued at $1 million equivalent or more will be awarded through ADB's international competitive bidding (ICB) procedures. Smaller packages for equipment and materials valued at less than $1 million equivalent will be procured following international shopping procedures or national competitive bidding (NCB) procedures. Shopping mode will be allowed for contracts valued at $100,000 equivalent or less. Civil works contracts estimated to cost $10 million or more will be carried out using ICB procedures, while those costing less than $10 million equivalent will be carried out using NCB procedures acceptable to ADB. The Procurement Plan is attached in Appendix 7.[6] HnPG is targeting start-up of priority civil works for the eight core subprojects before the onset of the 2006 flood season (which should start around April) and is finalizing FSR approvals and preparing detailed designs accordingly. Retroactive financing withdrawals from the Loan Account may be made for reimbursement of reasonable expenditures incurred under the Project before the Effective Date, but not earlier than 21 August 2005, or a maximum of 12 months prior to the date of the signing of the Loan Agreement, whichever is later, in connection with civil works contracts for the 8 core subprojects, subject to a maximum of $10,000,000.

5. Consulting Services

38. The Project will support provincial and local government capacity building in flood management for which training services will be contracted through specialist international and domestic institutions in accordance with the Consultants' Qualification Selection method described in ADB's Guidelines on The Use of Consultants. The PPMO has experience with past and ongoing WB- and JBIC-financed flood-control projects and the minimum required management and technical capacity exists to implement the proposed works. To ensure that requirements for each project location are met, the PPMO will use counterpart funds to hire domestic specialists or companies. Domestic third-party agencies will be recruited by the PPMO to assist with compliance monitoring and supervision of environmental, resettlement, and ethnic minority issues. The EA estimates that 69 person-months of domestic consulting will be required. Specific domestic consultants to be hired and financed by the EA include (i) project implementation specialists, (ii) procurement and finance specialists, (iii) economics analysts, (iv) environment specialists, and (v) resettlement specialists.

[6] The procurement plan will be updated in order to comply with the requirements set forth under the *Guidelines for Procurement*.

6. Anticorruption Policy

39. ADB's *Anticorruption Policy* (1998) was explained to and discussed with the Government. Consistent with its commitment to good governance, accountability and transparency, ADB reserves the right to investigate, directly or through its agents, any alleged corrupt, fraudulent, collusive, or coercive practices relating to the Project. To support these efforts, relevant provisions of ADB's *Anticorruption Policy* are included in the loan regulations and the bidding documents for the Project. In particular, all contracts financed by ADB in connection with the Project shall include provisions specifying the right of ADB to audit and examine the records and accounts for the EA and all contractors, suppliers, consultants, and other service providers as they relate to the Project.

7. Disbursement Arrangements

40. The Project is expected to make use of reimbursement and imprest fund procedures (including civil works) for disbursement in accordance with ADB's Loan Disbursement Handbook (January 2001). The PFD will establish an imprest account for the Project in a commercial bank to ensure that adequate loan proceeds are available on a timely basis. The initial amount to be deposited into the imprest account shall not exceed the equivalent of $20 million (10% of the total loan amount), or the estimated expenditures for the next 6 months, whichever is lower. PFD will be responsible for management, monitoring, maintenance, and reconciliation of the imprest account. Statement of Expenditures procedures will be used to reimburse expenditures and liquidate the imprest account for individual payments not exceeding $100,000 equivalent. For each subproject, a project implementation unit will prepare and submit the withdrawal application and required documentation to PFD through the local financial bureau, LPMO, and PPMO. PFD will consolidate withdrawal applications and submit them to ADB for disbursement processing.

41. Measures will be taken to accelerate internal review and verification for withdrawal applications, including: (i) PFD will have at least two authorized representatives assigned to withdrawal applications; (ii) to shorten the internal verification process, PFD, the local financial bureau, and the PPMO will establish written procedures with a specified timeframe for review and verification of withdrawal applications submitted by subprojects; (iii) subprojects are encouraged to use the reimbursement system or imprest account for large eligible expenditures, such as civil works-related items and small-value contracts; (iv) PFD will increase the turnover of imprest accounts in line with the needs of project implementation; and (v) PFD, the local financial bureau, the PPMO, and project implementation units will avoid withholding project funds at each level.

8. Accounting, Auditing, and Reporting

42. PWRD and each subproject IA will identify the goods and services for structural and nonstructural components to be financed by the ADB loan and other sources. Each subproject will prepare its own project accounts and submit annual project accounts to the PPMO after verification by the local financial bureau. The PWRD will verify the subproject accounts, consolidate the accounts of all subprojects, and incorporate the expenses incurred for the operation of the PPMO for the Project. PFD will verify the consolidated project accounts. Each project account will include a balance sheet, statement of sources and uses of funds, statement of implementation of loan agreement, and statement of imprest account. Subprojects will follow a uniform format, sound accounting principles, domestic regulations, and ADB requirements. The financial management assessment indicated that the existing institutional base can be strengthened to fulfill the required functions and responsibilities.

43. Each of the subproject accounts will be audited by the municipal or county local audit bureaus. The Hunan Provincial Audit Bureau will audit the consolidated project accounts and issue the audit report for the Project. The audit will be conducted in accordance with international standards on auditing and the Government auditing standards of the PRC. Audit coverage will include a special audit of project accounts, including separate opinions on (i) utilization of the imprest account; (ii) the statement of expenditures, including whether the amount claimed is duly supported and verified; (iii) whether the EA is operating the imprest account in accordance with ADB procedures; and (iv) compliance with financial covenants specified in the loan and project agreements. A letter describing internal management controls and procedures associated with the preparation of project accounts is required, and should be submitted together with the audited project accounts. Audit reports of consolidated project accounts will be furnished to ADB within 6 months of the end of each calendar year. Separate audits for resettlement funds will be prepared and provided to ADB annually. The PPMO will prepare quarterly progress reports indicating progress made, problems encountered during the period under review, steps taken or proposed to remedy the problems, the proposed program of activities, and the progress expected for the following half year. Within 6 months of physical completion of the Project, the PPMO, with support from the LPMOs, will submit a project completion report to ADB on implementation of project components, project management issues, actual costs incurred in relation to cost estimates, benefits, beneficiary consultations, and other information requested by ADB.

9. Project Performance Monitoring and Evaluation

44. ADB supervision missions are envisaged to occur at least twice yearly. A midyear review will focus on planning the following year's subproject start-ups and activities; an end-year review will focus on implementation performance during the past year. Implementation monitoring will extend to the monitoring and mitigation of the risks identified in the PDMF (Appendix 1). The monitoring system will be based on the agreed PDMF and existing baseline information, or on the first measurement at subproject start-up such as temporary environmental disturbances during construction. The principles of the monitoring system are provided in Appendix 18.

45. The initial project progress report will be prepared from the PDMF by ADB one month after the effective date, and will be updated periodically during project review missions in consultation with the EA or after receipt of project progress reports. A project completion report shall be prepared within three months of completion of the Project. A separate TA completion report will be prepared for the Government of Spain-funded advisory TA, which will be processed in conjunction with the loan. The assessment of the advisory TA performance will be reported and incorporated in the overall assessment of the Project.

10. Project Review

46. The Project's management information and monitoring system will provide the basis for the EA’s, IAs’ and ADB's monitoring and review. It is envisaged that ADB review missions will occur at least twice per year. The semiannual reviews will include a review of the consolidated work plan for the year, key steps needed to ensure timely implementation, proposed loan and counterpart funds needs, and compliance with safeguard measures. A midterm review will also be undertaken by ADB, HnPG, and the Government 3 years after project implementation begins. The review will include a detailed evaluation of scope, implementation arrangements, environmental management, resettlement, achievement of scheduled targets, and progress with capacity building measures.

IV. TECHNICAL ASSISTANCE

47. An advisory TA grant of $500,000 from the Government of Spain will be provided and will be administered by ADB. The EA will provide $120,000 for in-kind costs. The plans for IFM and supporting investments require a coordinated, well managed approach to implementation. Developing and sustaining strategic interventions in IFM will require updates to elements of Hunan's existing River Basin Flood Control Plan including strengthening capacity in annual planning and management systems for IFM systems.

48. The advisory TA will support HnPG and local governments to further develop domestic annual planning and management systems through the Hunan Flood Management Sector Project. The component will support preparation of effective subprojects, support the development of systems for annual activity planning, confirm counterpart financing needs and applications for construction works, ensure that such works employ proper safeguard measures, support the establishment of monitoring and reporting systems, and clarify the responsibilities of the various agencies. The advisory TA will also strengthen the capacity of the EA and IAs to meet safeguard requirements in noncore subproject areas.

49. The advisory TA will support HnPG in adopting strategies for flood warning systems and flood insurance as part of the Province's IFM plans. This component will comprise a review and analysis of the Province's existing flood warning system and facilities in one river basin, and propose ways to optimize the design of these facilities for hydrometeorological data collection and flood preparedness. Institutional capacity and financing needs will be identified for future development of flood warning systems. The advisory TA will involve close cooperation with the Hunan Water Resources Department. The advisory TA will help assess the feasibility of providing flood insurance to rural and urban people, and will support the Hunan Water Resources Department's future strategic planning efforts on IFM.

50. An international firm will be engaged through quality- and-cost-based selection method using simplified technical proposals in accordance with ADB's *Guidelines on the Use of Consultants by Asian Development Bank and Its Borrowers*. Consultants with expertise in areas such as flood insurance and flood modeling may be engaged as individuals or through specialist institutions. Fifteen person-months of international consulting services and 34 person-months of domestic consulting services will be required. The indicative consultant needs and outline terms of reference of the TA are provided in Appendix 12. Implementation of the TA will commence in the first year of the Hunan Flood Management Sector Project (2006).

V. PROJECT BENEFITS, IMPACTS, ASSUMPTIONS, AND RISKS

A. Economic Impact and Poverty Reduction

51. Without project flood protection, the mountain river basin municipal and county-level cities is currently in the range of 1 in 2-year return period to 1 in 20-year return period. These levels of flood protection are, in many cases, insufficient to handle average floods. Project flood protection will raise the level of protection to a 20-year return period flood in the case of county-level cities, and a 50-year return period for municipal cities. The combined populations for the target municipal and county cities are over 6.4 million people. The direct impact of the Project will be to reduce flood risks by: reducing flood hazards through structural works in project protected areas; reducing exposure to floods through property acquisition and resettlement in project protected areas; and reducing vulnerability to floods in project areas through nonstructural measures, including improved flood forecasting, emergency response, community awareness and preparedness for floods. The with-project scenario provides improved

advanced-flood-warning systems and flood protection systems. The Project is assessed to be financially sustainable. Economic internal rates of return (EIRRs) for the eight core subprojects exceed 12%. Further details of the Project's fiscal, economic, distribution, and poverty impact are provided in Appendix 17.

52. Indirect and unquantifiable impacts not included in quantified economic benefit calculations include reduced loss of life, avoidance of injuries, reduced hospitalizations, and avoided costs of mobilizing flood-fighting and evacuation crews during major floods. Unquantifiable benefits include environmental improvements in the project area and provision of recreational areas along river embankments. Other avoided losses include disruption of communication and transportation to areas adjacent to flood-prone zones, and losses of household assets, livestock, and farm machinery. Such losses affect vulnerable and poor households most severely. Avoiding such losses will reduce the fiscal burden of flood disasters, freeing up public spending for development of infrastructure and other services.

53. Reducing flood risks for public infrastructure, residential areas, businesses, and industrial investments in project areas will reduce investor concerns about floods and pave the way for increased investment. Increased investment will expand markets for rural and urban production, promote urban and rural employment and growth, and reduce poverty in areas economically linked to project areas (assuming Hunan's growth rates are maintained and low-income groups have access to labor and product markets).

B. Social Dimensions

1. Social Benefits and Poverty Reduction

54. Poverty incidence among project beneficiaries is 10% for urban dwellers and 5% for the rural population. The main stakeholders include urban residents, peri-urban rural residents, industry, and businesses. About 85% of the project protected area residents who live in poverty are urban dwellers. Surveys and analyses of social patterns in project communities have identified both positive benefits and short-run adverse impacts resulting from flood protection works that require land acquisition. The focus on river-basin growth centers means that three quarters of direct project beneficiaries are urban based. Flood damage is a direct contributor to the impoverishment of both urban and rural dwellers. Project surveys show that up to one third of urban poverty is caused by frequent floods. Construction of flood-control works will protect vulnerable people in project locations. Nonstructural investments will reduce vulnerability through improved flood warning and emergency response systems. The Project has developed social action plans that provide a framework for mitigating the potentially negative impacts of resettlement.

2. Land Acquisition and Resettlement

55. Structural works will require the resettlement of some rural and urban residents. The 35 subprojects will affect up to 101 townships (towns or subdistricts) and 352 villages or urban residential committees. Up to 863 hectares (ha) of land will be acquired, including 461 ha of farmland. The acquisition of farmland will leave up to 13,969 persons in need of full economic rehabilitation. In addition, during the construction phase, about 613 ha of land will be occupied temporarily. Along with land acquisition, about 1 million square meters (m^2) of structures will be demolished, including 709,899 m^2 of residential structures and 292,933 m^2 of non-residential structures. The flood protection works will cause permanent or temporary relocation of 5,236

households and 20,133 persons (77% urban and 23% rural) and affect 95 enterprises and 132 shops.

56. The majority of rural people who will lose land and property will be reabsorbed into their villages through a land-reallocation process. Compensation measures will be in place to cover losses. Urban residents will be relocated to areas close to their current locations or, if agreeable, to new development areas within the city. The approach for each subproject depends on community discussions, available options, compensation levels, and individuals' consent to be resettled. The RPs have been prepared for the 8 core subprojects and are open for discussion with affected people. In the subprojects where the affected persons include ethnic minorities, resettlement will require additional measures. The resettlement framework is presented in Part 3 of Supplementary Appendix B, the ethnic minority development framework (EMDF) is presented in Part 4. The full RPs are presented in Part 2 of Supplementary Appendix C for the eight core subprojects. One EMDP is provided in Part 3 of Supplementary Appendix C. The LPMOs will be responsible for preparing and implementing the RPs and EMDPs for their subprojects. Internal monitoring will be carried out by the PPMO and LPMOs. The EA will carry out internal and external monitoring during RP implementation to ensure compensation measures meet PRC regulations and ADB policies. External monitoring and evaluation will be assigned to a qualified independent monitoring agency. The PPMO will report to ADB on land acquisition and resettlement in quarterly progress reports. External monitoring reports will be submitted to ADB and the PPMO twice per year during resettlement implementation; evaluation will be conducted and reported annually. Prior to the completion of the Project, the PPMO will prepare and submit to ADB a comprehensive resettlement completion report.

C. Environmental Impact

57. Flood protection works will involve physical changes to riverbanks to protect flood-prone areas, and to material source sites needed to construct dikes and provide river bank or dike stabilization. The Project has been classified as Category B by ADB. To address environmental impact concerns, an initial environmental evaluation (IEE) has been prepared for each of the eight core project locations. Cumulative downriver effects of flood works are not expected but should be cross-analyzed and monitored. Consolidated or project-wide environmental reports have been prepared, including a consolidated IEE, a consolidated summary IEE and a consolidated environment management plan (CEMP). These reports outline the mitigation, monitoring, and institutional measures that need to be taken during project implementation, and the actions needed to implement semiannual monitoring and reporting to ADB of these measures. The total estimated cost for implementation of environment management plans for all subprojects is $13.5 million and is included in the Project costs.

D. Risks

58. Risks are grouped by project impact, outcome, and output. Impact risks involve increased losses resulting from the population in flood protected areas ignoring continued flood risks that can exceed design standards, which could be exacerbated by additional migration into protected areas by people and businesses seeking protection behind improved flood protection works. Mitigation measures are: (i) to progressively introduce—through more complete flood exposure and vulnerability measures such as enhancing land-use zoning in flood-prone areas—development planning and higher-standard building codes, and (ii) to consider, as part of the beneficiary-pays policy, increased taxes and insurance as an integral part of flood management policy.

59. Outcome and output risks include: (i) heavy floods may occur that exceed infrastructure design standards; (ii) incohesive implementation of structural and nonstructural components of the flood management strategy resulting from a lack of coordination between provincial and local government agencies; and (iii) insufficient counterpart budget for civil works, resettlement, and environment management at project start-up, which could delay implementation. Mitigation measures to address such risks are: (i) to improve flood warning and emergency response systems to better prepare people for floods; (ii) to clearly define the roles and responsibilities of provincial and local government agencies, and to ensure that interagency coordination mechanisms are functional; and (iii) to continually monitor the financial position of municipalities and counties in order to ensure that they are prepared to meet annual fiscal requirements for project implementation. Measure (ii) will be carried out under the technical assistance.

60. The collective benefits will outweigh the costs and outweigh the risks. Mitigation measures are designed to warn of risks in advance and allow time to respond to those risks.

VI. ASSURANCES

A. Specific Assurances

61. In addition to the standard assurances, the Government and HnPG as the EA give the following assurances, which are incorporated in the legal documents:

1. Flood Protection and Management Improvements

(i) HnPG through the PPMO will arrange for the preparation of the remaining 27 noncore subproject FSRs through a qualified design institute in line with the standards set in the eight core subproject FSRs, hold required public consultations, revise, and obtain approval of the municipal or county local government prior to submission to PDRC for appraisal and approval.

(ii) PDRC, in consultation with the PWRD, Hunan PFD, Hunan Environmental Protection Bureau, and relevant line agencies, will review and appraise the 27 noncore subprojects and ensure that the subproject selection criteria agreed with ADB are demonstrated.

(iii) The PPMO will ensure all PRC domestic requirements arising from each FSR are met in a timely way, including PRC-required approvals for land acquisition, environmental assessment, and technical assessments.

(iv) HnPG will submit all noncore subproject FSRs to ADB for review in accordance with subproject selection criteria, and for approval on a no-objection basis. Noncore subproject FSRs shall be submitted in line with proposed annual work plans and six weeks in advance of contract bidding. ADB's final approval of the financing of each sub-project shall be subject to post-facto review and confirmation that implementation is in accordance with the sector plan, subproject selection criteria and all relevant ADB policies. The approved resettlement framework (RF), EMDF, and the environmental assessment and management framework (EAMF) shall provide the basis for preparing noncore subproject RPs, EMDPs, and IEEs. HnPG will submit to ADB for approval prior to commencement of land acquisition all RPs and EMDPs. HnPG will submit all subproject IEEs to ADB for review at least six weeks in advance of contract award for approval by ADB on a no-objection basis.

(v) ADB financing of all subprojects shall be subject to post-facto review and confirmation of compliance with the selection criteria and that implementation accords with ADB policies and requirements.

2. Social Safeguards

(i) HnPG through the PPMO and IAs will ensure that (a) the RF and all RPs are implemented in accordance with their terms; (b) all land and rights-of-way required by the Project are made available in a timely manner; (c) provisions of the RPs, including compensation and entitlements for affected persons, are implemented in accordance with all applicable government laws and regulations and ADB's *Policy on Involuntary Resettlement* (1995); (d) compensation and resettlement assistance are given to the affected persons prior to dispossession and displacement; (e) counterpart funds for land acquisition and resettlement activities are provided in a timely manner; (f) any obligations in excess of the RP budget estimates are met; and (g) the affected persons will be at least as well off as they would have been in the absence of the Project.

(ii) HnPG through the PPMO will ensure that the RPs prepared for the core subprojects in the event of significant changes arising from detailed designs are updated, disclosed to the affected persons, and resubmitted to ADB for concurrence.

(iii) HnPG through the PPMO will ensure that (a) RPs prepared for the noncore subprojects are based on the RF and final design, and are submitted to ADB for approval; and (b) reflect any significant material changes in Project scope in an updated RP and submit to ADB for approval. HnPG will disclose such updated RPs to affected persons prior to ADB approval.

