

**REPORT AND RECOMMENDATION
OF THE
PRESIDENT
TO THE
BOARD OF DIRECTORS
ON A
PROPOSED LOAN
AND
GLOBAL ENVIRONMENT FACILITY GRANT
TO THE
PEOPLE'S REPUBLIC OF CHINA
FOR THE
SANJIANG PLAIN WETLANDS PROTECTION PROJECT**

February 2005

CURRENCY EQUIVALENTS

(as of 1 February 2005)

Currency Unit	–	yuan (CNY)
CNY1.00	=	\$0.121
\$1.00	=	CNY8.277

ABBREVIATIONS

ADB	–	Asian Development Bank
AP	–	affected persons
BCAP	–	Biodiversity Conservation Action Plan
BD	–	biodiversity
CSP	–	country strategy and program
EIRR	–	economic internal rate of return
EMP	–	environmental management plan
ENPV	–	economic net present value
EPB	–	Environmental Protection Bureau
FIRR	–	financial internal rate of return
GEF	–	Global Environment Facility
HPFB	–	Heilongjiang Provincial Financial Bureau
HPFD	–	Heilongjiang Provincial Forestry Department
HPG	–	Heilongjiang provincial government
IEE	–	initial environment examination
LIBOR	–	London interbank offered rate
NDRC	–	National Development and Reform Commission
NFPP	–	Natural Forest Protection Program
NPV	–	net present value
NR	–	nature reserve
NTFP	–	nontimber forest product
NWCAP	–	National Wetland Conservation Action Plan
OP	–	operational program
PIU	–	project implementation unit
PMO	–	project management office
PRC	–	People's Republic of China
PSC	–	project steering committee
RP	–	resettlement plan
SOE	–	statement of expenditures
TA	–	technical assistance
UNDP	–	United Nations Development Programme
UNEP	–	United Nations Environment Programme
VDP	–	village development plan
WACC	–	weighted average cost of capital

WEIGHTS AND MEASURES

ha	–	hectare (= 15 mu)
km	–	kilometer
km ²	–	square kilometer (= 100 ha)
m	–	meter
m ³	–	cubic meter
mu	–	0.067 ha

NOTES

- (i) The fiscal year (FY) of the Government and its agencies ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2000 ends on 31 December 2000.
- (ii) In this report, "\$" refers to US dollars.

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LOAN PROJECT SUMMARY

Borrower	People's Republic of China (PRC)
Classification	Targeting Classification: General intervention Sector: Agriculture and natural resources Subsector: Environment and biodiversity Theme : Environmental sustainability
Environment Assessment	Category B: An initial environmental examination was undertaken, and a summary initial environmental evaluation was prepared.
Project Description	<p>The Sanjiang Plain comprises 108,900 square kilometers, where the Heilongjiang, Songhua, and Wusuli rivers are confluent in a vast alluvial floodplain in the northeast of Heilongjiang Province. The Plain is one of the most important grain production areas in the PRC. Supporting rich biological diversity, which includes 23 species listed in the World Conservation Union as globally threatened, the wetlands in the Sanjiang Plain are some of the most species-rich and endemic-rich ecosystems in Asia. However, the wetlands and forestlands have shrunk to one fifth of their original size in the last five decades because of increasing population and grain production, and flora and fauna in the wetland nature reserves (NRs) are threatened by farmland encroachment and water resource exploitation. To protect these ecosystems while supporting the sustainable development of the area, the Project adopts a holistic model framework of watershed management by (i) rehabilitating and protecting degraded forests in the upper watershed areas, (ii) restoring and protecting wetlands NRs in the downstream areas, (iii) providing alternative livelihood to farmers, and (iv) strengthening the capacities of local agencies in charge of watershed wetland and NRs management. By developing and pilot-testing a model framework to protect wetland biodiversity while promoting the sustainable development of the areas, the Project will be instrumental in establishing a wetland protection program in the PRC that protects wildlife biodiversity effectively and generates employment and income in a sustainable manner.</p>
Rationale	<p>In the PRC, the Sanjiang Plain wetlands are one of the richest areas with globally significant flora and fauna, which are mostly concentrated in NRs. However, over time, they have lost their self-cleaning and generation capacity with a resultant decline in plant and animal biodiversity of global significance. Further, the wetlands' biodiversity is under constant threat by local communities exploiting biological resources for their livelihood through unsustainable farming practices at NRs, and the limited management capacity of NR staff. Recent government policies and plans are aimed at halting and reversing environmental degradation in the area. However, the policies need improvement to achieve a "model" for sustainable management of the wetland ecosystem as part of an integrated river-basin management policy. Heilongjiang is designated as one of the three environmental provinces in the PRC, and the provincial government (HPG) is looking for development opportunities that integrate watershed and wetland</p>

management in a sustainable way and that can be replicated throughout the Sanjiang wetland NRs and other areas with similar environmental conditions. The proposed Project will adopt integrated watershed management in the Sanjiang Plain for wetland and forest conservation, based on their potential to support ecologically sustainable economic development. It will provide a model framework that can be expanded for comprehensive, longer-term management of wetlands and biodiversity on a large river-basin scale.

Objectives

The overall goal of the Project is sustainable management of natural resources to protect globally significant biodiversity and to promote economic development. The immediate objective is to protect the natural resources of the Sanjiang Plain wetlands and their watersheds (biodiversity, water, forests) from continued threats, and promote their sustainable use through the integrated conservation and development of selected wetlands and forest areas of the Plain and improve the well-being of local communities. The project scope includes watershed management, wetland nature reserve management, alternative livelihood, and education and capacity building. The project management component will carry out overall implementation, administration, and monitoring. The world will benefit from the enhanced conservation of globally significant biodiversity through the Project. The project area covers 18 counties situated in the Sanjiang Plain, in the northeast of Heilongjiang Province.

Cost Estimates

The Project will cost about \$55.55 million equivalent, \$9.41 million of this in foreign exchange and \$46.14 million equivalent in local currency.

Financing Plan

Source of Financing	(\$ million equivalent)			
	Foreign Exchange	Local Currency	Total Cost	Percent
Asian Development Bank	1.56	13.44	15.00	27
Global Environment Facility	5.67	6.47	12.14	22
Heilongjiang Provincial Government	2.18	22.19	24.37	44
County Governments	0.00	4.04	4.04	7
Total	9.41	46.14	55.55	100

Source: Asian Development Bank estimates

Loan Amount and Terms

A loan to the PRC in the amount of \$15.00 million from the ordinary capital resources of the Asian Development Bank (ADB) will be provided under ADB's London interbank offered rate (LIBOR)-based lending facility. The loan will have a 25-year term, including a grace period of 5 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 set forth in the draft loan and project agreements. Global Environment Facility (GEF) grant cofinancing of \$12.14 million, which will be administered by ADB, has been proposed for the Project.

Period of Utilization

Until 31 December 2010

Estimated Project Completion Date	30 June 2010
Executing Agency	Heilongjiang provincial government
Implementation Arrangements	A project management office (PMO) has been established within the HPG Forestry Department to take charge of day-to-day administration and implementation of project activities, in cooperation with other key implementation agencies, civil society organizations, public and private enterprises, and local communities. The PMO will be guided by a project steering committee, and assisted by a team of international and domestic consultants under a project director. A total of 19 project implementation units (PIUs) will be established, one in each of 13 county forestry bureaus and 6 NRs.
Procurement	Goods and services to be financed by the ADB loan and the GEF grant will be procured in accordance with ADB's <i>Guidelines for Procurement</i> . Equipment or materials for each contract valued at \$1,000,000 equivalent or less will be procured through international shopping. Minor items costing less than \$100,000 equivalent will be procured by direct purchase. Civil works contracts will be relatively small—relating to site preparation, weeding or planting—and may be carried out through force account.
Consulting Services	Consultants will be selected and engaged in accordance with ADB's <i>Guidelines on the Use of Consultants</i> and other arrangements satisfactory to ADB for selecting and engaging domestic consultants. To provide implementation support to the PMO, international consulting firms in association with domestic firms will be selected using ADB's quality- and-cost-based selection method. The total consultant input for the Project is estimated at 640 person-months (112 international and 528 domestic) of technical assistance. Consultants are required in the management of water resources, wetland biodiversity, and NRs; eco-tourism; and conservation education and awareness subcomponents. The Project will also recruit qualified academic/research institutes for several studies, surveys, and long-term training programs, including those in water resources.
Project Benefits and Beneficiaries	The potential global environmental benefits will be (i) increases in areas of breeding and foraging habitats for waterfowl and other wildlife, and the resultant increases in populations of globally threatened species; (ii) improved water resources management locally and in watersheds leading to improved wetlands habitat quality and increasing wildlife numbers; and (iii) reduced threats to globally threatened wildlife through increased public and private awareness of the importance of wetlands for environmental conservation. The Project will result in positive global, national, and local environmental impacts. It is estimated that about 46,000 forestry workers will have working opportunities during the implementation period. In addition, using nontimber forest products and

adopting agroforestry intercropping as forest investments will enhance employers' benefits for forest workers. The overall financial internal rate of return of these forest developments is 14.9%, greater than the estimated weighted average cost of capital of 6.1%. The high financial return is due to low capital costs required in treating existing forests. The overall economic internal rate of return on national environmental benefits is 24.8% outweighing the social cost of capital of 12%.

Risks and Assumptions

The removal of threats to wetland biodiversity in the Sanjiang Plain requires the following: (i) cooperation among resource authorities in integrating watershed management with development and conservation planning, (ii) improved NR management through better-trained personnel, (iii) mutually beneficial relationships between protected areas and surrounding communities, and (iv) sustainable financial support to NR management. The project design recommends measures to minimize the risks of failure.

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on (i) a proposed loan to the People's Republic of China (PRC) for the Sanjiang Plain Wetlands Protection Project, and (ii) proposed administration of a grant from the Global Environment Facility (GEF) for the Sanjiang Plain Wetlands Protection Project.

II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES

2. The Project was prepared under Asian Development Bank (ADB) technical assistance (TA) and a project development facility block grant of \$330,000 from GEF.¹ The design of the proposed investment Project is based on integrated water resource management for the protection of wetland nature reserves (NRs), and thus the conservation of globally significant biodiversity. After the Project was included in the GEF Council's Work Program in July 2004, an ADB Appraisal Mission visited the PRC to refine the Project design and discuss with the Government the project objectives, scope, implementation arrangements, costs, financing plan, and components. This report is based on the findings of the Mission in the field and wide-ranging consultations with stakeholders. The project framework is in Appendix 1.

A. Performance Indicators and Analysis

3. Agricultural and food security policies in the PRC in the second half of the 20th century included a massive effort to expand grain production into the last areas of uncultivated fertile soils. The Sanjiang Plain,² a vast complex of marshes, meadows, and forests along the Russian border in the northeast of Heilongjiang Province, was a major area of focus. Extensive development over five decades has shrunk the forestlands and wetlands³ to a fifth of their original size and thus brought about various climatic changes (dry weather, drought, and frequent floods).

4. Deforestation and cultivation of hillsides in the Sanjiang Plain have caused deterioration of the wetlands due to soil erosion and diminished the water-retention capacity of uplands. Forest workers lost income from timber production and often fell into poverty.⁴ A potentially self-sustaining sector is not realizing their growth and quality potential. Consequently, potential benefits of the upland forests to the hydrological cycle in the watersheds are undermined. As the Plain has become more densely settled and reclaimed as farmland, the water-holding capacity of the wetlands has diminished even as flooding has become more frequent and intense. To reduce economic damage to farmland and protect the people from destructive flooding, the Government has built flood control dikes. Wetland drainage and dike construction on river floodplains have helped increase the cultivated land base, but have also damaged the natural flood-retention capacity of wetlands that support globally significant fauna and flora,

¹ ADB. 2002. Technical Assistance to the People's Republic of China for the Sanjiang Plain Wetlands Protection Project. Manila. The project concept entered the GEF financing pipeline in December 1999.

² Sanjiang means "three rivers"—the Heilong, Wusuli, and Songhua rivers. The Songhua River runs through the Sanjiang Plain, and the Heilong and Wusuli rivers run along the border between the PRC and Russia. The Sanjiang Plain (with about 8 million people living on 108,900 square kilometers (km²) of land, or slightly bigger than the Republic of Korea) accounts for 20% of Heilongjiang Province (both in area and population) and lies at the confluence of the three rivers. Before the agricultural development programs started in the 1950s, almost 50% of the Plain used to be wetlands.

³ "Wetland" is a general term for marshes, swamps, wet meadows, shallow lakes, and streamside areas. Boundaries of wetlands are transitional and are shaped by precipitation, evaporation, watershed hydrology, and wetland vegetation.

⁴ Heilongjiang has a poverty incidence of 9.7%–10.3% in the countryside, using official rural poverty indices at the national level, and a per capita net annual income for poor households of CNY1,000. About 10% of households in State forest farms are poor.

dehydrating those wetlands and threatening their biodiversity. As the population grows, development accelerates, and the floodplains are more densely settled, the economic cost of flood damage will also increase. The Government has therefore integrated nonstructural measures such as flood forecasting and development of decision support systems to better manage flood emergencies.⁵ But these measures cannot fully reflect holistic watershed management approach as part of an integrated floodplains and wetland ecosystem management. A new policy⁶ emphasizes the need to move toward natural resource management as a long-term, holistic way of floodplain management, which includes restoring farmland to wetlands and forest. The sector is challenged to increase the forest cover, to sustain agricultural production, as well as to ensure the livelihood of farm and forest workers.

5. The Sanjiang Plain, as one of the PRC's richest in globally significant flora and fauna,⁷ supports about 37 ecosystems, 1,000 species of plants, and 528 species of vertebrate fauna including 23 of the globally threatened species on the World Conservation Union Red List. Ten of the globally threatened species are waterfowl such as cranes, storks, and swan geese, which require extensive, undisturbed wetlands during their migration and breeding seasons. The Sanjiang Plain wetlands are an important nesting and stopover location at the northern end of the East Asian–Australian flyway for migratory waterfowl, most notably the white-naped and red-crowned cranes. The wetlands are also ranked as globally important in the *Directory of Asian Wetlands*. The transformation of the Sanjiang Plain into a major grain production field over the last five decades has therefore been achieved at considerable loss of plant and animal biodiversity, and overall cost to the environment. As the altered water cycle in the wetlands reduced their habitat size and self-cleaning capacity, plant and animal biodiversity of global significance has declined. The northeast tiger, red deer, bear, and other large wildlife have been killed off, and formerly abundant ducks, geese, cranes, and other waterfowl have nearly disappeared. Less than one tenth of the original populations of cranes now nest in the Sanjiang Plain. For these wetland-dependent wildlife species to survive, the continuing trend toward the reduction and degradation of the Sanjiang Plain wetlands must be reversed.

6. The Government has adopted several important national policies and legal measures⁸ to guide and direct habitat restoration and biodiversity conservation. The Wild Animal Protection Law of 1988 has reduced the overexploitation of wildlife from hunting and egg collecting. In 1993 the PRC ratified the Convention on Biological Diversity, which resulted from the Rio de Janeiro Conference on United Nations Environment and Development, and in 1994 it issued the Biodiversity Conservation Action Plan. The Heilongjiang provincial government (HPG) issued in

⁵ From 1999 to 2002, the Government invested CNY178.6 billion (\$22.3 billion) in building infrastructure for hydraulic projects, almost 2.5 times more than in the previous five decades. About 10% of such investments went to nonstructural measures; particularly flood detention basins and forecasting and modeling systems. The Australian Assistance for International Development is funding the Yangtze River Flood Control and Management Project (\$12 million), which will improve flood forecasting, flood warning, and the operation of 24 flood detention basins (up to 300 km² in the area) along the middle reaches of the Yangtze. The Canadian International Development Agency has recently completed a major hydraulic modeling study to improve flood forecasting for Dongting Lake, in the middle reaches of the Yangtze River. ADB's Songhua and Yellow River flood management projects also adopted nonstructural measures—flood forecasting and modeling.

⁶ The policy initiatives, by former Premier Zhu, are written in 32 words in Chinese, but no other formal documentation is available. The policy calls for the following: enclosing mountains to plant trees, transforming arable land back into forests, demolishing polder fields to release floods, transforming farmland back into lakes, supplying labor as contribution, relocating people to build townships, reinforcing stem river levees, and dredging river channels and lakes. Under the initiatives, the PRC is renewing flood control plans for all major river basins.

⁷ A detailed review and analysis is included in Supplementary Appendix A: Profile of Wetlands Biodiversity in the Sanjiang Plain.

⁸ A detailed review and analysis is in Supplementary Appendix B: Institutional, Legal, and Policy Analysis.

1996 the Regulation of Nature Reserves, establishing priority wetland NRs,⁹ and in 1998 the Decision on Wetland Conservation (Document of Heilongjiang Party Committee, No. 21, 1998), suspending further conversion of wetlands to farmland. In 2002, the National Wetland Conservation Action Plan, outlining priority actions to guide conservation, use, management, and institutional frameworks, was approved. The plan was reinforced a year later with the issuance of one of the PRC's first wetland regulations (Regulations on Wetland Conservation of Heilongjiang Province, HPG, 2003). The new regulations recognize the multiple values of wetlands, the necessity of conserving and managing them through the establishment of NRs, and the reality that wetlands and their wildlife remain threatened by agricultural expansion and exploitation of water and land resources. Despite the impressive legal steps, however, wetland restoration and protection are still new concepts in the PRC. Wetland restoration programs have been planned, but sound wetland management expertise and scientific knowledge, not to mention familiarity with healthy water resource management, are scarce.

7. The protected wetland area in the Sanjiang Plain now includes 28 NRs, which cover 10,278 square kilometers (km²),¹⁰ or 9.4% of the Plain. Three of the NRs have been listed by the Ramsar Convention Bureau¹⁰ as wetlands of international importance. The NRs were established to protect the best remaining wetland habitats and their biodiversity, including most of the known sites for waterfowl nesting and migration. Nevertheless, wetland biodiversity is still threatened by local communities exploiting biological resources for income, inappropriate farming practices in NRs, commercial tourism, and the limited management capacity of NR staff. Wetland protection policies and laws should be further strengthened and supplemented with operational tools and enforcement measures. Moreover, the low community awareness of wetland values still presents a serious challenge, preventing the NRs from attaining their objectives of habitat conservation and environmental protection through laws.

8. Different economic activities and wetland-dependent wildlife species vie for land and water resources in the Sanjiang Plain. Economic decisions on wetland use are fragmented among various sectoral agencies of the HPG, such as the Agriculture Department, Water Resources Department, Forest Department, Environmental Protection Bureau, State farms, and State forest farms. The 2003 Heilongjiang Wetland Regulations, however, gave official authority and responsibility for wetland management to the Heilongjiang Provincial Forest Department (HPFD). An integrated water resource plan for wetland management and biodiversity conservation, with NRs playing a key role, is needed. The various institutions must also coordinate among themselves in water and land resource sharing, as well as in information gathering and planning. Such coordination mechanisms have yet to be established, and roles and responsibilities still have to be defined clearly. With funding from the National Development and Reform Committee (NDRC), HPFD is about to launch a project that will restore 1,500 km² of farmland to wetlands and replant 685 km² yearly from 2006 to 2010. HPG realizes that it must improve its wetlands management approach, knowledge, and capacity to tackle this challenging task. It has therefore sought ADB's assistance in developing a model approach that could be

⁹ Nature reserves (NRs) are specially designated areas protected by PRC laws (National Regulation of Nature Reserves, effective 1 December 1994) to conserve wetland habitats. Current regulations based on these laws direct NR establishment and operation at all levels. Article 43 of the National Regulation, however, requires administrative levels below the State to use these regulations as a blueprint in developing and implementing their own regulations.

¹⁰ The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. There are now 138 Contracting Parties to the Convention and 1,367 wetland sites, totaling 1.2 million km², designated for inclusion in the Ramsar List of Wetlands of International Importance. The PRC ratified the Ramsar Convention on 31 July 1992. The Ramsar sites in the Sanjiang Plain—Honghe NR, Sanjiang NR, and Xingkaihu NR, which is one of the project sites— (i) support 23 globally threatened species and 16 endemic species, and (ii) represent 16% of the total area of the Ramsar sites in the PRC.

replicated effectively on a wider scale and in strengthening HPG's capability to manage wetland biodiversity.

B. Analysis of Key Problems and Opportunities

1. Threats and Constraints

9. Globally significant endangered species in the Sanjiang Plain rely on wetland habitats, and wetlands must have enough water to maintain their saturated soils (including peat), distinctive vegetation, and productivity. Agricultural development has dramatically altered the hydrology of the watersheds in the Plain, desiccating many of the remaining wetlands, even within NRs. Also, the construction of flood control dikes to protect farmlands, the deforestation in the middle and upper watersheds, and poor conservation practices on sloping agricultural lands have all tended to reduce water retention in entire watersheds in the Plain; accelerating runoff, increasing evaporation, or through soil erosion and sedimentation. These changes in watershed not only worsen flooding but also prolong droughts at critical times of the year. As farming expands and HPG faces a future of water scarcity, it becomes more difficult to maintain or increase the forest and wetland areas, and to provide the wetlands with the needed water supplies. The proposed Project aims to remove the barriers to balanced environmental protection, and to develop sustainable and replicable models to be applied elsewhere in the Sanjiang Plain and other provinces. The key barriers (Appendix 2) that restrict wetlands protection and biodiversity conservation in the Sanjiang Plain are as follows.

