Report No. 14013-CHA

People's Republic of China
Nature Reserves Management Project

Project Document
April 1995

Agriculture Operations Division
Country Department II
East Asia and Pacific Regional Office

(As of February 1, 1995)

Currency Unit = Yuan (Y)
$1.00 = Y 8.50
Y 1.00 = $0.11

FISCAL YEAR

January 1 - December 31

WEIGHTS AND MEASURES

1 cubic meter (m^3) = 35.31 cubic feet
1 hectare (ha) = 15 mu
1 ton (t) = 1,000 kg
= 2,205 pounds
1 kilogram (kg) = 2.2 pounds

ACRONYMS AND ABBREVIATIONS

BAP - Biodiversity Action Plan
CAS - Chinese Academy of Sciences
CDA - Course Development Advisor
CIG - community investment grant
CITES - Convention on International Trade of Endangered Species
CRMP - community resource management plan
DFP - Department of Forest Protection
DNR - Division of Nature Reserves
EA - environmental assessment
FAO - Food and Agricultural Organization of the United Nations
FRDPP - Forest Resources Development andProtection Project
GEF - Global Environment Facility
GET - Global Environment Trust Fund
GIS - geographic information system
GOC - Government of China
ha - hectare
ICF - International Crane Foundation
IUCN - International Union for the Conservation of Nature (or World Conservation Union)
kg - kilogram
km - kilometer
m - meter
M&E - monitoring and evaluation
MF - Management Forum
MFO - Ministry of Forestry
mm - millimeter
MOF - Ministry of Finance
MRL - Mountain, Rivers, and Lake Commission
NAP - National Afforestation Project
NEPA - National Environmental Protection Agency
NGO - non-governmental organization
NR - nature reserve
NRMIS - nature reserve management information system
NRMP - Nature Reserves Management Project
NRTT - nature reserve training team
ONR - Office of Nature Reserves
PMC - World Bank Loan Project Management Center (MFO)
PMO - Project Management Office
PRA - participatory rural appraisal
spp - species
TA - technical assistance
TAG - Technical Assistance Group
UNDP - United Nations Development Programme
UNESCO-MAB - United Nations Educational, Scientific, and Cultural Organization, Man and Biosphere Reserve
WCMC - World Conservation Monitoring Centre
WCS - Wildlife Conservation Society
WWF - World Wide Fund for Nature
YPFD - Yunnan Provincial Forestry Department

PART I: PROJECT SUMMARY

CHINA

NATURE RESERVES MANAGEMENT PROJECT

Grant and Project Summary

Grantee: People's Republic of China

Beneficiaries: Five nature reserve areas in Yunnan, Jiangxi, Fujian, Shaanxi, and Hubei Provinces; the Forestry Department of Yunnan Province; and the Ministry of Forestry

Amount: SDR 12 million (US$17.9 million equivalent)

Terms: Grant

Financing Plan:

	Local	Foreign	Total
	US$ million		
GET Grant	11.1	6.8	17.9
Central Govt.	2.4	0.0	2.4
Provincial Govt.	1.6	0.0	1.6
Beneficiaries	1.7	0.0	1.7
TOTAL	16.8	6.8	23.6

Poverty Category: Not Applicable

Economic Rate of Return: Not Applicable

CHINA

NATURE RESERVES MANAGEMENT PROJECT

1. Background. China, rich in biological diversity, contains about ten percent of the world's plants, mammals, birds, reptiles, and amphibians. However, over the past few decades, increasing population pressures and development activities have eroded China's biodiversity resources. The combination of a large population (estimated at 1.185 billion people in 1993 with an annual growth rate of 1.2 percent) and limited land resources has led to extensive loss of habitats to agricultural production, logging, fuelwood collection, and livestock grazing. The Chinese Academy of Sciences reports that about 200 plant species are believed to have become extinct and an estimated 5,000 species endangered in recent years due to human activity.

2. In recognition of these problems, the Government has significantly strengthened the policy framework for environmental protection in general and biodiversity conservation in particular. New Environmental Protection and Wildlife Conservation Laws were promulgated in 1989, which facilitated development of a comprehensive system of nature reserves and rationalized categories of protection for endangered wildlife. China has also become increasingly visible in international efforts, with the ratification of the RAMSAR (Wetland) Convention in 1992 and the Convention on Biological Diversity in 1993. These policy changes have been accompanied by increased emphasis on sector planning and management. A national nature conservation strategy was produced in 1987. A National Environment Protection Action Plan (NEAP) was recently approved that includes a chapter on objectives and priorities in biodiversity. Finally, the government recently completed a Biodiversity Conservation Action Plan (BAP), with support from the Global Environment Facility (GEF) Pre-Investment Facility (PRIF), that was approved by the State Commission on Environmental Protection in early-1994. The BAP reviews the present status of biological diversity and conservation efforts in China and sets out a comprehensive program of investment, policy reform, and technical assistance requirements to strengthen national biodiversity management and conservation. All of the project activities proposed under the GEF project have been reviewed and identified as priority measures in the BAP and NEAP.