(iv) HnPG through the PPMO and IAs will ensure that (a) adequate staff and resources are committed to supervising and monitoring the implementation of the RPs and providing quarterly reports on such implementation to ADB; (b) an independent agency acceptable to ADB is engaged by the PPMO to carry out monitoring and evaluation, and to forward reports to ADB semiannually during resettlement implementation and annually for two years thereafter; and (c) summaries of annual audits of resettlement disbursements and expenditures under each RP are provided to ADB.

(v) HnPG through the PPMO will (i) ensure that civil works contractor specifications include requirements to comply with the RPs and entitlements for permanent and temporary impacts to affected persons; and (ii) supervise contractors to ensure compliance with requirements of the RPs, applicable laws, and regulations, and ADB's *Policy on Involuntary Resettlement*.

(vi) HnPG through the PPMO and LPMOs will ensure that (a) the EMDF and EMDPs are implemented in accordance with their terms; (b) EMDPs are prepared for relevant subprojects in accordance with the EMDF and ADB's *Policy on Indigenous Peoples (1998)*; (c) EMDPs are disclosed to affected persons, reviewed, and endorsed by LPMOs; (d) ethnic minorities in the Project areas are consulted and provided with an opportunity to participate in the implementation of the EMDPs; (e) sufficient budget for implementation and monitoring of each EMDP will be made available in a timely manner, and any obligations in excess of the

EMDP budget estimates are met; (f) any significant changes to the EMDP will be submitted to ADB for approval; (g) an independent agency acceptable to ADB is engaged by the PPMO to carry out regular monitoring and evaluation of the implementation of the EMDPs and to report annually to ADB; and (h) the targeted ethnic minorities will benefit from the Project and will be at least as well off as they would have been in the absence of the Project.

3. Environment Management

(i) HnPG through the PPMO will ensure that with regard to all noncore subprojects: (a) subproject IEEs are prepared; (b) each IEE meets the requirements of relevant PRC laws and regulations, ADB's *Environment Policy (2002)*, the EAMF, and the model IEEs developed for the core subprojects; (c) each IEE indicates that the subproject will not result in significant long-term negative environmental impacts; and (d) each IEE includes a costed subproject environment management plan (EMP) and defined mitigation measures in line with PRC laws and ADB Environment Policy (2002) that will be implemented to mitigate environmental impacts during construction and operation.

(ii) HnPG through the PPMO will ensure that (a) mitigation measures follow PRC laws and regulations; (b) requirements for mitigation implementation are incorporated into all subproject construction contracts; and (c) subproject design minimizes detrimental environmental impact as a result of cumulative downstream flood effects from improved structural works.

(iii) HnPG through the PPMO will ensure that construction works do not take place in any areas of special environmental significance, including wetlands, areas of habitat for rare and endangered flora and fauna, and protected areas or nature reserves.

(iv) HnPG through the PPMO will ensure that (a) environmental management practices of the contractors are supervised and monitored during construction, as described in the EAMF and the CEMP; (b) air, water, and noise monitoring is undertaken as described in the ambient monitoring program in the EAMF and the CEMP; (c) performance of the contractors is reported in the Project progress reports; and (d) environmental performance of each subproject and the entire project is evaluated and reported as part of the project performance monitoring evaluation reports.

4. Financial Management and Procurement

(i) The PFD will establish and be responsible for an imprest account for the Project. The imprest account and other permissible methods will be operated and maintained in accordance with ADB's *Loan Disbursement Handbook (January 2001)*.

(ii) The PPMO and PFD will prepare and distribute before project start-up a model project financial management manual detailing guidelines on internal controls, accounting procedures, withdrawal application procedures, and job descriptions for financial staff.

(iii) Adequate numbers of qualified and trained project accounting staff will be placed at all levels where accounting and financial management work will be performed. PPMO and PFD will provide training on ADB's procedures and requirements on disbursement, procurement, and financial management before commencing project implementation.

(iv) The PPMO in conjunction with PFD will monitor LPMO subproject accounts, payments, and replenishment requirements, and shall coordinate loan funds disbursement and replenishment of the imprest account.
(v) The LPMOs will establish suitable financial management systems for their subprojects, issue requests to the PPMO for approval of expenditures, and provide the PPMO with quarterly progress reports.
(vi) The PPMO will manage procurement activities, including preparing bidding documents, prequalification and tender evaluations.

5. Counterpart Funding

(i) HnPG will ensure the local governments apply for and provide adequate counterpart funds in a timely manner and will cover any Project cost overrun. Municipality or county governments will prepare and monitor annual plans and budgets needed for project implementation.
(ii) Prior to completion of subprojects, municipal or county governments will conduct a budget needs assessment for operation and maintenance and debt servicing.

6. Other

(i) The PPMO will ensure that: (a) a project management and monitoring system is established, and (b) monitoring procedures are followed by each subproject.

B. Condition for Disbursement

62. No withdrawals will be made from the loan account for the ultimate benefit of the local municipal or county governments until the Government will have caused the PPMO and the PPMO will have certified to ADB that the relevant onlending agreement has been duly executed and delivered on behalf of the concerned local government, includes all terms and conditions required under the Loan Agreement and has become fully effective and binding.

VII. RECOMMENDATION

63. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and, acting in the absence of the President, under the provisions of Article 35.1 of the Articles of Agreement of ADB, I recommend that the Board approve the loan of $200 million to the People's Republic of China for the Hunan Flood Management Sector Project from ADB's ordinary capital resources, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; a term of 26 years, including a grace period of 6 years, and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan and Project Agreements presented to the Board.

Liqun Jin
Vice President (Operations 1)

Date: 01 June 2006

PROJECT DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
Impact Sustainable and inclusive socioeconomic growth in flood-prone areas of Hunan Province.	Number of newly established industrial and commercial enterprises in the project areas increases compared with base year 2006. Land values for commercial and industrial purposes in project areas increases by at least 20% over 2005 levels by 2012. Urban poverty incidence in the project areas[a] is reduced compared with 2003 incidence of 6.7%.	Registrar of Companies. Municipal and County Land Resource Bureau. Price Bureau. Hunan Provincial Statistical Yearbook.	**Assumptions** • Targeting flood protection in growth centers of the upper reaches of river basins increases investment in business and property in the project areas. • Increased investment in protected growth centers increases employment opportunities for urban and rural poor. **Risk** • Complacency in protected areas increases risks and losses from above-average floods.
Outcome Flood protection for strategic and priority flood-prone areas in the upper reaches of the four main river basins in Hunan Province is improved.	Annualized flood damage and disaster relief costs reduced in participating cities as a result of increased standards for flood protection works and improved flood emergency preparedness. Direct economic losses from floods and waterlogging reduced compared with current average losses.	Historical flood records from Hunan Statistical Yearbooks. Hunan Flood Control and Drought Relief Headquarters.	**Assumption** • The Government undertakes complementary measures by implementing the integrated flood management strategy and plans. **Risks** • Infrastructure design standards are unable to mitigate heavy floods. • Insufficient interagency coordination leads to incohesive implementation of structural and nonstructural components of the flood management strategy.
Outputs 1. Nonstructural flood management systems: operational flood warning and management systems for up to 35 municipalities and counties linked to the provincial flood warning and management system.	Increased warning time against potential floods in project area (current warning time is a few hours to one day). Forecasting and warning data more frequently accurate.	Hunan Hydrological Bureau. Hunan Hydrological Bureau.	**Assumptions** • Local governments have staff available to manage, monitor, and maintain systems during and after implementation. • Province leads and participates in process of strengthening

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
2. Structural flood protection, resettlement, and environment management: flood protection works are completed in priority locations as part of Hunan's River Basin Flood Control Plan and the 11th Hunan Provincial Five-Year Plan and in compliance with PRC regulations and Asian Development Bank (ADB) safeguard policies.	Flood-control level of county-level cities improved to 1 in 20-year-return flood from below 1 in 5-year-return flood recurrence by end of project. Flood-control level of municipal cities improved to 1 in 50 or 100-year-return flood by end of project. Satisfaction level of the 20,133 relocated persons restored to pre-resettlement levels in terms of income and livelihood. Percentage of environment management plan (EMP) monitoring targets achieved.	Provincial Water Resources Bureau. Provincial Water Resources Bureau. Household surveys, government, and third-party resettlement monitoring and evaluation (M&E) reports. Local government environmental protection bureau monitoring reports, third-party environmental M&E reports, records of subproject compliance with PRC and ADB safeguard requirements.	capacity at the municipal and county levels. **Risks** • Coordination of nonstructural measures between city-level and river basin and/or provincial level is not realized. • Insufficient counterpart budget for civil works, resettlement, and environment management at project start-up (see mitigation measure under Activity 4.2). • Trained and experienced project personnel do not remain with flood management related agencies or divisions.
3. Project management and capacity building: operational and strengthened project management and monitoring systems.	Timely and informative reporting of local project management offices (LPMOs) that reflects accurate and on-time project implementation in line with agreed assurances. Domestic systems-based project management and monitoring system, including Project Performance Management System (PPMS) operationalized.	Subproject management and monitoring reports. ADB's Project Performance Reports (PPRs). Annual work plans and budgets. Project M&E system records	
4. Flood management sector planning: selected sector assessments and planning to support development of integrated flood management plans (grant financed through the advisory technical assistance).	Basin-wide flood warning system development needs assessed; flood insurance appraised with support from advisory technical assistance (TA); next actions for inclusion in future flood management plan agreed upon by key provincial authorities by Year 2008.	Provincial Water Resources Department and advisory TA reports. Provincial sector plan documents.	

Activities with Milestones	**Inputs**
1. Flood Warning and Response 1.1. Train staff in municipal and county-level cities to operate flood warning systems and plan for and manage flood emergencies (by June 2008). 1.2. Establish or upgrade hydrological stations in up to 35 subproject locations and link to provincial data acquisition system (by June 2008). 1.3. Improve data management, flood forecasting, and decision support systems for overall flood management in up to 35 subproject locations (by June 2008). 2. Flood Protection Works 2.1. Prepare Feasibility Study reports for each selected non-core subproject. 2.2. Prepare detailed engineering designs for each selected subproject. 2.3. Acquire land where needed to accommodate flood protection civil works, temporarily or permanently relocate affected persons, and provide compensation and other social and economic rehabilitation measures for affected persons in accordance with PRC laws and regulations and ADB resettlement and indigenous peoples safeguard policies. 2.4. Prepare initial environmental assessments and EMPs for each non-core subproject in accordance with PRC laws and regulations and ADB Environmental safeguard policies. 2.5. Construct flood protection works for up to 35 subprojects, including rehabilitation and construction of dikes, upgrading and construction of sluice gates, upgrading and construction of pumping stations, and upgrading and construction of diversion channels (according to subproject phasing). 3. Project Management 3.1. Establish and equip provincial and local project management offices in 35 cities (on a rolling basis according to subproject phasing) . 3.2. Train key government staff at municipality and county-level cities to plan, design, and implement and monitor structural and nonstructural flood works according to PRC regulations and ADB safeguards (on a rolling basis according to subproject phasing). 3.3 Supervision and monitoring of subproject implementation by provincial and local project management offices. 3.4 Strengthen provincial project management capacity (technical, financial, administration, and implementation) for annual work planning and the successful implementation and monitoring and evaluation of the Hunan Flood Management Sector Project according to PPMS principles (throughout project implementation). 4. Sector Planning 4.1. Review and analysis of the Province's existing flood warning system and facilities in one mountain river basin, existing flood warning facilities and optimize their design for hydrometeorological data collection and flood preparedness for inclusion in the 12th 5-year flood management plan (by June 2008). 4.2. Feasibility assessment of providing flood insurance to rural and urban people through a pilot study in one project area for consideration in the 12th 5-year plan (by June 2008).	ADB: ADB project loan of $200.0 million. Flood warning and response—$10.5 million Flood protection works—$185.4 million Project management and capacity building—$4.1 million Core subproject contingencies - $16.8 million Government: Counterpart financing of $297.4 million. Cofinancing: Grant attached TA from Government of Spain of $0.5 million

[a] Project areas refer to the 46 counties (of which 15 are designated poverty counties) in which the 35 subprojects will be located. The discrepancy between the number of counties and the number subprojects arises because subprojects located in prefecture-level municipalities tend to involve more than one district or county.
[b] Timing of milestones for the construction of structural measures is dependent on the phasing of the individual subprojects. Work on all subprojects is expected to begin by project year 3.

Richard S. Bolt OIC Agriculture, Environment, and Natural Resources Division	H. Satish Rao Director General East Asia Department

SECTOR ANALYSIS

A. Flood Management in the People's Republic of China

1. The People's Republic of China (PRC) has approximately 1 million square kilometers (km^2) of flood plain, which accommodates 50% of the population, 33% of cultivated land, and 70% of all constructed property in over 600 cities (which serve as the base for industrial and mining enterprises, and major railway and highway systems). Many cities and industrial centers are adjacent to the major rivers of the country, meaning that a high proportion of the PRC's economic activity is at risk from periodic floods. In the PRC, major floods and poor drainage (waterlogging) are the most frequent and severe forms of natural hazard. Floods recur frequently and have a substantial negative impact on the local, regional, and national economies. During the 1990s, direct losses caused by floods amounted to about CNY1.2 trillion; direct losses from the 1998 Yangtze floods alone amounted to about CNY250 billion, and total loss of life exceeded 3,600 people. Annual flood-induced losses in the PRC are estimated to be 1% (one estimate of the impact of the 1998 Yangtze flood is 4%) of the national gross domestic product (GDP). This is 10 to 20 times greater than the losses incurred from major floods in countries such as the United States and Japan.[1]

2. The PRC recognizes that structural flood management measures are an essential element of flood control, implying a belief that flooding can be controlled through human intervention. Since the 1998 Yangze floods, PRC has clearly acknowledged that a flood control only approach is neither practical nor economically feasible because the cumulative effects of excessive control are complex and can be negative. Managing the risks associated with growing populations and economic development in the floodplains requires modifying flood hazards, modifying exposure, and modifying vulnerability. Modifying flood hazards involves installation of structural measures such as detention basins, levees and dykes, flood diversion channels, flood-control dams, and other regulating structures. Modifying exposure to floods involves property acquisition, land use zoning, building codes, planning development controls, and building on platforms. Modifying flood vulnerability involves nonstructural measures such as flood forecasting and warning, emergency response, community awareness and preparedness, post-flood recovery actions, and flood insurance. Risk assessment determines whether the prevailing risk is tolerable and defense measures adequate, or whether additional risk mitigation measures are required. A flood management strategy considers such risks in planning to deal with potential flood disasters—either design-standard floods or more extreme events. Integrated flood management requires river basin scale assessment and considers economic, social, and environmental objectives to identify the best outcome for society as a whole.

3. **Policy and Laws.** Flood management policy is embodied in the PRC's Law on Flood Control (1997), the 1999 Water and Soil Conservation Law (1999), the Water Law (2002), and in river basin-wide plans such as the Yangtze River Flood Control Plan (updated in 2005). Flood management strategies and action plans are being drawn up as part of the National Flood Management Strategy under the direction of the Ministry of Water Resources.[2] The PRC's changing approach includes a policy that the costs for flood protection and flood management works should be borne by beneficiaries—either provincial, municipality, or county-level beneficiaries. Protection is needed through a combination of structural and nonstructural measures to improve living conditions, and provide assurance for investors in communities and future development at affordable levels.

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[1] Sogreah Consultants. 2005. *Hunan Flood Management Project Sector Analysis.* Paris, France. Report prepared for ADB under TA 4324-PRC.

[2] Support is being provided by ADB. 2004. *Technical Assistance to the People's Republic of China for the Flood Management Strategy Study.* Manila (TA 4327-PRC, for $600,000).

B. Floods in Hunan Province

4. **Yangtze Basin and Hunan Province.** Hunan Province is located in central PRC. Hunan has 5,141 rivers with channel lengths of 5 kilometers (km) or more. Most of Hunan's rivers originate in the mountainous border areas in the east, south, and west of the Province. These rivers drain 96.7% of the Province as part of four major provincial river basins—the Lishui, Xiangjiang, Yuanjiang, and Zishui. These rivers drain into Dongting Lake and the Yangtze River system. Less than 4% of rivers drain south to the Pearl River basin, or eastward to the Poyang Lake basin. The Province's four major river systems flow into the Dongting Lake. Dongting Lake also receives inflow via three diversion channels from the main stem of the Yangtze River as off-takes upstream from the city of Shashi. Dongting Lake then flows into the Yangtze River at Chenglingji in Yueyang County. As the lowest point in Hunan, Dongting Lake acts as a large offstream balancing reservoir for major flood flows in the Yangtze River, as well as an onstream retardation basin for discharge from the four rivers before it finally reaches the Yangtze River. The river system in Hunan Province is a significant part of the overall Yangtze River system, joining the Yangtze main stem at the critical and highly flood-prone middle reach via Dongting Lake. Addressing flood problems in Hunan have historically been key to Yangtze River flood management, and the national Government identifies the Province as an integral part of overall Yangtze River flood management.

5. **Floods in Hunan Province.** Floods are a recurrent natural hazard in Hunan Province, accounting for more than 50–60% of the total economic losses stemming from natural disasters in the Province. The Lishui, Xiangjiang, Yuanjiang, and Zishui mountain river basins drain a total area of 179,000 km^2 (84% of the provincial area); this area is home to 56.4 million people, or 84% of the provincial population. Intense cyclonic and/or typhoon rains are the main causes of floods and drainage disasters in Hunan Province. Based on available statistics, rainfall exceeds 50 mm per day, per station, for 3.3 days every year, on average. Flood-inducing rain normally occurs from March to October, with most floods occurring between May and October. Wide area, long-lasting floods usually occur in June or July. Two types of floods arise in Hunan: (i) mountain floods (sometimes called flash floods that are generally of short duration and high intensity), which usually occur in the upper reaches of the four main rivers; and (ii) floodplain floods (wide area, long-lasting, slowly to rapidly rising, slowly receding floods), which occur in the lower reaches of the four main rivers, and throughout the Dongting Lake area. Mountain floods occur in stretches of river that have steep gradients, turbulent flow, short flow paths, high velocity, and high peak discharges. Water levels in such rivers tend to rise and fall quickly. These rivers are erosive and usually heavily laden with mud and rock. Floodplain floods are larger in scale (time, volume, and area), and lead to extensive damage because of their depth, wide coverage area, and long duration.

C. Provincial Plans and Implementation

6. **Hunan's Flood Plans.** In general, the 1 in 2-year return period to 1 in 10- or 20-year return period floods in Hunan's river systems can be controlled with the currently existing protection measures. But average floods often exceed these levels, and to ensure sustained development of Hunan's economy, improvements to the provincial flood-control and flood management system are needed. In line with national flood management policy directives and strategy, the Hunan Government prepared River Basin Flood Control Plan in 1999 for various structural and nonstructural interventions. The flood-control program for Hunan consists of: flood control and drainage in the Dongting Lake Area; city flood control; flood-control reservoirs; river channel regulation; rehabilitation of unsafe reservoirs; flood control and nonstructural systems warning for farmland along the low river banks; flash-flood disaster prevention and warning; and soil and water conservation. Elements of the plan are illustrated in Figure A2. Future plans have the following objectives: (i) economic activity and social life should not be

affected by average floods; and (ii) extraordinary floods should not severely disrupt economic activity, social life, or the long-term provincial economic program. Key targets include: (i) establishing an effective flood-control system for average flood events (those that are not expected to exceed infrastructure design standards); (ii) establishing and enforcing legal standards for approved flood diversion, storage, and detention basins; (iii) using professional teams to fight floods; and (iv) designing an emergency flood response program for all major rivers and flood-prone areas to prepare for flood events that exceed infrastructure design standards.