10. **Unsound Local Planning Water Resource Allocation.** Agricultural, industrial, and domestic water uses draw on water supplies that are also needed to sustain wetlands. Agriculture accounts for 70% of water use in Heilongjiang Province. Frequent droughts indicate serious problems of groundwater overdraft in the Sanjiang Plain. According to the Five-Year Comprehensive Water Plans for the Province, the "ecological water supply" is a marginal 3.6% of the total requirements. This is a gross underestimate that does not adequately cover the water requirements of the Sanjiang Plain wetlands. Water consumption for agriculture in the Province is expected to increase as the irrigated area expands from 9,530 km² to 14,130 km² by 2010. Any further expansion of irrigation diversions or groundwater overpumping would also reduce the available water for wetlands, besides lowering the groundwater table. Although Heilongjiang Province has formally halted further wetland drainage, agricultural interests in the Sanjiang Plain are still active in wetland drainage projects near NRs.¹¹ The great need for arable land is unavoidable as the population grows. To protect wetland NRs, water resource allocation at the local level must be optimized.

11. **Poor Understanding of Nonstructural Flood Mitigation and Floodplain Management.** Flood control and management have become a high-priority issue for HPG, especially after the devastating floods of 1998. Flood control measures are still mainly structural—dikes, pumping schemes, and flood storage reservoirs, which often encroach on wetlands or obstruct water supply to wetland NRs. Wetland conservation has not been a significant consideration in flood control in the comprehensive water resource plans prepared every 5 years. However, flood control agencies of the Government now realize that allowing the natural flow of floodwater can be beneficial for wetlands conservation. An assessment must be made to (i) strike a suitable balance between flood protection and wetland conservation; (ii) analyze changes in precipitation in the catchment basin and the future seasonal runoff behavior of the main watercourses as part of forecasting; (iii) determine the factors for the efficient implementation of integrated floodplain management in watersheds; and (iv) develop the most appropriate management model, which can be adapted to suit different watershed conditions.

¹¹ NRs are legally protected by land use zoning. Thus, threats to NRs from expanding agricultural land are not due to the land use conversion but due to a lowering groundwater table, which further affects the size of wetlands in NRs.

12. **Lack of Alternative Livelihood Enterprises, Leading to Exploitation of Nature Reserve Resources.** The prospect of a net annual income of \$210 to \$256 per hectare from dryland grain production (wheat-soy-corn) strongly motivates farmers to expand the farmland in any way possible, including draining wetlands. Pesticide and fertilizer pollution, burning, grazing, and other agricultural practices within or near NRs adversely affect ecology. Rural residents exploit fish, wildlife (e.g., duck eggs), and other “common property” wetland resources to supplement their diet and income. Alternative livelihood enterprises must be provided to discourage such harmful natural resource exploitation in wetlands.

13. **Weak Interagency Coordination for Integrated Watershed Management.** Irrigation and drainage, flood control, agricultural development, and wetland protection responsibilities in the Sanjiang Plain are divided among agencies with little basis or incentive for coordination. Although HPFD now has formal authority for wetland protection, State farms and other provincial agencies that work in drainage and irrigation projects allocate water resources and make watershed forest management decisions independently of one another. Interagency coordination is urgently needed for integrated watershed management.

14. **Weak Technical Capacity in NR Management.** Personnel responsible for managing wetland NRs in the Sanjiang Plain rarely have the necessary training for duties such as enforcement, wildlife surveys, natural resource monitoring, and public outreach. Many staff members were recently reassigned to NRs from agricultural positions in State farms, reed production companies, or similar productive enterprises. Moreover, NR management is a new responsibility of HPFD, which has no training program for its wetland NR staff members, who are seriously underprepared for their duties. Thus, a training program for wetland NR staff and managers is urgently needed.

15. **Lack of a Replicable Financing Model and Shortage of Available Capital to Replace Arable Farmland.** Wetland restoration will require converting farmland back to wetlands within certain NRs. Farmers on State farms and villagers with agricultural leases within the NRs must be compensated for the income lost and provided with replacement land as required. On the other hand, the financial burden on the Government for replacing lost farmland should be manageable. To address the financial constraints, an alternative model approach that provides opportunities for revenue generation (sustainable livelihood) and positive returns on investment, instead of sunk compensation costs, is needed.

16. **Low Public Awareness of Wetland Values and Biodiversity Conservation.** Biodiversity conservation and wetland protection are hampered by the lack of education and training and low awareness of the environmental values of wetlands among the people in villages surrounding the NRs. Simply restoring farmland to wetlands would result in only temporary protection, which would be unsustainable over the longer term. Thus, an appropriate community awareness campaign is required.

17. **Incorrect Interpretation of Legislation on Experimental Zones.** NR establishment and management are governed primarily by regulations adopted by the State Council in 1994. As defined by the *Environment and Natural Resource Protection Legal Handbook* (1998), protected wetland NRs comprise three types of zones: core, buffer, and experimental. Human activities in core and buffer zones are clearly prohibited, but activities in the experimental zone (the outer portion of the NR surrounding the buffer zone) are permitted subject to interpretation of local regulations. Past activities in the experimental zone have disturbed wildlife nesting and breeding, and further unauthorized use could threaten wetland biodiversity conservation because of habitat loss and degradation. A clearer interpretation of NR legislation and more effective enforcement are required.

2. Government Policies and Plans

18. The Government’s development program was set out by the 16th Party Congress in

2002, the 10th National People's Congress of 2003, and the Tenth Five-Year Plan (2000–2005). The major focus of national economic policy has gradually shifted in the last few years from hard economic indicator targets toward quality of growth and sustainable development. Besides its continued strong emphasis on market-related reforms and nonstate sector development, the Government is increasingly emphasizing the protection of the environment, sustained natural resource management, and a better quality of life. National economic priorities include programs to reduce poverty in rural areas, increase rural incomes, improve income distribution, and enable the private sector to create employment. Farmers may now leave their farming business by selling land-use rights or take advantage of government land conversion programs. One such program is the Farm-to-Forest Program of NDRC, which has converted vast areas of marginal farmland to forestland in upper watersheds of northern PRC. The conversion of farmland to wetlands in Heilongjiang, begun in 2003, is in line with this program.

19. **Agricultural Policy and Wetlands.** The PRC's Agenda 21 White Paper on China's Population, Environment and Development in the 21st Century requires, among others, holistic treatment of watersheds as fundamental to wetland management. The agriculture sector has increasingly emphasized environmental protection and sustainable farming since the Agenda 21 Agriculture Action Plan of 1998. This document mentions the need for biodiversity conservation and wise use of farmland, grassland, and ecosystems, as well as monitoring and control of agricultural pollution. It sets the goal of "establishing 160 conservation zones to cover a total area of 25 million hectares" (ha) to strengthen the conservation of wildlife, and will conduct monitoring and research in agricultural/pasture/fishery areas.¹²

20. **Forest Policy and Watersheds.** The Natural Forest Protection Program (NFPP) for 1998–2010 drastically restricts the harvesting of natural forests nationwide, allowing HPG to strengthen its commercial forests. The Sanjiang Plain has about 1.1 million ha of forests: over 0.7 million ha of natural forests and almost 0.4 million ha of commercial forest plantations. Heilongjiang Province has the country's largest standing timber reserves and timber production. Hence, current national and provincial policy is to replant forests on a commercial basis on excessively steep, erodible, or unproductive farmland, and compensate the farmers under the Farm-to-Forest Program. The availability of compensation funds limits State forest farms' ability to carry out this program only within their own forestlands, substantial portions of which are currently leased to forest workers for grain production as alternative income sources.

21. **Biodiversity Conservation.** PRC's Biodiversity Conservation Action Plan (BCAP), issued on 13 June 1994, lists and describes priority biodiversity conservation projects. Project 18—Establishment of an Integrated Nature Reserve Network in the Sanjiang Plain, Heilongjiang Province—has been achieved in part by the establishment of 28 national, provincial, and local NRs. The PRC is also a signatory to the Convention on Wetlands (Ramsar Convention). Complementing the BCAP is the National Wetland Conservation Action Plan (NWCAP), approved in 2002, which is the key document guiding the conservation, use, and management of PRC wetlands. The NWCAP lists among "important wetlands in China" several that are part of the project area: the Sanjiang Plain in general, the Naoli-Qixing river basin, the lower reaches of the Muling River, Xingkai; and the Small Xingkai lakes. The NWCAP calls for an inventory and study of the wetlands, as well as "comprehensive management of wetland and hydrologic basins" and, particularly in Project 20, "wetland conservation and sustainable use of the Sanjiang Plain."

3. ADB's Country Strategy

22. ADB's country strategy and program (CSP 2004–2007) for the PRC places strong emphasis on (i) promoting equitable and inclusive growth, especially in remote rural areas; (ii)

¹² Agriculture Action Plan for China's Agenda 21, Section 7.53, 1998.

making the markets work better; (iii) improving the environment, including dealing with land and water degradation issues; and (iv) promoting regional cooperation. CSP 2004–2007 thoroughly reflects the PRC's medium- and long-term strategy and is focused on the following sectors: (i) agricultural and rural development, including land degradation; (ii) transport and energy; and (iii) the environment, including water and soil management. Conservation of soils, forests, and wetlands and abatement of water pollution are recognized as critical environmental interventions with a positive impact on the poor. In this context, the proposed Project strongly supports ADB's principal strategic concerns. The wetlands and forests of the Sanjiang Plain are major environmental assets. Appropriate conservation of wetlands and their forested watersheds will have a positive effect on flood management and overall watershed management in the river basins, while encouraging agricultural interests to use water more wisely. Project income-generating initiatives are aimed at remote forest farms and wetland areas, supporting ADB's focus on equitable and inclusive growth.

4. The Global Environment Facility

23. The Project addresses both the underlying and proximate causes of wetland habitat loss by creating a model framework to protect high-quality wetlands, and by building community relations and NR management capacity to maintain the health of these wetlands. HPG actions and project initiatives strongly complement each other. HPG took concrete regulatory steps in 2003 to clarify responsibility for wetland management and to emphasize its commitment to improving the management of wetland NRs in the Sanjiang Plain. HPG will implement activities specifically identified in the BCAP and NWCAP of the PRC. The Project addresses a national priority and therefore meets a GEF criterion. GEF supports only strategic operational program (OP) areas with global benefits.

5. External Assistance to the Sector and Lessons Learned

24. Wetlands protection and biodiversity conservation are relatively new concepts in the PRC, as well as in HPG, and there has been very little external assistance directly for NRs and Sanjiang Plain wetlands protection (Appendix 3). (One exception, a project of the United Nations Development Programme (UNDP)/GEF had Honghe and Sanjiang NRs in the Sanjiang Plain as two of four pilot study cases.) ADB and World Bank assistance in the natural resources and environment sectors has focused on improving flood management and increasing agricultural production. ADB's forest development projects in general provide lessons from various countries, indicating (i) community participation and (ii) partnership between forest department and participants, as key factors in the success of plantations and reforestation. More recently, ADB assistance to the PRC in the environment sector has focused on developing the institutional framework for combatting land degradation in the western region. The \$12 million UNDP/GEF project Wetland Biodiversity Conservation and Sustainable Use in China, 2001–2006, may complement the proposed Project. However, this project has taken an engineering approach to restoring the hydrologic regime at specific NRs, and its institutional arrangements for NR management from the nation's capital have been complicated and difficult to implement at the local level. The proposed Project addresses these two weaknesses by (i) treating wetland protection and water resource management holistically at the watershed scale, not simply at the level of NR sites; and (ii) implementing and administering the Project at the provincial level to improve coordination and minimize interagency conflicts. A new initiative of the United Nations Environment Programme (UNEP)/GEF, the Amur River Basin Transboundary Cooperation Project, focusing on land-based pollution along the Amur and Heilong rivers on the boundary between the PRC, Mongolia, and Russia, falls under the international water issue dealt with in OP 9, Integrated Land and Water Multiple Focal Area. The UNEP/GEF initiative requires international cooperation for biodiversity conservation, while the proposed Project seeks to minimize the complexities of institutional coordination in wetland management by working under one provincial government with a strong sense of ownership.

The Project will exchange information and expertise with the ongoing UNDP/GEF project—Peatlands, Biodiversity and Climate Change—which is experimenting with wetland restoration in the Ruoergai marshes, and with the UNEP/GEF Siberian crane project.

III. THE PROPOSED PROJECT

A. Objectives

25. The overall goal of the Project is the sustainable management of natural resources to protect globally significant biodiversity and to promote economic development. The immediate objective is to protect the natural resources of the Sanjiang Plain wetlands and their watersheds (biodiversity, water, forests) from continued threats, and promote their sustainable use through the integrated conservation and development of selected wetlands and forest areas of the Sanjiang Plain and the improved well-being of local communities. The Project will give priority attention to the protection of globally significant wetlands in contiguous watersheds, by expanding the upstream forest areas while protecting downstream wetlands and NRs. The project area covers 18 counties, situated in the Sanjiang Plain. These 18 counties are grouped into five contiguous watersheds. Six NRs¹³ with the greatest concentration of biodiversity in the five watersheds will be the focus of protection/restoration models. Xingkaihu NR is one of the sites listed by the Ramsar Convention, and the others are all national NRs. Thirteen out of 18 counties have investment proposals of reforestation interventions in the Sanjiang watersheds (Map 2).

26. The proposed project intervention is based on the need to integrate sustainable environmental management strategies with rural economic development. Rather than simply address the sustainability of localized environmental issues in the six selected pilot NRs, the Project aims at developing a model framework that can be replicated to provide direct examples for ongoing HPG wetland and forestland restoration programs. The project approach conforms to ADB's CSP (2004–2006); is fully compatible with the objectives of GEF's biodiversity conservation focal area; and is consistent with the following strategic priorities indicated in *GEF Business Planning: Directions and Targets*: Strategic Priority Biodiversity (BD)-1: Catalyzing Sustainability of Protected Areas, BD-2: Mainstreaming Biodiversity in Production Landscapes and Sectors, and BD-4: Generation and Dissemination of Best Practices for Addressing Current and Emerging Biodiversity Issues. Appendix 4 summarizes the rationale for GEF involvement and the Project contributions to national sustainable development and incremental global benefits.¹⁴

B. Components and Outputs

27. The four principal project components will address the main threats to globally significant biodiversity in the Sanjiang Plain. The primary global benefit will be the increase in the population of globally endangered species through improved wetland habitat and wildlife management at NRs. The country itself will benefit from strengthened forest development and sustainable environmental management. A fifth component, project management, covers project implementation and management support.¹⁵

28. **Component 1: Watershed Management.** This component will address the threat to wetlands from competition for water resources and altered water balance in the Sanjiang Plain. The subcomponents are (i) forest Improvement in watersheds, to improve forest management,

¹³ Supplementary Appendix C discusses the site selection analysis and the selected six NRs, such as Anbanghe, Dajihe, Naolihe, Qixinghe, Xingkaihu, and Zhenbaodao.

¹⁴ GEF Executive Summary is in Supplementary Appendix D.

¹⁵ Supplementary Appendix E includes a summary table of the Project's physical components by location, and describes the project' components in greater detail.

reduce surface runoff, and increase soil water retention and groundwater recharging; (ii) local NR water resource management, to restore natural water balance within wetland NRs; and (iii) water resource planning in watersheds, to enhance watershed-level water resource management. Activities include planting 11,900 ha of indigenous poplar and larch on denuded slopes or farmland, and improving an additional 43,700 ha of existing plantations; establishing interagency working groups among stakeholders at the local level for water resource management in targeted NRs; and developing model watershed-level water allocation plans in and around watersheds, incorporating flood control impact and wetland protection aspects, and institutionalizing this process.

29. **Component 2: Wetland Nature Reserve Management.** This component is designed to address the threats from past wetland conversion and degradation of habitat, and to promote enhanced biodiversity protection in wetland NRs. The subcomponents are (i) conservation management, to develop monitoring and management plans and methodologies; (ii) pilot wetland restoration, to provide models of well-designed and well-monitored wetland restoration in the six project NRs; (iii) wildlife species recovery, to promote repopulation of NR wetlands with globally threatened wildlife species, especially high-profile migratory waterfowl (cranes, storks, and swan geese); and (iv) reduction of resource exploitation, by establishing of reliable information baselines and a geographic information system (GIS); management planning; pilot restoration of 3,433 ha of wetlands, including testing various restoration techniques (natural, supported, and engineered recovery) as appropriate at different habitats/sites; building the capacity for farmland-to-wetland restoration; developing restoration guidelines; producing a manual on farmland-to-wetland restoration; and developing and implementing species recovery programs. The model wetland restoration approach will be linked to alternative livelihood schemes, to compensate for lost access to farmland and other resources. Seminars, workshops, and conferences will be held to share the learning experiences, to extract lessons, and to identify core elements for successful replication and scaling up.

30. **Component 3: Alternative Livelihood Programs.** In this component, the Project will develop and implement programs for sustainable livelihood in villages affected by reverting farmland to legally designated forestlands or NR wetlands,¹⁶ to ensure lasting benefits for both the environment and the affected communities. The subcomponents are (i) agroforestry and nontimber forest product (NTFPs) interventions, providing investments in agroforestry (intercropping) and NTFPs to State forest farms affected by the reversion program, to increase income-earning opportunities for workers whose farming activities may be curtailed; (ii) village development, providing compensation to villages affected by the reversion of farmland to NR wetlands, including support for eco-friendly livelihood enterprises, or village development based on resettlement and village development plans; and (iii) sustainable ecotourism, including master planning for NRs, preparation of tourism guidelines, and implementation of pilot projects (e.g., construction of basic NR infrastructure such as signboards).

31. **Component 4: Education and Capacity Building.** This component will address the root causes of overexploitation, human disturbances, and habitat degradation in NRs by increasing the capacity of NR staff and building community knowledge about wetlands, wildlife, and nature conservation. Where possible and appropriate, there will be gender awareness and sensitivity training programs. The three subcomponents are (i) conservation education, for teachers and their students in rural schools near NRs; (ii) public awareness, to improve understanding of the importance of conserving wetland resources among rural residents around

¹⁶ Except for 43 households, there will be very little physical resettlement of people, but compensation will be given for loss of access to farmland in the wetland NRs. Because the remaining land in villages will be reallocated, village collectives rather than individuals will be affected. Under the subcomponent intercropping and nontimber forest products, the farmland to be reverted to forestlands in State forest farms already belongs to those farms and so there will be no need to transfer landownership.

NRs; and (iii) wetland management training, primarily to give NR staff practical skills and knowledge to better manage the wetland NRs. The Project will actively involve academic/scientific communities in building benefit monitoring and evaluation capacity.

32. **Component 5: Project Management.** The consulting services in this component will strengthen the coordination of technical support and improve the capacity of the executing and implementing agencies to manage and supervise project activities. Project implementation capability at the provincial, county, and NR levels will be strengthened through technical support and training for finance and technical personnel. Environmental monitoring will also be strengthened through (i) mitigations, specifically for forestry improvement components, as part of the integrated watershed management approach; (ii) further environmental assessment for the pilot wetland, agroforestry, and NTFP components and village development subcomponents; and (iii) monitoring and review activities of the Heilongjiang provincial environmental bureaus, as part of mitigation implementation and environmental assessment.

C. Special Features

33. The Project will develop a model framework for dealing with root causes, and adopt a holistic approach for wider replication. The model framework will incorporate root problems of different scales at both local and watershed levels by integrating the management of upper watershed forested areas and low-lying wetland habitats, and will lay the foundation for widening the scale to the river-basin level in later stages. To protect globally important biodiversity resources, the landscape must be protected so that globally threatened waterfowl and mammals have enough room for migration pathways, feeding grounds, and breeding sites. However, longer-term benefits depend, not only on the simple multiplication of activities but also on the ability to scale up activities to cover larger areas. For these reasons, the scaling up of project interventions is an integral part of the exit strategy,¹⁷ especially as HPG is expected to restore 150,000 ha of farmland to wetlands by 2010 under the Master Plan for Heilongjiang Province Wetland Restoration. Thus, the Project will build an exit strategy to strengthen these key aspects of viability and sustainability, and formulate target indicators for monitoring the success of its scaling-up efforts.

34. Key elements of the exit strategy are (i) strengthening financial sustainability by (a) improving forest management to increase the financial returns of the sector; (b) covering recurrent costs of NR management through successive yearly increases in payments by county forest bureaus of CNY0, 2, 4, 6 and 8 ha/yr during implementation; and (c) financing village development as part of land compensation and resettlement costs to support sustainable livelihood; (ii) building community participation and awareness of the importance of biodiversity to broaden support; (iii) strengthening institutional sustainability through scaled-up interagency coordination between local and provincial water resource management agencies by (a) linking water resource allocation planning by individual agencies and integrating this with development and conservation planning, (b) sharing information, and (c) setting up working groups as coordinating committees; and (iv) institutionalizing working group arrangements. Resources have been allocated for workshops and conferences to identify factors for successful scaling up, and for training relevant to the exit strategy.

35. The Project's model approach will guide wetland restoration in more than 150,000 ha of NRs throughout the province. As 3,433 ha of farmland reverts to wetlands, village development plans (VDPs) will be attached to the restoration program to ensure that livelihood enterprises in villages affected by the farmland-to-wetland program can increase alternative income opportunities in a sustainable manner. Part of the land compensation will be targeted for village

¹⁷ The exit strategy is to strengthen these key aspects of sustainability and viability, namely, (i) financing, (ii) institutional framework, (iii) capacity building, (iv) stakeholder participation, and (v) monitoring and evaluation. Further details are in Supplementary Appendix F.

development. Individuals who give up farmland in the NRs will receive replacement land in their village, provided by the village collective. Land compensation will be paid to the village collective, which will reallocate land use. Depending on the village, about 30% of resettlement compensation will go to alternative livelihood enterprises, particularly those that are conducive to wetland management. Livelihood activities will be approved only after all the affected villagers are consulted and consensus is reached on the VDPs. The VDPs will form part of the resettlement plans, and will be guided by the environmental management plan (EMP) to ensure that activities near the NRs are consistent with wetlands/biodiversity protection. For the farmland-to-forest restoration program, investments will be made in agroforestry and NTFPs, to ensure that villagers losing farmland retain at least the same standard of living.