3. As in many other countries, biodiversity protection in China has focused on the establishment of nature reserves. There has been a dramatic expansion of protected areas over the past four years and more than 700 nature reserves are now established, with a total area of approximately 56 million hectares covering some 5.5 percent of the country. The Ministry of Forestry (MFO) has jurisdiction over two-thirds of the reserves. Despite a strong commitment to biodiversity conservation, MFO's staff levels, management budgets, and training and performance standards have not kept pace with reserve expansion. Few areas are protected or managed effectively, and if current trends continue, biological diversity in many critical reserves will diminish dramatically. The main constraints include a weak guard force, excessive emphasis on capital-intensive infrastructure development, inadequate recurrent budgetary support, and an inadequately structured management system.

4. The proposed Nature Reserves Management Project (NRMP) is associated with the World Bank Forest Resource Development and Protection Project (FRDPP). FRDPP was approved by the Executive Directors in June 1994, with a total project cost (excluding NRMP) of $333 million and IDA financing equivalent to $200 million. NRMP was not approved at that time as the GEF I replenishment was not yet effective. The combined FRDPP/NRMP project is designed to introduce a new sectoral approach to sustainable resource planning and management in forestry. For the first time in China, the

combined project addresses resource use in all four of the main forest types in China (timber plantations. watershed protection forests, natural forests, and nature reserves) and presents an integrated package c investment, policy reform, and technical assistance requirements designed to improve the efficiency and productivity of the sector as a whole. This comprehensive sectoral focus not only capitalizes on the critical economic and environmental linkages among different forest areas and land uses but also integrates national and global benefits into sector planning and management. This approach is an important step away from the Government's current ad hoc and unprioritized investment program in forestry. The FRDPP/NRMP project is a direct outgrowth of the Bank's Country Assistance Strategy presented to the Board in May 1995, as it supports income enhancement and sustainable environmental development in poor, remote areas across China.

5. Lessons Learned. Since the proposed project would be the first Bank Group or GEF investment in biodiversity in China, it draws on project experience from other countries under the GEF Pilot Phase and from NGOs in China. The key lessons include: (a) the importance of a national strategic framework for biodiversity investments; (b) the need to build in financial sustainability and long-term commitment from the government; (c) the need to involve local people in design and implementation; and (d) the key role of macroeconomic and sector policies in establishing an appropriate incentive framework for resource conservation. It also draws on the implementation experience of the GEF PRIF in China over the past two years, particularly the importance of twinning domestic and international technical assistance to ensure effective transfer of new ideas and technologies. Similarly, the project draws on related lessons from the 1991 Board paper on forestry, the 1991 Operations Evaluation Department report on forestry, and the 1994 Board paper on forestry project implementation: (a) the importance of integrating the management of protected and unprotected natural forest areas into regional forest management plans; (b) the importance of developing restructuring programs for inefficient state forestry enterprises; and (c) the need to expand the protected area system and improve management technologies for forests with high biodiversity and environmental services values. Finally, the community participation program supported under the project incorporates lessons learned from several on-going pilot activities in China managed by NGOs and the government, particularly (a) the importance of integrating local villagers into the assessment of community needs through participatory rural appraisal techniques; and (b) the need to establish clear, mutually agreed contracts that identify the respective rights and responsibilities of reserve staff and local communities in resource use within reserves.

6. Rationale for GEF Financing. The proposed project meets the eligibility criteria and program priorities agreed at the recent Conference of the Parties to the Convention on Biological Diversity, as follows. The project strengthens conservation, management, and sustainable use of ecosystems and habitats that have been identified as national priorities by the government in the BAP and NEAP; increases the involvement of local communities in the planning and management of nature reserves, addressing in particular the social and economic requirements of poor households in poverty areas; introduces a new, innovative economic incentive program to reduce biodiversity land-use conflicts in critical habitats that involves enterprise restructuring and job redeployment; builds institutional capacity for preparation of conservation plans and implementation of sustainable land-use programs; develops new research mechanisms and priorities to encourage scientific excellence and facilitate international exchange; expands the role of local and international NGOs in sector planning and management; and promotes conservation of endemic species, such as the Giant Panda and other plants and animals unique to China. GEF involvement in the development of FRDPP/NRMP has made possible a combined approach to resource use in the four main forest types in China that integrates national and global benefits into sector planning and management. Without GEF funding, MFO would continue to maintain a minimum level of reserve protection and management, with little community involvement, on the basis of ad hoc, unprioritized investment programs in the forestry sector.