7. **Strategic Shift.** Past investments have focused on flood control and disaster mitigation in the flood plains surrounding Dongting Lake. In a strategic shift, the Hunan Provincial Government's (HnPG) flood management efforts under the Hunan Provincial 11th Five-Year Plan (2006–2010) focus on flood control, management and forecasting systems, and emergency response systems in the four mountainous river basins and their flood-prone municipal and county-level cities. The plan aims to reduce flood risks in mountainous catchment areas and provides priority structural protection to higher-value property and growth centers in the mountain river basins. The plan prioritizes flood protection measures for 35 of the 94 flood-prone municipal and county-level cities, weighted by extent of the flood-prone area, frequency of flood occurrence, number of affected peoples, and value of the recurring damages and/or losses. The strategic shift recognizes that full control of flooding in the Dongting Lake and lowland areas, including the lake's fertile floodplain farmlands, would be costly and diminish the natural role the lake plays in retarding Yangtze River floods. Improving data acquisition, communication, and warning and response systems, and establishing a decision-making framework that supports flood management decisions, are also part of the strategy. Table A2.1 summarizes the current status and future actions for nationally defined flood management principles.

8. **Plan Financing.** In 2004, the Provincial Water Resources Department (PWRD) received only 27% of its capital budget from national and provincial sources, compared with 65% in 2001. This decline was offset, in part, by an increase in self-raised funds from 34% of the capital budget for flood control measures in 2001, to 51% in 2004. During this period, capital expenditure on flood control by PWRD was $147 million in 2001, $244 million in 2002, $198 million in 2003, and $127 million in 2004. Municipalities and counties are also increasingly relying on self-raised funds. As existing flood-control plans are reassessed to consider changing economic conditions and strategies, flood risk-management measures and alternatives need to balance cost and affordability of local stakeholders and communities.

9. **Disaster Relief Financing.** Hunan's urban and especially rural poor populations are particularly vulnerable to the impacts of flood disasters. Once hit by flood, livelihood recovery for the poor greatly depends on disaster relief money. The current disaster relief system is mainly provided by central and local governments. This places huge pressure on the fiscal system, and timely fiscal transfers can be hard to come by. Currently natural hazards such as flood and mudflow hazards are included in the property insurance provided by commercial insurance businesses, but such insurance is only provided outside “flood passage” areas and flood detention areas. In the areas where this insurance is offered, the outcome is not encouraging, as low-income rural households cannot afford it. The National Flood Control Law has stipulated (article 47) that Government will encourage and support flood insurance. The recent Flood Control Regulation stipulated by the national Government requires local governments to gradually establish flood insurance mechanisms. Nevertheless, commercial insurance companies find it hard to operate in such markets without government support. For all intents and purposes, the flood insurance market in the PRC does not exist.

Table A2.1: Hunan Province Flood Management Strategy, Status, and Plan

Strategy Element	Current Status	Future Actions, Including the Hunan Flood Management Sector Project
1. Raising public awareness of flood prevention and disaster reduction.	Awareness in the Dongting Lake area is better than in the mountainous regions; rural people are more aware than urban citizens; flood-risk maps prepared in 2000 for each city and municipality.	The Project will support public consultation and strengthen flood-risk and response awareness programs.
2. Building a unified river basin management authority.	PWRD is legally designated as the water resources administrator for 6 river basins and Dongting Lake area.	Plans prepared and organizational structure operational.
3. Updating river basin and flood-control plans with IFM strategy based on land use and planning.	Adoption of IFM and new policy for prevention and protection. Hunan's River Basin Flood Control Plan will be revised in line with the updated Yangtze River Flood Control Plan.	The Project will provide TA to support updating of the 12th Flood Control Plan to incorporate IFM principles.
4. Establishment and upgrading of Infrastructure and technical flood management systems.	HnPG and PFCDRHQ established a reliable resource management system; systematic inspections implemented; operations and maintenance budget provided.	Future needs will be addressed as part of regular ongoing operations and requirements and progressive upgrades.
5. Soil and water conservation and reforestation for disaster reduction.	Since 1990, several projects implemented to mitigate land degradation and accelerated runoff from upland forestry areas.	Requirements being addressed through the ongoing River Basin Afforestation Project and other programs throughout the Yangtze River Basin.
6. Reinforcement of flood-plain management.	Reinforcement of flood management policy and strategy and projects for the Dongting Lake area flood plains.	As there are no large flood-plain areas in the mountainous areas, no action in this area needed for mountain river basins.
7. Reinforcement of urban flood management.	Dongting Lake area cities being provided with improved flood protection under the World Bank- and JBIC-funded projects. Improved flood protection, planning for mountainous river basin cities and towns started.	The Project will finance flood protection in 36 locations. Central government will provide funds to urgently rehabilitate infrastructure and facilities damaged in the 2005 flood. Land-use plan needed as part of flood mitigation.
8. Coordination and improvement of scientific research for disaster reduction.	Established nonstructural measures include flood-risk mapping, flood forecasting and warning, data acquisition, flood fighting management, disaster management, and MIS; all need strengthening, however.	The Hunan Flood Management Sector Project will improve data acquisition system, flood forecasting and warning system, and flood management information system. HnPG will implement other nonstructural measures with own financing.
9. Setting up flood insurance and post-disaster rehabilitation systems.	The development of a flood insurance mechanism needs to be considered and determined at the national level, and developed for different situations and risks.	Seen as a future activity in the mountainous areas. Some pilot schemes are already being trialed in the Dongting Lake area.
10. Capacity building for legal action.	Laws and regulations have been established and are being applied by relevant agencies.	The project activities will be a catalyst to reinforce the understanding of the relevant laws at the municipal and county levels.

HnPG = Hunan provincial government, IFM = integrated flood management, JBIC = Japan Bank for International Cooperation, MIS = Management Information System, PFCDRHQ = Provincial Flood Control and Drought Relief Headquarters, PWRD = Provincial Water Resources Department, TA = technical assistance.
Source: Sogreah Consultants.

10. **Institutional Arrangements.** The Hunan Provincial Flood Control and Drought Relief Headquarters (PFCDRHQ) is responsible for flood management in Hunan Province, which is closely related to flood management in the larger Yangtze River Basin. The office of PFCDRHQ is set up within PWRD. PFCDRHQ is headed by a provincial vice governor, with members from PWRD, the Meteorological Administration, the Civil Affairs Department, the Communication Department, and other relevant provincial agencies. To fulfill its mandate, HnPG has established a hierarchy of operational regulations for flood management and operation of the Lishui, Xiangjiang, Yuanjiang, and Zishui rivers, and for Dongting Lake. Detailed measures and management schemes are defined for managing large-scale floods, with responsibilities of the PFCDRHQ and other agency members explicitly stated. The municipal and county governments have local flood-control and drought relief offices within their local water resource bureaus, with membership mirroring provincial-level agencies. These offices are headed by deputy mayors. Local Flood Control and Drought Relief Headquarters membership comprises representatives from local government level line agency offices, whose responsibilities are similar to those of their provincial counterparts, but with specific variations in line with local municipality and county flood characteristics and concerns. During flood events, they receive flood-status updates from the Hunan Hydrology Bureau through the PFCDRHQ, and they maintain bidirectional communications with PFCDRHQ during emergencies. They are responsible for assisting citizens and stakeholders under their jurisdiction, keeping the provincial authorities advised of developments, and responding to directives issued by the PFCDRHQ. The organizational structure for flood warning and management is well established.

D. Policy, Plan, and Capacity Strengthening

11. **Integrated Flood Management Plan Development.** Flood-control plans for Hunan Province are a part of the integrated national flood-control system. The River Basin Flood Control Plan includes flood control as an integral part of flood management, together with subplans for flood control in river basins and cities. Established plans emphasize using flood-control civil works (dikes, diversion channels, drainage culverts, pumping stations, embankment stabilization, weir rehabilitation, and dredging) to secure and protect economically important production centers and infrastructure, and to protect strategically located cities that are frequently inundated (at least once every 5 years). As the overall flood risk-management strategy shifts toward greater use of nonstructural management measures, existing flood-control plans should be reviewed, updated, and costed to incorporate and expand nonstructural measures. As plans are updated and approved, budget appropriations need to be realigned or increased at the provincial and local government level.

12. **Subproject Strengthening**. Municipality and county flood prevention subprojects are part of an integrated flood management strategy and are regarded by provincial and local governments as priority public investments to secure growth and development. Subproject planning needs to be carried out in conjunction with the integrated flood management strategy for each river basin. Further analytical and design needs for subprojects include the following: (i) for subprojects located in the mountainous area of western Hunan (many of which have little hydrological and hydraulic survey data for estimating flood flows), data and design calculations need to be cross-checked using several methods, as required by PRC regulations; (ii) operation and maintenance procedures need further detailing to ensure long-term reliability; (iii) requirements and response systems should be clearly identified for managing floods that exceed infrastructure design standards; (iv) the extent to which planned structural works will mitigate flood impacts when combined with the indicated nonstructural measures needs elaborating; (v) although the cumulative impact of local flood works is not expected to be significant, feasibility study reports are needed to variably assess the potential impacts of works on the surrounding area, such as sediment movement in constrained river channels, and waterlogging in urban areas (because, for example, dikes are preventing drainage of surface

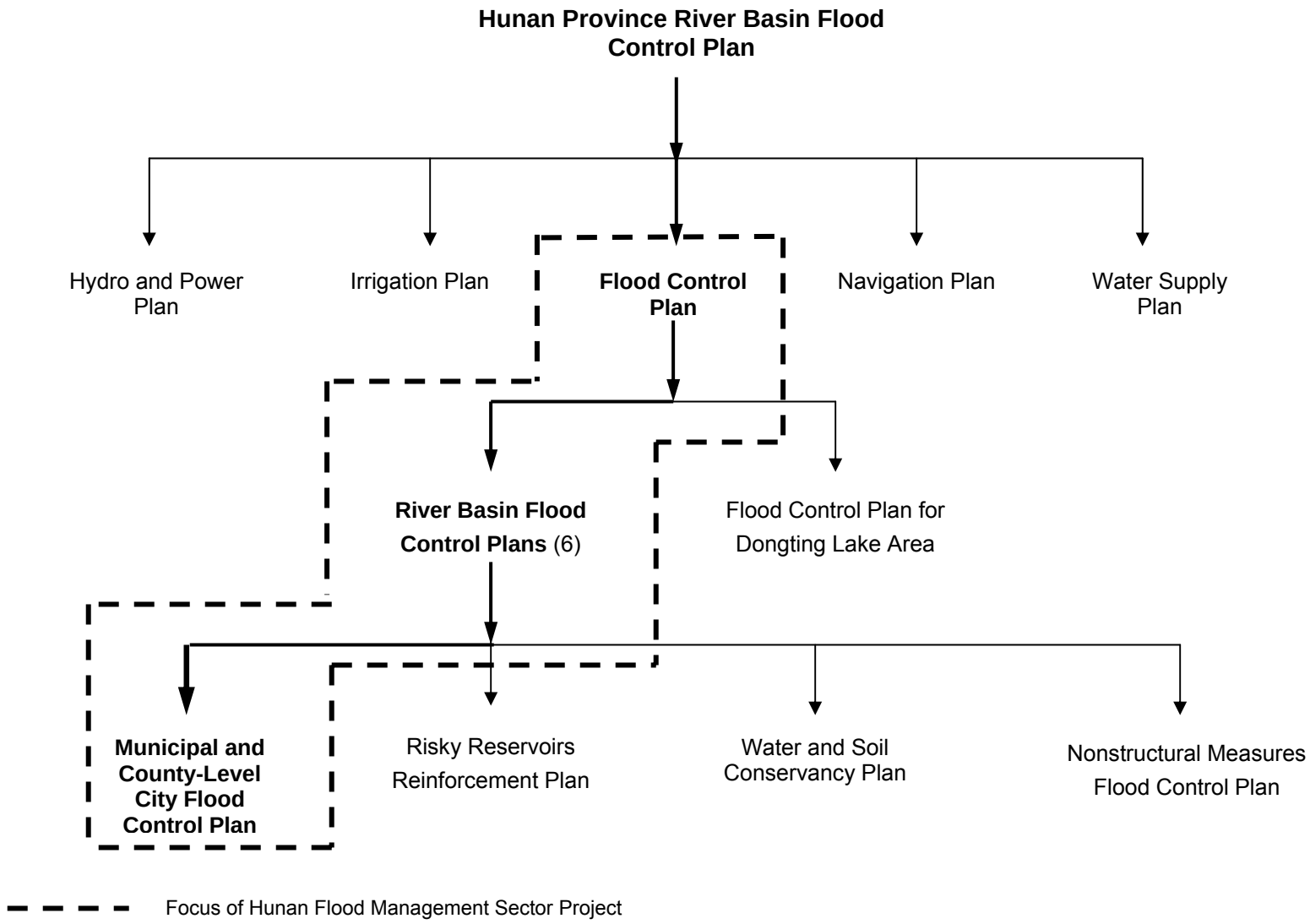
water during the flood season); analysis of these impacts needs to be strengthened and mitigating measures need to be identified; and (vi) some subproject feasibility study reports have undertaken flood-risk analysis, but because data is limited the results of these analyses are not always reliable for engineering planning; flood-risk analysis for subprojects needs to be strengthened; and risk zoning maps need to be prepared for areas that currently lack them.

13. **Provincial and Local Government Coordination.** PWRD and the provincial project management office (PPMO) have prior experience in implementing major domestic, World Bank, and Japan Bank for International Cooperation flood control-related civil works projects. Local governments in the four river basins have varied experience in implementing major flood management works. Construction and management of major flood-control works and flood response systems require qualified, experienced personnel. PWRD will need to provide support and guidance to municipal and county governments for the implementation of subprojects. PWRD and its related line agencies—the Provincial Development and Reform Committee, PWRD, and Provincial Finance Department—will need to ensure that municipal and county governments and the associated line agencies understand and follow policy, strategy, and regulations so that their flood-control works and flood management procedures are consistent with provincial flood-control plans, and so that relevant staff are provided with skills to effect a coordinated approach to flood management on a river basin-wide level. A PRC systems-based annual plan and management framework is needed to strengthen provincial–local government coordination, project monitoring, and implementation.

14. **Resettlement and Environment Safeguards.** As in other areas of the PRC, HnPG has also had to deal with resettlement and environment management in association with the construction of flood works. When donors have considered PRC safeguard systems inadequate in the past, they have applied their own systems to ensure compliance with donor-supported investments. The PRC is strengthening its laws and regulations to address wider concerns about managing affected people and the environment. Opportunities are emerging to address social and environmental safeguards by building capacity based on strengthened country-wide systems. For externally assisted projects where major construction works have affected people's livelihoods, safeguards have generally followed various donor requirements. A national safeguard system that replicates donor safeguard standards is needed. One of the lessons learned from the Asian Development Bank's ongoing projects is that safeguard compliance is better ensured through the use of an independent, on-site monitoring mechanism. Through the Hunan Flood Management Sector Project, the Asian Development Bank can build government capacity in the management and monitoring of safeguards.

15. **Public Awareness and Education.** Experience from previous flood and emergency response shows that public awareness and participation is key to implementing successful flood management, avoiding heavy economic losses, and fighting floods. A challenge for flood management in Hunan Province will be to raise public awareness of the need to shift from flood control to flood management. Managers, government staff, engineers, researchers, designers, and residents all need to become more aware. Public awareness in flood management is a multi-sector concern. Public and institutional awareness of the developing strategy needs to be raised through training and mass media campaigns.

Figure A2: Hunan Province River Basin Flood Control Plan



Source: Asian Development Bank.

SUBPROJECT SELECTION CRITERIA

1. The Hunan Provincial Government's main flood management objectives include (i) economic activity and social life should not be affected by average floods; and (ii) extraordinary floods should not severely disrupt economic activity, social life, or the long-term provincial economic program. Achieving these objectives requires a combination of structural and nonstructural measures. Structural measures will improve the flood-control standard at county-level cities to a 1 in 20-year-return flood and in municipal cities to a 1 in 50-year-return flood or 100-year-return flood. Structural measures in subprojects may include: (i) new and strengthened earth embankments, (ii) flood-control walls, (iii) dike slope protection and toe protection, (iv) dike seepage prevention, (v) riverbank protection, (vi) building or renovating flood diversion channels, (vii) construction of new gravity discharge culvert sluices and electric pumping stations, (viii) dredging to improve river channel capacity, (ix) installation of traffic access gates, (x) renovation or removal of river weirs, and (xi) construction of flow management dams and control gates.

2. To be eligible for financing through the Project, each structural subproject feasibility report study will include a flood-risk and situation assessment, technical analysis and description, subproject rationale, scope and components, cost estimates and financing plan, implementation arrangements, financial and economic analysis, and social and poverty impact assessment. Based on the feasibility study, structural subprojects must be selected according to the following criteria:

(i) The subproject is a priority investment in the Hunan Provincial 11th Five-Year Plan (2006–2010) and conforms to one of four local River Basin Flood Control Plans, namely the Lishui, Xiangjiang, Yuanjiang, and Zishui Rivers.

(ii) The subproject flood-risk analysis is based on People's Republic of China (PRC) requirements for hydrological and hydraulic survey data for estimating flood flow and impact, and structural designs meet PRC technical requirements.

(iii) The structural subproject is designed to minimize cost with a combination of structural and nonstructural measures for optimal flood management.

(iv) The subproject's social and poverty impact assessment assesses that the proposed flood protection measures will have a net positive impact on stakeholders' social welfare, will reduce poverty, and can be monitored.

(v) The subproject is designed to minimize social impacts and ensure that people adversely affected by civil works under the Project are compensated in compliance with PRC laws and Asian Development Bank (ADB) involuntary resettlement safeguard policies; land acquisition, resettlement processes, and compensation procedures follow PRC laws and regulations; due consultation and process is carried out in line with resettlement plans agreed upon with ADB and disclosed to affected persons; and local government has submitted written confirmation to the Executing Agency and ADB that all households to be moved as a result of the subproject are agreeable to the resettlement terms and conditions.

(vi) The subproject initial environmental examination assesses that the environmental impact during construction can be minimized, in line with PRC laws and regulations and ADB's environmental policies; a consultation process is in line with environment management plans are undertaken, documented and agreed among stakeholders; defined mitigation measures can be taken to mitigate environmental impacts during construction, in line with PRC laws and

ADB environmental safeguard policies; mitigation measures during construction will follow PRC laws and regulations and are incorporated in civil works contracts, or as part of local government responsibilities; and the subproject is designed to minimize detrimental environmental impact stemming from cumulative downstream flood effects from improved structural works.

(vii) The Implementing Agency managing the subproject is assessed by the Executing Agency to have the necessary staffing, implementation, and financial management capacity, including internal auditing capacity, or can provide specific assurances that shortcomings can be rectified, such as by adding qualified staff or providing timely in-service training.

(viii) The subproject's implementation timeframe is reasonable, and surveys and design can be prepared, reviewed, and safeguard processes and procedures followed, and implemented within the project period (2006–2012).

(ix) The borrowing local government can afford the subproject cost and provides commitment to the investment though provision of budgetary resources to meet counterpart funding requirements for capital expenditures during the construction phase, resettlement costs, environment management costs, loan repayment, and routine operations and maintenance.

(x) Local communities and beneficiaries demonstrate commitment to the investment through willingness to contribute, in cash or in kind, to the cost of development as appropriate.