36. The elements of the project design will (i) ensure that the Project benefits the people, (ii) provide a model framework that can be replicated extensively, and (iii) reduce the financial burden of resettlement compensation on the Government from sunk cost into environmentally sustainable investment opportunities for the affected villages.

D. Cost Estimates

37. The Project will cost about \$55.55 million equivalent, with \$9.41 million in foreign exchange and \$46.14 million equivalent in local currency costs. Table 1 summarizes the cost estimates; details of the project costs and financing plan are in Appendix 5.

Table 1: Cost Estimates
(\$ million)

Item	Foreign Exchange	Local Currency	Total Cost
A. Base Costs			
1. Watershed Management	1.29	21.92	23.21
2. Wetland Nature Reserve Management	2.18	3.22	5.40
3. Alternative Livelihood	0.55	15.21	15.75
4. Education and Capacity Building	2.48	1.15	3.63
5. Project Management	0.42	2.29	2.71
Subtotal (A)^a	6.92	43.79	50.71
B. Contingencies^b	0.31	2.35	2.66
C. IDC and Commitment Charges^c	2.18	0.00	2.18
Total Cost	9.41	46.14	55.55

IDC=interest during construction

Note: Figures may not add up to the given totals because of rounding.

^a Value-added tax is computed at 17% on equipment and materials that will be financed by the Government

^b Physical contingencies are based on 2% of base cost. For price contingencies, the local currency inflation is projected as 2.7% in 2005, 3.0% in 2006 and onward; US dollar inflation is projected as 1.53% in 2005, 0.89% in 2006 and onward, based on the manufacturer's unit value index.

^c No front-end fee included, if approval is obtained by June 2005.

Sources: Asian Development Bank estimates.

E. Financing Plan

38. It is proposed that ADB provide the PRC with a loan of \$15.00 million (27% of the project cost) from its ordinary capital resources to finance the foreign exchange cost of \$1.56 million and \$13.44 million equivalent of the local currency cost (Table 2). The proposed financing plan is justified given the important pilot nature of the environmental protection strategy and goals. The loan will have a 25-year term, including a grace period of 5 years, an interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, an annual commitment charge of 0.75%, and such other terms and conditions set forth in the draft loan and project agreements. The front-end fee of 1.0% will be waived if the loan is approved by ADB before July 2005. 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. GEF will cofinance the Project through a grant administered by ADB.¹⁸ The GEF grant will be for \$12.14 million equivalent (22% of the Project cost): \$5.67 million in foreign exchange and \$6.47 million equivalent in local currency. The Government will contribute \$24.37 million equivalent (44% of project cost) to finance interest during construction and commitment charges of \$2.18 million in foreign currency and \$22.19 million equivalent in local currency. Local currency costs will also be financed partly by GEF and ADB. The remaining \$4.04 million equivalent in local currency costs will be financed in kind by the participating beneficiaries and county governments as part of their equity contribution for the income-generating activities.

Table 2: Financing Plan
(\$ million)

Source	Foreign Exchange	Local Currency	Total Cost	Percent
Asian Development Bank	1.56	13.44	15.00	27
Global Environment Facility	5.67	6.47	12.14	22
Heilongjiang Provincial Government	2.18	22.19	24.37	44
County Governments	0.00	4.04	4.04	7
Total	9.41	46.14	55.55	100

Source: Asian Development Bank estimates.

F. Implementation Arrangements

39. **Executing Agency.** HPG will be the Executing Agency for the Project, and will have overall responsibility for coordinating, supervising, and implementing all Project activities.

40. **Project Steering Committee.** The Project Steering Committee (PSC), which has been established, will oversee Project implementation and set general policies related to the Project. The Steering Committee will also be responsible for Project coordination between the PMO and all concerned HPG authorities. The Steering Committee will be composed of representatives of the relevant HPG agencies, and will meet once every six months, or more frequently if necessary.

41. **Project Management Office.** A project management office (PMO) has been established within HPFD for the day-to-day implementation of the project, under the guidance of the PSC. Composed of professional and administrative staff assigned from government agencies for the Project, the PMO will have the capacity to carry out the project activities in coordination with HPG agencies. It will be headed by a full-time project director who will report to HPG through the PSC. The principal functions and responsibilities of the PMO are (i) managing all Project activities in coordination with HPG agencies and in accordance with the requirements and guidelines of the national government, HPG, ADB, and GEF; (ii) planning for, and monitoring and supervising of use of the project funds in coordination with HPFB, including from the State farm bureaus, and (iii) administering, monitoring, reporting, and coordinating all Project activities. The HPG Financial Bureau (HPFB) will be responsible for the administration and supervision of disbursements of the proceeds or counterpart funds, from the loan, the GEF grant, the central government, State farm bureaus and Heilongjiang country finance bureaus to the HPG agencies under the Project.

42. **Project Implementing Agencies and Implementation Units.** Besides the PMO, 19 project implementation units (PIUs) with adequate professional and technical staffing will carry out field operations and coordinate the flow of funds from county financial bureaus to the

¹⁸ Cofinancing is subject to the final approval of the Project by the GEF.

beneficiaries. Thirteen PIUs will be housed at the county forestry bureaus, and will be responsible for the day-to-day implementation of forest management, agroforestry, and NTFP activities in the 13 project counties. The six other PIUs will be housed at six NRs where wetland NR management activities will be implemented, and will be responsible for carrying out those activities. The PIUs will be staffed by adequate professional and technical personnel provided by either the county forestry bureaus or the NRs, depending on the type of PIU. The PIUs will prepare their annual operating plans detailing the physical and financial dimensions of their programmed activities. The PMO will consolidate the PIU annual plans into a project-level annual work plan and budget.

43. **Coordination.** PSC will be composed of representatives of the relevant HPG agencies. PSC will be responsible for supervision of PMO and for coordination of agencies involved in the Project. The PMO will report directly to the PSC, which will be composed of representatives of provincial government agencies, thus ensuring coordination between project management and all concerned provincial authorities. The HPFD has responsibility for wetland management in the province, as well as the forest management activities in state forest farms in the 13 project counties. This will give the PMO staff clear lines of authority for project activities in both the upland and wetland project sites. Provincial-level coordination will also require close links with HPFB, which will be responsible for flow of funds from ADB (including GEF) and the national and provincial governments. The PSC will oversee project implementation and set general project policies relevant to the project. A field office will be based in the Baoqing County PIU, near the center of the Sanjiang Plain, to support field activities. Technical working groups, to be formed at each NR, will include county-level staff of the Forestry Department, Environmental Protection Bureau, Water Resource Bureau, and Tourism Bureau; representatives of State forestry farms, State farms, or villages involved; and local school teachers. Watershed-level interagency coordinating body will be established at the provincial level to coordinate the component, water resource planning in watersheds. The project implementation organization chart is in Appendix 6.

44. **Beneficiary Participation.** Since the lands for project components are still owned by the state farms, village collectives, or State forest farms, engagement and joint planning and development are essential. The Project will support the involvement of local communities in project design, implementation, and management through participation in preparing the (i) NR master plans, (ii) watershed management plans, (iii) VDPs and alternative livelihood programs, (iv) ecotourism plans, and (v) employment opportunities related to project implementation (e.g., tree plantation and treatment). To promote participation and strengthen a sense of ownership, improved compensation and access to alternative livelihood development will be provided to affected communities.¹⁹

45. **Implementation Schedule.** The Project will be implemented from July 2005 to June 2010. Year 1 will involve management and implementation arrangements and other preparatory tasks. Year 5 will focus more on evaluation, monitoring, sustainability and exit strategy, and the handover of responsibilities. The project implementation schedule is in Appendix 7.

46. **Land Acquisition and Resettlement.** The Project involves the conversion to wetlands of 3,433 ha of farmland—1,433 ha in five NRs and 2,000 ha in Naoli NR—allocated for conversion in 2002, and the provision of supplementary alternative livelihood support. Since 260 farmers²⁰ from eight villages (in six NRs) will have to abandon farming in the NRs and future land use will be restricted, the farmers will have to be compensated for lost land use and nonmovable assets. A resettlement framework and resettlement plans (RPs) for Qixinghe and

¹⁹ Supplementary Appendix G discusses the social assessment and public participation plan.

²⁰ Only 43 families will be physically relocated; the rest will require land compensation only.

Xingkaihu NRs have been prepared,²¹ endorsed by HPFD and approved by ADB. In the alternative livelihood component, RPs will be prepared for each of the six NRs, including updates of the RPs for Qixinghe and Xingkaihu NRs. Each affected village (or State farm) will prepare a VDP in consultation with the affected farmers and county officials. The PIUs in the NRs will review the VDPs²² to ensure that the types and locations of alternative livelihood schemes and village improvements conform to the master plans for the NRs. Once each plan has been screened for environmental impact, an agreement will be signed between the NR and the village committee or State farm. RPs, together with the VDPs, will be submitted to the provincial PMO and to ADB for approval. After each plan is approved, land compensation and village development costs can be disbursed by HPFB (through the County Financial Bureau) from the counterpart fund to the affected village committee or State farm, and farmers will then abandon farming in the NRs. The counterpart funds will pay for the land compensation and all resettlement activities in the RPs, including the implementation of the approved VDPs. EA will set up an account for the resettlement costs (compensation and village development), which will be managed by HPFB. Internal and external monitoring and evaluation will be conducted to ensure compliance with ADB's resettlement policy. The summary resettlement framework is in Appendix 8.

47. **Procurement.** All supplies, equipment, and services to be financed by ADB will be procured in accordance with ADB's *Guidelines for Procurement*. For cost efficiency, most items will be procured centrally (by the PMO) for distribution to the subproject areas, spread widely over the 13 project counties. The Government's domestic procurement procedures will be followed, provided they are acceptable to ADB. Equipment or materials for each contract valued at \$1,000,000 equivalent or less will be procured through international shopping. Other minor miscellaneous equipment and supply packages, each valued below \$100,000 equivalent, will be procured through direct purchase. The force-account procedure will be applied to civil works for forest improvement and wetland restoration, i.e., the county governments (the implementing agencies) will use their own work force and equipment, since each contract will have a value of less than \$1 million equivalent and the locations are remote, making competitive bidding unsuitable. Also, the implementing agencies can efficiently handle civil works at reasonable cost. Indicative procurement packages are listed in Appendix 9.

48. **Consulting Services.** Consultants will be selected and engaged in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements acceptable to ADB for selecting and engaging domestic consultants. Consulting firms will be selected using ADB's quality- and cost-based selection method. The total consultant input for the Project is estimated at 640 person-months of consulting services: 112 international and 528 domestic. Consultants will be required for water resources, wetland biodiversity and nature reserve management; ecotourism; conservation education, and public awareness subcomponents. The Project will also engage the services of qualified academic/research institutes for studies, surveys, and short- and long-term training programs. The institutes will be selected by HPG according to competitive selection criteria and procedures acceptable to ADB. The consultant requirements are summarized in Appendix 10. The training and education requirements for capacity building are summarized in Appendix 11.

49. **Disbursement Arrangements and Fund Flows.** GEF funds will be channeled through ADB, and ADB will disburse both ADB loan and GEF grant funds to HPFB. To expedite the disbursement of the loan and GEF grant proceeds, HPG will set up imprest accounts in a commercial bank acceptable to ADB, in accordance with ADB's *Loan Disbursement Handbook*

²¹ The full resettlement framework and the RPs for Xingkaihu NR in Mishan City and Qixinghe NR in Baoqing county have been posted on ADB's web site (Supplementary Appendix H, I, and J, respectively).

²² The percentage of compensation cost allocated for alternative livelihood schemes will depend on the VDP, but is estimated to average 30%.

of January 2001 and detailed arrangements between the Government and ADB. The initial deposit in the imprest account will not exceed 6 months of estimated expenditure, or 10% of the total loan amount, whichever is less. HPG will disburse eligible expenditures under the Project through either (i) the imprest account, to be set up immediately after the loan agreement takes effect and managed by HPFB; or (ii) ADB's direct payment, commitment, force account, or reimbursement procedures. ADB's statement of expenditures (SOE) procedures will be followed in liquidating the imprest account and reimbursing individual SOE payments up to \$100,000 equivalent.

50. **Accounting, Auditing, and Reporting.** NRs and county PIUs will keep records and accounts according to sound accounting principles and in sufficient detail to identify subprojects financed by the loan and to disclose the use of funds under the Project. The records and accounts will be forwarded regularly to the provincial PMO. HPFB will be responsible for overall project accounting and will ensure that the consolidated provincial project accounts are prepared for final consolidation and audited yearly by independent auditors acceptable to ADB. The audit report should include a separate audit opinion on the use of the imprest account and SOE procedures. The audited financial statements will be submitted to ADB not later than 9 months after each fiscal year. The PIUs will submit quarterly reports to the PMO detailing implementation activities, physical and financial accomplishments, problems encountered or anticipated, and actions taken to resolve the problems.²³ The PMO will compile quarterly reports from the PIUs and submit the compilation to ADB for review. Also, the PMO will prepare consolidated project progress reports twice a year, following the project performance report format proposed by ADB at inception. Within 6 months after project completion, the PMO will prepare, in coordination with the PIUs, and submit to ADB a completion report summarizing loan and grant funds utilization, project implementation, attainment of objectives and targets, implementation experience, project performance, actual costs incurred, benefits, and other information requested by ADB or GEF. Copies of annual reports, and other reports as required, will be provided to GEF.

51. **Project Review.** The PMO will submit an annual work plan and annual reports to be reviewed in meetings with the PSC, ADB, and GEF, and will also be responsible for the final report. The PMO will prepare progress reports every 6 months, indicating progress, problems met in the past 6 months, remedies taken or proposed, proposed program of activities, and progress expected in the next 6 months. In year 3, ADB and GEF will conduct a comprehensive midterm review and detailed evaluation of the Project, including an assessment of (i) the project design and scope as formulated at appraisal; (ii) HPFD's capacity for effective implementation, and PIU effectiveness in implementing the Project; (iii) physical and financial progress of implementation (including contracts and disbursements), and performance of consultants; and (iv) beneficiary participation. The project performance management system (PPMS)²⁴ will support regular and timely feedback between components, as well as project performance reports updated every 6 months, to guide the adjustment of project activities to enhance their effectiveness and beneficial impact.

52. **Advance Action and Retroactive Financing.** The Government has requested and ADB has approved (i) advance procurement action for early planting of seedlings, and (ii) retroactive financing of eligible expenses (i.e., ground preparation, seedlings and planting, and advance mobilization payment for consultants preparing subproject feasibility reports), incurred by HPG on or after 15 September 2004, up to \$200,000 equivalent. HPG has been

²³ HPG can effectively manage its financial resources and has already dealt with several ADB-funded projects. To strengthen the project accounting and auditing systems and the Forest Department's capacity to manage financial resources, implementation support includes the services of financial management specialists.

²⁴ The PPMS is described in detail in Supplementary Appendix K.

advised that approval of advance actions and retroactive financing does not commit ADB to finance the proposed Project.

53. **Anticorruption Policy.** ADB's anticorruption policy was explained to the Government and HPG's attention was drawn to the section on fraud and corruption in ADB's *Guidelines for Procurement* and *Guidelines on the Use of Consultants*, particularly the need for bidders, suppliers, contractors, and consultants to observe the highest standard of ethics in procuring and executing ADB-financed contracts, and the sanctions if fraud and corruption are discovered.

IV. PROJECT BENEFITS, IMPACT, AND RISKS

54. The Project derives its overall economic rationale from the need to protect globally significant flora and fauna, reduce natural resource losses, achieve sustainable management of wetland NRs, and improve the economic potential of forest areas in the Sanjiang Plain. Increasing the forest cover and improving water resource planning will strengthen wetland protection and promote balanced agricultural development in an environmentally sustainable manner. More balanced allocation and use of water resources will bring local economic benefits, as they will help reduce flooding and drought and recharge groundwater. Restoring the wetlands and protecting endangered species will increase biodiversity in the Plain. Institutional strengthening in forestry and NR management activities, training, and campaigns to make the public more aware of the value of biodiversity will also bring substantial incremental global benefits over the long term. Alternative income-generating opportunities, including village development plan-supported alternative livelihood enterprises, agroforestry, and NTFP will ensure that the affected communities will stay away from natural resources as their primary income sources, thus promoting sustainable development. Project intervention at the national level is further justified as (i) converting barren lands to forests, and (ii) reverting farmland to legally assigned forestland with intercropping and NTFP activities are expected to bring higher net benefits.

A. Financial and Economic Benefits

55. The financial analysis for the Project focused on revenue-generating activities: (i) establishment of new forest plantations of native species of larch and poplar, and treatment of existing forest plantations of the same species; (ii) agroforestry and intercropping; and (iii) investments in NTFPs, particularly potherbs, berry fruit, and wild grapes. The overall financial internal rate of return (FIRR) of the Project is 14.9%, which is higher than the weighted average cost of capital (WACC) of 6.1%.²⁵ The overall project net present value (NPV) is CNY124.33 million. Therefore, the proposed Project is financially viable. The FIRR and NPV by nature of activity and by county were also calculated. The computations show that all types of activities are financially viable, and so are the operations programmed for each county. The FIRR is lowest (8.8%) for new forest plantations of larch because of the long waiting period of 20 years from planting to harvest. Hegang, Jidong, Linkou, and Qitaihe have lower FIRRs than other counties, only slightly more than 10%, because they are programmed for planting more heavily with larch (yielding lower returns than poplar) in new plantations and treated stands. Sensitivities for FIRRs and financial NPVs were computed at plus and minus 10% of the (i) wood price, (ii) wood harvest, (iii) investment costs, and (iv) total costs. The results show that unfavorable changes do not reduce the FIRRs below the WACC, neither in the aggregate nor in any particular county. A switching value analysis was conducted for wood prices, which turned out to be the most sensitive variable in the sensitivity analysis. A drop of 12% in wood prices will still allow for a viable operation in the counties with the lowest FIRR. Details of the financial analysis are in Appendix 12.

²⁵ The FIRR has been computed on an incremental basis, after tax in real terms. The WACC is also computed in real terms on an after-tax basis.

56. Economic evaluation of the Project focused on the economic benefits and costs of forestry and NTFP investments. The significantly positive annualized NPV per hectare of land converted from currently barren lands to legally required forestlands (zero versus CNY2,078/ha) gives strong economic justification for the Project. On the other hand, when the current croplands revert to the legally required forestlands, combining forest and NTFP investments to replace crop cultivation opportunities lost may provide economic justification. Economic analysis was conducted for the project duration of 25 years, including construction. The costs and benefits were expressed in yuan in constant 2004 prices. In the case of economic NPVs, a discount rate of 12% was applied. A shadow exchange rate factor of 1.01 was applied to all financial costs and benefits to derive the economic cost and benefit streams. The economic wage rate of unskilled labor is 80% of the financial wage rates. The major benefits from forestry plantation were related to timber before tax, expressed in economic prices. Economic benefits derived from NTFPs were adjusted to reflect economic values based on the financial benefits. Incremental economic costs include investment costs and expenditures expressed in economic value for the forestry plantation components but not the GEF-supported investments. The economic internal rate of return (EIRR) for the Project as a whole is 24.8%, higher than the economic opportunity costs of capital (12%). The economic NPV, at a 12% discount rate is CNY93.03 million, which is positive. Therefore, the Project is economically viable. Details of the economic analysis are also in Appendix 12.

B. Environmental Impact and Benefits

57. The Project falls under environmental category B. An overall initial environmental examination (IEE)²⁶ was undertaken to assess the generic impact of each Project component. The IEE shows that the Project will bring significant environmental benefits and have a positive impact on both the project area environment and globally important biodiversity by increasing forest cover, improving wetland hydrology, restoring degraded wetlands, improving the status of threatened wildlife, providing wetland conservation education, and establishing wetland management capacity. The IEE also shows that the potential negative effects on the environment are localized and short-term but not significant, and can be fully mitigated. Therefore, no full environmental impact assessment is required.

58. The six project NRs were selected because they support significant populations of globally threatened species, whose survival depends on the successful implementation of interventions to remove the root causes of problems and threats. The benefits of these interventions—predominantly conservation activities—therefore accrue to the global community. The benefits include (i) expanded breeding and foraging habitats of birds and other wildlife, and, hence, increased populations of globally threatened species; (ii) improved management at the local and watershed levels, leading to secure water resources for wetlands, support for globally threatened biodiversity, and improved habitat quality, and thus to increased wildlife populations; (iii) increased carbon sequestration in standing wood and forest soils through reforestation and sustainable forest management; and (iv) minimized threats to globally endangered wildlife as a result of greater public awareness of globally threatened biodiversity and the importance of wetlands in environmental conservation. Replicating and scaling up the model framework throughout the Sanjiang Plain will intensify these global environmental benefits.

59. Local communities will benefit from restored wetland functions, such as water storage for use in the dry season and groundwater replenishment. In upland areas, barren lands and marginal agricultural lands will be put to more appropriate use, for forest plantation. The conversion will reduce erosion, improve water infiltration, and lead to a more reliable supply to streams and aquifers during the dry season. Because of wider tree spacing, agroforestry intercropping as well as the growing of NTFP crops, can be promoted. Global and national

²⁶ The IEE along with the environmental management plan is in Supplementary Appendix L.

environmental benefits will accrue from the establishment of ecotourism guidelines that will help reduce adverse effects, limit inappropriate development, and ensure sustainability. Both NTFP enterprises and ecotourism development will stimulate local employment. The promotion of environment-friendly livelihood enterprises will provide long-term financial benefits to communities and heighten the demonstration potential of the Project.