7. Project Objectives. The main objective is to enhance biodiversity conservation through innovative approaches to organization, planning, skills development, information management, and the integration of local communities into reserve management. The main focus will be on developing skills, human resources, and systems for improving protection and management at the field level.

8. Project Description. The proposed project would comprise five components.

9. The **Nature Reserves Component** (34 percent of total costs) would develop more effective management and protection systems in five pilot reserve areas of international significance that have been identified as top biodiversity priorities in the BAP: *Xishuangbanna*, a cluster of five sub-reserves in southwest Yunnan Province; *Poyang Lake*, China's most important wetland site in Jiangxi Province; *Wuyishan*, the highest and richest peak in southeast China straddling the borders of Fujian and Jiangxi Provinces; *Qinling* mountains of Shaanxi Province, consisting of four reserves (Foping, Niubeiliang, Zhouzhi, and Taibaishan) and their surrounding natural forest areas where healthy populations of giant pandas still reside; and *Shennongjia*, an area of very rich pristine forest in Hubei Province. The key investment activities include: (a) preparation and implementation of new management plans; (b) strengthening of field-level protection through financing of guard posts, new communications systems, field kits and other miscellaneous equipment; and (c) expanding the role of local communities living within and adjacent to nature reserve sites in the planning and management of reserves.

10. The sub-component on community involvement, which will create new incentive structures for long-term sustainable use of biodiversity resources, will support four activities. First, project officials will review the objectives and design of the project with the stakeholders, raise awareness about the scope for co-management, and solicit community interest in participation. Second, the project will provide training in participatory rural appraisal (PRA) techniques and other participatory and advocacy skills to local communities. Third, stakeholder committees will be formed at each reserve to work with project officials in conducting PRAs, collecting and analyzing data on resource use, and identifying and ranking community problems and needs. Fourth, stakeholder committees and project officials will prepare Community Resource Management Plans and Co-Management Contracts that identify the respective roles and responsibilities in resource use in reserves. The project will support the implementation of these plans and contracts through: (a) establishment of a new community investment grants program to support non-consumptive economic activities consistent with sustainable resource use; (b) development of new education programs to strengthen public awareness and environmental education; (c) introduction of a variety of community outreach programs such as summer nature camps; and (d) detailed monitoring and evaluation to ensure equitable and effective implementation and to facilitate adjustments over the life of the project .

11. The **Enterprise Restructuring Component** (34 percent of total costs) would introduce a pilot program for resolving biodiversity land-use conflicts adjacent to the Qinling Reserve Group. Two state-owned forest farms under the Changqing Forestry Bureau have aggressively harvested timber outside the reserve boundaries over the past two decades, which has significantly reduced the forest cover and degraded a small but important corridor for the movement of Giant Pandas. The component would introduce more sustainable management of this area through development of a restructuring program for the enterprise based on a significant reduction in harvesting and the transfer of workers to more environmentally sustainable employment. This program – the first of its kind in China – is expected to establish a model for sustainable land-use management and enterprise restructuring that would be disseminated to other protected areas in China.

12. The following policy reforms and investment requirements would be supported. First, the entire area would be legally designated as a national level nature reserve, with a core zone of 11,000 ha and an experimental zone of 19,000 ha. The **core zone** would comprise the main panda habitat and all harvesting, road construction, and other human interventions would be prohibited there (the government has already stopped all these activities as of December 1, 1993 in preparation of the project). The project would support a variety of protection activities for the core zone. The **experimental zone** would be managed on a sustainable basis. The farms would still be permitted to harvest timber in this area, but the following new conditions would apply: (a) the annual cut would not exceed the mean annual growth of the forest; and (b) new silvicultural management practices would be introduced to maintain biodiversity values. The project would support improved management of the experimental zone through preparation of a management plan, reforestation of degraded areas, and training and technical assistance in improved silvicultural management techniques. Second, the labor force of the forest farms would be restructured in line with the revised cutting program, with the 1,193 redundant workers redeployed to more conservation-oriented economic activities in the project area or terminated with a relocation package. The project would finance (a) sub-loans to develop employment opportunities for 1,043 redundant workers at existing and new enterprises; and (b) relocation packages for 150 redundant workers that would comprise specific expenditures related to worker and family relocation costs, worker retraining and placement costs, and livelihood development.