(xi) Subproject economic internal rate of return exceeds 12% in line with PRC requirements for subproject EIRR calculation, with calculations following ADB's *Guidelines of Economic Analysis of Projects.*

CANDIDATE SUBPROJECTS

City	Main River(s)	Catchment Area	City Population ('000s)	Design Return Period (1 in x yr)		Flood and Drainage Protection Works (New Constructions and Rehabilitation)								Resettlement
		km²	Total	Flood	Drainage	Dikes (km)	Flood Walls (km)	Diversion or Drainage Canals (km)	Culvert with Sluice Gate(s)	Electric Drainage Stations	Rock, Earth, and Sand Excav. ($m3*10^3$)	Dredging (m^3*10^3)	Jet Grouting of Embankment (m)	Estimate of People to be Relocated
Core Subprojects (8)														
Yongzhou	Xiangjiang + Xiaoshui	33,590	308.40	50	10	21.50	23.37	1.30	16	6	1,015.50	-		1,121
Wugang	Nanshui	608	130.40	20	10	5.47	10.76	6.00	14	4	194.03		17,760	792
Loudi	Lianshui + Sunshui	7,962	278.20	50	10	30.91	5.89	-	19	2	945.11	307.90		488
Leiyang	Leishui	9,902	232.70	20	10	11.29	1.05	-	5		306.18	-	2,640	409
Chenxi	Yuanjiang + Shuangxi	52,249	65.00	20	10		0.73	1.95	3	1	142.97	-		26
Huaihua	Wushui + Taipingxi	9,836	333.80	50	10	13.39	9.64	5.44	10	4	370.00	58.99		483
Xinhua	Zishui	17,740	130.00	20	10	12.25	-	1.30	4	2	221.20	39.55	2,100	172
Sangzhi	Lishui + Youshui	3,114	42.50	20	10		7.29	-	7	2	313.03	40.12		201
Core Subproject Subtotal		**135,001**	**1,521.00**											**3,692**
Noncore Subprojects (27)														
Hengyang	Xiangjiang	52,150	754.20	50/100	10									1,810
Chenzhou	Chenjiang, Tongxin	948	300.00	50	10									959
Shaoyang	Zishui	12,238	606.10	50	10									409
Jishou	Donghe	4,143	152.00	50	10									54
Zhuzhou	Xiangjiang	71,979	55.00	20	10									529
Youxian	Mishui	6,198	47.80	20/50	10									460
Hengyang	Zhengshui	2,857	90.80	20	10									560
Longhui	Nanshui	5,871	95.49	20	10									318
Jiangyong	Yongming	505	25.00	20	10									80
Xintian	Chongling	390	40.00	20	10									285
Ningyuan	Ningyuan	2,169	42.00	20	10									406
Zhongfang	Wushui	9,874	18.00	20/50	10									-
Xupu	Xushui + Sandu	3,156	106.80	20	10									202
Lianyuan	Lianshui	1,749	101.00	20	10									419
Shuangfeng	Ceshui	1,462	76.00	20	10									461
Cili	Lishui + Loushui	11,282	84.50	20	10									621
Zhuzhou	Xiangjiang	71,979	748.50	100	10									1,428
Xiangtan	Xiangjiang	81,638	692.10	100	10									1,516
Qiyang	Xiangjiang	23,420	103.00	20	10									1,380
Liling	Lujiang		153.00	20	10									1,197
Shimen	Lishui	15,113	131.60	20/50	10									629
Shaodong	Shaoshui	614	134.50	20	10									338
Jianghua	Xiaoshui	12,099	66.00	20	10									472
Xinhuang	Wushui	6,717	60.00	20	10									294
Lengshuijiang	Zishui	16,236	119.00	20	10									396
Fenghuang	Tuojiang	524	45.00	20	10									552
Baojing	Youshui	12,495	37.00	20	10									666
Noncore Subproject Subtotal		**427,807**	**4,884.39**											**16,441**

Scope of works to be finalized during implementation.

CNY = yuan, km^2 = square kilometers.
Source: Sogreah Consultants.

EXTERNAL ASSISTANCE

Donor	Project Title	Year	Amount
World Bank	Hunan Urban Development Project	2005	$172 million
	Third Inland Waterways Project	2001	$100 million
	Yangtze Dike Strengthening	2000	$ 29 million
	Hunan Power Development Project	1998	$300 million
	Yangtze Basin Water Resources Project (Hubei and Hunan Provinces)	1995	$130 million
Japan Bank for International Cooperation	Changsha Diversion Works & Water Quality Environmental Project	2004	¥19,964 million
	Public Health Project(Hunan Province)	2003	¥ 2,855 million
	Hunan Environmental and Living Conditions Improvement Project	2003	¥ 2,190 million
	Changsha Water Supply Project	2001	¥ 4,850 million
	Hunan Urban Flood Control Project (administered by the Japan International Cooperation Agency)	2000	¥24,000 million
	Hunan Yuanshui River Basin Hydropower Development Project	1998	¥17,664 million
Canadian International Development Agency	Renewable Energy Diversification - Small Hydro Technology in Western China Project (Beijing, Guizhou, Hubei, Hunan, Sichuan, Zhejiang)	2003–2005	Can$2.2 million
Government of Netherlands	Dredging Project in Dongting Lake	1995	$25 million
Australian Agency for International Development (AusAID)	Yangtze River Flood Control and Management Project	2001–2006	Aus$16 million

Sources: Australian Agency for International Development, Canadian International Development Agency, Government of Netherlands, Japan Bank for International Cooperation, World Bank.

COST ESTIMATES

Table A6.1: Cost Estimates by Component
($ million)

Item	Foreign Exchange	Local Currency	Total Cost
A. Base Cost			
1. Nonstructural Flood Management Systems	10.5	0.9	11.4
2. Structural Flood Protection, Resettlement, and Environment Management			
a. Core Subprojects	43.0	77.4	120.4
b. Noncore Subprojects	142.4	124.7	267.1
3. Project Management			
a. Provincial Project Management	1.4	2.2	3.6
b. Local Project Management	2.7	25.6	28.3
4. Taxes and Duties	0.0	13.6	13.6
Subtotal (A)	**200.0**	**244.4**	**444.4**
B. Contingencies			
1. Core Subproject Physical Contingencies	4.2	7.8	12.0
2. Core Subproject Price Contingencies	1.9	2.9	4.8
Subtotal (B)	**6.1**	**10.7**	**16.8**
C. Financing Charges During Implementation	**36.2**	**0.0**	**36.2**
Total (A+B+C)	**242.3**	**255.1**	**497.4**

Note: The project cost estimates were based on price data of April 2006 and were derived from the feasibility study reports prepared for the individual subprojects by the Hydro and Power Design Institute of Hunan Province and by other local design institutes in Hunan. Discrepancies in totals are due to rounding.

The following general parameters were used in estimating costs:

(i) The exchange rate for base cost calculations has been adjusted for purchasing power parity.
(ii) Domestic inflation rates and foreign inflation rates are based on the Economic Analysis and Operations Support Division (EREA) cost escalation factors. Domestic inflation is projected at 3.3% (2006), 3.2% (2007), and 3% for subsequent years. Foreign exchange costs are inflated at the rates of 2.8% (2006), and 1.9 % the subsequent years.
(iii) Physical contingencies for all expenditures are estimated at 10%.
(iv) Financing charges during implementation are estimates of interest during construction. The front-end fee will be waived (assuming the Project is approved before 30 June 2007).
(v) Based on US dollar 5-years swap rate (5.07% as of 23 February 2006) and ADB terms for spread.
(vi) Project costs include local taxes, which are charged at 3.41% on the cost of civil works, and the vehicle purchase added fee, which is charged at 15% on the purchase of vehicles. Duties and taxes were not applied to the cost of other items required under the subproject since the Government is expected to exempt the subproject from payment of these charges.

Source: Asian Development Bank estimates.

Table A6.2: Detailed Cost Estimates of Core Subprojects

($'000)

Core Subproject	Foreign	Local	Total
A. Chenxi County			
1. Civil Works, Equipment, and Vehicles			
2. Resettlement and Environment Management	14.4	445.5	460.0
3. Project Management and Capacity Building	1.5	34.4	36.0
B. Huaihua City			
1. Civil Works, Equipment, and Vehicles			
2. Resettlement and Environment Management	51.4	3,647.5	3,698.9
3. Project Management and Capacity Building	3.1	151.5	154.6
C. Leiyang City			
1. Civil Works, Equipment, and Vehicles			
2. Resettlement and Environment Management	37.3	3,270.9	3,308.2
3. Project Management and Capacity Building	0.0	41.0	41.0
D. Loudi City			
1. Civil Works, Equipment, and Vehicles			
2. Resettlement and Environment Management	57.8	8,173.9	8,231.7
3. Project Management and Capacity Building	3.6	282.8	286.5
E. Sangzhi County			
1. Civil Works, Equipment, and Vehicles			
2. Resettlement and Environment Management	42.4	2,216.9	2,259.2
3. Project Management and Capacity Building	3.1	73.8	76.9
F. Wugang City			
1. Civil Works, Equipment, and Vehicles			
2. Resettlement and Environment Management	62.9	2,540.8	2,603.7
3. Project Management and Capacity Building	3.3	88.4	91.7
G. Xinhua County			
1. Civil Works, Equipment, and Vehicles			
2. Resettlement and Environment Management	28.8	2,245.7	2,274.5
3. Project Management and Capacity Building	3.3	92.4	95.7
H. Yongzhou City			
1. Civil Works, Equipment, and Vehicles			
2. Resettlement and Environment Management	85.7	6,042.6	6,128.3
3. Project Management and Capacity Building	3.8	158.2	162.0
Total Core Subprojects[a]	**51,230.7**	**98,666.9**	**149,897.7**

[a] These totals differ from totals in Table A6.1 which only include costs related to structural measures.

Notes:

Based on June 2005 price estimates.

Totals include contingencies. Discrepancies in totals are due to rounding. Local cost estimates include duties and taxes.

"Civil Works, Equipment, and Vehicles" cost category includes related costs of construction management and research and design for civil works. Resettlement and Environment Management" cost category includes costs of soil and water conservation. Capacity building cost estimates cover domestic training and study-tour costs.

Sources: Feasibility study reports prepared for the individual subprojects by the Hydro and Power Design Institute of Hunan Province and by other local design institutes in Hunan.

PROCUREMENT PLAN

Packages	Estimated number of Contract Packages	Procurement Mode[a]
A. Core Subproject (Civil Works)		
1. Chenxi County	1	NCB
2. Huaihua City	3	NCB
3. Leiyang City	2	NCB
4. Loudi City	4	NCB
5. Sangzhi County	2	NCB
6. Wugang City	2	NCB
7. Xinhua County	2	NCB
8. Yongzhou City	4	NCB
Subtotal (A)		
B. Core Subprojects (Equipment and Materials Supply)		
1. Pumping Station	1	ICB
2. Sluice Gate	1	ICB
Subtotal (B)		
C. Noncore Subprojects (Civil Works)		
1. Embankment: Flood Control Wall and Diversion Channels, etc.	multiple packages	NCB/ICB
Subtotal (C)		
D. Noncore Subprojects (Equipment and Materials Supply)		
1. Pumping Station	multiple packages	NCB/ICB
2. Sluice Gate	multiple packages	NCB/ICB
Subtotal (D)		
E. Core Subprojects (Nonstructural and Project Management)		
1. Equipment and Vehicles[b]		
a. Vehicle	multiple packages	NCB
b. Computer Hardware and Software	multiple packages	NCB/S
2. Data Acquisition System	multiple packages	ICB
Subtotal (E)		
F. Noncore Subprojects (Nonstructural and Project Management)		
1. Equipment and Vehicles		
a. Vehicle	multiple packages	NCB
b. Computer Hardware and Software	multiple packages	NCB/S
2. Data Acquisition System	multiple packages	ICB
Subtotal (F)		
G. Capacity Building		
1. International training and study tours	multiple packages	CQS
2. Domestic training and study tours	multiple packages	CQS
Subtotal (G)		

ICB = international competitive bidding, NCB = national competitive bidding, S = shopping, CQS = Consultants' Qualifications Selection.

[a] The threshold of NCB for civil works is below $10 million. The first draft English language version of the procurement documents should be submitted for ADB review and approval regardless of the estimated contract amount. ADB will review the bid evaluation report and award of contracts on a post review basis.

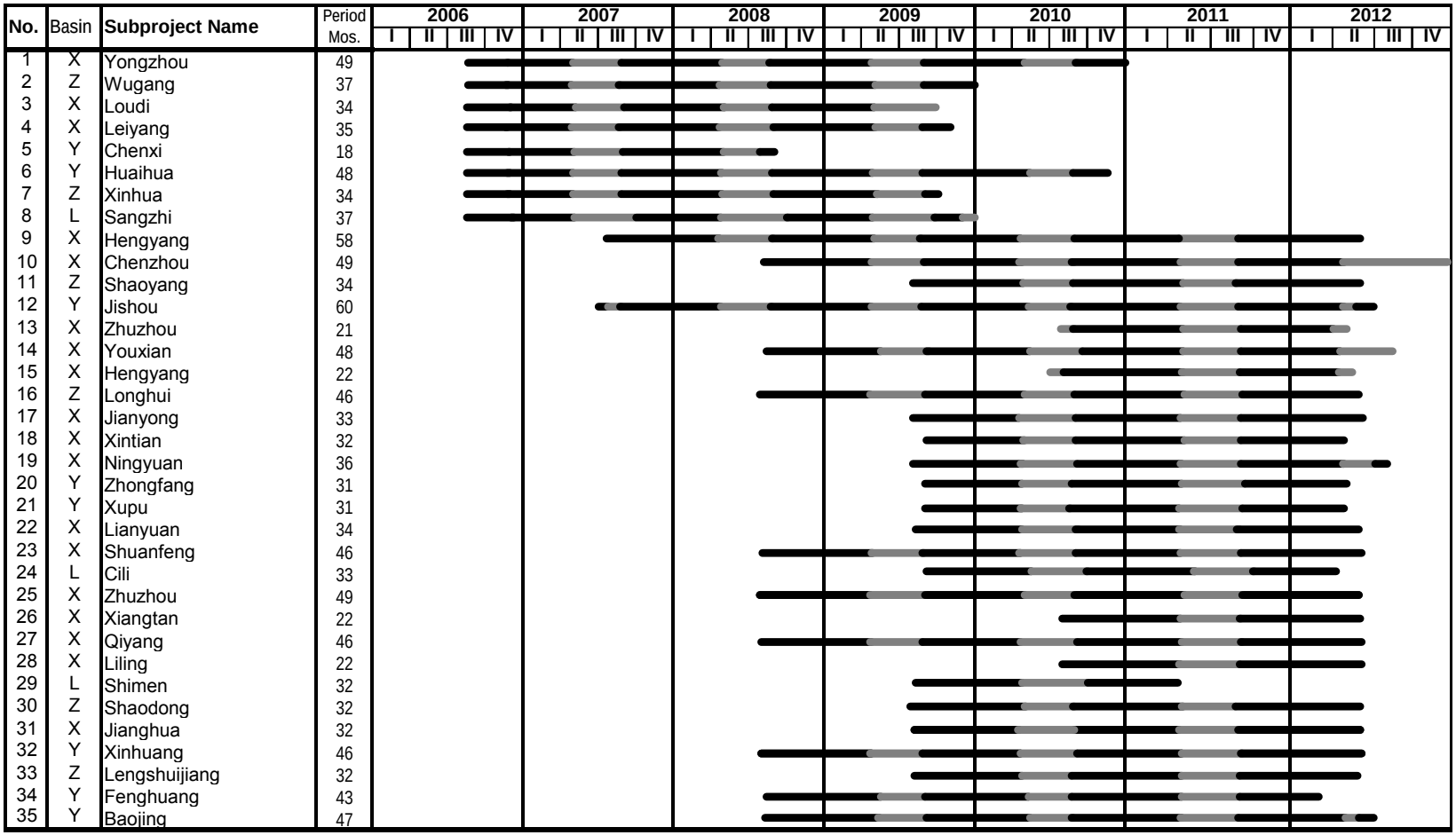
[b] The threshold for NCB for equipment is below $1 million.

[c] The threshold for S is below $100,000. ADB will review the bid evaluation report and award of contracts on a post review basis.

Source: Asian Development Bank estimates.

IMPLEMENTATION SCHEDULE

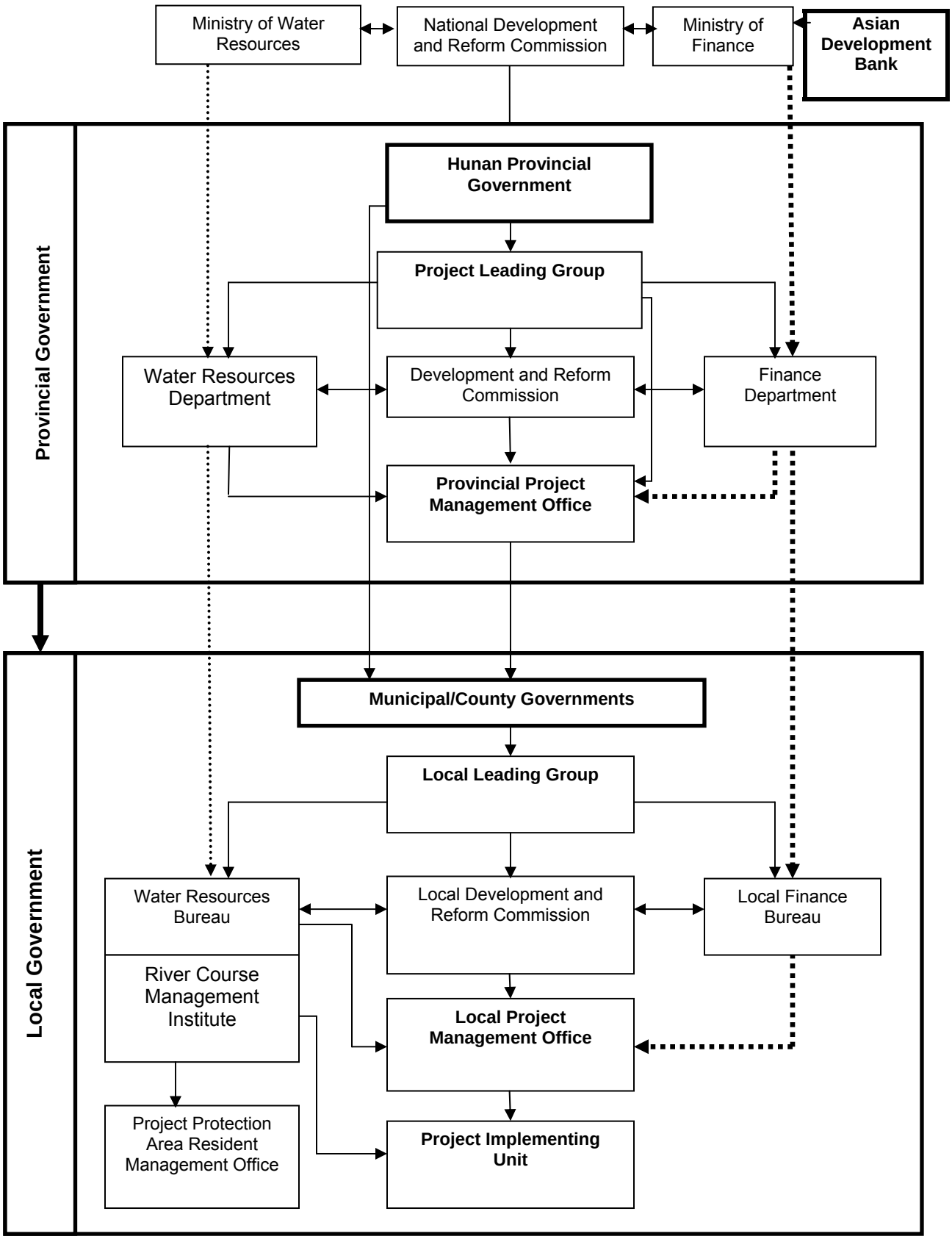
No.	Basin	Subproject Name	Period Mos.
1	X	Yongzhou	49
2	Z	Wugang	37
3	X	Loudi	34
4	X	Leiyang	35
5	Y	Chenxi	18
6	Y	Huaihua	48
7	Z	Xinhua	34
8	L	Sangzhi	37
9	X	Hengyang	58
10	X	Chenzhou	49
11	Z	Shaoyang	34
12	Y	Jishou	60
13	X	Zhuzhou	21
14	X	Youxian	48
15	X	Hengyang	22
16	Z	Longhui	46
17	X	Jianyong	33
18	X	Xintian	32
19	X	Ningyuan	36
20	Y	Zhongfang	31
21	Y	Xupu	31
22	X	Lianyuan	34
23	X	Shuanfeng	46
24	L	Cili	33
25	X	Zhuzhou	49
26	X	Xiangtan	22
27	X	Qiyang	46
28	X	Liling	22
29	L	Shimen	32
30	Z	Shaodong	32
31	X	Jianghua	32
32	Y	Xinhuang	46
33	Z	Lengshuijiang	32
34	Y	Fenghuang	43
35	Y	Baojing	47