C. Social Dimensions and Impact on Poverty

60. The Project will provide employment opportunities to state farm forestry workers in tree planting, stand treatment, logging, and wood transport. During the implementation period, there will be work opportunities for 7 months for about 36,000 forestry workers on larch plantations, and for 6 months for about 10,000 forestry workers on poplar plantations. Preferential access to employment and intercropping agroforestry opportunities will increase incomes for the Project's beneficiary forestry workers. Investments in various NTFPs such as potherbs, berry fruit, and wild grapes will increase off-season income and employment benefits.

61. In accordance with resettlement and village development plans, about 30% of resettlement compensation from the counterpart funds will finance village development investments in alternative livelihood activities. The actual mix and scale of alternative livelihood outputs in each village are, by intent, not predetermined, as the Project aims to be both participatory and flexible. Farmers and villages affected by wetland restoration activities can themselves decide the most suitable types of alternative livelihood investments, instead of being provided with a blueprint. The farmers are mostly concerned with the yields and price of their grain crops. Village development can add value to their farm outputs through support for agroprocessing businesses. The benefits of alternative enterprises under VDPs are expected to outweigh simple cash resettlement compensation, as that result will (i) ensure longer term project benefits to the intended beneficiaries,; (ii) provide a model framework that can be replicated beyond project implementation, and (iii) assist the Government in adopting a model of compensation, not as sunk cost but as sustainable investment opportunities.

62. **Impact on Poverty.** Poverty incidence is 9.7% in Heilongjiang and about 10% in the project areas. Of the 13 project counties in the Sanjiang Plain, 4 are nationally designated poverty counties (Fuyuan, Huanan, Raohe, and Tongjiang), with a slightly higher poverty incidence (15%). Overall, the Project will enhance livelihood enterprises in agriculture and create new economic opportunities for state forest workers through intercropping, NTFPs, and VDPs. Benefit distribution and poverty impact analysis shows that the poverty impact ratio of the Project is about 22%. The Project is classified as a "General intervention" (Appendix 13).

63. **Ethnic Minorities.** The Project's components and locations have all been identified, and no significant adverse impact on ethnic minority villages or groups is envisaged. Ethnic individuals who may be affected by project activities will be compensated and, if required, special measures will be included in the RPs. Based on ADB's *Policy on Indigenous Peoples*, a full plan is not required but a specific action for indigenous peoples is included in the resettlement framework.

64. **Gender.** Women in the Project areas are actively involved in both productive activities and household chores, except where physical strength is required (e.g., for logging or wood transport). Men and women have equal access to land resources. However, women are less well-represented than men are in decisions on public affairs and are burdened with household chores, and may, for these reasons, receive less awareness training in the value of wildlife or wetlands biodiversity conservation. The project strategies intended to promote gender awareness and sensitivity in training and awareness programs should therefore have a positive impact on women.

D. Project Risks

65. The removal of threats to wetland biodiversity in the Sanjiang Plain requires the following: (i) cooperation among resource authorities in integrating watershed management with development and conservation planning, (ii) improved NR management through better-trained personnel, (iii) mutually beneficial relationships between protected areas and surrounding communities, and (iv) sustainable financial support to NR management. The project design recommends measures to minimize the risks of failure.

66. **Cooperation to Integrate Resource Management.** Integrated watershed management is a new concept in the Sanjiang Plain. The UNDP-GEF Sustainable Use of Wetlands in China Project established provincial wetland management authorities (WMAs) in an attempt to foster cross-sector contribution to wetland biodiversity management. The WMAs were only partly effective because of their geographic and institutional distance from the wetlands. The proposed Project will establish local working groups in the target pilot NRs. Working group members will represent all local stakeholders in water and biodiversity resource management.

67. **Improved NR Management.** Barriers to the success of the 5-year Project must be removed early on. NR management standards are low at present, partly because equipment and materials for basic functions, such as field surveys, long-term monitoring, data analysis and reporting, and patrol and enforcement, are lacking. NRs should be supported with appropriate technologies and their capacity should be enhanced through short- and long-term training.

68. **Alternative Livelihood.** If the proposed activities were to impoverish or disenfranchise local communities, the Project would be less likely to succeed. To foster community support, the Project will address the need for alternative livelihood enterprises at both forest and wetland sites. Communities will also be involved in programs to reduce NR resource exploitation and will participate in local watershed working groups. A public awareness and conservation education program will make the communities more aware of the relationship between resource protection and community welfare.

69. **Sustainable Financial Support to NR Management.** Several factors will contribute to the sustainability of project benefits beyond the life of the Project. One is the financial commitment of the Government to conserve the wetlands. Innovative approaches to providing alternative livelihood for forest workers and the adoption of VDPs as part of RPs will enhance benefits from investment alternatives rather than burden the Government with sunk cost. To strengthen the financial sustainability of NR management, HPG will improve the financial returns from forest sector development through better management of existing forests, and will successively increase its yearly budget for recurrent costs of NR management from CNY0 to 2, 4, 6, and 8 /ha during implementation.

V. ASSURANCES

A. Specific Assurances

70. In addition to the standard assurances, the PRC Government and HPG have given the following assurances, which are incorporated in the legal documents:

- (i) **Environmental issues.** The HPG will ensure that
 - (a) the Project complies with applicable PRC environmental laws and regulations and ADB's *Environmental Policy (2002)*.
 - (b) HPFD, HPG and county environmental protection bureaus (EPBs) implement the environmental mitigation measures and monitoring requirements as outlined in the IEE and the environmental management plan (EMP); further, HPG will ensure that an appropriate budgetary

allocation (including vehicles, materials and equipment, operating expenses, and staff) is provided to HPFD, HPEPB, and the county EPBs to fulfill their responsibilities for implementing mitigating measures and monitoring requirements as outlined in the IEE and EMP;

- (c) before starting activities in components 1, 2, and 3, the preparation of county-level environmental plans for siting and establishing of new plantations and operating new and existing plantations, the environmental management plans for recoveries in each NR, and all individual subprojects will be subject to the environmental assessment and review procedures for subprojects outlined in the IEE and EMP; and
 - (d) adequate budget and human resources are made available for the implementation of EMPs and any mitigation measures and monitoring requirements that may arise for the environmental assessment and review of subprojects.
- (ii) **Experimental zone of nature reserves.** HPG will commit the necessary resources to enforce the National Regulation of Nature Reserves and the related Heilongjiang provincial regulations regarding permissible activities in the experimental zone of NRs, to limit incompatible and unsustainable practices, and to promote the intended conservation management purposes of the three zones. Taking into account the relevant recommendations of the ADB TA for Support for Environmental Legislation in the PRC and the legal consultant financed under the Project, HPG will prepare and submit for the consideration of the Heilongjiang Provincial People's Congress draft amendments to the Heilongjiang provincial regulations, so that the activities permitted in the experimental zone of NRs are consistent with the protection of wetland nature reserves and promotion of biodiversity.
- (iii) **Conversion of farmland to forest.** In converting farmland to forest, the HPG will ensure, among others, that (a) a new forest plantation is not adjacent to or near (within 1 kilometer) a NR; (b) an appropriate buffer zone is maintained between the plantation and any riparian zones or sensitive habitats; (c) affected forestry workers and villagers receive wage income from tree planting; (d) an area equivalent to 20% of the converted farmland is used for planting NTFPs to benefit affected workers or villagers; (e) for the first 3-5 years, intercropping is allowed at a nominal annual contract fee (around CNY6–CNY7 per mu); and (f) the remaining farmland is recontracted to all workers or villagers within each forest farm, so that they share equally in the benefits.
- (iv) **Ecotourism.** In consultation with ADB, HPG will prepare a comprehensive ecotourism master plan and detailed planning and environmental guidelines for the project NRs, and make the plan and guidelines publicly available, for possible replication elsewhere.
- (v) **Endangered species.** The HPG will develop and implement a public awareness program regarding endangered species, and strengthen the enforcement of penalties for violations of the relevant laws and regulations.
- (vi) **Resettlement.** HPG will ensure that any resettlement conforms, in a timely manner, to the relevant PRC laws and regulations, ADB's *Policy on Involuntary Resettlement (1995)*, and the resettlement framework agreed between HPG and ADB. The activities will include (a) preparing subproject RPs acceptable to ADB before any subproject activities and before award of civil works contracts for each subproject (for the six NRs with farmland-to-wetland restoration); (b) submitting to

ADB for approval any NR RPs and VDPs before farmers are displaced and before award of civil works contracts for each subproject; (c) submitting to ADB updated RPs for Qixinghe and Xingkaihu after subproject detailed design and livelihood development plan for ADB review and approval; (d) consulting with and disclosing subproject RPs to affected persons and the public, and on the ADB web site; (e) making provisions for compensation eligibility, compensation rates, rehabilitation measures, institutional arrangements, resettlement costs, grievance redress, and monitoring and evaluation; and (f) ensuring that in relevant subprojects, compensation and allowances are paid and assets are replaced before displacement of affected people.

- (vii) **Village development.** HPG will ensure that (a) a portion of the land compensation and resettlement costs under the Project is used for village development; and (b) village development plans for alternative livelihood schemes and community infrastructure improvements, and their activities and locations are compatible with the master plans for the NRs. Once a plan is approved by the provincial PMO and ADB, counterpart funds for village development will be disbursed by HPFB through the County Financial Bureau to the affected village committee or State farm. Financing for village development will be subject to guidelines and procedures including the following: (a) the alternative livelihood investments were identified with the participation of the affected persons (APs), and are eco-friendly according to the evaluation criteria in the EMP and compatible with the master plans for the NRs; (b) APs and then the hosts will have priority with respect to use; and (c) training and technical assistance for alternative livelihood schemes and environmental protection will be provided if the investment proposals fit the “green,” eco-friendly investment criteria in the EMP.
- (viii) **Pilot testing and replicability.** HPFD will pilot-test, monitor, and evaluate the farmland-to-wetland model and forestland restoration subprojects. HPG will ensure that manuals are prepared based on pilot testing, and these manuals incorporate lessons learned, so that they can be used for other wetland restoration. HPG will ensure that such subprojects (including intercropping, NTFPs, and village development as part of resettlement compensation) are replicable and can be scaled up, particularly in connection with the Master Plan for Heilongjiang Province Wetland Restoration.
- (ix) **Master Plan for Heilongjiang Province Wetland Restoration.** HPG will take the necessary actions to promptly obtain NDRC endorsement of the Master Plan and then apply the model approach developed under the Project more widely to restorations under such plan, as appropriate to specific sites.
- (x) **Participation.** HPG will ensure that stakeholders in the project area (including women, minority groups, and the poor) participate in project design, management, and implementation, including the formulation of the NR master plan, watershed management plan, alternative livelihood programs, ecotourism planning and development, and project employment opportunities. HPG shall implement an incentive framework to encourage and maintain stakeholder ownership and support for the Project, in particular for the alternative livelihoods development component and conservation management activities.
- (xi) **Exit strategy.** In consultation with ADB, HPG will implement the exit strategy developed under the Project to refine policy measures and carry out activities in integrated watershed and wetland NR management following Project completion. The strategy will be carried out during Project implementation to strengthen the

overall sustainability of financing requirements and sources, capacity building, and institutional mechanisms for local and intersectoral planning and cooperation. For the financial sustainability of NR management, HPFD, county forestry bureaus, and State farms will successively increase budget amounts by CNY2 ha/yr from CNY0 ha/yr in year 1 to CNY8 ha/yr in year 5.

- (xii) **Counterpart funds.** The HPG will ensure the timely provision of all counterpart funds required for the successful implementation of the Project, including incremental recurrent costs, land compensation, resettlement costs and post completion recurrent costs. The HPG will ensure that the counterpart funds for the land compensation and resettlement costs for the State farms are provided from the funds allocated by the central and local governments.
- (xiii) **Monitoring and evaluation.** In consultation with ADB, HPG will establish and implement a project performance monitoring system, including performance indicators relating to forestry development, wetland restoration, NTFPs, resettlement and alternative livelihood schemes, counterpart financing for village development, ecotourism, and beneficiary participation. HPG and ADB will carry out a midterm review in 2008 on issues including the implementation of the exit strategy, incentive framework, and beneficiary participation.

B. Condition for Loan Effectiveness

71. Effectiveness of the Loan Agreement will be subject to the following special condition: confirmation of GEF financing through the endorsement by the Chief Executive Officer of the GEF Secretariat.

VI. RECOMMENDATION

72. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

- (i) the loan of \$15,000,000 to the People's Republic of China for the Sanjiang Plain Wetlands Protection 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 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan and Project Agreements presented to the Board; and
- (ii) the administration by ADB of a grant not exceeding the equivalent of \$12,140,000 to the Government of the People's Republic of China for the Sanjiang Plain Wetlands Protection Project to be provided by the Global Environment Facility.

Haruhiko Kuroda
President

15 February 2005

PROJECT FRAMEWORK

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions/Risks
<p>Goal:</p> <p>Improved management of natural resources to protect globally significant species and to sustain economic development</p>	<p>Conservation status of eight key globally threatened species in the Sanjiang Plain lifted from the lists of endangered-to-vulnerable species</p>	<p>World Conservation Union biodiversity surveys</p>	
<p>Purpose:</p> <p>Achieve an integrated conservation and development model to protect natural resources of the Sanjiang Plain wetlands and their watersheds (biodiversity, water, forests), from continued threats, and to improve the well being of local communities</p>	<p>By 2010, populations of native species in 6 target NRs up by at least 10% (improved biodiversity)</p> <p>By 2010, nature reserve (NR) and watershed water resource management mechanisms in the Sanjiang Plain established and/or integrate wetland water requirements</p> <p>Income status of affected villages maintained or increased through environmentally sustainable alternative livelihood mechanisms</p> <p>By 2010, wetland restoration model replicated in 5-6 additional Sanjiang Plain wetland NRs</p>	<p>NR and provincial wetland inventories</p> <p>Targeted NR species censuses and associated habitat surveys</p> <p>Red Data Book and other endangered species status reports</p> <p>NR water allocation surveys</p> <p>Forest cover assessments</p> <p>Socioeconomic surveys</p> <p>Reports detailing changes in water resource management strategies (e.g., from engineered solutions to nonstructural solutions)</p> <p>National poverty census statistics</p>	<p>Assumptions:</p> <p>Provincial regulation preventing further wetland conversion in NRs is enforced.</p> <p>Government follows through on its commitment to implement the SFA/NDRC Farmland to Wetland Restoration Program.</p>
<p>Outputs:</p> <p>1. Watershed Management</p> <p>1.1 Forest Improvement</p> <p>Increased forest cover</p> <p>Increased forestry-based income</p> <p>Improved forest stand health and performance</p> <p>1.2. Local (NR) Level Water Resource Management</p> <p>Strengthened water resources management at the local level</p> <p>Improved coordination among local stakeholder agencies for management of water resources</p> <p>1.3. Watershed-Level Water Allocation Planning</p> <p>Provision of adequate water to meet ecological water requirements in NRs</p> <p>Integration of management of water resources at the watershed level</p> <p>Incorporation of wetland protection criteria into flood management plans</p>	<p>By 2010, upper watershed forest cover increased by 11,900 ha in 13 counties and 5 watersheds</p> <p>By 2010, international silvicultural health standards achieved in 43,700 ha of existing upper watershed forest in 13 counties</p> <p>By project year 3, water resource management sections incorporated into the management plans of 6 NRs</p> <p>By 2010, local water allocation plan for NRs increased by at least 20%</p> <p>By 2010 wetland protection criteria and management requirements included in water resource plans</p> <p>By 2010, wetland issues integrated into water resources allocation in the Wusuli, Naoli-Qixing, Anbang, and Qihulin/Abuqin rivers</p> <p>By project year 2, interagency coordination body formed, and meeting quarterly</p> <p>By 2010 Songhua River Basin Management Authority ready to adopt integrated Songhua River Basin</p>	<p>County and provincial forestry assessments</p> <p>County silviculture survey reports</p> <p>NR water flow and recharge monitoring, baseline and annual water balances</p> <p>Baseline and annual reviews of NR planning status</p> <p>NR water flow and recharge monitoring, baseline and annual water balances</p> <p>Working group meeting minutes</p> <p>Baseline and periodic institutional assessments of planning at provincial county, and watershed levels</p> <p>NR water flow and recharge monitoring, baseline and annual water balances</p> <p>Comparisons of actual water flows and levels with provincial water resource allocation plans</p>	<p>Assumption:</p> <p>Government forestry sector and resettlement investments are carried out.</p> <p>Risk:</p> <p>External factors (e.g., climatic anomalies, regime change) lead to further upper watershed deforestation.</p>

Continued on next page

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions/Risks
	Management Plan incorporating wetland protection.		
<p>2. Wetland Nature Reserve Management</p> <p>2.1. Conservation Management Improved conservation management practices with respect to wetlands and wildlife in NRs</p> <p>2.2. Pilot Wetland Restoration Decreased farmland area in core and buffer zones; increased total wetland area in NRs Development of model for farmland to wetland restoration</p> <p>2.3. Wildlife Species Recovery Increased numbers of key threatened species in the six pilot NRs Improved condition of wetland habitats and increased wildlife populations Reduction in over-utilization of wildlife and plants in NRs, relative to the baseline</p> <p>2.4. Reduction of Resource Exploitation Reduction in illegal exploitation of targeted wetland species, and recovery of populations of target species in 6 NRs Reduction in Illegal international trade in endangered species (closely linked with awareness activities in 4.2)</p> <p>3. Alternative Livelihoods</p> <p>3.1. Intercropping and NTFPs Sustainable income-generating opportunities for the villagers affected by farmland-to-forest restoration program through intercropping</p>	<p>Significant recovery of biodiversity achieved within 6 NRs by 2010: occurrence of key threatened species in NRs increased by 10% (number of individuals, population size, number of sightings, etc.)</p> <p>Total wetland area in 6 pilot NRs increased by 3,433 ha by 2010 Wetland restoration models and guidelines developed by year 4 Wetland restoration models replicated in at least 5 other NR sites in the Sanjiang Plain by end of Project, and restoration program functioning in all Sanjiang Plain wetland NRs by 2010</p> <p>Target species habitat area increased by 10% in all 6 NRs Overall wildlife populations increased Observed populations of 8 key species of globally threatened waterfowl (see list)¹ increased by 10% by project end</p> <p>Extent of vegetation cover contributed by reeds, thatch grass, wild herbs, and wild fish populations, in the project pilot area increased by 50% by 2010 Illegal international trade in animal species originating in project area reduced by 50% by 2010</p> <p>Income levels in unaffected villages maintained or increased throughout life of project Income levels in affected villages maintained or increased throughout life of project</p>	<p>Baseline and annual review of NR management plans Baseline and annual review of NR water, wildlife, and habitat monitoring programs Baseline and annual NR biodiversity surveys</p> <p>Baseline and annual NR wetland inventories and surveys NR administrative/progress reports Pilot wetland restoration plan reports and guidelines</p> <p>Baseline and annual census of populations of key targeted wildlife species Baseline and annual census of associated habitats of key targeted wildlife species Baseline and annual NR biodiversity surveys NR progress reports</p> <p>Baseline and annual census of key exploited species Baseline and annual survey and quantification of natural resource use in and around NRs Detailed vegetation surveys in NRs Customs seizure records</p> <p>Per capita and household income baseline and follow-up surveys Surveys of economic activities in NTFP and agroforestry</p>	<p>Assumption: Government provides adequate NR staff, salaries, and operational budget.</p> <p>Risk: Various threats to wildlife or habitats continue outside project area.</p> <p>Assumptions: Government provides resettlement funds to be used for village development investment rather than as direct compensation.</p> <p>Adequate seed populations of key species are extant for initiation of recovery program A critical number of qualified personnel committed to the task.</p> <p>Adequate NR and local support for enforcement of existing legislation on core and buffer zones, and on protected species are provided.</p> <p>Markets are accessible. Product demand is adequate</p>

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions/Risks
<p>3.2. Land Compensation and Village Development Sustainable income-generating opportunities for the villagers affected by farmland-to-wetland restoration program</p>	<p>At least 30% of resettlement/land compensation costs utilized for village development</p> <p>At least one new livelihood project initiated and operational in each of 8 affected villages by project completion</p>	<p>Per capita and household income baseline and follow-up surveys</p> <p>Surveys of economic activities and results of village development fund investments</p>	<p>Assumptions: Government counterpart fund is available in timely manner.</p>
<p>3.3 Ecotourism Creation of ecotourism opportunities for communities and NRs, without adverse effects on wetland habitats or key species</p>	<p>Economically and environmentally sustainable ecotourism activities in place in 3 NRs by end of Project</p>	<p>Baseline and annual surveys of ecotourism activities, including assessment of community participation</p>	<p>NR management and local community are receptive to alternative, low-key ecotourism</p>
<p>4. Capacity Building</p>			
<p>4.1. Conservation Education Increased knowledge about conservation issues, and about local NRs, among schoolchildren and teachers</p>	<p>Conservation awareness program incorporated into curriculum of schools and implemented in 8 of pilot elementary and 4 secondary schools around 6 NR sites within first 2 years of project, reaching approximately 5,000 schoolchildren</p>	<p>Review of school curricula</p> <p>School administrative records</p> <p>Baseline and periodic conservation awareness surveys and evaluations administered through schools</p>	
<p>4.2. Conservation Awareness Increased knowledge of conservation among general public around 6 NRs, including appreciation of importance of protecting endangered species</p>	<p>Program for conservation on public awareness developed for 13 counties and at provincial level, and carried out over life of the Project, including at least 45% women participants, during the life of the Project</p> <p>Measurable reduction in capture of and trade in endangered species for export</p>	<p>Baseline and periodic surveys and evaluations of community awareness on conservation</p> <p>Community organization records</p> <p>Customs seizure records</p>	
<p>4.3. Wetland Management Training Short-Term Technical Staff at six NRs and community leaders (including women leaders) with enhanced conservation knowledge and skills Long-Term Professional NR managers in the northeastern of the People's Republic of China prepared to assume responsibility for ongoing management by end of the Project</p>	<p>Comprehensive, targeted awareness training administered to 300 NR staff and to 20 community leaders in 13 counties</p> <p>Comprehensive, targeted awareness training administered to at least 15 NR managers and staff during life of the Project</p>	<p>Baseline and follow-up human resource surveys of knowledge/understanding of NR technical staff, and of teachers/ community leaders, regarding wetland conservation principles</p> <p>Baseline and follow-up surveys of wetland management skills of NR management staff</p>	<p>Assumption: Staff stability and availability in NRs</p> <p>Risk: Trained staff are transferred to another NR site.</p>
<p>4.4 Institutional and Behavioral Change Internalization of sustainable environment principles and wetland conservation principles by key economic policy-makers and development planners at national, provincial, and county level Changes in attitude and</p>	<p>By 2010, all new relevant legislation incorporating sections on sound environmental, water resources management and wetland conservation</p> <p>Development plans at national, provincial, and county levels incorporating principles of sound environmental, water resources management and wetland conservation</p>	<p>Records of new bills and enacted legislation</p> <p>Planning records</p> <p>School activity and curriculum reports</p> <p>NR annual reports</p> <p>Surveys to assess student-teacher attitudes on environment and conservation</p>	