13. The **Capacity Building Component** (20 percent of total costs) would strengthen technical and managerial skills in biodiversity through development of a national training team that would provide about 900 person months of training at the national, provincial, and reserve levels. It would also enhance the organizational capacity of the Division of Nature Reserves (DNR) in MFO through: (a) preparation of a national conservation plan; (b) financing of computers, office equipment, and related TA; and (c) preparation of a series of policy studies related to biodiversity conservation. Finally, it would strengthen the Office of Nature Reserves (ONR) of the Forestry Department in Yunnan Province (YPFD), which contains the largest diversity of species in China, through preparation of a provincial conservation plan and development of a provincial geographic information system. The **Management Information System Component** (8 percent of total costs) would support improved management decision making through: (a) investment in computers, software, climatic recording equipment, and other scientific and office equipment; (b) TA in database structure, data analysis and information management; and (c) development of a comprehensive monitoring and evaluation program for NRMP. The **Research Component** (4 percent of total costs) would strengthen existing national research initiatives through: (a) financing of research infrastructure and equipment in the five reserve areas; and (b) establishment of a new national small-scale competitive research grants program.

14. The project cost is estimated at $23.6 million, with a foreign exchange component of $6.8 million (29 percent of total costs). The Global Environment Trust Fund grant would finance $17.9 million in incremental costs (76 percent of total costs). To facilitate early start-up activities of the project, retroactive financing of up to $500,000 equivalent is proposed for expenditures made after September 1, 1994 for priority planning and training requirements. A breakdown of project costs and the financing plan are shown in Schedule A. Procurement methods, disbursement amounts, and the disbursement schedule are shown in Schedule B. A timetable of key project processing events and the status of Bank Group operations in China are given in Schedules C and D, respectively.

15. Project Implementation. The proposed project would be implemented by MFO on the basis of Project Implementation Rules (PIR) to be agreed with the Bank Group. A ministerial-level Leading Group would set principles and policies, approve the overall implementation plan, and coordinate inter-ministerial discussions. The actual day-to-day management would be jointly carried out by the DNR and

the World Bank Project Loan Management Center (PMC) in MFO, which coordinates all Bank-assisted forestry projects in China. DNR would be responsible for all technical management, including management plans, monitoring and evaluation, and training and TA. The PMC would handle financing, procurement, disbursement, accounting, auditing, and administrative activities. The same division of responsibilities would occur at all project provincial forestry departments, where existing project management offices (PMO), under PMC, would work closely with the Offices of Nature Reserves (ONR), under DNR. Many of the tasks done at the provincial level would devolve to the nature reserves at the end of the second year of the project, when nature reserve staff have had sufficient training and their capacity has been strengthened. Local communities will participate in project implementation through stakeholder committees and co-management contracts, which will permit a wide range of options for community involvement that reflect the specific conditions of each nature reserve area.

16. Community and NGO Involvement. The project has provided for extensive involvement of local communities and non-governmental organizations (NGOs) in preparation and implementation. Group and household interviews were conducted in each of the nature reserve areas as part of preparation, which provided detailed information on local needs, natural resource use and conflicts, and economic activities. Socio-economic profiles of the communities were prepared that formed the basis for the co-management program. Similarly, representatives from a variety of local and international NGOs participated in the design and preparation of the project. Their continued involvement in the project will be ensured through a bi-annual meeting designed to enhance cooperation and coordination among the many NGOs and international donors involved in biodiversity conservation in China.

17. Project Sustainability. Institutional sustainability is addressed through the strong emphasis on capacity building in the project, particularly the development of: (a) improved organizational management structures at the national and reserve levels; (b) a new national in-service training program; and (c) a new management information system. Financial sustainability is addressed through: (a) a high level of cost-sharing, including increasing recurrent budgetary allocations from county and provincial governments for project activities during the life of the project; (b) policy studies that will review the appropriate level of visitor fees and charges at reserves; and (c) government assurance to continue meeting all recurrent operating costs after the project.