Construction period
Flood season

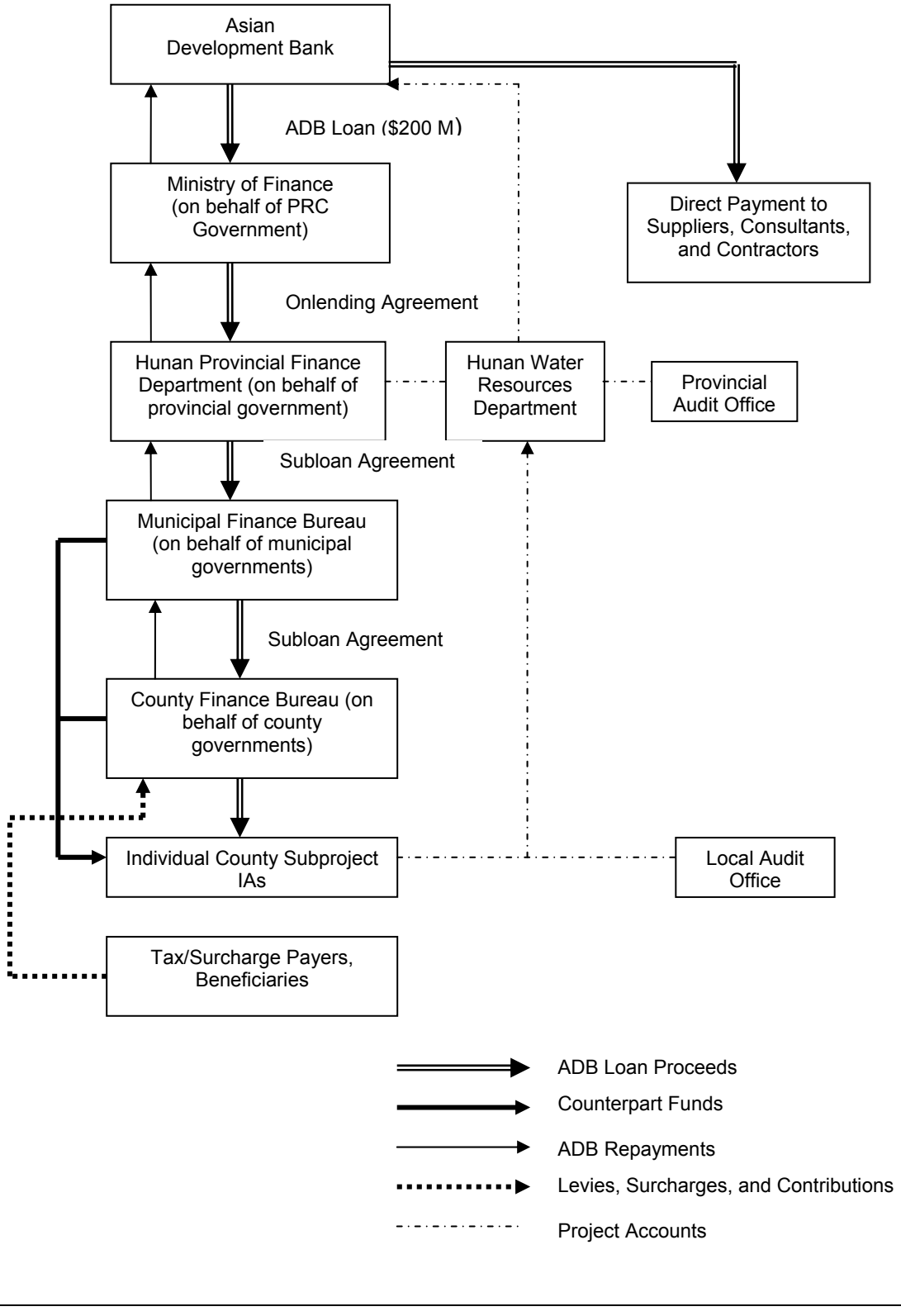
I = first quarter, II = second quarter, III = third quarter, IV = fourth quarter.
L = Lishui river basin, X = Xiangjiang river basin, Y = Yuanjiang river basin, Z = Zishui river basin.
Source: Asian Development Bank.

ORGANIZATIONAL CHART AND PROJECT MANAGEMENT ARRANGEMENTS



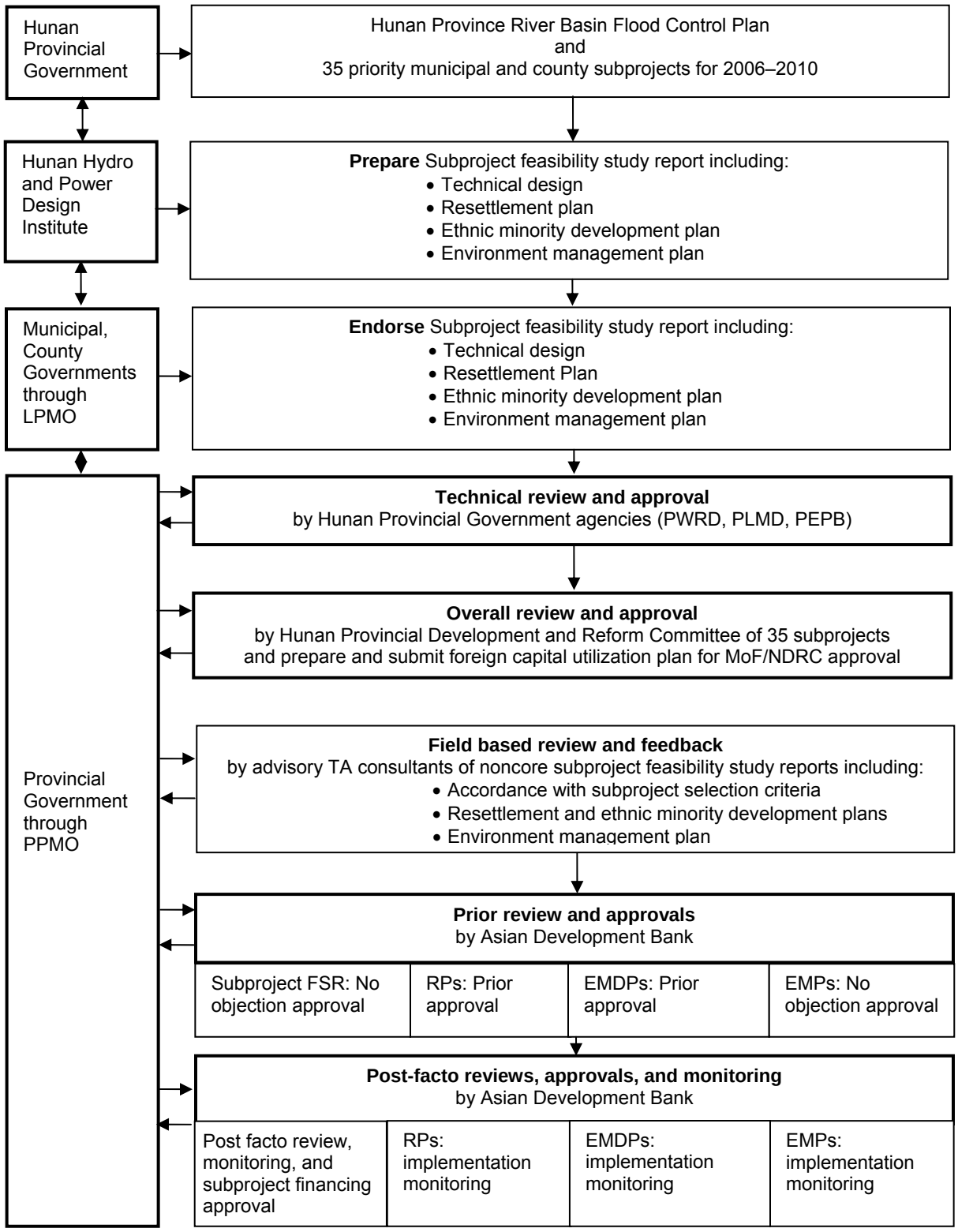
Source: Asian Development Bank.

FLOW OF FUNDS AND ONLENDING ARRANGEMENTS



ADB = Asian Development Bank, IA = implementing agency, M = million, PRC = People's Republic of China.
Source: Asian Development Bank.

SUBPROJECT PREPARATION, REVIEW, AND APPROVAL PROCESS



EMDP = ethnic minority development plan, EMP = environment management plan, FSR = feasibility study report, LPMO = local project management office, MoF = Ministry of Finance, NDRC = National Development and Reform Committee, PEPB = Provincial Environmental Protection Bureau, PLMD = Provincial Land Management Department, PPMO = provincial project management office, PWRD = Provincial Water Resources Department, RP = resettlement plan, TA = technical assistance.
Source: Asian Development Bank.

TECHNICAL ASSISTANCE

A. Introduction

1. To further develop strategic interventions in integrated flood management requires updating aspects of Hunan's 1999 River Basin Flood Control Plan. The sector analysis and Provincial Water Resources Department (PWRD) have identified two priority issues that need to be improved in future flood management planning: flood warning systems and flood insurance (see Appendix 2). The scope of plans for integrated flood management and supporting investments, such as the Hunan Flood Management Sector Project, requires strong coordination and management. The Hunan Provincial Government currently uses an annual plan system for managing flood investments, but application needs strengthening to be sustainable.

B. Purpose and Scope

2. The purpose of the technical assistance (TA) is to strengthen the capacity of PWRD in strategic and annual planning and management systems to support integrated and sustainable flood management. The advisory TA has three components: (i) a review and analysis of the Province's existing flood warning system that optimizes hydrometeorological data collection and flood preparedness; (ii) a feasibility assessment of providing flood insurance to rural and urban people in Hunan; and (iii) further development and capacity building for a country systems based annual planning and management system for the Hunan Flood Management Sector Project. Activities and outline terms of reference are as follows.

1. Needs Assessment and Strategy Development for the Flood Warning System in Hunan Province

3. The TA will review and analyze the Province's existing flood warning system, focusing on one river basin jointly identified by the Province and Asian Development Bank (ADB). The design of existing flood warning facilities will be optimized for hydro-meteorological data collection, analysis, and flood preparedness. Current software and hardware systems will be assessed for their capacity to collect, process, and disseminate information. Bottlenecks in developing an effective flood warning system will be identified and a strategy for the flood warning system will be defined.

2. Feasibility Assessment of Flood Insurance in Hunan Province

4. The TA will review existing international and domestic experiences in flood insurance. In collaboration with the insurance industry and flood management agencies, the TA will evaluate flood hazard and economic losses using flood maps, hydrological and socioeconomic data, and the costs of managing flood insurance in the chosen pilot urban and rural areas. National insurance regulations and legislative procedures for flood insurance will be reviewed. The affordability of insurance for households and businesses will be examined by conducting pilot surveys on Hunan households and businesses. The gap between the level of flood insurance premiums that people can afford and the cost of providing that insurance will be identified in order to estimate the likely amount of government flood insurance subsidies required. Government flood insurance subsidy estimates will be compared with historical financial losses and relief payments resulting from flood disasters in order to assess the fiscal feasibility of flood insurance. The fiscal, legislative, and institutional feasibility of flood insurance in Hunan will be identified and policy and planning recommendations developed.

3. Annual Planning and Management System for the Project

5. The advisory TA will support the Hunan Provincial Government and local governments to further develop domestic annual planning and management systems for the Hunan Flood Management Sector Project. The TA will support implementation preparedness, including review of noncore subprojects and their compliance with selection criteria. The TA will help to further clarify assigned functions, responsibilities, and procedures (including subproject approval, contract package preparation, review and approval, reporting and monitoring, site inspections, and overall implementation supervision) among provincial and local government agencies. The proposed annual plan and management system designed during project preparation will be improved as needed and implemented in line with the Project's first- and second-year work plans. The TA will support PWRD in identifying human resource development needs and in designing and delivering a training program in safeguard planning and other subjects. Noncore subproject resettlement and environment management plans prepared by the Hunan Hydro and Power Design Institute will be reviewed. Field visits will be carried out to discuss plans with affected people. The Provincial Project Management Office (PPMO), Hunan Hydro and Power Design Institute, and Local Project Management Office will be advised on improvements to plans. Prior to PPMO submission of resettlement plans and ethnic minority development plans to ADB, assessments of compliance with ADB safeguard policies will be prepared for the PPMO and ADB. Training on resettlement and environment management and monitoring will be provided to the PPMO and Local Project Management Office.

C. Consultant Needs

6. To meet these objectives and outputs, 15 person-months of international consulting services and 34 person-months of domestic consulting services will be required. The indicative international consultants include: (i) a team leader/flood management planner, (ii) a flood warning system specialist, (iii) a hydrological modeler, (iv) an insurance specialist, (v) a natural resources economist, (vi) a resettlement specialist, and (vii) an environmental specialist. Indicative domestic consultants include (i) a deputy team leader with expertise in institutional development and experience in integrated flood management, (ii) a flood warning specialist, (iii) a hydrological modeler, (iv) a decision support specialist, (v) an information technology (IT) system specialist, (vi) an insurance specialist, (vii) an economist/survey specialist, (viii) a hydrologist, (ix) an environmental specialist, (x) a resettlement specialist(s), (xi) a public finance analyst, and (xii) planning and management trainers.

D. Estimated Costs

7. The total cost of the TA is estimated at $620,000 equivalent, of which $500,000 will be provided by ADB on a grant basis. The grant will be financed by the Government of Spain. The remaining $120,000 will be financed by the Government through in-kind contributions. The estimated costs are provided in Table A12.

Table A12: Cost Estimates and Financing Plan
($'000)

Item	Total Cost
A. Asian Development Bank Financing	
1. Consultants	
a. Remuneration, Per Diem, and Travel	
(i) International Consultants	302.00
(ii) Domestic Consultants	150.00
b. Reports, Communications, Translation, and Interpretation	20.00
2. Equipments and Supplies[a]	10.00
3. Surveys and Workshops	10.00
4. Contingencies	8.00
Subtotal (A)	**500.00**
B. Government Financing	
1. Remuneration and Per Diem of Counterpart Staff	35.00
2. Office Accommodation, Utilities, and Transport	20.00
3. Surveys and Investigations	25.00
4. Logistical Support in Districts	25.00
5. Contingencies	15.00
Subtotal (B)	**120.00**
Total	**620.00**

[a] Includes computers, survey equipment, and office supplies.
Source: Asian Development Bank estimates.

SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

A. Linkages to the Country Poverty Analysis

Is the sector identified as a national priority in country poverty analysis?	☒ Yes ☐ No	**Is the sector identified as a national priority in country poverty partnership agreement?**	☒ Yes ☐ No

Contribution of the sector or subsector to reduce poverty in the People's Republic of China (PRC):
Since 1994, the PRC has been implementing poverty reduction programs in counties officially classified as poor by national or provincial standards in remote mountains, desert, and loess plateau regions, reservoir catchments, areas with frequent disasters, and former revolutionary bases. Poor transport, environmental degradation, slow economic growth, lack of drinking water, extremely harsh conditions for production and livelihood, and high concentrations of ethnic minorities characterize these areas. Targeting poor villages, increasing participation, and addressing both income poverty and non-income poverty are the main features of new strategy for poverty reduction in the new millennium.

Increased emphasis on reducing urban poverty is in line with the PRC's current poverty strategy. The PRC has no official urban poverty line, and urban minimum living standards are set by different city governments, under which supplementary living allowances are provided. The responsibility for financing and delivering such assistance to the urban poor lies primarily with the local government. The urban poor include laid-off workers, landless farmers, and vulnerable people (e.g., disabled, elderly, and women-headed households).

In 2003, the total population in Hunan Province was about 66.6 million, of whom 34% were classified as urban and 66% as rural. Compared with the provinces in the western region of the PRC, much of Hunan is relatively well off, and the absolute rural poverty figure was 1.1 million people, or 2.5%, in 2003, which is less than the national average (3.4%). However, income poverty in rural areas of Hunan is still significant. Using the PRC's poverty line of CNY900 per capita per year, there were 4.1 million rural poor in Hunan in 2003, accounting for 9.3% of the population. Most of the poverty is concentrated in the western mountainous areas, which are characterized by poor infrastructure and a high concentration of ethnic minorities. In addition, under the poverty guidelines set by different cities and counties, about 1.34 million urban people are deemed poor, accounting for 6% of the provincial population. The main urban poverty reduction effort is focused on providing financial relief, supplemented with job information and skills training by different local governments.

Improving flood control in 35 mountainous cities in Hunan Province will benefit the poor directly and indirectly in the project counties, particularly those poor residents in the project areas. In order to minimize inundation, flood mitigation requires that control structures be placed in the most strategic locations rather than in areas with the largest number of the poor. The Project is not intended to directly improve the income generation capacities of households or to address the key impediments to poverty reduction in each location. The Project will benefit the poor by: (i) fostering community consultation for the planning and design of subprojects and the formulation of resettlement plans, which will enhance the community's role in developing appropriate means for income restoration, delivery of compensation, and technical assistance; (ii) providing adequate compensation to local villages for land loss and house demolition; following the new State Council Document (No. 28) on *Deepening Reform on Land Acquisition System and Reinforcement*, the adopted compensation will provide these villages with an opportunity to improve and restore their income and livelihood; and (iii) prioritizing employment for poor households, particularly in constructing and maintaining platforms and other relocated local facilities.

B. Poverty Analysis

Targeting Classification: General intervention

What type of poverty analysis is needed?
The purpose of the social and poverty assessment is to develop a broad socioeconomic and poverty profile of the project area, with an analysis of the key social issues associated with the Project. Examination of the current social patterns in affected communities and analysis of the basic stakeholder interests have identified both positive benefits and short-term adverse impacts resulting from the Project. The social and poverty analysis is based on a combination of data collection, key informant interviews, focus-group discussions, and household surveys.

Based on detailed social and poverty assessment among eight core subprojects, a poverty profile among the project beneficiaries was derived. Due to the location of flood-control works, three quarters of project beneficiaries are urban dwellers. The main stakeholders include urban residents, rural residents, enterprises and small shops, and government. Poverty incidence among project beneficiaries is 10% of the urban population and 5% of the rural population. Urban poor account for 85% of total poverty in project-protected areas.

Frequent floods place a heavy economic, financial, and social burden on local communities. Severe flooding disasters can claim lives, destroy housing and belongings, inundate crops, destroy small businesses, lead to factory closures, and damage public facilities. This causes substantial direct and indirect economic losses to local areas. For most rural and urban individuals, particularly vulnerable people, flood damage is a direct cause of impoverishment. In some cities and county-level towns, frequent floods directly cause about one third of urban poverty. In fact, among the urban poor, serious illness, loss of jobs, single-parent households, and flood damage are the key factors that lead to poverty. The construction of flood-control works in mountainous cities of Hunan will directly protect people in those cities, including urban and rural poor in the project-protected areas.

C. Participation Process

Is there a stakeholder analysis? ☒ Yes ☐ No

Is there a participation strategy? ☒ Yes ☐ No

Stakeholder analysis was conducted during project preparation. Based on interviews with officials and business representatives, informal discussions among affected people, and sample surveys among benefited households, both positive benefits and negative impacts of the Project have been identified (see poverty impact assessment matrix in Supplementary Appendix C). In accordance with the ADB guidelines for poverty and social issues, the social assessment examined the basic interests of vulnerable groups in the project-protected areas, including urban and rural poor, women, and minorities. Through extensive consultation with the stakeholders, and with the promotion of pro-poor, pro-minority, and gender-sensitive approaches, the social assessment has led to a range of proposed activities that will maximize the benefits and minimize the negative impacts of the Project. These activities are summarized, and recommendations outlined, in the resettlement plans, ethnic minority development plan, and environment management plans for subprojects. To minimize negative impacts of the Project, increase social benefits for the local communities, and enhance poverty reduction impacts, the Project has developed a social action plan. The social action plan provides an overall framework to address mitigation measures within the resettlement plans, ethnic minority development plans, and environment plans for the Project.