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions/Risks
<p>behavior among teachers, students, and community members</p> <p>NR managers with greater sense of stewardship, strengthened conservation ethic</p>	<p>New elective environmental programs initiated in schools, with 30% more participating students/teachers than at project inception</p> <p>Noncompliance cases reported on overuse/exploitation of wetlands resources (fishing nets, or reeds harvests) decline by 50% by the project end</p> <p>NR managers pass on knowledge and skills through mentorship of junior staff—at least 2-3 mentor-apprentice relationships created among staff in each NR</p>	<p>Surveys to assess NR manager mentorship skills</p>	
<p>Activities:</p> <p>1. Watershed Management</p> <p>1.1. Forestry Investments</p> <p>Plant 11,900 ha of new forestry plantations</p> <p>Treat 43,700ha of existing forestry plantations</p> <p>1.2. Local (NR) Level Water Resource Planning</p> <p>Establish local stakeholder working groups</p> <p>Conduct workshops</p> <p>Prepare water resources management plan inputs to overall NR management plans</p> <p>1.3. Watershed Level Water Allocation Plan</p> <p>Add conferences with local working groups</p> <p>Conduct training on wetland water supply and watershed level water resource allocation</p> <p>Develop and calibrate numerical models of water use and availability for Anban and Naoli watersheds</p> <p>2. Wetland Nature Reserve Management</p> <p>2.1. Conservation Management</p> <p>Establish water, wildlife and habitat monitoring programs in NRs</p> <p>Prepare annual monitoring reports, conduct workshops</p> <p>Establish geographic information systems (GIS) for 6 NRs</p> <p>Draft management plans for all 6 NRs</p>	<p>Site preparation, planting, and treatment operations proceeding per county schedule over 5-year period</p> <p>6 stakeholder working groups established (1 per NR) and operational by year 1</p> <p>Biannual water monitoring workshops conducted</p> <p>6 NR management plans produced by year 2 incorporating NR water allocation plans by year 3</p> <p>Gross water balance estimates completed for 5 NRs by year 1</p> <p>Numerical computer models completed for Anban and Naoli watersheds by year 2</p> <p>Water allocation and flood control policies developed by year 3</p> <p>Provincial and county water management staff participates in 5 annual interagency coordination workshops over life of Project.</p> <p>Permanent monitoring stations established for water, wildlife, and habitat monitoring by year 1</p> <p>Monitoring protocols recorded in monitoring manuals by year 2</p> <p>NR GIS set up by year 2 and data updated continuously</p> <p>Draft management plans prepared for 6 NRs by year 3</p>	<p>Annual operations plans and planting reports</p> <p>Project activity and progress report</p> <p>Review of stakeholder working group reports, workshop reports</p> <p>Assessment of water resource management plans and NR management plans</p> <p>Gross water balances and numerical computer models</p> <p>Provincial/county water allocation plans</p> <p>Water resource engineering reports</p> <p>Workshop reports</p> <p>Project activity and progress reports</p> <p>Water, wildlife and habitat monitoring program reports</p> <p>Monitoring manuals</p> <p>Annual monitoring workshop reports</p> <p>NR adaptive management plans</p> <p>Project activity and progress reports</p>	<p>Assumptions:</p> <p>Human resources are available for operations and technically competent at State forest farms.</p> <p>Stakeholders are interested in identifying and solving problems.</p> <p>County and provincial officials cooperate to share information.</p>

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions/Risks
<p>2.2 Pilot Wetland Restoration Restore 3,433 ha of farmland to wetland at model sites in 6 wetland NRs Provide input to NR management plan Develop and disseminate replicable wetland restoration models Conduct workshops, conferences, study tours and training as venues for information exchange on wetland restoration</p> <p>2.3. Wildlife Species Recovery Prepare and implement recovery plans for 8 globally threatened species Conduct symposium on project species recovery experiences</p>	<p>Restoration of wetland areas from farmland, measured annually, achieving specified targeted area by year 5 Wetland restoration models, including appropriate technologies and tools for information dissemination prepared by year 4 By project year 4, at least one national and one international study tour conducted By project year 5, international conference on wetland restoration organized and implemented</p> <p>Species Recovery Plans completed for 8 globally threatened species of waterfowl by end of year 2, and measures implemented by year 3</p>	<p>Annual inspection of restored wetland sites, and assessment of their functioning and condition Progress according to detailed restoration plans, activity schedules, and quality standards Wetland restoration model information packages Project activity and progress reports</p> <p>Species recovery plans Baseline and annual census of populations of key targeted wildlife species, and associated habitats</p>	<p>Assumptions: Members of Nature Reserve management staff remain unchanged throughout project implementation</p> <p>Risk: Various threats to the selected species continue to exist outside of the project pilot areas.</p>
<p>2.4. Reduction of Unsustainable Harvesting in NRs Conduct inventory of types and levels of exploitation of thatch grass, fish, wild herbs Develop and implement plan for reducing unsustainable harvesting in NRs</p> <p>3. Alternative Livelihoods 3.1 Intercropping and NTFP Plant 1,300 ha of NTFPs, in 6 counties Conduct studies on markets, prices, yields and costs to assess expansion opportunities for NTFPs</p> <p>3.2 Land Compensation and Village Development Develop detailed resettlement plans as per resettlement framework Prepare village development plans in affected villages Conduct community and stakeholder consultation</p> <p>3.3. Ecotourism Develop ecotourism feasibility study, master plan and environmental guidelines</p>	<p>Utilization inventories conducted by end of year 1 Harvesting reduction plans implemented by end of year 2 Prohibited activities minimized—number of apprehensions/seizures increased (with improved enforcement), then reduced and stabilized</p> <p>Intercropping proceeds per county schedules over 5-year period At least 20% of area converted from farmland to forest allocated for NTFP production NTFP market feasibility study report prepared</p> <p>Resettlement plans for all 6 NRs prepared by year 1 Village development plans of all 8 villages prepared and finalized by year 2 At least 1 new livelihood project processed, funded, and tested for possible revolving fund mechanism by year 5</p> <p>Ecotourism feasibility study and master plan guidelines prepared by year 1 At least 2-3 community-based ecotourism pilot projects initiated</p>	<p>Baseline and annual census of thatch grass, fish, wild herbs Harvest reduction monitoring Reports of violations/ apprehensions Project activity and progress reports</p> <p>Annual agroforestry reports Annual plantation intercropping/ NTFP reports NTFP market feasibility report Project activity and progress reports</p> <p>Resettlement plans Surveys of types of economic activity, and results of village development feasibility report Resettlement monitoring Project activity and progress reports</p> <p>Ecotourism feasibility and master plan Ecotourism guidelines Ecotourism pilot project reports</p>	<p>Assumptions: State farms within the project area cooperate with Heilongjiang Provincial Financial Bureau and finance resettlement cost in a timely manner</p>

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions/Risks
Develop ecotourism pilot projects, incorporating capacity building for local community and NR staff	beginning in year 2 at each NR, according to appropriate planning and screening processes	Project activity and progress reports.	
<p>4. Capacity Building</p> <p>4.1. Conservation Education (schools) Select pilot schools Prepare teaching kits Train teachers Develop and implement NR outreach/extension programs for schools</p> <p>4.2. Conservation Awareness (communities/SFFs) Develop public awareness strategies and campaign materials Implement public awareness strategies, including participation in national and international events (e.g., Earth Day, World Wetland Day)</p> <p>4.3. Wetland Management Training Conduct training needs assessment Develop and conduct short-term training courses and study tours for technical NR staff Develop and conduct formal courses for professional level NR staff</p> <p>4.4 Institutional and Behavioral Change Institutionalize mechanisms for improved interagency coordination on a sustainable basis Promote internalization of sustainable environment principles and wetland conservation principles</p>	<p>Conservation education programs developed by end of year 1 Teacher kits developed and teachers trained in their use by end of year 2 Conservation awareness program for schools incorporated into curriculum and implemented in pilot elementary and secondary schools in 5 counties starting in year 2 and running for remainder of the Project</p> <p>Conservation public awareness strategies developed in year 1 Conservation public campaign program developed for 5 counties by end of year 2, and carried out over life of the Project Web site up and running by year 2, and updated at least quarterly thereafter</p> <p>Training needs assessment completed by end of year 1 Beginning in year 2, short-term training courses for technical NR staff Beginning in year 2, formal higher level courses for professional level NR staff Exchange programs, study tours, internships, and workshops proceeding according to yearly program</p> <p>By project year 2, interagency coordination body (working group) formed, and meeting quarterly; working group transitioning into permanent working committee by end of project 5 key decision makers at national level, 10 at provincial level, and 40 at county level, completing advanced environmental awareness training program by end of project Conservation awareness programs reaching approximately 5,000 schoolchildren; 300 NR staff, 20 community leaders, and 15 NR managers and staff during life of Project</p>	<p>Surveys of school curricula at beginning and towards end of Project Conservation program design reports Attendance records of teachers at training events Frequency of NR presentations at local schools No. of teacher kits prepared/distributed</p> <p>Annual awareness program progress reports Monitoring of web site "hits," user feedback Project activity and progress reports</p> <p>Training needs assessment Annual short-term training and study tour reports Annual long-term training reports Surveys/evaluations of participants in training programs</p> <p>Working group/working committee meeting minutes Project training records Awareness surveys Mentorship skills evaluations</p>	<p>Assumptions: Support comes from educational and NR authorities/staff. Teachers are willing to take on this extra task.</p> <p>Strong involvement of public authorities at all levels in promoting awareness of environmental policies.</p> <p>The provincial supports professional quality improvements at NRs through staffing plans and incentives. There is commitment to maintaining high standards for training programs.</p>

Design Summary	Performance Indicators/Targets			Monitoring Mechanisms	Assumptions/Risks
Inputs:					
(\$ million)	Foreign Exchange	Local Currency	Total Cost		
1. Watershed Management	1.29	21.92	23.21	Project performance Monitoring System (PPMS), including <ul style="list-style-type: none"> - Implementation schedule - Consultants' reports - Disbursement of ADB loan and GEF grant funds - Annual progress reports - Project review missions 	Assumption: Allocation of local counterpart funds is timely
2. Wetland NR Management	2.18	3.22	5.4		
3. Alternative Livelihood	0.55	15.21	15.75		
4. Education Capacity Building	2.48	1.15	3.63		
5. Project Management	0.42	2.29	2.71		
Total Base Cost	6.92	43.79	50.71		
Contingencies	0.31	2.35	2.66		
IDC/ Financial Charges	2.18	0.00	2.18		
Total	9.41	46.14	55.55		

GIS=geographic information system; NR=nature reserve; NDRC= National Development and Reform Commission; SFA=State forest administration; VDF= village development fund

- 1 Oriental stork (*Ciconia boyciana*); red-crowned (*Grus japonensis*) and white-naped (*Grus vipio*) cranes; scaly-sided merganser (*Mergus squamatus*); swan goose (*Anser cygnoides*) and three other geese of the genus *Anser*, the greater white-fronted goose (*A. albifrons*), the lesser white-fronted goose (*A. erythropus*), and bean goose (*A. fabilis*); and Menzbier's pipit (*Anthus (gustavi) menzbieri*).

THREATS ANALYSIS

1. The Global Environment Facility (GEF) project design is based on threats analysis to remove the underlying causes of the problems identified. To facilitate project design, an analysis identified the immediate threats to biodiversity, along with underlying and root causes and possible avenues for addressing them. The outcome of the analysis is illustrated in Figure A2. The indicative threats analysis is summarized in Table A2. An extensive discussion, history of these threats, and an account of current threats are in Supplementary Appendix M.

2. The indicative threats analysis identified four main threats to globally significant biodiversity in the Sanjiang Plain: as (i) changes in hydrology/desiccation; (ii) conversion to farmland; (iii) inappropriate practices in the use of resources (overexploitation of resources, disturbances, and habitat degradation); and (iv) limited conservation awareness and capacity of nature reserve (NR) staff and adjacent communities. Underlying causes of water pollution are closely related to incorrect use or overuse of agricultural fertilizers in their farming activities and farmers' awareness on conservation. Following this analysis and the logical framework, the four main threats (and their underlying causes) are targeted by four closely linked project components, each with a set of subcomponents that address various aspects of the underlying causes.

3. Some of the underlying causes will not be addressed by the present Project, as they are already the focus of another project or beyond the scope of a GEF intervention. One of the unaddressed underlying causes pertains to NR legislation, regulations and zoning, and differences in how they are applied or interpreted at national and provincial levels. An Asian Development Bank (ADB) technical assistance,¹ being developed at present that will address environmental legislation. The underlying cause of pressures on natural resources due to increases in the human population is regarded as being outside the scope of a GEF intervention.

Table A2: Threats Analysis and Project Response Matrix

Threats/Constraints	Root Cause	Required Response	Proposed Project Intervention
<p>Increasing Wetland Dehydration</p> <p>Surface water drainage, diversion and/or storage systems</p> <p>Deforestation changing water balance</p>	<p>Government crop production policy and practice</p> <p>Limited understanding of water requirements of various users, including wetland nature reserves (NR)</p> <p>Road construction</p> <p>Flood management</p> <p>Irrigation supply</p>	<p>Forestry investments in watershed</p> <p>Integrated watershed-level water resource planning</p>	<p>Subcomponent 1.1, reforestation of 10,900 hectares (ha)</p> <p>Subcomponent 1.2, local-level (NR) water management</p> <p>Subcomponent 1.3, watershed-level water resources management</p>
<p>Wetland Conversion</p> <p>State Farm cropland expansion</p> <p>Leasing of farmland within NRs</p> <p>Expansion of road, rail transport corridors</p>	<p>Pressure to increase incomes by expanding crop production</p> <p>Some farmland existing before NR establishment</p> <p>Need for lease income for NR operations</p>	<p>Government farmland-to-wetland restoration with compensation</p> <p>Policy, regulation, and enforcement to prohibit conversion and do land use planning</p> <p>Increased financial</p>	<p>Subcomponent 2.1, management planning to guide transport development</p> <p>Subcomponent 2., pilot wetland restoration, including development of model, and development of manual.</p> <p>Subcomponent 3.2</p>

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Threats/Constraints	Root Cause	Required Response	Proposed Project Intervention
	Incorrect interpretation of legislation regarding experimental zones	allocation to NRs Integrated transport development planning and engineering Review of protected area legislation (focus of technical assistance on environmental legislation currently being formulated)	establishing village development mechanism for maintaining livelihood of villages affected by wetland restoration program Subcomponent 3.3, to stimulate sustainable ecotourism development Subcomponent 4.3, wetland management training to include capacity building in wetland restoration
Overexploitation of Wildlife and Plants Overfishing Overhunting Excessive plant product harvest Excessive medicinal herb harvest Excessive reed harvest	Increase household food supply Income generation Paper production Roofing material needs Fuel needs Construction material needs Few economic alternatives	Alternative income sources Improved enforcement of existing regulations and training Reduce exploitation to sustainable levels Education and training of NR staff in enforcement, management, and wildlife conservation	Subcomponent 2.4, reduction of overuse, to focus on achieving sustainability and eliminating unsustainable use forms Subcomponent 3.2, village development plans for maintaining livelihood schemes affected by resource use reduction program Subcomponent 4.2 focuses on raising awareness of farmers and state farm staff
Human Disturbance of Wildlife During Sensitive Periods (Nesting, Rearing, Migration) Households in wetlands Farms in wetlands Fishermen in wetlands Hunters in wetlands Tourists in wetlands Capturing wildlife for display in NR visitor centers	Existence before NR establishment To increase crop production To increase household income To obtain food supply Recreation Low awareness of wildlife biology and general conservation needs	Enforcement of existing regulations on use of NR zones Resettlement of households and removal of farmland from NRs Development of tourism management plans Conservation education among villagers Education and training of NR staff	Subcomponent 2.2, pilot wetland restoration, including development of model, and development of manual Subcomponent 2.4, reduction of overuse, to focus on achieving sustainability and eliminating unsustainable use forms Subcomponent 3.3, development of ecotourism master plans and guidelines Subcomponents 4.1 (education), 4.2 (awareness), and 4.3 (training)
Habitat Degradation (Other Than Related to Conversion) Anthropogenic fire Overgrazing	Forage improvement Livestock industry development "Controlled burns" as precaution against catastrophic fire Untrained NR personnel	Relocation & compensation of grazers Husbandry programs for grazing, hay, fire Education and training of NR staff	Subcomponent 2.4, reduction of overuse, to focus on achieving sustainability and eliminating unsustainable use forms Subcomponent 4.2, awareness of local farmers and State farms Subcomponent 4.3, training of NR staff

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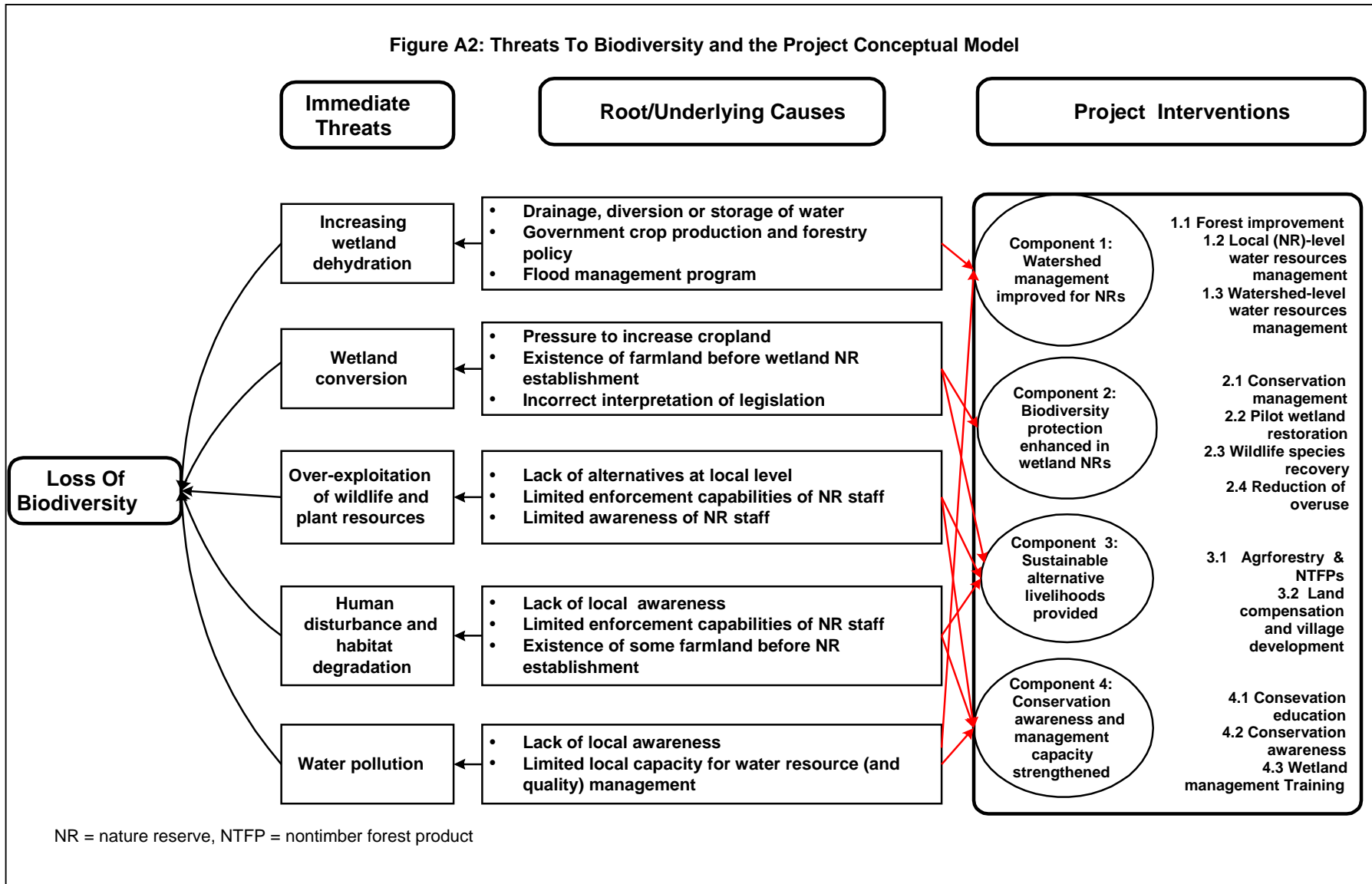
Threats/Constraints	Root Cause	Required Response	Proposed Project Intervention
Water Pollution Agricultural fertilizers and pesticides Sedimentation Sewage	To increase crop production Excessive use of agrochemicals due to poor user practice No facilities for treatment of effluents	Increase public/state farm awareness Water resource planning for water quality Development of best management practice	Subcomponent 1.2, local-level (NR) water resources management Subcomponent 4.2, awareness of local farmers and State farms

NR= nature reserve; TA= technical assistance.

¹ ADTA-PRC. Support for Environment Legislation for \$600,000, programmed for 2004. One of the focal areas of this to-be-approved TA will be legislation related to protected area management.

Source: Asian Development Bank estimates.

Figure A2: Threats To Biodiversity and the Project Conceptual Model



**KEY EXTERNAL ASSISTANCE RELEVANT TO HEILONGJIANG PROVINCE AND
TO THE ENVIRONMENTAL SECTOR (1994-2004)**

Source	Project Name	Sector ^a	Loan/TA (\$million)	Year of Approval
Loan Projects				
ADB	1. Changchun-Harbin Expressway: Hashuang Expressway	Transport	170.00	1998
	2. Qitaihe Thermal Energy and Environmental Improvement	Energy	165.00	1994
	3. Changchun-Harbin Expressway: Changyu Expressway	Transport	220.00	1998
	4. Northeast Flood Damage Rehabilitation: Heilongjiang Province	Multisector	110.00	1999
	5. Yellow River Flood Management (Sector) Project	Others	150.00	2001
	6. Songhua River Flood Management Project	Others	150.00	2002
	7. Harbin City Water Supply	Social infrastructure	100.00	2003
	Total		1,065.00	
World Bank	1. Grain Marketing Development	Agriculture	6.30	1994
	2. Comprehensive Agricultural Development in HLJ	Agriculture	12.00	1997
	3. Social Welfare System in HLJ	Health, Nutrition and Social Protection	0.25	1999
	4. Milk Production Base	Agriculture	10.00	2003
	Total		28.55	
Technical Assistance Projects				
ADB	1. Soil and Water Conservation in the Upper Yangze River Basin	Agriculture	0.10	1998
	2. Provincial Legislation on Environmental Protection and Natural Resources Conservation	Others	0.30	1998
	3. Policies and Strategies for Sustainable Development of the Lancang River Basin	Agriculture	0.66	1998
	4. Capacity Building in Ministerial Status Responsibilities in State Environmental Protection Administration	Others	0.81	1999
	5. Yellow River Flood Management Sector Project	Agriculture	0.93	1999
	6. Songhua River Flood Wetland and Biodiversity Management	Agriculture	1.55	1999
	7. Preparing National Strategies for Soil and Water Conservation	Agriculture	0.80	2000
	8. Global Environmental Facility Partnership on Land Degradation in Dryland Ecosystems	Agriculture	0.10	2000
	9. Transjurisdiction Environment Management (TA cluster)	Others	2.10	2000
	10. Ningxia Shapoutou Water Resources	Agriculture	0.93	2000
	11. Strategic Planning Study for the Preparation of the Yellow River Law	Agriculture	0.97	2001
	Total		9.24	

^a Sector Classification for Asian Development Bank (ADB) projects are based on project processing information system record. Others may be considered as environment.

Note: Other GEF assistance to the People's Republic of China is summarized in Supplementary Appendix N.
Source: ADB estimates.

THE ROLE OF THE GLOBAL ENVIRONMENT FACILITY (GEF) IN THE PROJECT

A. Broad Development Objective

1. The northeastern part of the People's Republic of China (PRC) is one of the last areas in this huge and biologically rich country to be drained and converted to agriculture. Because of this late development, threats and risks are high on some of the last remaining tracts of wetland and native forests with their associated biological diversity, including many endangered and rare species.

2. The PRC gives high priority to wetland biodiversity conservation, watershed protection and sustainable management of natural resources. By the end of 2000 the PRC had established 1,276 nature reserves (NRs) covering 123 million hectares (ha), or 12.4% of the national land area. Some 12 million ha of the total protects wetlands, representing nearly half of the estimated total of 25 million ha of natural wetlands in the PRC. The PRC ratified the Ramsar Convention on 31 July 1992, and three wetland NRs (Honghe, Sanjiang, and Xingkaihu NRs) in the Sanjiang Plain are listed as wetlands of international importance (i.e., Ramsar sites). The PRC subsequently ratified the Convention on Biological Diversity on 5 January 1993, followed by notification of participation in the restructured GEF on 16 May 1994. The PRC's Biodiversity Conservation Action Plan gives conservation of the Sanjiang Plain highest priority.

3. The Sanjiang Plain (or Three Rivers Plain) is located in Heilongjiang Province in the far northeastern part of the PRC. The Plain formerly extended over 108,900 (km²), with half forest and half wetlands, but these forest and wetlands have been reduced to one fifth of their original area, mainly due to the expansion of agriculture. Key wetlands and globally threatened species are now primarily found in NRs, but management of these areas is beset with challenges. Given the presence of key populations of globally important species in the Sanjiang Plain, the Project is expected to have significant global environmental benefits.

B. Rationale for GEF Involvement

4. The Sanjiang Plain has some of the PRC's most important and largest (almost one million ha, or 10,000 km²) floodplain wetlands. Located on this plain are 28 of Heilongjiang's 58 wetland NRs of which the 6 key NRs (Anbanghe, Dajihe, Naolihe, Qixinghe, Xingkaihu, and Zhenbaodao) will be targeted by the Project. The six NRs support key populations of 23 species listed by the International Union for the Conservation of Nature (IUCN) as globally threatened (i.e., endangered or vulnerable), and include breeding populations of Oriental stork, red-crowned crane, white-naped crane, Baikal teal and Chinese softshell turtle. The six support unique wetland habitats that have largely disappeared in the region, nowadays.

5. In 1998, the Heilongjiang provincial government (HPG) issued a decree suspending wetland development in the province and preventing further conversion to farmland; the suspension was reinforced in June 2003 with the adoption of the Regulation on Wetland Conservation of Heilongjiang Province. To address losses, HPG developed plans for restoring of >150,000 ha (or 1,500 km²) of farmland to wetlands within wetland NRs in the Sanjiang Plain, and in 2003 the provincial Forestry Department began implementing of the restoration program.

6. The Project aims at sustainable management of natural resources to protect globally significant species and promote economic development. The Project's global biodiversity objective is to protect the Sanjiang Plain wetland ecosystems and their associated globally significant biodiversity by relieving threats and associated root causes of their decline. Globally significant biodiversity in the Sanjiang Plain faces four main threats, namely, (i) changes in

hydrology/desiccation, (ii) conversion to farmland, (iii) inappropriate land use practices, and (iv) limited conservation awareness and capacity of NR staff and adjacent communities. These threats and their underlying causes will be targeted by four interdependent Project components

- (i) **Component 1. Outcome: NR watershed management improved.** The Project will increase forest cover, improve forest management (to reduce surface runoff, and increasing soil water retention and groundwater recharge), and enhance watershed-level water resource management.
- (ii) **Component 2. Outcome: Biodiversity protection in wetland NRs enhanced.** The Project will develop models and the capacity for wetland NR conservation management, and embed component outputs in NR management plans.
- (iii) **Component 3. Outcome: Alternative livelihoods developed and sustained.** The project will develop and implement programs for sustainable livelihood in villages affected by the reforestation program (under component 1) and farmland-to-wetland restoration (under component 2)¹ to ensure that the restoration programs have lasting beneficial effects.
- (iv) **Component 4. Outcome: Conservation awareness and capacity for sustainable management of wetland NR biodiversity increased.** The Project will develop and implement conservation education at local schools, public awareness programs for State farms and communities in/around NRs; and a targeted training program for NR staff and other stakeholders. This will be directly linked to component 2; for example, development of the NR management plan and species recovery plans will be incorporated into the long-term training program.

7. The Project is fully compliant with the GEF operational strategy in the focal area of biodiversity and consistent with GEF's Operational Program 2 (OP#2) aimed at conservation and sustainable use of biological resources in coastal, marine, and freshwater ecosystems. The project may further have linkages with the other OPs as sustainable development activities. However, efficiencies are achieved in the Project by combining complementary baseline and incremental activities as an integrated package. Individual programs alone would contribute to only local and national benefits. But when integrated, the linkages provided by sustainable development activities will further enhance global incremental benefits, which largely contribute to the objectives of OP#2. The Project will also enhance the objectives of

- (i) OP#3 Forest Ecosystems, as a total of 11,900 ha of new forest plantations will be planted on degraded, unproductive farmland and deforested/eroding areas. In addition, 43,700 ha of existing forestry plantations will be subjected to improved management and upgrading;
- (ii) OP#12 Integrated Ecosystem Management, as it takes an integrated, basin wide approach to the management of water and other natural resources, and will establish an institutional framework (based on existing structures) to achieve this; and
- (iii) OP#15 Sustainable Land Management, as management of catchments will be upgraded and vastly improved via the forestry program (i), and also assist with

¹ No physical resettlement of people is involved, but the compensation is for loss of access to farmland in the NRs. Due to readjustment of villages' remaining land, village collectives rather than individuals are affected.

identifying, developing, and promoting sustainable land management in areas adjacent to/near the wetland protected areas.

8. The Project aims at developing models that can be replicated to provide much-needed examples for ongoing provincial programs. This approach is fully compatible with the objectives of GEF's Strategic Priority BD-1: catalyzing sustainability of protected areas; BD-2: mainstreaming biodiversity in production landscapes and sectors; and BD-4: generation and dissemination of best practices for addressing current and emerging biodiversity issues. The Project will significantly contribute to BD-1, BD-2, and BD-4, as outlined in Project Contribution to Operational Programs and Strategic Directions of GEF Business.²

9. Sustainability of benefits and achievements beyond the completion of the GEF Project will be positively affected by (i) promulgation of the Regulation on Wetland Conservation of Heilongjiang Province, which took effect on 1 August 2003, and lays a solid foundation for long-term improvement in wetland conservation in the Sanjiang Plain; (ii) financial commitments confirmed by HPG for implementing of the farmland-to-wetland and farmland-to-forest restoration programs; (iii) availability of already ongoing financial assistance by National Development Reform Commission (NDRC) for affected communities from the farmland-to-wetland program, rather than the simple provision of funds directly as compensation; (iv) strong commitment of the PRC Government to improve water resource management, among others, by improving watershed management; (v) development of practical/workable models for wetland restoration (including restoration of local livelihood schemes) that are targeted to the local situation in the Sanjiang Plain; (vi) strong emphasis of the Project on capacity building; this is included in each of the components, especially component 4, which is entirely focused on education, awareness education, and training, along with development of training modules and curricula; (vii) emphasis on interagency collaboration under a single provincial government and in all project areas under the jurisdiction of Heilongjiang Province, increases sustainability.

10. HPG has agreed to utilize wetland restoration models (including livelihood restoration) developed by the Project in its farmland-to-wetland restoration program, under which over 150,000 ha will be restored to wetland NRs in the Sanjiang Plain alone. Funds have been allocated for this replication by NDRC. The Project will facilitate the program by providing much-needed examples of how restoration can be achieved successfully, and maximizing benefits to biodiversity conservation. The watershed-level water resources management approach will provide a model for water resources management (and allocation for conservation) to the Song-Liao Water Resources Commission, allowing replication in subcatchments in the entire Songhua River basin and much of northeast PRC. The production of training manuals and development of training curricula will facilitate further replicability of the model framework. In particular, the Project will be led by one provincial government, facilitating interagency coordination of water, forestry, agriculture, and environmental protection departments. Thus, lessons learned will be of great value in the course of replication in other contexts under the broader framework of river basin management.

C. Quantification of GEF Contribution

11. GEF funds the incremental costs of activities required to secure global environmental benefits that would not normally be undertaken as part of national sustainable development (SD) intervention. Therefore, GEF involvement is justified for activities aimed at achieving global environmental objectives (OP#2) over and above national SD costs.

² Supplementary Appendix O: Project Contribution to Operational Programs and Key Indicators of GEF Business Plan.

12. Global benefits from the Project will be derived from (i) protection of endangered species, (ii) conservation of ecosystems that are under threat, and (iii) improved watershed management and wetlands habitat quality, leading to increased number of wildlife. Replicability of the project model framework throughout the Sanjiang Plain will enhance the global environmental benefits. Quantification of incremental costs in achieving global benefits over and above national SD costs is presented in Annex B of the GEF Executive Summary (Supplementary Appendix D). The key approach in quantifying GEF contribution is summarized below.

13. **Business as Usual (BAU) Baseline.** The BAU baseline assumes continued investment by the Government and aid agencies in watershed and water resource management, nature conservation, and further expansion of the protected area system. It also assumes continued (but modest) investment by the Government in wetland restoration and reforestation, but under the following practices: (i) There will be an established network of wetland NRs and annual government allocations of funds to manage them. (ii) NRs would, however, continue to operate without management plans and use approaches that have proved to be less effective at stemming the decline of globally important species. (iii) Recovery of globally threatened species would not be accelerated unless projects are specially designed for that purpose. (iv) Existing programs would restore some farmlands to wetlands, but compensation payments to displaced farmers would not be designed to yield long-term economic benefits, nor would there be any incentives for adopting environment-friendly approaches compatible with wetland protection. (v) Water resources would be allocated first to municipalities, then to industry and agriculture; if a surplus remained, it would be available for NR use. (vi) Commercialized tourism facilities would be developed in the experimental zone of NRs due to incorrect interpretation of regulations, but this would come at a cost in terms of disturbing wetland habitat. (vii) Lack of training and education would continue to hamper NR personnel in performing their duties. (viii) Communities surrounding NRs would not be aware of the importance of conservation management. (ix) Populations of globally threatened species would continue to decline or at best show only marginal recovery. (x) Sufficient funds would not be allocated and trained personnel would not be available to fully protect wetland biodiversity or carry out the mandates of the various conservation action plans. The cost of the baseline scenario has been calculated at \$39,850,000.

14. **Sustainable Development (SD) Alternative.** The SD alternative adds to the BAU baseline investments by the government (including the Asian Development Bank loan) in reforestation, and investments in economic development in villages affected by both the farmland-to-forest and the farmland-to-wetland restoration programs. The investments will improve environmental management and conditions, but will be mainly of national benefit. Implementation of the SD alternative over the 5 years of the Project is expected to cost approximately \$79,510,000.

15. **GEF Alternative.** The GEF alternative scenario adds to both the BAU baseline and SD alternative activities that are designed to achieve the Project's global biodiversity objectives, and that are expected to generate significant global benefits. Implementation cost of the GEF alternative scenario over the 5 years of the Project (July 2005–June 2010) is as follows.

16. **Incremental Cost of GEF Alternative.** The estimated cost of the BAU baseline is \$39,850,000; that of the SD alternative, \$79,510,000; and that of the GEF alternative, \$90,557,000. The incremental cost is \$11,047,000.³ If contingencies (\$1,100,000) are included, the amount requested from GEF is \$12.14 million.

³ \$90.5 million minus \$79.5 million equals \$11.0 million, which is the base cost of the GEF financing portion. Then, \$90.5 million minus \$39.8 million equals \$50.7 million, which is the total baseline cost of the Project.

PROJECT COSTS AND FINANCING PLAN

Table A5.1: Whole Project Cost Summary

Component	CNY Million			\$ Million			Foreign Exchange (%)	% Total Base Cost
	Foreign	Local	Total	Foreign	Local	Total		
1. Watershed Management								
1. Forest Improvement	9.77	174.04	183.81	1.18	21.03	22.21		
2. Local Watershed Resource Management	0.75	1.99	2.74	0.09	0.24	0.33		
3. Watershed Level Resource Management	0.16	5.36	5.53	0.02	0.65	0.67		
Subtotal	10.68	181.39	192.08	1.29	21.92	23.21	6	46
2. Wetland Nature Reserve Management								
1. Habitat Conservation Management	7.78	7.32	15.10	0.94	0.88	1.82		
2. Pilot Wetland Restoration	4.72	11.76	16.48	0.57	1.42	1.99		
3. Wildlife Species Recovery	5.58	6.00	11.58	0.67	0.72	1.40		
4. Reduction of Overuse	0	1.56	1.56	0	0.19	0.19		
Subtotal	18.09	26.64	44.72	2.18	3.22	5.40	40	11
3. Alternative Livelihoods								
1. Agroforestry and nontimber forest products	0	35.92	35.92	0	4.34	4.34		
2. Resettlement Compensation and Village Development ^a	0	86.39	86.39	0	10.44	10.44		
3. Ecotourism	4.54	3.55	8.09	0.55	0.43	0.97		
Subtotal	4.54	125.86	130.40	0.55	15.21	15.75	3	31
4. Education and Capacity Building								
1. Conservation Education	1.76	1.99	3.75	0.21	0.24	0.45		
2. Public Conservation Awareness	0.90	1.13	2.03	0.11	0.14	0.24		
3. Wetland Management Training	17.86	6.44	24.30	2.16	0.78	2.94		
Subtotal	20.52	9.56	30.08	2.48	1.15	3.63	68	7
Project Management Office	3.45	18.96	22.41	0.42	2.29	2.71	15	5
Total Baseline Costs	57.28	362.40	419.68	6.92	43.79	50.71	14	100
Contingencies	4.67	40.39	45.06	0.30	2.25	2.65	24	5
Total Project Costs	61.96	402.79	464.75	7.23	46.14	53.36	14	105
Interest During Implementation	16.96	0	16.96	1.96	0	1.96		
Commitment Charges	1.96	0	1.96	0.22	0	0.22		
Total Costs to Be Financed	80.87	402.79	483.66	9.41	46.14	55.55	17	110

Source: Asian Development Bank estimates.

^a Includes resettlement compensation costs of \$9.16 million.

Table A5.2: Project Costs, by Expenditure Accounts

Item	CNY Million			\$ Million		
	Foreign	Local	Total	Foreign	Local	Total
A. Investment Costs						
1. Civil Works	0.00	115.52	115.52	0.00	13.96	13.96
2. Equipment and Vehicles	15.37	5.19	20.56	1.86	0.63	2.49
3. Materials	4.24	27.89	32.13	0.51	3.37	3.88
4. Training	10.5	11.13	21.63	1.27	1.34	2.61
5. Consulting Services	27.17	35.75	62.92	3.28	4.32	7.60
6. Resettlement Compensation and Village Development	0.00	75.81	75.81	0.00	9.16	9.16
7. Intercropping and nontimber forest products Work	0.00	53.67	53.67	0.00	6.48	6.48
B. Recurrent Costs						
1. Operation and Maintenance	0.00	20.49	20.49	0.00	2.48	2.48
2. Salary	0.00	6.55	6.55	0.00	0.79	0.79
Taxes/Duties	0.00	6.38	6.38	0.00	0.77	0.77
Total Baseline Costs	57.28	362.40	419.68	6.92	43.79	50.71
Contingencies	4.67	40.38	45.05	0.30	2.34	2.64
Total Project Costs	61.96	402.79	464.75	7.23	46.14	53.36
Interest during Implementation	16.96	0.00	16.96	1.96	0.00	1.96
Commitment Charges	1.96	0.00	1.96	0.22	0.00	0.22
Total Costs to Be Financed	80.87	402.79	483.66	9.41	46.14	55.55

Source: Asian Development Bank Estimates.