D. Gender Development

Strategy to maximize impacts on women:
The physical and psychological hardship caused by flood disasters affects all people in the path of floods. This means that project benefits will accrue to women as well as men. These benefits include economic and noneconomic benefits from reducing flood risks, and improved environment along river fronts. The following project benefits will help women in the long run: safer working and living environments, reduced flood-caused damages to houses and production facilities, less time and money spent on flood mitigation, increased employment opportunities during and after Project, and increased economic development. As part of resettlement activities, gender-specific job training will be provided for women affected by land acquisition and resettlement, and for affected ethnic minorities.

Has an output been prepared? ☐ Yes ☒ No

E. Social Safeguards and Other Social Risks

Item	Significant/ Not Significant/ None	Strategy to Address Issues	Plan Required
Resettlement	☒ Significant ☐ Not significant ☐ None	Resettlement impacts have been identified for all 35 subprojects. These include: (i) land acquisition of 850 hectares (ha), 55% of which is farmland; this will require economic rehabilitation of 14,800 persons; (ii) demolition of 1 million square meters (m^2) of structures; this would cause the relocation of 5,167 households and 20,800 persons; and (iii) partial or full displacement of 95 enterprises and 132 shops. A resettlement framework and full resettlement plans for eight core subprojects have been prepared and approved by ADB. Full resettlement plans will be prepared and approved prior to construction commencing for the remaining 27 noncore subprojects.	☒ Full ☐ Short ☐ None
	☐ Significant	Funding for the Project will come from four different sources: (i) the flood-control security fund; (ii) the urban	☐ Yes

Affordability	☒ Not significant ☐ None	construction and maintenance tax, which is collected following relevant national and provincial regulation; (iii) various local revenues, such as revenues from land lease sale and land exploitation; and (iv) potential grant transfers from national and provincial governments. Any additional contributions (cash and in-kind) to be raised from beneficiaries for the Project will depend on willingness and ability to pay.	☒ No
Labor	☐ Significant ☒ Not significant ☐ None	By reducing flood risks, the Project is expected to promote industrial investment in project areas, which will have a positive impact on employment. Jobs will also be created during construction works. The Project will have negative impacts on 95 enterprises; these impacts and provisions for workers are addressed in the resettlement plans.	☐ Yes ☒ No
Indigenous Peoples	☒ Significant ☐ Not significant ☐ None	For subprojects located in counties with indigenous peoples, there will be some impact on ethnic minority groups. The Project will have mostly positive impacts on local and ethnic minorities who are not affected by land acquisition and resettlement. However, flood protection works that require resettlement of ethnic minorities will require measures that consider the needs of minorities. Provisions for mitigation measures are included in the resettlement plan. The plan ensures that ethnic minorities adversely affected by resettlement will benefit from the Project. PRC policies and programs for ethnic minorities further enhance project benefits for ethnic minority groups. Among the eight core subprojects, one subproject is located in a predominantly ethnic minority county. An ethnic minority development plan and an ethnic minority development framework have been prepared.	☒ Yes ☐ No
Other Risks and/or Vulnerabilities	☐ Significant ☐ Not significant ☒ None	Overall, a key objective of the Project is to reduce flood risks and reduce peoples' vulnerability to floods.	☐ Yes ☒ No

SUMMARY RESETTLEMENT FRAMEWORK[1]

A. Background

1. The Project will support activities that require land acquisition, house demolition, and resettlement. In accordance with Asian Development Bank's (ADB) *Policy on Involuntary Resettlement*, a sector Project requires the preparation of (i) a resettlement framework applicable to all subprojects, and (ii) resettlement plans (RPs) for core subprojects. The resettlement plans have been prepared by the local project management offices (LPMOs), assisted by Hunan Hydro and Power Design Institute and the provincial project management office (PPMO), based on detailed socioeconomic surveys and extensive consultation among affected people. Resettlement plans will be prepared during project implementation for the 27 remaining subprojects based on the resettlement framework.

B. Project Impacts

2. The 35 subprojects will affect up to 101 townships (towns or subdistricts) and 352 villages or urban residential committees. Up to 863 hectares (ha) of land will be acquired, including 461 ha of farmland. The acquisition of farmland implies that up to 13,969 persons will need full economic rehabilitation. In addition, during the construction phase, about 613 ha of land will be occupied temporarily. Along with land acquisition, about 1 million square meters (m^2) of structures would need to be demolished, including 709,899 m^2 of residential structures and 292,933 m^2 of non-residential structures. The demolition would cause relocation of 5,236 households and would affect 95 enterprises and 132 shops. About 62% of houses in areas affected by relocation are made of brick concrete and 38% are brick-wood and/or earth-wood structures. A total of 20,133 persons will be affected.

C. Preparation and Approval Procedures for Resettlement Plans

3. For all the 27 noncore subprojects, individual RPs will be prepared based on preliminary designs and in accordance with the resettlement framework. For subprojects that affect less than 200 people, short RPs should be prepared; subprojects impacting more than 200 people will require full resettlement plans. RPs will be reviewed by the PPMO before submission to the advisory technical assistance (TA) resettlement specialists for review and assessment (see Appendix 13). The advisory TA resettlement specialists will prepare a RP compliance assessment note for each subproject.[2] If the RP passes the advisory TA assessment, it will be submitted to ADB for review and approval. If quality improvements are needed, the advisory TA resettlement specialists will specify requirements to be addressed by the Hunan Hydro and Power Design Institute and LPMOs; once revisions are made, the RP will be rechecked, the RP compliance assessment note will be revised, and the plan will be sent to ADB for approval. In the event of significant changes arising from detailed designs for the eight core subprojects, RPs will be updated and disclosed to the affected persons and sent to ADB for approval. For each subproject, land acquisition or occupation, demolition of structures, and/or dispossession of assets can only commence after ADB approval of the RP or updated RP.

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[1] The resettlement framework is presented in Supplementary Appendix C. Detailed RPs are presented in Supplementary Appendix D for the eight core subprojects.

[2] The proposed TA-supported field-based review process is designed to fulfill OM Section F2/BP, which allows review by an international third party acceptable to ADB as described in OM Section F2/OP, para. 38. In the absence of an advisory TA, ADB would have to review and approve RPs in accordance with OM Section F2/OP.

D. Policy and Legal Framework

4. The resettlement framework reflects both the People's Republic of China's (PRC) legal requirements and ADB's policy. The main principles are: (i) minimizing negative impacts; (ii) carrying out resettlement and compensation to improve or at least restore the pre-project income and living standards of affected persons; (iii) fully informing and consulting the affected persons on compensation options and resettlement planning; (iv) providing asset compensation at replacement rates; and (v) compensating in full for lost assets, replacement dwellings, and resettlement allowances prior to ground-leveling and demolition.

5. The resettlement framework stipulates eligibility and entitlements for land, houses, income losses, and rehabilitation subsidies in accordance with the 1998 *Land Administration Law,* the State Council Document No. 28 *Deepening Reform on Land Acquisition System and Reinforcement* (2004), and ADB's *Policy on Involuntary Resettlement* (1995). As the PRC laws and regulations allow for variations in compensation standards, each subproject RP will give specific provisions within allowable ranges based on land productivity, the available land in affected villages, and features of each subproject site.

6. Affected village groups will be compensated for permanent land losses through payment of (i) a land compensation fee, and (ii) a resettlement subsidy. According to the Land Administration Law (1998) and the Hunan Provincial Implementation Decree (2000), compensation for farmland will be based on annual average output value (AAOV) in the past 3 years and multiples set forth according to average per-capita landholdings in affected villages. The land compensation fee will be at least six times the AAOV, and the resettlement subsidy will be at least 16 times the AAOV. Where possible, permanent land losses will be replaced through land reallocation within village domains. Temporary land losses will be compensated in cash to affected persons at the rate of two times AAOV (assuming 2 years of occupation), plus the land reclamation cost and compensation for lost crops and trees.

7. House and attachments losses will be paid to affected persons in cash at the cost of replacement, excluding demolition expenses and including revenues from salvaged materials. The compensation rates are based on analysis of actual material costs of replacement structures in each project area. Compensation for attachments to buildings, infrastructure facilities, moving expenses, and trees has been set in accordance with compensation rates for similar projects in project counties. Nonresidential structure losses will be paid in cash to the affected work units and individuals at replacement cost. The compensation rates will be based on analysis of the material cost of replacement structures in project areas. Compensation for equipment relocation, moving expenses, and lost wages and net income during interruption will be paid in accordance with actual costs. Impact on special public facilities will be compensated based on the replacement cost to the relevant government departments.

8. The PPMO and LPMOs will ensure that resettlement entitlements are provided to affected people prior to the commencement of ground-leveling and demolition. Land compensation and resettlement subsidies will be paid to affected village groups. Housing compensation and compensation for crops and other assets will be provided directly to people affected by asset loss. Compensation for infrastructure, such as electricity lines and communication fixtures, will be paid to the government departments responsible for restoring affected infrastructure.

E. Resettlement and Rehabilitation

9. Loss of land for farmers are generally not expected to be significant as most flood works will take place in land classified as urban. However, there are some cases where the nature of the flood protection works will impact village groups with farmland significantly. Affected villages with farmland could mitigate losses through land reallocation and/or cash compensation. In villages with limited land, affected persons will receive non-land-based and non-farm activity rehabilitation. For the eight core subprojects, detailed economic rehabilitation plans have been drawn up for all seriously affected villages and included in the RPs; similar village rehabilitation plans will be prepared for the remaining 27 noncore subprojects.

10. Compensation for house demolition and rehabilitation following relocation for affected rural households will be provided based on replacement value, plus funds to obtain new housing sites connected to roads, electricity, and water within the villages they currently inhabit. Affected urban households will be provided with either cash or in-kind compensation options. In-kind options include better quality replacement housing within the same urban area. Depreciation will not be subtracted from housing values when calculating compensation, and people will be allowed to salvage materials from their old houses.

F. Resettlement Cost and Funding

11. Based on detailed cost estimates of the eight core subprojects and preliminary estimates for the 27 noncore subprojects, the total cost of land acquisition and resettlement is CNY790.0 million ($92.8 million equivalent), including CNY204.2 million for the eight core subprojects and CNY585.8 million[3] for the 27 noncore subprojects. These land acquisition and resettlement costs are included as part of total project costs. Compensation for land acquisition, demolition of buildings, and other costs for each subproject should be paid to affected persons through the resettlement office of their city or county project management office. According to the compensation policies and standards defined in the RP, the payment and usage of compensation funds will be carried out under the supervision of the internal monitoring agencies, with regular review by an independent external monitoring agency. The funding for resettlement costs will be provided for through municipal or county budgets. Disbursements will be monitored quarterly to ensure that full compensation has been paid in a timely manner.

G. Information Disclosure and Public Participation

12. Public consultation and information disclosure was undertaken within the project area. Knowledge and acceptance of the proposed compensation policies and rehabilitation measures for affected persons is a precondition for approval of RPs. The resettlement framework was provided to local governments in all subproject cities in June 2005. For the eight core subprojects, resettlement information booklets have been distributed to affected persons to provide details on impacts and compensation rates prior to ADB approval. The RPs were made available in the relevant government offices at municipal, county, and township levels; village offices, and residential committees. This process has started for the remaining 27 subprojects. Any updates to RPs will also be disclosed to affected persons prior to ADB approval. During implementation, impacts, compensation entitlements, and payments will be publicly disclosed in each village or residential committee.

13. Both affected communities and project stakeholders can participate publicly in the entire

[3] The cost is subject to further revision pending the endorsement of the final RPs by 27 local governments.

resettlement process. Affected persons have been encouraged to participate in the planning process; this will continue during implementation of the RP. During the preparation of RPs, communities and affected persons were invited to consultation meetings, where they were informed of the resettlement framework and the planned developments. The PPMO and subproject LPMOs will continue to consider affected persons' opinions on resettlement and compensation policies.

H. Institutional Responsibilities

14. The PPMO will be responsible for overall project implementation. The city and county LPMOs of the 35 subprojects are the agencies in charge of implementing the Project, including preparing and implementing the individual RPs. They will share this responsibility with municipality and county city local land management and resettlement offices, which will be responsible for resettlement activities including asset valuation, consultation, delivery of entitlements; and issuance of land acquisition, demolition, and building permits. Field tasks such as compensation disbursement, selection of replacement land, and provision of livelihood support will rest with township officers and village leaders.

I. Grievance Procedures

15. Complaints and grievance procedures are set out in the RPs. The local city or county subproject resettlement office will keep records of all appeals and resolutions. Following the new provisions of the Land Administration Law and the new Grievance Regulation (which became effective on 1 May 2005), affected persons will be made aware of grievance procedures through the participatory meetings and through the resettlement information booklet. If any affected person does not agree with the compensation or RP, he or she can voice their complaint to the village committee (residential committee). The village or residential committee should keep records, consult with the local resettlement office, and provide a reply to the affected person within 10 days. If the affected person is not satisfied with the reply, he or she can appeal to the township or subdistrict resettlement work group, which will record the complaint, consult with the local resettlement office, and provide the affected person with a solution within 10 days. If the affected person still does not accept the proposed resolution, then he or she can appeal directly to the city or county resettlement office. The resettlement office should make a record of that appeal and provide a resolution within 15 days. If the dispute still cannot be resolved, then the affected person can either appeal to the PPMO, go through an administrative appeal according to the “Administrative Procedure Law of People’s Republic of China”, or go directly to the People’s Court.

J. Monitoring and Evaluation

16. As required by ADB, both internal and external monitoring of RP implementation will be carried out. Internal monitoring will be the responsibility of the PPMO and subproject LPMOs, as part of the Project's management and monitoring system. This will include reviewing the implementation milestones, tracking progress of physical and financial progress, and reporting results to ADB on a quarterly basis. External monitoring and evaluation will be assigned to a qualified independent monitoring agency. External monitoring reports will be submitted to ADB and the PPMO twice a year after resettlement activities are completed. Each subproject will be evaluated annually for 2 years. Once resettlement is deemed successfully completed, the PPMO will submit a resettlement completion report to ADB.

ETHNIC MINORITY DEVELOPMENT FRAMEWORK[1]

A. Introduction

1. The Ethnic Minorities Development Framework (EMDF) of the Hunan Flood Management Sector Project is designed to ensure that project benefits and mitigation measures are distributed equitably among affected minority communities and individuals, and that special actions are taken accordingly. The EMDF prepared for Sangzhi County[2] (a core subproject) is based on the resettlement framework, the social and poverty assessment, and consultation with ethnic minority groups and relevant agencies. The EMDF includes four main components: (i) an outline of project scope; (ii) a summary of distribution and socioeconomic characteristics of ethnic minorities in project areas; (iii) the basic legal framework for the EMDF, which includes both national laws concerning the ethnic minority population in the People's Republic of China (PRC), and provisions of *ADB Policy on Indigenous Peoples*; and (iv) key provisions to enhance the economic conditions of minority groups based on review of the ethnic minority development plan (EMDP) for the core subproject assessed. Provisions for mitigation measures are included in the resettlement plan, which ensures that ethnic minorities adversely affected by resettlement will benefit from the Project. PRC policies and programs for ethnic minorities further help to protect and enhance project benefits to ethnic minority groups.

B. Ethnic Minorities in Project Areas

2. The four river basins have a relatively high concentration of ethnic minorities compared with the rest of Hunan Province. There are an estimated 8 million ethnic minority people living in the four river basins, accounting for about 13% of the total population. The Tujia (11% of the population), Miao (8%), and Dong (4%) are the main ethnic groups. The 47 counties covered by the Project are home to about 3 million ethnic minority people (12% of the total population in those counties). This includes 1.5 million Tujia (41% of the total minorities), 0.56 million Yao (18%), 0.45 million Miao (15%), 0.23 million Dong (7%), and 0.17 million Bai (3%). Forty percent of ethnic minorities in project counties live in the Lishui basin, 36% live in the Yuanjiang basin, 22% live in the Xiangjiang basin, and 2% live in the Zishui basin. Most of the ethnic minority populations living in the project area are located in nine western counties. Social surveys and analyses of subprojects in these nine counties have determined that ethnic minorities will be among the project beneficiaries and project-affected persons.

C. Screening Criteria and Preparation Procedures for EMDP

3. The Project is committed to ensuring and has the organizational structure to ensure that ethnic minorities are: (i) consulted in matters related to each subproject, (ii) provided with opportunities to participate in decision making related to the subproject, and (iii) provided with opportunities for participation in project activities should they so desire. The basic criteria for determining whether an EMDP will be required for any subproject is to determine whether a significant proportion of project beneficiaries and project-affected persons belong to ethnic minorities. Based on social analysis and statistics, nine subproject counties where ethnic minorities account for more than 15% of population will be need to prepare individual EMDPs. The other subprojects are located in urban or peri-urban areas, which tend to have lower ethnic minority populations.

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[1] Initial screening for impact on indigenous people assessed the Project as category B. Specific action favorable to indigenous peoples/ethnic minorities will be addressed through resettlement plans, which are detailed in Appendix 14.

[2] The EMDP for Sangzhi county, which has been reviewed and approved by the local authority, is included in Supplementary Appendix C.

D. Ethnic Minority Development Plan

4. Based on extensive consultation among stakeholders, an EMDP will be developed for each of the nine subprojects concerned. The content of the EMDPs, following Asian Development Bank (ADB) policy and the sample EMDP for Sangzhi, will consist of an overview of minority groups, their socioeconomic conditions, potential negative impacts, proposed mitigation measures, and enhancement programs and actions to be carried out during project implementation. The EMDP will include a range of measures to (i) mitigate potential negative impacts; (ii) enhance positive benefits for the beneficiaries based on existing policies and programs aimed at minority populations; and (iii) ensure that project benefits accrue to affected minority populations in a preferential or at least in an equitable manner. Based on proposed measures, detailed budget and implementation arrangements should be developed, including institutional-structure and monitoring and evaluation (M&E) arrangements. Each EMDP will involve local participation and will include: a legal framework, baseline data, land-tenure information, identification of development or mitigation activities, the institutional-structure arrangement, an implementation schedule, M&E arrangements, and a cost and financing plan.

E. Reporting, Budget, and Implementation Arrangements

5. The EMDP will be reviewed and endorsed by a local project management office (LPMO), and submitted to ADB through the Provincial Project Management Office (PPMO) in line with procedures for review, submission and approval of feasibility study reports, resettlement plans, and environment assessments. All mitigation measures will be financed by the local government. Based on types of measures, actions will be financed by existing government minority assistance program or funds; or by counterpart funds as part of project resettlement program or environment mitigation measures.

6. The PPMO will be responsible for management of overall project implementation and the EMDP. The LPMOs for the nine minority counties are the Implementing Agencies. As such they have specific responsibilities to implement the EMDPs in accordance with this EMDF. The PPMO will authorize the LPMO of each subproject city to regularly monitor and report on the implementation of EMDPs, as per the requirements of this EMDF. County governments will take a leading role in implementing mitigation measures. Several government agencies will be involved, including the minority affairs bureau, land administration bureau, poverty reduction office, forestry bureau, agricultural bureau, women's federation (government organized NGO), and township governments.

F. Monitoring and Evaluation

8. The M&E of each EMDP is required to ensure that each plan complies with PRC laws and regulations and ADB policies, and that it meets its specified objectives. ADB, through the PPMO, will provide assistance to LPMOs in formulating the M&E plans. The objectives of the M&E plans are to be agreed upon before subproject implementation. Data and information, disaggregated by gender where possible, will be gathered in line with the indicators of resettlement in order to identify project impacts and project-induced social changes on ethnic minorities and their communities.