Table A5.3: Components, by Financier (\$ million)

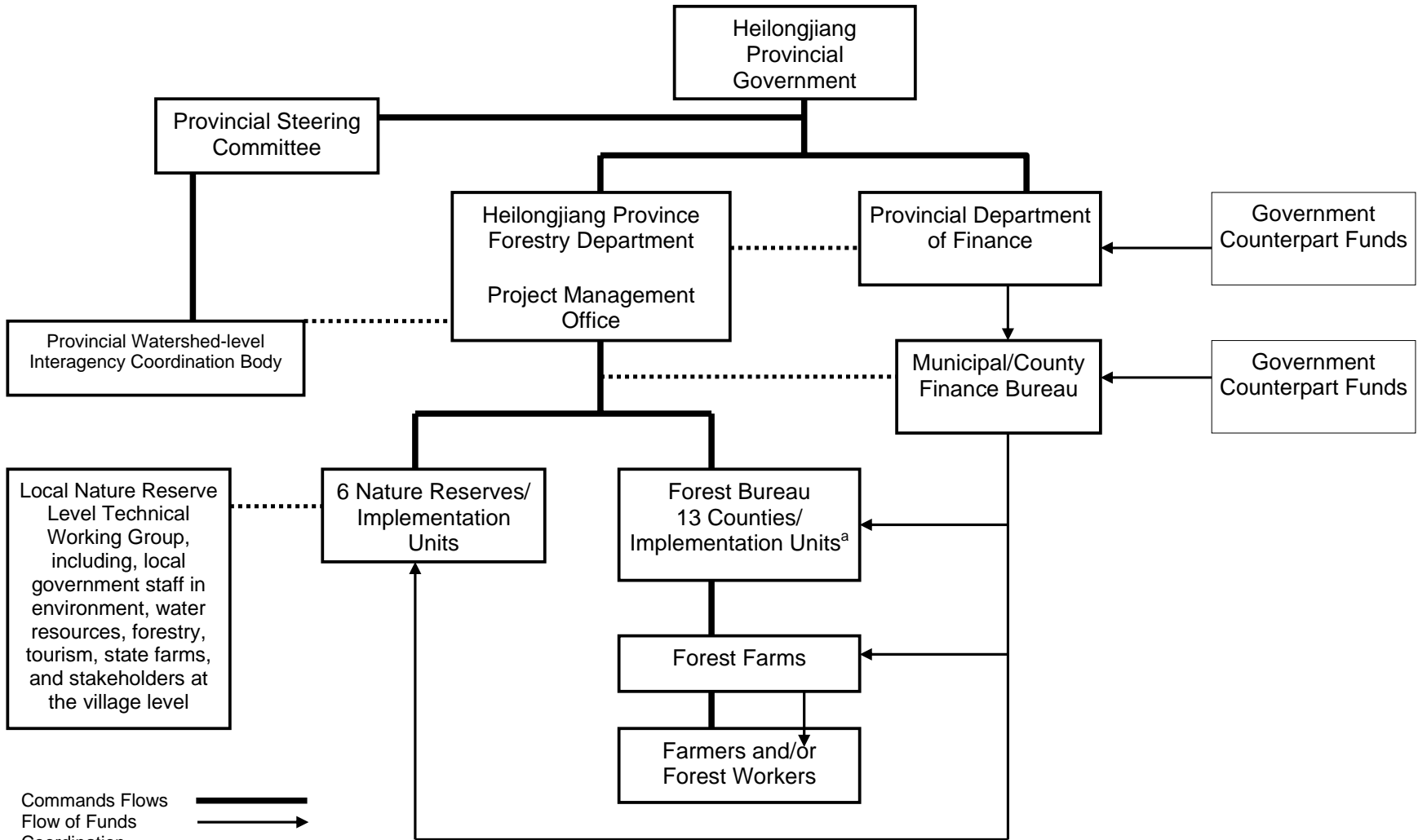
Component	ADB	GEF	Government	County	
				Government	Total
A. Watershed Management	12.92	0.83	7.23	3.50	23.44
B. Nature Reserve	0	4.40	1.23	0	5.63
C. Alternative Livelihood	1.47	2.42	12.18 ^a	0.53	16.60
D. Capacity Building	0	3.17	0.63	0	3.81
E. Project Management	0.61	1.32	0.91	0	2.84
Total Project Cost	15.00	12.14	22.19	4.04	53.37
Interest during Construction	0	0	1.96	0	1.96
Commitment Charges	0	0	0.22	0	0.22
Total Project Cost to Be Financed	15.00	12.14	24.37	4.04	55.55

ADB=Asian Development Bank, GEF = Global Environment Facility.

^a Including resettlement compensation costs of \$9.16 million.

Source: Asian Development Bank estimates.

PROJECT ORGANIZATION CHART



Commands Flows **—————**
 Flow of Funds **—————>**
 Coordination **.....**

^a Project implementation unit at Baoqing county as a field coordination office.

IMPLEMENTATION SCHEDULE

Component Activities and Key Tasks	2005			2006			2007			2008			2009			2010		
A. Watershed Management																		
1. Forestry Improvement																		
a. New Plantations	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
b. Plantation Treatment	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
2. Local-Level Water Management				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
3. Watershed-Level Water Resource Planning				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
B. Wetland Nature Reserve Management																		
1. Conservation Management				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
2. Pilot Wetland Restoration																		
a. Design	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
b. Implementation				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
c. Monitoring							■	■	■	■	■	■	■	■	■	■	■	
3. Wildlife Species Recovery				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
4. Reduction of Resource Exploitation				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
C. Alternative Livelihood Program																		
1. Agroforestry and Nontimber Forest Products				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
2. Land Compensation and Village Development				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
3. Sustainable Ecotourism				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
D. Capacity Building																		
1. Conservation Education				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
2. Public Awareness				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
3. Wetland Management Training				■	■	■	■	■	■	■	■	■	■	■	■	■	■	
E. Project Implementation Support				■	■	■	■	■	■	■	■	■	■	■	■	■	■	

Full implementation



Project phase out



SUMMARY RESETTLEMENT FRAMEWORK

A. Scope of Resettlement Impacts

1. The Project will finance wetland protection and forest plantation in projects in the Sanjiang Plain, covering 13 counties¹ in 6 prefectures², and involving 6 nature reserves.³ The Project will include four components: watershed management, wetland NR management, alternative livelihood program, and education and capacity building. Environmental policies in Heilongjiang Province require restoration of ecological conditions, especially in the Sanjiang Plain. Environmental policies, in general, have substantial impacts on farming activities in wetlands, and involve significant cost implications for resettlement compensation. This issue has delayed the Government's environmental programs for wetland and forest restoration. The Project will pilot a livelihood development approach that will ensure income opportunities are restored or improved at lower cost to the Government, and will benefit community relations with the NR management. The success of the approach depends on the participation of affected persons (APs) and NRs in planning, and implementing viable and sustainable alternative livelihood options.

2. The resettlement impacts induced by the Project are mainly associated with the sub-component of farmland-to-wetland restoration. Of the total 3,433 hectares (ha) to be converted from farmland to wetland, about 1,433 ha (1,183 ha in core zones and 250 ha in experimental zones) will be in 5 NRs and will affect 820 persons, of whom 186 are State farm workers. Along with land acquisition, 1,950 square meters (m²) of houses owned by the State farm will be demolished. The demolition will necessitate the physical relocation of about 43 households or 136 individuals who occupy these shelters during the farming season. The other 2,000 ha of farmland in Naolihe NR has already been abandoned, but the wetland still needs to be restored. In 2001, about 318 workers from the Honqiling State farm were affected and provided replacement farmland in nearby villages. An assessment of the situation found that the state farm has already restored the livelihood schemes and incomes of these people. Under the Project, the abandoned land would be restored to wetland, and the State Farm (or villages affected) would be eligible for compensation funding for alternative livelihood development. In 13 counties, 10,800 ha of land will revert to its original legal use as commercial forest, of which 4,300 ha is currently being farmed by 1,770 forest workers in 28 State forest farms and 447 farmers in 12 villages; these workers are employees of State forest farms and are contracted to attend to the lands with salary payments. No minority villages or groups will be affected by the Project. However, the subproject resettlement plans (RPs) will verify whether any individual ethnic minority people will be affected by resettlement.

B. Legal Framework

3. People are strictly prohibited from living in the core zone of wetland NRs. Those who are presently farming in the core zone of the wetland NRs will be relocated immediately and all productive activities will stop. Those who live in the buffer zone should move out step by step.⁴ According to the Chinese Land Administration Law, land acquisition caused by an infrastructure project will require the developer to pay compensation to the current land owners/users. For this Project, the impacts caused by ecological restoration are in accordance with the wetland protection regulation by which land use rights are restricted, and there may be no transfer of

¹ The 13 counties are Baoqing, Boli, Fuyuan, Hegang, Huanan, Hulan, Jixian, Linkou, Luobei, Mishan, Ningan, Qitahe, and Raohe.

² The six prefectures are Hegang, Jiamusi, Jixi, Mudanjiang, Qitaihe, and Shuangyashan.

³ Anbanghe NR, Dajiahe NR, Naolihe NR, Qixinghe NR, Xingkaihu NR, and Zhenbaodao NR.

⁴ The Heilongjiang Provincial Wetland Protection Regulation (2003).

landownership. The Nature Reserve Protection Regulation of PRC, Article 27 states, “For those people who live in the core zone of nature reserve, the local government should resettle them appropriately.” But there is no detailed regulation of land compensation rates about farmland restoration to wetland. According to the Asian Development Bank's (ADB) *Policy on Involuntary Resettlement*, if any project causes individuals or a community to lose all or part of their land, housing, infrastructure, resources, income sources, and services, they will be compensated in cash or kind so that their economic and social circumstance will be at least restored to the pre-project level. Thus, all compensation is based on the principle of replacement cost.⁵

4. For the farmland-to-forest restoration, there is potential for loss of incomes during the years that the trees are growing. The standard practice in the People's Republic of China is to provide an annual subsidy of 100 kilograms of grain and CNY20 in cash to local farmers for each mu (1/15 ha) of farmland converted to forestland, for 8 years for natural forest or 5 years for commercial forest.⁶ This practice is considered costly and welfare oriented, and may not fully restore lost incomes. Therefore, under this Project, a different approach has been taken—the Project will finance the planting of nontimber forest products (NTFPs) for people affected by the conversion. They will receive replacement forestland and wages for tree planting, and simultaneously implement intercropping for 3-5 years on the newly planted forest area at a nominal fee of CNY6-7/mu/year (or land contracting fees may be waived). In this manner, the affected people will be able to maintain or even increase their income from the land. The project will finance the NTFP for these people at the estimated cost of CNY35.92 million (\$4.34 million).

5. The Heilongjiang Provincial Government (HPG) will ensure that any resettlement under the Project is carried out in accordance with relevant PRC laws and regulations, ADB's *Policy on Involuntary Resettlement* and *Handbook on Resettlement*, and the resettlement framework agreed upon by HPG and ADB (including the provisions on eligibility for compensation, compensation rates, rehabilitation measures, institutional arrangements, resettlement costs, consultation, disclosure and grievance redress, and monitoring and evaluation). For the six NRs with farmland-to-wetland restoration, RPs with village-level resettlement and development plans must be disclosed to APs, and submitted to ADB for approval before the award of civil works contracts or displacement of farmers.

C. Eligibility for Compensation

6. All APs, regardless of their legal status, will be compensated and rehabilitated. Lack of legal documents of their customary rights or occupancy certificates will not bar them from obtaining compensation. The resettlement policy will apply to all components of the Project regardless of whether or not they are directly financed by ADB. Particular attention will be paid to the needs of vulnerable groups among those affected, especially the poor, the elderly, women, and children. Based on the principle of replacement cost, the annual income loss from land will be the annual net output value. The dry land compensation rate is CNY2,500/mu, and the paddy compensation rate is CNY3,500/mu. The compensation rates for houses will be CNY700/m².

D. Rehabilitation Measures

7. After land acquisition, the affected villages or State farms will readjust the farmland within the groups, thus ensuring that the APs obtain adequate farmland to replace lost crop production. Development of alternative livelihood programs will be encouraged as part of the RP

⁵ ADB. 2003. *Involuntary Resettlement, Operations Manual* (Section F2/OP). Manila. Available Lotus Notes database, LNADBG1.

⁶ Farmland to Forestry and Grassland Restoration Notice (2000).

to increase the income of villagers through alternative livelihood or investment opportunities. The villages or State farm will utilize part of the land compensation costs to implement a village development plan.⁷ The villages and State farms will be encouraged to invest in production activities that enhance or are at least compatible with wetland protection.

8. In Xingkaihu State farm, 43 households need to be relocated from the core zone of the NR. The affected houses belong to the State Farm, so the house compensation will be paid to the farm directly, and the farm will select the new site outside the NR, rebuild the new houses, and then allocate them to all affected families. In addition, a transfer and transportation allowance and cash compensation for loss of other private properties will be provided to each household. Xingkaihu State Farm will be responsible for site preparation, electricity connection, water supply, and road construction.

9. For those who will be affected by farmland conversion to forestland, landownership will not be transferred. The affected workers or villagers will receive wages for tree planting and maintenance and can share in the profits of forestry. Due to the long period for trees to mature, the APs will be permitted to practice intercropping between the seedlings for 3-5 years. Also, the Project will develop at least 860 ha of NTFPs for the APs to ensure incomes will be maintained or increased. In addition, villagers can benefit from the subsidy policy (footnote 6) of the central Government and the provincial governments.

E. Resettlement Cost and Funding

10. About \$9.16 million (CNY75.8 million) of the \$24.37 million government counterpart fund will be required to pay for resettlement, i.e., compensation, physical resettlement, and village development. HPG will set up an account for the resettlement costs (compensation and village development), which will be managed by the Heilongjiang Province Financial Bureau (HPFB). After the VDP is approved, HPFB will disburse the fund to the affected village committee or State farm through the County Financial Bureau. The funds for land compensation and resettlement have been guaranteed by HPG. The proposed funding sources are the Provincial Wetland Restoration Fund and the central Government fund of the State Farm Bureau.

F. Institutional Arrangement for Resettlement

11. County-level project implementation units (PIUs) under the Forestry Department will be set up and be responsible for supervising RP preparation and implementation. The county land administration bureaus will assist the county management office to implement the RP, and will be responsible for land inventory and acquisition approvals.

G. Consultation, Disclosure, and Grievance Redress

12. Consultation with the APs has taken place in the early process of resettlement planning. The draft RPs have been disclosed to the county and township offices and the affected villages. A resettlement information booklet for two draft RPs has been distributed to the affected villagers. Further information will be provided to all APs before implementation. Such consultation and participation will be continued throughout the planning and implementation process. A formal mechanism for grievances will be established, in addition to standard informal procedures.

⁷ Tentatively, 30% will be utilized for livelihood development.

H. Monitoring and Evaluation

13. Following the requirements of ADB, there will be both internal and external monitoring and evaluation of both the farmland-to-wetland, and the farmland-to-forestland programs. The aim is to ensure that all APs are compensated adequately and timely, and assess whether their incomes and livelihood are restored after resettlement and rehabilitation. Each county PIU will carry out internal monitoring and report to the project management office (PMO) and ADB. For external monitoring and evaluation, the PMO will engage an independent institution such as a university or a social research institute. Monitoring and evaluation will cover the progress of implementation, compliance with resettlement policies, delivery of compensation funds, allocation of replacement land, changes in income and livelihood among APs, consultation, and participation.

I. Procedural Guidance for Resettlement Plan Preparation

14. For the farmland-to-wetland restoration component, a resettlement framework and two preliminary RPs for Xinkaihu NR and Qixinghe NR have been prepared for ADB approval. The reason for the resettlement framework is the need for a community-based process to formulate alternative livelihood schemes as the basis for resettlement. Further consultation with the APs and with the NR PIUs will be carried out to formulate VDPs. This approach will ensure that viable and sustainable alternative livelihood schemes are developed to offset lost income from farming, especially activities that are compatible with wetland protection. It will take time to set up the PIUs, strengthen the staff of NRs, and prepare VDPs for the affected villages. The six subprojects RPs (two draft RPs and four new RPs) will require further community consultation and participation of villagers, local officials, and NR staff to identify and agree on alternative livelihood schemes. VDPs will specify (i) where the compensation funds will be invested, (ii) what activities will be established under resettlement compensation counterpart, according to the VDP agreed upon, and (iii) how the village collectives and affected farmers will share the benefits from the planned village development activities. The proposed activities should meet environmental and income-generating criteria. The VDPs should be approved by the PMO of HPG and ADB, before the State farm or village committee receives the compensation and before displacement of farmers from the NRs. The Project will provide some technical assistance in formulating VDPs and consultations.

J. Action Plans and Schedule

15. The project implementation schedule will be refined during the first year of the Project. However, resettlement planning will be carried out once the Project is approved. The full resettlement framework is in Supplementary Appendix H, including preliminary action plans and schedules for farmland-to-wetland restoration.

INDICATIVE CONTRACT PACKAGES

Item	Estimated Total Cost (\$ million) ^a	Packages (no.)	Mode of Procurement
A. Civil Works			
1. Forest Improvement	19.17	Multiple	FA
2. Wetland Restoration	0.97	Multiple	FA
3. Nontimber Forest Products	2.78	Multiple	FA
B. Equipment, Materials, and Vehicles			
1. Forest Improvement Equipment	1.78	3	LCB
2. Nature Reserve Equipment, Materials, and Vehicles	0.91	3	IS
3. PMO Equipment, Materials and Vehicles	0.66	Multiple	IS/DP
C. Training and Study Tours			
1. Domestic Training	1.49	Multiple	IS/ DS
2. Overseas Training and Study Tours	1.19	Multiple	IS/DS
D. Consulting Services^b			
1. PMO Management Support	1.83	1	QCBS
2. Consulting Services for Implementation	5.22	1	QCBS

DP = direct purchase, DS = direct selection, FA = force account, LCB = local competitive bidding, IS = international shopping, PMO = project management office, QCBS = quality-and cost-based selection.

^a Excluding resettlement compensation costs.

^b International consulting firm in association with domestic firms.

Source: Asian Development Bank estimates.

CONSULTING SERVICES REQUIREMENTS

Component ^a and Experts' Field/Designation	Services (person-months)			Cost (\$'000)		
	Domestic	Int'l.	Total	Domestic	Int'l.	Total
1.0 Watershed Management						
- Stakeholder Working Group	10		10	25		25
- Water Studies in Nature Reserves	6	4	10	15	80	95
- Watershed Hydrologic Studies	3		3	8		8
- Policy Development	5	6	11	13	120	133
- Hydraulic Engineering	7		7	18		18
2.1 Habitat Conservation Management						
- Nature Reserve Management	42	16	58	127	320	447
2.2 Pilot Wetland Restoration						
- Wetland Restoration	48	16	64	145	320	465
2.3 Wildlife Species Recovery						
- Species Recovery	42	16	58	127	320	447
2.4 Reduction of Overuse						
- Resource Productivity	24		24	58		58
- Evaluation and Planning	18		18	44		44
- Monitor and Modify Plan	18		18	44		44
- Produce Guidelines	18		18	44		44
3.2 Village Development Plan						
- Village Development Consultant	11	11	22	33	275	308
3.3 Pilot Ecotourism Development						
- Ecotourism	12	8	20	36	160	196
4.1 Outreach to School System						
- Training in Public Awareness	10	4	14	30	80	110
4.2 Increase Public Awareness						
- Public Participation Specialist	5	2	7	15	40	55
- Media External Relation Specialist	5	2	7	15	40	55
4.3 Wetlands Management Training						
- Wetlands Management Specialist	12	12	24	43	178	220
5.0 Project Management Office						
- Wetlands Expert Advisor		15	15		300	300
- Monitoring and Evaluation Specialist ^b	28		28	84		84
- Monitoring and Evaluation Coordinator	60		60	120		120
- Monitoring Field Teams	120		120	60		60
- Financial Management Specialist	12		12	24		24
- Resettlement Specialists	12		12	18		18
Total	528	112	640	1,143	2,233	3,376

^a Components are in boldface.

^b specialist will spend approximately 50% of his/her time on environmental compliance and benefit monitoring, which is covered by an environment management plan budget, and is essentially a full-time position.

Source: Asian Development Bank estimate.

CAPACITY BUILDING PROGRAM

Capacity Building Course	Course Duration (days)	2005		2006		2007		2008		2009		Total	
		C	T	C	T	C	T	C	T	C	T	C	T
A. Short Course National (Activity 4-3-2)													
1. Habitat and vegetation mapping (using GPS, GIS)	10	1	10	1	10	1	10	1	10	1	10	5	50
2. Biodiversity survey, monitoring, and data management (GPS, GIS)	10	1	10	1	10	1	10	1	10	1	10	5	50
3. Conservation law, enforcement, and patrolling	10	1	10	1	10	1	10	1	10	1	10	5	50
4. Wetland restoration	10	1	10	1	10	1	10	1	10	1	10	5	50
5. Protected area management	10	1	10	1	10	1	10	1	10	1	10	5	50
6. Methods in education, public awareness, and outreach	10	1	10	1	10	1	10	1	10	1	10	5	50
B. Long Course International (Activity 4-3-3)													
1. Wetland science	45	1	1	1	1	1	1	1	1	1	1	5	5
2. Wildlife management and species recovery using GIS	45	1	1	1	1	1	1	1	1	1	1	5	5
3. Watershed management and GIS	45	1	3	1	3	1	3	1	3	1	3	5	15
4. Community relations and participation	45	1	3	1	3	1	3	1	3	1	3	5	15
5. Nature reserve management and conservation law and regulation	45	1	1	1	1	1	1	1	1	1	1	5	5
6. Tourism in protected areas	45	1	3	1	3	1	3	1	3	1	3	5	15
C. Language for International Training													
1. English language	45	6	12	6	12	6	12	6	12	6	12	30	60
D. Long Course National/University (Activity 4-3-4)													
1. Wetland science	45	1	2	1	2	1	2	1	2	1	2	5	10
2. Wildlife management & species recovery using GIS	45	1	2	1	2	1	2	1	2	1	2	5	10
3. Watershed management and GIS	45	1	4	1	4	1	4	1	4	1	4	5	20
4. Community relations and participation	45	1	4	1	4	1	4	1	4	1	4	5	20
5. Nature reserve management and conservation law and regulation	45	1	2	1	2	1	2	1	2	1	2	5	10
6. Tourism in protected areas	45	1	4	1	4	1	4	1	4	1	4	5	20
E. Exchanges and Study Tour (Activity 2 and 4)													
1. National	14	2	12	2	12	2	12	2	12	2	12	10	60
2. International	14	2	12	2	12	2	12	2	12	2	12	10	60
F. Conference, Workshops and Seminar													
1. National	Various	3	6	3	6	3	6	3	6	3	6	15	30
2. International	Various	3	6	3	6	3	6	3	6	3	6	15	30
G. Unallocated													
	90	1	3	1	3	1	3	1	3	1	3	5	15
Total		35	141	30	142	30	141	30	141	30	139	155	704

C = courses; GIS = geographic information system, GPS = global positioning system; T = Trainees
 Source: Asian Development Bank estimates.

FINANCIAL AND ECONOMIC ANALYSES

A. Introduction

1. This is an evaluation of the financial and economic benefits and costs of the Sanjiang Plain Wetland Protection Project. The Project has five components: (i) watershed management, (ii) wetland nature reserve management, (iii) alternative livelihood, (iv) education and capacity building, and (v) project implementation. Wetland nature reserve management is largely associated with global environmental benefits, while subcomponents of watershed management (forest improvement) and alternative livelihood (nontimber forest product [NTFP] intercropping) components will generate financial and economic analyses are based mainly on the benefits and costs associated only with national benefits. The financial cash flows and economic value flows were estimated on an incremental basis.