ENVIRONMENT ASSESSMENT AND MANAGEMENT FRAMEWORK

A. Introduction

1. **Country Environment System Categorization.** The Hunan Environmental Protection Bureau (HEPB) was granted authority by the State Environmental Protection Administration to review the proposed Project. In July 2005, HEPB officially certified that: according to the State Environmental Protection Administration *Order 14* on environmental impact assessment (EIA) categorization, as a sensitive dike construction project an EIA document should be prepared; and according to the *Notice on Strengthening the Environmental Management of International Finance Institution Projects*, promulgated in 1993, projects which have limited negative impacts on the environment should be designated category B. Based on the above the HEPB assigned the Project as category B, and required that a full EIA report be prepared. The Hunan Hydro and Power Design Institute subcontracted the Environmental Science Institute of Hunan Province to prepare an EIA report, which was to be supplemented by Hunan Hydro and Power Design Institute-produced category B-level environmental impact reports (EIRs, also referred to as environmental forms) for all subprojects. A draft of the EIA report, without the subproject EIRs, was submitted to the HEPB in early July 2005. The EIRs were completed, reviewed by local environmental protection bureaus, and submitted to the HEPB. Final HEPB approval of the EIA was provided in November 2005.

2. **ADB Environment Categorization.** For ADB environmental assessment purposes, the Project has been classified as Category B. As the Project will be implemented under a sector approach, eight priority core subprojects have been developed in full to the ADB-standard feasibility level during the technical assistance (TA) implementation. In accordance with the environmental requirements of the ADB, an environmental review of the Project was undertaken. The summary initial environmental assessment is provided in Supplementary Appendix D. In addition, a project-wide consolidated initial environmental evaluation (IEE) and consolidated environment management plan (EMP) were also prepared. An IEE report, including an EMP, was prepared for each of the eight core subprojects. Subproject EMPs (i) present environmental compliance and ambient monitoring programs, relevant to People's Republic of China (PRC) environmental standards and regulations that will be adopted, and environmental reporting requirements; (ii) facilitate institutional arrangements and define roles and responsibilities for the implementation of the environmental mitigation measures, environmental compliance and ambient monitoring programs, and environmental reporting; (iii) provide the basis for compliance with the environmental requirements of PRC and ADB; and (iv) present the subproject EMP budgets.

B. Project Environmental Impacts

3. Construction of the Project is not anticipated to have significant terrestrial ecological impacts as the project study area typically consists of heavily modified urbanized/semi-rural farmland mosaics, and no sensitive terrestrial resources or rare and endangered flora and fauna have been identified in the core subproject project study areas. Dike construction will not affect the hydrology of the project rivers. The main impacts that require special measures are associated with the construction phase, including: soil erosion and runoff from exposed earthwork sites, the rehabilitation of borrow areas and spoil sites, construction wastewater and domestic wastewater from construction camps, construction solid wastes and domestic waste from construction camps, air pollution from traffic and construction site dust, noise pollution from construction activities and heavy machinery, dredging, on- and off-site health and safety, and public safety. Where dredging is planned, it will be implemented carefully to minimize impacts, as will construction in some locations so as to not damage historical and culturally important sites and edifices.

4. Overall, construction environmental impacts are localized and temporary, and can be adequately mitigated. Operation of the dikes and other flood works will have no significant negative impacts on the project rivers water' levels or water quality, or on terrestrial or aquatic flora and fauna. A comprehensive program of mitigation measures, ambient and effluent environmental monitoring, and compliance inspections has been designed to address these issues. If the mitigations are implemented, the Project should have minimal negative impacts and should result in positive benefits brought about by the flood protection.

C. Environmental Criteria for Subproject Selection and Approval Process

5. To be eligible for financing through the Project during implementation, each noncore structural subproject will be screened according to technical, social, financial, and other criteria defined in Appendix 3. Table A16.1 presents environmental criteria that will be used to screen subprojects.

Table A16.1: Noncore Subproject Environmental Selection Criteria

Criteria	Specifications
Structural Measures	Structural measures in subprojects may include: new and strengthened earth embankments, flood-control walls, dike slope protection and toe protection, dike seepage prevention, riverbank protection, building or renovating flood diversion channels, construction of new gravity discharge culvert sluices and electric pumping stations, dredging to improve river channel capacity, installation of traffic access gates, renovation or removal of river weirs, and construction of flow-management dams and control gates. No other structural measures are allowed.
Siting	Construction works will not take place in any areas of special environmental significance, including wetlands, areas of habitat for rare and endangered flora and fauna, and protected areas or nature reserves.
Environmental Review Requirements	(i) A subproject environmental review has been prepared either in accordance with the environmental assessment framework (EAF) presented in Table A17.2. (ii) The environmental review indicates that the subproject will not result in significant long term negative environmental impacts. (iii) Mitigation measures will follow PRC laws and regulations. (iv) Requirements for mitigation implementation are to be directly incorporated into the subproject construction contracts.
Public Consultation	Due public consultation and processes in line with the Environment Management Plan, PRC and ADB requirements are agreed upon with ADB and implemented.

ADB = Asian Development Bank, PRC = People's Republic of China.
Source: Asian Development Bank.

6. Two levels of environmental approval review and approval will be undertaken for proposed noncore subprojects depending on the scale of the flood works proposed and the extent of dredging works, as summarized in Table A.16.2. Category 1 noncore subprojects provide flood protection works designed to control floods that exceed a 1 in 50-year return period , or involve dredging in excess of 200,000 cubic meters (m^3), or have dike construction taking place adjacent to a Class 1 water source protection zone. Because of the height and magnitude of the dikes and flood walls required to protect against floods that exceed the 1 in 100-year return period —and the associated higher rates of excavation, demolition, materials used, and production of wastewater and solid waste; the relatively high levels of dredging; and the need to protect drinking water source zones—Category 1 subprojects require the highest degree of environmental review. The Provincial Project Management Office (PPMO) will prepare an IEE in accordance with ADB environmental assessment guidelines. The IEE must be submitted to the ADB for review and approval at least six weeks before the subproject contract is awarded. The ADB will approve and/or comment on the IEE within three weeks of its submission. The review will be undertaken by the Agriculture, Environment, and Natural

Resources Division of ADB's East Asia Department in consultation with the Regional and Sustainable Development Department. Category 2 noncore subprojects have flood protection works designed to control floods below the 1 in 50-year return period, a dredging volume less than 200,000 m^3, and are not located adjacent to Class 1 water source protection zones. These subprojects have more moderate sized dikes, flood walls, and associated impacts. The PPMO will prepare an environmental impact report (EIR) in accordance with PRC Category B level requirements and submit it to the HEPB and/or relevant subproject municipal environmental protection bureaus for approval and review. Upon approval by the environmental protection bureaus, the PPMO will submit the EIR to ADB. If deemed equivalent to an ADB standard IEE, the EIR will be endorsed on a non-objection basis at least 4 weeks before the subproject contract is awarded. Where the EIR is not equivalent to an IEE, an IEE will be prepared for ADB's no-objection endorsement at least 4 weeks before the subproject contract is awarded.

Table A.16.2: Summary of Noncore Subproject Environmental Assessment Framework

Item	Category 1	Category 2
Subproject Characteristics	– Protection standard > 1:50 yr – Dredging > 200,000 m^3 – Class 1 water source protection zone	– Protection standard ≤ 1:50 yr – Dredging ≤ 200,000 m^3 – No class 1 water source protection zone
Subproject Environmental Review Process	– ADB standard subproject IEE to be prepared – ADB must review and approve	– PRC category B standard subproject EIR to be prepared – HEPB and/or local EPB to approve – ADB endorses on a no-objection basis
Proposed Noncore Subprojects	14 subprojects: Hengyang municipality, Shaoyang, Zhuzhou, Youxian, Hengyang county, Longhui, Zhongfang, Cili, Zhuzhou, Xiangtan, Qiyang, Liling, Shimen, and Lengshuijiang	13 subprojects: Jiangyong, Xintian, Ningyuan, Xupu, Lianyuan, Shuangfeng, Shaodong, Jianghua, Xinhuang, Fenghuang, Baojing, Chenzhou, and Jishou

ADB = Asian Development Bank, EIR = environmental impact report, EPB = Environmental Protection Bureau, HEPB = Hunan Environmental Protection Bureau, IEE = initial environmental evaluation, PRC = People's Republic of China, m^3 = cubic meter, yr = year.
Source: Asian Development Bank

D. Management of Environmental Impacts and Costs

7. A stand-alone consolidated (project-wide) EMP has been prepared. The consolidated EMP includes: an overview of the predicted environmental impacts of the Project, an overview of the recommended mitigation measures, an environmental assessment framework to evaluate the remaining 28 noncore subprojects, and an environmental compliance and ambient monitoring program. In addition, the consolidated EMP facilitates institutional arrangements for: implementation of the environmental assessment framework; implementation of the recommended environmental mitigation measures; implementation of the recommended environmental compliance and ambient monitoring programs, including reporting requirements; and compliance with the environmental requirements of PRC and ADB. The estimated budget for environmental protection and management is approximately $13.5 million.

E. Institutional Responsibilities

8. The EMPs (consolidated and subproject) present institutional arrangements and responsibilities for the implementation of the measures and activities presented in the IEEs and EMP. They specify the roles and responsibilities of the key stakeholders for environment management, including the PPMO and its environmental and social division, subproject local project management offices (LPMOs) and their local environmental and social divisions, the HEPB, local environmental protection bureaus and their environmental monitoring stations, environmental supervision engineers, construction supervision engineers, the contractors, and ADB review/supervision missions. The EMPs also present measures for enforcing mitigation implementation and actions to be taken if noncompliance occurs.

9. The PPMO and ADB have agreed that an environmental management regulation for project construction will provide the legal basis for the overall environment management of the Project. It will be developed by the environmental and social division of the PPMO. It will address the common environment management and mitigation requirements and issues of all subprojects, and should include, but not be limited to, a summary of: a) the mitigation measures presented in the consolidated IEE, b) the project EMP presented in the consolidated EMP, c) applicable PRC environmental regulations and standards presented in the consolidated EMP, and d) requirements for incorporation of environmental considerations into subproject construction tendering documents and contracts.

10. At the subproject, the local environment and social division under the supervision of the environmental and social division, will develop tendering documents and ultimately construction contracts that clearly define the contractors' environmental obligations. The subproject construction contract environmental obligations should include, but not be limited to, the contractors' responsibilities with respect to: a) implementing the mitigation measures presented in the subproject IEE; b) participating in the compliance monitoring program (mitigation compliance monitoring and mitigation construction quality monitoring) presented in the EMP of the subproject IEE; c) participating in the ambient monitoring program presented in the subproject IEE; d) reporting responsibilities as presented in the subproject IEE; e) participating in the environmental enforcement mechanism; f) developing a construction EMP, which describes how the contractor will meet its environmental obligations; g) developing a health and safety plan, which describes how the contractor will meet its obligations; h) providing suitable environmental and health and safety training to employees; and i) other responsibilities as designated by the local environment and social division. The construction contract environmental requirements should be part of the subproject tendering documents and eventually part of the subproject construction contracts. The construction contracts will be the legal documents for the LPMOs' management of environmental issues in the subprojects.

F. Monitoring and Reporting

11. Environmental monitoring will be undertaken to: provide feedback on the extent and severity of the environmental impacts against the predicted impacts, ensure that mitigations are being appropriately implemented, and assess the overall effectiveness of the project environmental protection measures. Two types of environmental monitoring will be undertaken: compliance and inspection monitoring, and ambient monitoring. Compliance monitoring will be undertaken to ensure that the contractor is implementing the mitigation measures in compliance with their contractual requirements and with the environmental regulations and standards of the PRC. The mitigation compliance inspections will be carried out by environmental supervision engineers and construction supervision engineers employed by a qualified and accredited inspection company hired by the PPMO. The subproject EMPs present environmental compliance monitoring programs, which should be incorporated into the legal agreement between the subproject LPMOs and inspection company.

12. Ambient monitoring supports compliance monitoring through assessing either the quality or extent of pollutant (effluent) generated or the quality of the receiving environment (air, water, and noise). The objective of ambient monitoring is to provide feedback on the extent and severity of the environmental impacts against the predicted impacts, assess the overall effectiveness of the project environmental protection measures, and ensure that relevant environmental standards of the PRC are being maintained. Ambient motoring will be carried out by the subproject environmental protection bureaus, either through their environmental monitoring centers or through their own environmental monitoring companies. The subproject EMPs present ambient monitoring programs, which should be incorporated into monitoring agreements between the subproject LPMOs and the environmental protection bureaus. The

Executing Agency through the PPMO will undertake compliance monitoring and submit a semiannual report to ADB on the progress of implementation of subproject EMPs.

FINANCIAL AND ECONOMIC ANALYSES

A. Analysis of the Project

1. Rationale for Public Intervention

1. The Hunan economy is growing rapidly and the urban population of 22 million is projected to increase by one third by 2010. Presently, 70% of Hunan Province's municipal and county-level cities are located in the middle and upper reaches of the Province's river basins (termed mountainous areas). Cities typically are located along the narrow bottom lands flanking mountain rivers and are exposed to the dangers of flash flooding and the consequent damage and loss of life. The frequency of floods, low levels of protection, and population growth in flood-prone areas has led to a rise in losses, costs, and disruption from floods.

2. Because of a lack of investment in urban flood protection, most of the cities in the mountainous areas of the four river basins have very low flood protection standards, and some poor counties do not have any protection at all. The table below demonstrates that, while the impact of large floods has varied over the past 40 years, more recent floods like those in 1996 and 1998 have multiplied significantly in actual value terms as compared with the 1954 flood, which is still considered to be the worst flood event over the past 100 years.

Table A17.1: Comparison of Costs for Large Floods in Hunan Province
(actual year costs)

Year	Inundated Area (10^4 ha)	Casualties	Economic Loss (CNY billion)
1954	57.3	2,339	21.0
1983	31.0	286	1.9
1996	134.7	744	5.6
1998	124.9	616	10.0
1999	57.9	125	6.0
2002	137.2	156	1.5

ha = hectare, CNY = yuan.
Source: Asian Development Bank.

2. Past flood-control and flood management investments have largely focused on the lower floodplains of Hunan's rivers and the Dongting Lake area. Future economic losses will increase and development will be hindered as flood-prone areas in the upper reaches of provincial rivers become more densely populated. The Hunan provincial government (HnPG) prioritizes increasing flood protection to the mountainous river basins by providing improved flood-control engineering measures and other nonstructural flood forecast, warning, and management measures.

2. Goals of the Investment Plan

3. The HnPG's flood-control plan focuses on a comprehensive framework for flood management and stipulates medium-term (over the next 5 years) and longer-term flood protection targets for the mountainous rivers. The medium-term targets require financing and capacity building of local governments. National and provincial governments in the People's Republic of China (PRC) are shifting their attention away from flood control and more toward flood management. Still, nonstructural aspects of Hunan's flood management plan are in a formative stage and plans for integrated flood management need further development.

3. Design of the Plan and ADB's Role

4. Identification of a least-cost plan for flood management has not yet been done in the PRC, although the current change in flood management strategy probably reflects an implicit assessment of alternatives to the flood-control-only approach. Asian Development Bank (ADB) can assist HnPG to accelerate the implementation of its plan, including (i) flood management measures, (ii) flood-control works, and (iii) capacity building and plan management.

B. Analysis of Individual Subprojects

1. Introduction

5. To appraise the financial and economic impact and feasibility of the Project's activities and outputs, financial and economic analyses were carried out on the eight core subprojects. An overview of the general approach for the economic analysis is presented below and results are presented for each of the eight subprojects. As described in Section III of the main text, the eight subprojects represent the range of physical, social, and economic conditions that characterize the 35 candidate subprojects. Detailed results for individual subprojects are set out in the supplementary appendixes for the individual subproject feasibility study reports (Supplementary Appendix C).

2. Assumptions

6. Financial prices used in the analysis were identified through review of the cost estimates made by the provincial and local design institutes for the initial feasibility study reports, including estimates of unit costs and estimated quantities. Identified discrepancies were cross checked with the original estimates and verified with the estimates of the design institutes. The quantities were similarly checked by the consultant team. To assess each subproject's contribution to the PRC economy, it is necessary to convert financial values to their economic equivalents. Economic valuations exclude transfers from one part of the economy to another (i.e., taxes, duties, and subsidies)[1] and attempt to facilitate the comparison of project benefits and real opportunity costs to the economy by translating all prices into a common, undistorted footing. Basic assumptions used in the economic analysis include:

(i) The use of a domestic price numeraire.
(ii) Cost estimates are based on price of April 2006.
(iii) The PRC yuan (CNY), or Renminbi, is the unit of account. The exchange rate used is CNY8.11 per US dollar.[2]
(iv) The economic benefits of the subprojects are estimated to be equivalent to the annualized economic value of damages avoided through implementation of the subprojects.
(v) For non-traded goods, a standard exchange rate factor of 1.09 and a shadow wage rate factor for unskilled labor of 0.90 are used.
(vi) Transfer payments such as taxes, duties, and subsidies are excluded from the estimation of economic values.
(vii) All costs that are incurred prior to loan appraisal are treated as sunk costs, and costs expected to be incurred between loan appraisal and loan effectiveness are treated as year 1-costs.

[1] National level taxes and duties are excluded from the cost estimates because it is anticipated that the subprojects will be exempt from these due to their strategic importance. However, local taxes on purchases of equipment and vehicles, as well as land taxes as a part of resettlement costs, are included.

[2] The impact of the revaluation of the CNY on the project costs was calculated and has been found to be minimal. Therefore, the cost estimates which are in the PRC Foreign Capital Utilisation Plan have been retained, in the interest of consistency.

(viii) The economic value of incremental operation and maintenance (O&M) costs is estimated to be 5% of the incremental costs of civil works, equipment, and vehicles, including physical contingencies.

3. Financial Analysis

7. Urban flood-control works are financed by municipalities/counties mainly through two sources: (i) collection from the Flood Control Security Fund,[3] and (ii) a prescribed portion of the collection of the Urban Maintenance and Construction Tax.[4] In most of the cities/counties, 15% of the Urban Maintenance and Construction Tax is earmarked for flood-control works. The funds from these two sources are used to finance construction of flood-control projects and O&M of completed works. Other sources for financing flood-control works include land sales and exploitation, contributions from project beneficiaries,[5] and, if needed, incremental budgetary allocation from local governments.

8. Fiscal affordability of the core subprojects by municipalities/counties is assessed by comparing annual collections from identified financing sources with the annual counterpart funds required for (i) capital expenditures during project implementation, and (ii) recurrent costs for O&M and debt services during the operational life of the project facilities. Annual O&M costs are estimated following relevant domestic standards and regulations. Interest and principal repayments for the ADB loan are estimated based on a grace period of 6 years and a maturity of 20 years. Table A.17.2 shows the results.

Table A17.2 : Fiscal Affordability Analysis

(CNY million, 2004 prices)

	Implementation Period					Operation Period			
Local Authority	**Identified Annual Funds Available**	**Capital Costs to be Financed Locally**	**Works Period (months)**	**Annual Counterpart Funds Required**	**Affordability**	**Debt Service**	**O&M Cost**	**Annual Capital Required**	**Affordability**
	(a)	(b)	(c)	(d)=(b)/(c)*12	(e)=(a)/(d)	(f)	(g)	(h)=(f)+(g)	(i)=(a)/(h)
Xinhua County	3.40			27.79	12%	2.66	3.91	6.57	52%
Chenxi County	2.90			15.95	18%	1.22	1.59	2.81	103%
Sangzhi County	6.00			22.38	27%	2.07	3.07	5.14	117%
Loudi City	30.00			90.41	33%	8.13	12.42	20.55	146%
Leiyang City	8.90			19.93	45%	1.40	1.99	3.39	263%
Wugang City	13.30			22.93	58%	2.33	3.17	5.50	242%
Huaihua City	25.70			35.14	73%	4.73	7.07	11.80	218%
Yongzhou City	40.00			42.52	94%	5.77	8.16	13.93	287%

CNY = yuan, O&M = operation and maintenance.
Notes: At appraisal, estimated annual funds available did not include project budget allocations from 2006 onwards; therefore, these estimates were conservative.
Source: (a), (c), and (g) are from DFR.

[3] According to Provisions on Raising a Flood Control Security Fund for Hunan Province, issued by HnPG (31 August 1994), businesses must pay 0.08% to 0.2% of the sales/revenues to the Flood Control Security Fund. For insurance companies, the Flood Control Security Fund is levied at 1% of annual property insurance premiums. Flood Control Security Fund collections are allocated at 10% to the Province and 90% to cities/counties.

[4] The tax is levied on all enterprises and individuals that pay value-added taxes, business taxes, and consumption taxes on the basis of 7%, 5%, and 1%, respectively, of the collection of the three taxes.

[5] Contributions can be through the Urban Maintenance and Construction Tax, or in-kind or labor contributions.

9. The analysis indicates that, based on identified funds during project preparation (i.e., excluding new budget appropriations and allocations), the Yongzhou subproject has acceptable affordability indicators for subproject implementation. Indicators for the Sangzhi, Leiyang, Huaihua, Wugang, and Loudi subprojects demonstrate that these local authorities will have to mobilize substantially more financial resources for subproject implementation. The Xinhua and Chenxi subprojects have the lowest affordability indicators, with available funds accounting for less than 25% of the annual capital required for subproject implementation. All subprojects except Xinhua will have sufficient funds available for O&M costs and debt service during the operation period. Xinhua may have difficulty meeting this ongoing capital demand.

10. The fiscal analysis conservatively excludes other possible financing sources, which are not quantifiable at this stage. For several reasons, it is expected that the needed funds will be realized. First, all subprojects are located in flood-prone areas and local authorities have much incentive to improve their flood-control works. The flood-control works established under the Project will prevent flood-induced physical and social damages and protect the lives and property of residents. The improved security and infrastructure conditions of the municipalities/counties will attract more domestic and foreign investment. Thirty-four of the 35 subprojects have submitted commitment letters cosigned by the mayor and director of the local finance bureau to the Hunan Provincial Finance Department. Priority will be given to flood-control works when the identified funds are insufficient to satisfy the demand for counterpart funds. Second, the improved flood facilities resulting from the Project will help residential, commercial, and industrial development in the project area, providing an expanding base for Flood Control Security Fund and Urban Maintenance and Construction Tax collections. Third, fiscal revenue of subproject municipalities and counties will also grow in line with economic development, providing even more mobility for the local authorities to finance the project. Fourth, a social survey conducted under the project preparatory technical assistance has indicated residents' willingness to pay for flood protection measures.

4. Subproject Economic Rate of Return Analysis

11. The cost components for each of the subprojects are limited to the costs of flood-control infrastructure, flood management (nonstructural costs), and local subproject management. The cost of provincial-level project management, which accounts for about 1% of project base costs, is not included. The eight core subprojects are located throughout Hunan Province and are designed both to construct new flood protection infrastructure and to upgrade existing infrastructure to provide the level of protection stipulated for each city. Since the subprojects are concentrated in urban areas, the main benefits will accrue to urban infrastructure, including state-owned and private factories, houses, and public infrastructure. Benefits will include significant reductions production and inventory losses. Agricultural benefits are relatively minor and mainly relate to rice and vegetable crops.

12. The principle of reverse rate of return analysis is applied to the EIRR for the eight core subprojects.[6] For the EIRR analysis, benefits and costs were first estimated in financial values and then converted to economic values. The benefits from subproject implementation are assessed as the increased protection that will be provided by the proposed investments, as

[6] The technique, a contingent type analysis, is used in other public service projects and non-revenue-generating projects whose scope includes social objectives and financing of public services or infrastructure. The method can be used to justify flood management subprojects when the value and extent of flood avoidance are clearly quantified, and conventional benefit-cost analysis results in the estimation of EIRR that equals or exceeds the threshold of 12%. Additional quantifiable and non-quantifiable benefits can further justify the economic viability, but no further attempt is needed to quantify these. Sensitivity analysis is not carried out as part of this method.

compared with the protection offered by the current, 'without-project' situation. The current levels of protection vary by subproject, and even within individual subprojects, and were individually assessed. For the 'with-project' situation, the anticipated level of protection provided is for a 20-year-return period flood for county-level cities, and a 50-year-return period for municipal-level cities. Some authorities also anticipated improved protection against localized inundation (waterlogging); this is included as necessary in the analysis.

13. Only direct and quantifiable benefits were included in this analysis, including benefits from nonstructural measures (which extend well beyond project boundaries). However, there are significant additional indirect and unquantifiable benefits that are not included in the analysis. For example, the economic benefit estimates exclude the avoidance of injuries, hospitalizations, deaths, and unneeded mobilization of flood-fighting crews. The estimates also exclude the reduced need for large-scale emergency evacuations necessitated by major floods; reduced losses stemming from disruption of communications and transportation to areas adjacent to flood-prone zones; and reduced losses of household assets, livestock, and farm machinery. Significant unquantifiable benefits are also envisaged from major improvements to the city environment, including the creation of recreational areas along river embankments.

5. Distribution and Poverty Impact

14. The expected impact of the Project on poverty was analyzed in a qualitative manner.[7] The distribution of project impacts among the three main groups—poor, non-poor, and the Government—were also analyzed qualitatively. The purpose of the distribution and poverty impact analysis is to inform decision makers about the potential impact of the Project, to specify the types of parameters that should be monitored to quantify the impact of the Project, and to mitigate the negative effects and/or enhance the positive effects of the Project. Monitoring parameters include those needed to identify unexpected impacts and potential structural constraints that could hinder the access of certain groups, such as the poor, to project benefits. Potential project impacts are expected to affect both poor and non-poor communities and people, and are summarized in Table A17.3 (see Supplementary Appendix C for the summary project impact assessment matrix). Possible positive and negative impacts on the provincial and local governments are also included.

15. Baseline data shows that urban and rural communities have their own distinct characteristics. While rural poverty incidence in the project-protected areas (3.7%) is lower than the average in the project counties (4.1%), the reverse situation is true for urban poverty incidence (urban poverty incidence in the project-protected areas—15.7%—is actually higher than the average in the project counties—13.4%). It is expected that 75% of the project beneficiaries will be in urban areas. Two conclusions drawn from these statistics are as follows. First, the assumption that there would be a higher incidence of poverty in rural areas compared with urban centers does not hold true in this case; urban poverty incidence is much higher than rural poverty incidence, and the situation seems to be exacerbated in project-protected urban areas. Second, the impact of the Project on the poor can potentially be significant, even if the Project is not designed to directly implement poverty reduction measures. This, however, depends on the following assumptions: (i) the 75% of project beneficiaries living in urban areas will include a proportionate percentage of the poor (preliminary studies estimate around 9% of the total project beneficiaries qualify as poor), and (ii) there will be no structural constraints obstructing the poor from benefiting in full from the Project.

[7] Given that this is a sector project supporting an accepted sector plan, no project-wide quantitative economic internal rate of return analysis has been carried out.

16. The expected impacts summarized in Table A17.3 should be monitored using the indicators included in the project design and monitoring framework. This will reduce duplication in collecting baseline data and ensure that the type of data needed to update the distribution and poverty impact analysis will be better integrated into the Project Performance Management System (PPMS) and project monitoring activities. The project monitoring system being developed is intended to continuously inform the distribution and poverty impact analysis by capturing the unexpected effects, both positive and negative, of the Project. The monitoring data should be disaggregated by gender when this adds value to understanding the Project impacts or considering the need for gender-specific mitigation measures. Suggested monitoring indicators are included in the footnotes of the Table below.

Table A17.3 Expected Project Impacts and Suggested Monitoring Indicators

Channels of Effect	Categories of Stakeholders					
	Poor		Non-Poor		Provincial and Local Governments	
	Short Term	Medium–Long Term	Short Term	Medium–Long Term	Short Term	Medium–Long Term
Labor Market	During the first 2 years of construction, the Project will generate employment opportunities for about 4,000 unskilled laborers. (1)	As part of increased investment in protected growth centers, new industries and commercial enterprises in the project area contribute to increased employment opportunities, including for unskilled laborers. (2)	No significant impact expected.	As part of increased investment in protected growth centers, new industries and commercial enterprises in the project area contribute to increased employment opportunities. (5,6)	No significant impact expected.	Reduced uncertainty and instability because of improved flood protection would mean that the governments can better plan for longer-term growth and employment.
Product Markets (inputs and outputs)	Disruption to livelihoods caused by resettlement.	More secure product markets and closer proximity to commercial enterprises and factories reduce transaction costs and lowers prices. (5,6)	Increased business opportunities for supplying building material and equipment during construction. (1)	More secure product markets and closer proximity to commercial enterprises reduce transaction costs and lowers prices of inputs and outputs. (5,6)	No significant impact expected.	General local economic growth from increased flood protection, reduced uncertainty in product markets, and reduced losses from floods, waterlogging. (12)
Asset Markets (e.g., land)	Acquisition of some farmland (2% of total farmland in project counties). (13)	The land on which households would be resettled should be more secure from flooding. (3,7,8)	Acquisition of 5,672 ha of farmland (2% of total farmland in project counties). (13)	Property owners will benefit from rising asset values. Land prices and values in the project areas increase. (4)	Local governments need to acquire land for construction; this could temporarily raise land values. (13)	Increase in land revenue and land or property assessments and taxes. (4)

Channels of Effect	Categories of Stakeholders					
	Poor		Non-Poor		Provincial and Local Governments	
	Short Term	Medium–Long Term	Short Term	Medium–Long Term	Short Term	Medium–Long Term
Services	As a result of resettlement, affected persons will be provided with the full range of services needed for economic and social rehabilitation.	Increased flood protection will lead to more private and public investment in services. (5) Employment generated will increase access to basic services.	As a result of resettlement, affected persons will be provided with the full range of services needed for economic and social rehabilitation.	Assume that increased flood protection will lead to more private and public investment in services and increase the number and choice of service providers. (5)	No significant impact expected.	Reduced expenditure for relief operations implies more budget funds available for investing in the provision of public services. (11)
Transfers	Transfers expected in the form of resettlement compensation where relevant, in order to restore income and livelihoods. (3)	No significant impact expected.	All wage earners will have to contribute to counterpart funding through the Flood Control Security Fund. (1)	No significant impact expected.	Local governments will have to reallocate budgets to co-finance the flood-control works, which may reduce other areas of public expenditure.	Premiums from flood insurance schemes, if implemented, would reduce the need for Government budget and contingency allocations for flood relief operations. (14)

Notes:
Monitoring indicators (from Project Design and Monitoring Framework [PDMF] where possible):
(1) Local project management office (LPMO) contract and procurement data.
(2) PDMF: Incidence of urban poverty.
(3) PDMF: Satisfaction level of the project-affected persons in terms of restored income and livelihoods to pre-resettlement levels.
(4) PDMF: Land values in project areas.
(5) PDMF: Number of newly established commercial enterprises in the project areas.
(6) PDMF: Number of newly established industrial enterprises in the project areas.
(7) PDMF: Flood-control level of municipal cities.
(8) PDMF: Flood-control level of county-level cities.
(9) PDMF: Percentage of accurate data for forecasting and warning.
(10) PDMF: Warning time for potential floods in project areas.
(11) PDMF: Amount of disaster relief operations as reflected in the aggregate provincial expenditures of the human resource capital fund.
(12) PDMF: Total of direct economic loss from floods and waterlogging.
(13) Land-acquisition data from resettlement monitoring reports.
(14) Feasibility and possible monitoring indicators to be further studied under the advisory technical assistance.
Source: Asian Development Bank.

PROJECT PERFORMANCE AND MONITORING SYSTEM

A. Management of the Hunan Flood Management Sector Project

1. One special feature of this Project is that it emphasizes monitoring of implementation based on annual plans, monitoring and reporting systems, and the environment, resettlement, and ethnic minority frameworks/plans. The emphasis on the monitoring of implementation also extends to the monitoring and mitigation of the risks identified in the project design and monitoring framework (PDMF).

2. There is scope to use the inbuilt flexibility of a sector loan as an opportunity to apply adaptive management approaches. Feedback and analysis of lessons learned (for example, from the core subprojects which start up in the first year of the Project) need to be an integral part of project management. While observations and recommendations from external reviewers are necessary, it is equally essential to ensure that internal and external feedback is used by project management to improve the quality and safeguard compliance of the subsequent subproject implementation.

B. Key Principles of the Proposed Monitoring System

3. The monitoring system will, to the extent possible, be based on the People's Republic of China's (PRC) management and reporting guidelines for similar projects and subprojects. The monitoring system will also contribute to more effective project management by: providing adequate practical and operational guidance on monitoring project performance and implementation in areas not covered by the PDMF; ensuring that Asian Development Bank (ADB) safeguards on resettlement, ethnic minorities, and environment management are complied with; capturing unintended negative or positive impacts of the Project to the extent possible; and complementing the annual plan-based management systems, which include work-planning, activity-tracking, and tracking of financial, construction, and staff management.

4. Key principles[1] used in developing the monitoring system include: (i) the monitoring system is to be based on the agreed PDMF, and (ii) baseline information, depending on relevance and availability, could be based on existing data, first measurement after project start-up, or a rolling baseline for subprojects, where data is collected only when the subproject starts up. A sample matrix of the monitoring system for resettlement under the Project illustrates a monitoring and management approach for the output indicator corresponding to resettlement in the PDMF.

[1] Based on Gujit, I. and J. Woodhill. 2002. *A Guide for Project Monitoring and Evaluation (M&E)*. IFAD Rome.

Table A18.1: Sample Monitoring Matrix

Output 2: Flood protection works are completed in priority locations as part of Hunan's River Basin Flood Control Plan and 11th Five Year Plan and in compliance with the People's Republic of China (PRC) regulations and Asian Development Bank (ADB) safeguard policies: Resettlement subcomponent

Performance Targets	Information Needs	Baseline Information Requirements and Status	Data Gathering Methods and Responsibilities	Planning, Training, Data Management, Expertise, Resources, Responsibilities	Analysis, Reporting, Feedback, and Change Processes and Responsibilities
1. Land acquisition and resettlement minimized. 2. Adequate funding available for land acquisition and resettlement. 3. Domestic approval achieved before land acquisition and resettlement implementation. 4. Affected people and work units compensated for lost assets in line with RP. 5. Rehabilitation implemented according to the RP. 6. Affected facilities and temporary land areas restored to original condition. 7. Income and living conditions restored to previous levels.	Efforts in comparing alternatives to minimize resettlement impacts. Allocated resettlement funds to LPMOs. Adopted compensation rates. Disclosure of RPs and compensation rates in project areas. Implementation status for economic rehabilitation in affected villages. Status of housing site selection, reconstruction, and relocation. Income levels and sources of incomes among sample households for both before and after resettlement.	Resettlement Plans (RPs) for all subprojects. Published resettlement compensation rates in the project areas or compensation contract or agreements with affected people. Resettlement information booklet. Resettlement minimization efforts were summarized in the RPs. Consultation process, identification of new housing sites, and proposed village economic rehabilitation plans were included in the subproject RPs. Socioeconomic survey and income levels of sample households were included in the subproject RPs.	Local project management offices (LPMOs) and land resources bureaus internal resettlement monitoring and site supervision, including status of compensation delivery, information disclosure, compensation rates, disbursement of resettlement funds, and implementation of rehabilitation measures. Regular supervision by PPMO staff and twice-yearly ADB review missions. Resettlement implementation and institutions will be monitored by a third party, external agency. Internal meetings will be held among resettlement officials, affected villages and work units, and interviews with sample households will be conducted. Post-construction review to be undertaken.	Detailed internal reporting format has been developed and introduced for the Provincial Project Management Office (PPMO) and LPMOs. Consulting services will be provided through advisory technical assistance (TA) to assist the PPMO and LPMOs to prepare the first internal resettlement monitoring report for submission to ADB. PPMO will provide on-the-job training to staff of LPMOs during project implementation. on: construction activities, required mitigations, sensitive areas requiring special protection, compliance monitoring, enforcement procedures, and reporting requirements. A resettlement unit will be set up for each LPMO and staffed with qualified personnel.	LPMOs submit to PPMO quarterly and semiannual subproject resettlement internal monitoring reports. PPMO submits quarterly/annual monitoring report to ADB. Key resettlement progress reporting tables for each subproject will be included in the overall internal resettlement monitoring report. External monitoring reports will be sent to both the PPMO and LPMOs to be reviewed and acted on. Based on issues identified, the PPMO will follow up with individual LPMOs; resolutions will be reported in the next internal monitoring report. Annual workshops with key stakeholders (including representatives from the PPMO and LPMOs) could be organized to review overall resettlement implementation, exchange experiences, and explore ways to resolve remaining issues and problems.

Source: Asian Development Bank.

Table A18.2: Monitoring Indicators

Ref.	Indicator	Baseline	Monitoring Mechanism
A.	**Economic Growth (Impact Level)**		
1.	Number of newly established industrial enterprises in the project areas.	Count before each subproject implementation.	Registrar of Companies.
2.	Number of newly established commercial enterprises in the project areas.	Count before each subproject implementation.	Registrar of Companies.
3.	Land values in project areas.	TBC by subproject before implementation.	Municipal and County Land and Resources Bureau and County Construction Bureau.
4.	Incidence of urban poverty.	6.7% (2003).	Hunan Provincial Statistical Yearbook.
B.	**Effectiveness of Structural and Nonstructural Flood Protection Measures (Outcome Level)**		
1.	Total of direct economic losses from floods and waterlogging.	CNY1.5bn (2002).	Hunan Statistical Yearbook.
2.	Amount of disaster relief operations as reflected in the aggregate provincial expenditures of the human resource capital fund.	TBC by subproject.	Hunan Flood Control and Drought Relief Headquarters.
C.	**Accomplishment of Project Implementation Measures (Output Level)**		
1.	Warning time for potential floods in project areas.	Current: one day or less.	Hunan Hydrological Bureau.
2.	Percentage of accurate data for forecasting and warning.	TBC by subproject.	Hunan Hydrological Bureau.
3.	Flood-control level of county-level cities.	1 in 4 year return flood recurrence.	Hunan flood control and drought relief reports.
4.	Flood-control level of municipal cities.	1 in 10 to 20 year return recurrence.	Hunan flood control and drought relief reports.
5.	Satisfaction level of 14,000 project-affected persons in terms of restored income and livelihoods to pre-resettlement levels.	Pre-resettlement socioeconomic surveys, compensation rates, entitlements and targets in each subproject resettlement plan.	Household tracer surveys, government and third party resettlement monitoring and evaluation reports, records of subproject compliance with PRC and ADB safeguards.
6.	Percentage of EMP monitoring targets achieved.	Initial environment examinations, surveys and management plan targets in each subproject .	Local government EPB monitoring reports. Third party environment monitoring, records of subproject compliance with PRC and ADB safeguards.
7.	Proposed items for future flood management sector plan agreed to with key authorities.	ADTA recommendations on FWS and Flood Insurance.	PWRD and ADTA reports.
8.	Number and percentage of reports from LPMOs that are submitted on time and contain acceptable level of detail on project implementation, in line with agreed Assurances.	TBC 3 months after project effectiveness.	Subproject management and monitoring reports; ADB's PPRs.
9.	PPMS operational.	TBC 3 months after project effectiveness	AWPB, Project M&E records.

ADB = Asian Development Bank, ADTA = advisory technical assistance, AWPB = Annual Workplan and Budget, CNY = yuan, EPB = Environmental Protection Bureau, EMP = environmental monitoring plan, FWS = flood warning system, LPMO = local project management office, M&E = monitoring and evaluation, PPMS = Project Performance Monitoring System, PPR = Project Performance Report, PRC = People's Republic of China, PWRD = Provincial Water Resources Department, TBC = to be collected.

Source: Asian Development Bank.