2. The proposal is to use 55,600 hectares (ha) of land for forestry improvement—11,900 ha for new plantations and 43,700 ha for treatment of existing stands—and 2,380 ha for NTFPs. About 25% of forestry improvement will involve poplar, and the rest, larch. The plantations will cost CNY55 million; treatment, CNY129 million; and NTFPs, CNY35 million. The Project will have a total cost of CNY420 million, excluding contingencies, and a construction period of 5 years (from mid-2005 to mid-2010). The Project will use funds from ADB, Global Environment Facility (GEF), and the Government of the People's Republic of China (PRC), as well as labor inputs from State forest farm workers. These sources can be categorized into three: debt (ADB loan), equity (GEF and labor input), and government funds. GEF and labor input are treated as equity because they are assumed to have the same required rate of return. The weighted average cost of capital (WACC)—the weighted sum of estimates of the cost of debt, cost of government funds, and cost of equity—is 6.11%.

B. Least Cost Analysis of Alternatives

3. The Project provides a major opportunity to examine the possibility of reducing tree planting density, thereby improving the economic efficiency of forest plantations over current practices. Both provincial and county reports were reviewed very thoroughly, and numerous discussions were held with technical staff of the Heilongjiang Provincial Forestry Department. Forest plantation practices in Heilongjiang Province are based on traditional standards, which in this particular case involve narrow spacing with one thinning for larch and no thinning for poplar. Two options with varied spacings and tending costs were compared, and the spacing distance of 2 meters (m) x 2.5m for larch (2,000 stems/ha) and poplar (1,250 stems/ha) was selected to allow wider spacing between trees—and therefore lower plantation and tending costs—with one thinning for both larch (at age 12) and poplar (at age 6). The financial and economic analyses are based on this option, as it lowered plantation and tending costs and added the opportunity for NTFPs.

C. Financial Analysis

4. **Focusing on Revenue-generating Activities.** The activities include (i) establishing new forest plantations of native species of larch and poplar, (ii) treating of existing forest plantations of the same species, and (iii) producing NTFPs. The assumptions in computing the financial internal rate of returns (FIRRs) and net present values (NPVs) and the results of the financial analysis are as follows. The incremental cash flow for the financial analysis includes sales revenue from commercial forestry and NTFP development. Final harvest volume projections per hectare are based on a 20-year rotation (with one thinning at age 12) for larch, and a 10-year

rotation (with one thinning at age 6) for poplar. The Faustmann model¹ was used to estimate optimal rotation years for poplar and larch, using the WACC as a discount rate for maximum NPV with a single rotation during the Project. Net thinning volumes removed are 9 cubic meters (m³)/ha for larch and 22 m³/ha for poplar, while final harvest net volume removals are 115 m³/ha for larch and 99 m³/ha for poplar. These volume parameters were applied to both new and existing plantations. New forest plantations and stand treatment operations will take place in all 13 project counties. It is assumed that most of the total net volume of larch and poplar will be old to pulp mills, while some will be sold as mine pit props and as raw material for other wood products. County reports and additional surveys indicate larch prices of CNY400/m³ at final harvest and CNY300/m³ at thinning, and poplar prices of CNY380/m³ at final harvest and CNY350/m³ at thinning.

5. Estimated Costs and Expenditures for Plantations. Per hectare, cost structures for new forest plantations add up to CNY5,200 for larch and CNY4,600 for poplar, and treatment costs for existing plantations total CNY3,500/ha for both larch and poplar. These cost structures include overhead costs based on general and administrative expenses directly connected to the plantation operations under the proposed project. Additionally, the cost of goods sold includes logging and transportation costs. Logging cost is assumed at CNY170/m³ for larch thinning, and CNY140/m³ for felling; and CNY140/m³ for poplar thinning and CNY 110/m³ for poplar felling. Transportation cost is assumed at CNY12.5/m³ for both species. Additional financial charges include a plantation fund surcharge and a sales tax. The plantation fund surcharge is estimated at 10% of sales revenue, which is the current effective in the PRC. Sales taxes for timber raw material and surcharges are estimated at 5% of sales revenue. Price contingencies and interest during the construction period are excluded from the financial analysis. In treatment of existing plantations, it is assumed, on the basis of the with and without principle, that untreated plantations would have 30% of the harvest value of a healthy plantation on account of much deadwood, small diameters, trees with poor form, and damage from insects and diseases.

6. Financial Assumptions for NTFPs. In addition to timber products, three NTFPs (berry fruit, wild grape, and potherbs) will be planted in the commercial forestry plantations. While forestry operations will take place in all 13 project counties, only those counties with new plantations will participate in NTFP production. These are Boli for berry fruit; Huanan for wild grape; and Baoqing, Hulin, Linkou, and Luobei for potherbs. The NTFP yields are projected very conservatively in light of spotty information obtained in the field. A price of CNY2/kg for all three products was assumed. The cost of harvesting has been projected at CNY1/kg and transportation cost at CNY42/metric ton, assuming an average distance to markets of 50 kilometers NTFP sales are subject to a 7% sales tax on agricultural products. The project life is released at the end of the Project for commercial forestry and NTFP development. The WACC was calculated as 6.11%, which is used for calculating the financial NPV of the Project.

7. Results of Financial Analysis. The overall FIRR of the Project is 14.93%. Detailed calculations are shown in Supplementary Appendix P. The NPV evaluated at the WACC is CNY124 million, which is greater than zero. Since the FIRR is higher than the WACC and the NPV is positive, the proposed Project is financially viable under the above assumptions. The FIRR and NPV by activity and by county were also calculated and the results are shown in Table A12.1. An important conclusion from the calculations is that all types of activities included are financially viable, and so are the operations programmed for each county. Treating existing plantations has a higher FIRR than establishing new ones. The main reasons are that existing plantations have the advantage of a sunk cost from their original planting, treatment costs are

¹ The Faustmann analysis shows that larch can reach maximum NPF at 20 years as the optimal rotation year. For poplar, the optimal rotation year is chosen at 20 years from the analysis, since there are not enough historical data to show the maximum output level.

lower than plantation costs, volume outputs from treatment are assumed to be the same as those from new plantations, and benefits are reaped more quickly from treated plantations than from new ones. Additionally, the FIRR for treating poplar is higher than that for treating larch, mainly because the waiting period with poplar is shorter. This is so even after considering an opportunity cost of 30% of harvest value if the stand were left untreated. Among the counties, Hegang, Jidong, Linkou, and Qitahe show FIRRs slightly in excess of 10%, while Raohe has the highest FIRR, at more than 29%. The first four counties are heavy in larch and new plantations and treatment, while Raohe has major areas of poplar treatment. The three NTFPs are also shown to be profitable, with FIRRs from 12.2% to 22.78%, based on the current market data analysis.

8. FIRRs and financial NPV sensitivities were tested at plus and minus 10% for the following variables: (i) wood prices, (ii) wood final harvest volumes, (iii) investment costs, and (iv) all costs. The sensitivity analysis for the major components shows that the 10% changes, when unfavorable, do not reduce the FIRRs below the WACC, neither in the aggregate nor in any particular county. While the Project is most sensitive to wood prices, it remains quite robust at a 10% change in any of these variables. The sensitivity analysis is summarized in Table A12.2. Switching-value analysis was conducted for wood prices, which turned out to be the most sensitive variable in the sensitivity analysis. Even with a drop of 12% in wood prices, the counties with the lowest FIRR could still have a viable operation.

D. Economic Analysis

9. The GEF-supported activities emphasize global environmental values such as protection of globally endangered species. Various components of the Project are expected to generate either global environmental benefits, national environmental benefits, or both. However, the economic evaluation of the Project is conducted from the perspective of national benefits to assess its investment rationale.

10. **Economic Benefits Related to Forestry and NTFP Investments.** The major economic benefits from forestry plantation are the cash inflow from timber production, expressed in economic prices, as well as plantations, new seedlings, and maturing trees providing improved soil cover. Other related benefits include watershed improvement, flood control, protection from soil erosion, and potential production of other NTFPs. Flood control benefits may often be estimated on the basis of flood damage avoided or minimized, especially in public and private infrastructure and in industrial and agricultural outputs. In the proposed Project, flood control benefits can take the form of reduction in losses of agricultural output. The proposed plantations will also help the PRC reduce greenhouse gas emissions while protecting watershed and wetland biodiversity.² However, these other benefits are not easily quantified and for this reason were not included in the economic analysis. Economic benefits derived from NTFPs were converted from financial benefits, but valued at prices before tax.

11. **Economic Benefits Related to GEF-Supported Investments.** The four other components are designed to improve global environmental values through various interventions, including those that will produce marketable products as well as secondary benefits. Rehydrating the wetlands will recharge the groundwater, moderate stream flows (thus mitigating floods and drought), reverse changes in the microclimate, and protect the water supply, among other benefits. Recreational activities can include nature observation, bird watching, and camping. But biodiversity and critical habitat benefits, although they could be substantial, are

² Like other trees, larch and poplar sequester carbon dioxide from the atmosphere during their natural growth. It has been estimated that forests can sequester more than 0.5 million tons of carbon over their rotation periods. However, the value of sequestered carbon is highly variable since the market for this commodity has not been established, and is therefore not used in this analysis.

not easily valued, especially since they are based on non-use values. Hence, only economic benefits related to plantation, treatment, and NTFPs are included in the economic analyses.

12. **Economic Costs and Other Technical Parameters.** Basic costs and prices are the same as those used in the financial analysis. However, all financial values were adjusted to reflect economic values. A shadow exchange rate factor of 1.01 was applied to all costs and benefits other than labor. For labor, a shadow wage rate of 0.8 was applied. Taxes (5% sales tax on timber, 10% plantation fund surcharge on total timber revenue, and 7% sales tax on NTFPs) were excluded from the economic calculations. In the case of economic NPVs, a discount rate of 12% was applied. Incremental economic costs of the Project include expenditures expressed in economic values for forestry plantations, but not for the GEF-supported investment costs and subsequent cash outflows. The analysis was conducted for a project life of 25 years, including the construction period, which is conservative for the types of environmental benefits. Costs and benefits are expressed in yuan, in constant 2004 prices.

13. **Opportunity Cost of Land Converted to Forest Plantation.** Two types of land are acquired to prepare sites for plantations. One is barren land owned by the State forest farms, with an opportunity cost of zero. The second type is land in State forest farm territory but currently being cultivated for crop production, mainly to provide partial welfare as off-season work to employees, or to retired former employees of the State forest farms. Nevertheless, current regulations severely restrict crop production on forestlands. These lands, if cultivated, must revert to forests. The opportunity cost of these lands reverting to forests is lost crop production. In the Sanjiang Plain the marginal loss of crop production has been estimated at CNY938/ha, or RMB63/mu. NTFP production was designed to offset this lost crop revenue for those who previously cultivated the land. Table A12.3, which compares the NPVs of plantation, NTFP production, and crop production (per year on average), shows that NTFP is sufficient to offset lost crop revenue and that plantation forests have positive NPV.

Table A12.3: NPV Per Hectare for Various Land Use Options (yuan; 12% discount rate)

Land Use Options	NPV/ha
Barren land	0
Plantation	2,078
NTFP	8,939
Total Forestry (Plantation + NTFP)	11,017
Crop Production	7,406

NPV = net present value, NTFP = nontimber forest product.

Source: Asian Development Bank estimate

14. **EIRR and ENPV Calculations.** The economic internal rate of return (EIRR) for the Project as a whole is 24.8%, which is higher than the economic opportunity cost of capital (12%). The economic net present value (ENPV) at 12% discount rate is CNY93.03 million, which is positive. Therefore, the Project is viable from the economic point of view. The EIRR and ENPV for different activities and for all the counties are summarized in Table A12.1.

15. **Sensitivity Analysis for EIRR and ENPV.** Sensitivity analyses conducted in the economic analysis of the same variables as in the financial analysis show that the Project is not only financially but also economically robust. All the counties continue to have economically viable operations despite unfavorable changes of up to 10% in the variables considered. (Table A12.2). Additionally, switching-value analysis indicates that, to reduce the EIRR to below 12% for the lowest-performing counties (Hegang, Jidong, Linkou, and Qitahe), wood prices would have to drop by more than 15%.

16. **Labor and Impact on Poverty.** In addition to the cited economic benefits, the Project also provides farmers with employment opportunities in tree planting, stand treatment, logging, and wood transport. Once the plantations are mature, there will be further employment opportunities in harvesting, conversion, and use of forest products, especially wood. Assuming 55,600 ha of forestry operations (both new plantations and treated plantations remain under tree cover and labor-intensive methods are used for forestry operations), about 10,000 full-time jobs can be created in planting, treatment, logging, and transport to woodyards (7 months for about 36,000 forestry workers on larch plantations, and 6 months for about 10,000 forestry workers on poplar plantations).

Table A12.1: Summary of FIRR and EIRR by Investment Type and by County

Item	FIRR (%)	Financial NPV (CNY)	EIRR (%)	Economic NPV (CNY million)
Plantation				
Larch			12.62	
Poplar			29.74	
Treatment				
Larch			17.50	
Poplar			74.17	
NTFP				
Berry Fruit			35.33	
Wild Grape			24.39	
Portherb			25.38	
Total			24.77	
County				
Baoqing			36.60	
Boli			25.82	
Fuyan			38.87	
Hegang			16.15	
Huanan			27.14	
Hulin			33.06	
Jidong			16.18	
Jixian			24.79	
Linkou			16.02	
Luobei			17.24	
Mishan			33.31	
Qitaihe			15.92	
Raohe			51.39	
Total			24.77	

EIRR = economic internal rate of return, FIRR = financial internal rate of return, NPV = net present value, NTFP = nontimber forest product.

Source: Asian Development Bank estimates.

Table A12.2 Summary of the Results of Sensitivity Analysis

Item	Financial Analysis		Economic Analysis	
	FIRR (%)	FNPV (CNY million)	EIRR (%)	ENPV (CNY million)
Wood Price -10%	11.34	65.72	21.66	64.80
Wood Harvest Volume -10%	13.76	103.01	23.69	81.42
Investment Cost +10%	14.02	117.11	23.61	89.11
Total Costs +10%	11.07	70.26	21.16	69.10

EIRR = economic internal rate of return, ENPV = economic net present value, FIRR = financial economic internal rate of return, FNPV = financial net present value.

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?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the sector identified as a national priority in country poverty partnership agreement?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>Contribution of the sector or subsector to reduce poverty in the People's Republic of China (PRC): Through plantation, treatment of existing plantations, development of nontimber forest products, many employment opportunities and diversified and more sustainable livelihood opportunities will be available to poor forest workers and farmers, as well as minority groups and women. The development of alternative livelihood schemes will also help the poor shift to sustainable use of natural resources while generating income, thus reducing the poor households' wanton cultivation of environmentally fragile areas of the Sanjiang Plain. In the medium to long -term, they can also benefit from the high returns from forest plantations when these reach maturity. With farmland conversion to wetland and the establishment and rejuvenation of natural reserves, the local vulnerable environment will be improved, which in turn will reduce the occurrence of natural disasters such as flooding, and will improve the yield performance of poor households that are producing nontimber products. The proposed Project's good practices in the development of sustainable livelihood options, plantation of forest products, treatment of existing plantations, and sustainable development of nature reserves can serve as models that may be replicated in the PRC's other environmentally fragile areas with a poor population base.</p>			

B. Poverty Analysis

Targeting Classification: General Intervention

What type of poverty analysis is needed?

The national-level official rural poverty lines for Heilongjiang Province are RMB1,300 per capita net annual income for the poverty villages and RMB1,000 RMB per capita net annual income for the poverty households (which is comparable to the ADB's poverty threshold for the country). Of the 13 cities and counties of the Project in the Sanjiang Plain, there are three nationally designated poverty counties (Raohe, Huanan, and Fuyuan). The rural poverty population in these counties is 388,692 persons, accounting for 15% of the total poverty population of the province. Poverty incidence is 9.7% in Heilongjiang and 9.19% in the directly affected project area. Therefore, there is no severe poverty issue in the directly affected project areas, and this Project is classified as "general intervention."

Compared with the average household in the province, poor households in the poverty villages of the project area obtain their income from farming and have less income from livestock and migrant labor. Many of the poor farmers in the project area live in and around the nature reserve (NR). They depend primarily on earnings from the cultivation of land from the nature reserve that have been converted to farmland or from work in the state forestry/agricultural farms that are located in or adjacent to the NRs. Some of these farmers (referred to as permanent residents) have obtained long-term user rights of arable land that have been allocated to them by the village committees. Other farmers (or contract farmers) who are not recognized by the local governments as local residents of the area obtained short-term contracts to farmland plots owned by state forest and agricultural farms. Aside from these poor farm households, about 10% of the total households in the state forest and agriculture farms can be considered poor. The income sources of these poor households are 60% from farming, 10% from collecting agarics, mushrooms, and wild vegetables gathered from the NR area, 10% from forest/agriculture farm salaries, and 20% from other sources such as animal husbandry and fruit trees. Because of the various national and provincial policies to protect forestry and wetland resources, incomes of forest workers have declined through the years as their tasks have been limited largely to tending the trees and to tree planting. Underemployment is high, with a typical farm worker providing about 3-4 months of work in a year and earning RMB2,500 for that work.

Though poverty is not extensive, a key cause of income poverty is the limited livelihood opportunities both on-farm and off-farm. Where there is work in the state forest/agriculture farms, these are more and more being constrained by public policies that protect and conserve the already fragile and limited forestry and wetland areas of the Sanjiang Plain. With limited skills for other income-earning activities and constraints to credit access, poor farm households and workers tend to be averse to changing their farming work, which at present provides them secure and stable income, despite the more frequent occurrence of natural disasters (like drought, waterlogging, flood, early forest, and soil erosion) that adversely impact their farm income.

The other disadvantaged groups in the project area include women and minority groups. Not only do women perform household chores; they are also engaged in productive activities. Women contribute 50%, 70%, and 60% of forest,

agarics, and crop production. In crop (mainly rice, corn, and soybeans) production, women take about 60% of the workload in preparing the land planting, weeding, applying fertilizer, and harvesting. In logging operations, women are responsible for cutting limbs, preparing fuelwood, and tending trees. About two thirds of those employed in the paper processing and other agroprocessing facilities are women. Because of their huge contribution to farming and forestry-related activities, women often make decisions in their respective households over the sale of most of the products. However, within the villages and the state forestry/agriculture farm levels, women’s participation in the planning and decision-making process is still limited; they are constrained to borrow funds; and they have limited access to skills-enhancing activities.

Raohe is the main county with a small group of ethnic minority. Currently, there is no project component in the vicinity of Hezhe minority villages in Raohe. Koreans in the villages of Yongfeng and Dongsheng in Raohe might be affected by conversion of 300 ha of farmland to wetlands in the Dajiahe NR if the selected areas are confirmed. Loss of land and related income from paddy farming will affect 37 households. The adverse impacts on the two Korean villages can be compensated under the resettlement plans and mitigated under the village development plans to develop alternative livelihoods schemes.

C. Participation Process

Is there a stakeholder analysis? Yes No
Stakeholder analysis: A stakeholder analysis was conducted during the project preparatory TA (technical assistance) and roles of each stakeholder were well-defined. The stakeholders at each level were consulted during the TA: government ministries/agencies at the national to local levels, local governments from provincial down to village levels, state-owned and local forest/agriculture farm leaders, workers, women, rural community leaders, the poor farmer households, minorities, and nongovernment organizations. Their expectations and needs were identified, the potential project impacts on them were identified, and the resettlement plans, gender development plans, minority development plans, and public participation plans were developed in consultation with the stakeholders.

Is there a participation strategy? Yes No
Participation strategy: To strengthen the project design and enhance the sustainability of the Project, a community-based approach to project planning, implementation, monitoring and evaluation will be emphasized during all phases of implementation. To enhance the sense of ownership, three community-level project working groups will be set up: project planning working group, project implementation group, and project monitoring group. The groups will play different roles throughout the Project. Each group will include community leaders, women, and the poor. The social assessment and public participation plan is in Supplementary Appendix G.

D. Gender Development

Strategy to maximize impacts on women:
Gender Analysis: Division of labor by gender is evident in the project area—men are more inclined to conduct outside activities, operate as migrant labor, and conduct heavy physical activities, while women are more responsible and tend to carry out farming and household chores. Women have lower education levels than men and have less representation in community affairs. Other features of women are participation and involvements in economic activities have been detailed above.

Gender and development plan: Project will not have significant negative impacts on women, but equal representations of both gender in development planning and implementation have been strengthened in the project design, given the fact that local project staff have low gender sensitivities and lack the knowledge and skills for gender analysis and incorporation. The gender development action will facilitate and encourage women’s involvement throughout project implementation, ensure tangible benefits for both female and male community members, and address the gender impact on the proposed activities in the project areas.

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	<input checked="" type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None	Resettlement plan (RP) will be prepared in line with ADB policy.	<input type="checkbox"/> Full <input type="checkbox"/> Short <input type="checkbox"/> None

Affordability	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None	This Project does not provide services in nature. The affected people do not need to buy services that are generated from this Project and will not be affected by affordability of other services.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Labor	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None	Surplus laborers (working time) are common in the project area. Alternative livelihood projects have been designed in the Project.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Indigenous Peoples	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None	The minorities are primarily located in Raohe county, but are not directly affected by the Project. Some farmland, which may have to be converted to wetland in individual cases, will be given special consideration in employment opportunities in new forest plantations, and treatment of existing plantations and alternative livelihood. They can also own the trees to be planted in their contracted land. The local government will fully compensate them for their land converted to wetland according to the resettlement framework.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Other Risks and/or Vulnerabilities	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None		<input type="checkbox"/> Yes <input type="checkbox"/> No