18. Agreed Actions. The following are the main assurances obtained at negotiations: (a) nature reserve management plans, incorporating time-bound implementation schedules, descriptions of any civil works required, and environmental assessments carried out in accordance with guidelines acceptable to the Bank Group, will be prepared and furnished to the Bank Group for comment for the Shennongjia Nature Reserve and the five Qinling Nature Reserves by December 31, 1996, and for Wuyishan, Poyang Lake, and Xishuangbanna Nature Reserves by Decembe 31, 1997; and thereafter implemented taking into account the comments of the Bank Group; (b) the Community Investment Grant Program and Small Grants Research Program will operate in accordance with guidelines acceptable to the Bank Group; (c) any involuntary resettlement of persons arising under the project would be carried out in accordance with procedures and principles satisfactory to the Bank Group; (d) sub-loans under the Changqing Restructuring Component will be made only to enterprises that generate a financial rate of return of at least 10 percent, are demonstrated to be technically feasible on the basis of a feasibility study approved by the Bank Group, and are shown to have no adverse environmental impact on the basis of an environmental assessment carried out in accordance with guidelines acceptable to the Bank Group; (e) sub-loans will be extended for a maturity of not more than twelve years, including not more than four years of grace, and accrue interest at 4 percent per year; (f) the relocation package under the Changqing Restructuring Component will only finance costs from a list of expenditure items acceptable to the Bank

Group; and (g) a baseline survey to determine the cost and composition of each relocation package will be carried out in accordance with terms of reference and timing acceptable to the Bank Group.

19. The issuance of PIR acceptable to the Bank Group and the provision of written acceptances of the PIR from all project provinces would be a condition of effectiveness. The project would also include the following conditions of disbursement: (a) if any resettlement is expected as a result of the corridor development in Wuyishan, the completion of a resettlement action plan satisfactory to the Bank Group will be a condition of disbursement for the corridor development; (b) State Council designation of the Changqing forestry area as a national-level nature reserve, and the completion of a relocation report acceptable to the Bank Group will be conditions of disbursement for the relocation program under the Changqing Restructuring Component; and (c) State Council designation of the Changqing forestry area as a national-level nature reserve, and the provision of sub-loans in accordance with the agreed procedures and terms and conditions will be conditions of disbursement for the job creation program under the Changqing Restructuring Component.

20. Environmental Aspects. The project is expected to have a positive environmental impact through the improved management and protection of approximately 625,000 hectares within the five pilot reserve sites, and the introduction of new land use and conservation measures on an additional 100,000 ha of contiguous biodiversity landscapes. However, the project may support some activities with potentially adverse minor impacts, such as small-scale civil works construction in nature reserves and development of new enterprises as part of the Changqing restructuring program. Therefore, individual environmental assessments (EA) carried out in accordance with guidelines acceptable to the Bank Group will be prepared under the project for all nature reserve management plans and for all enterprise investments under the Enterprise Restructuring Component.

21. Social Aspects. The project may involve the resettlement of 25-35 households as part of the program to establish a protected corridor linking two core areas within Wuyishan. However, the specific number of resettled households, if any, will not be known until the exact size and shape of the corridor is determined during the preparation of the nature reserve management plan, which will be carried out in the second year of the project. As reviewed in para. 19, the completion of a resettlement plan acceptable to the Bank Group will be a condition of disbursement for the corridor development in Wuyishan. No other involuntary resettlement is expected under the project; the EAs for the Changqing enterprises will confirm that no land acquisition will be involved in the development of new enterprises.

22. Since a few of the project areas contain important historical or religious sites, the EAs for nature reserves will pay particular attention to the impact of project activities on cultural property and the development of sound mitigation measures to ensure adequate protection. In addition, the project will closely monitor the needs of ethnic minorities living within or adjacent to project areas (notably in Xishuangbanna in Yunnan Province). In particular, the terms-of-reference for EAs, nature reserve management plans, and tourism development plans will require detailed review of minority issues to ensure that they are not adversely affected by project activities and that the social and economic benefits they receive are consistent with their cultural preferences. Minorities will participate directly in the design and implementation of project activities through stakeholders committees, Community Resource Management Plans, and Co-Management Contracts.

23. Project Benefits. The project would generate the following benefits: (a) a wide variety of environmental benefits, including increased protection of rare biodiversity, improved water catchment protection (all five reserve areas drain into major river systems), and increased carbon sequestration from afforestation activities; (b) employment opportunities for low-income households involved in community

management of reserves and the Changqing restructuring program (the incidence of absolute rural poverty is much greater in project areas than throughout the rest of the provinces as a result of limited access to productive land and limited off-farm income near nature reserves); and (c) strengthening of human resources and sector institutions, which would raise the overall productivity of resource use in the sector. Most importantly, the project would provide new models for improved nature reserve management, human resource development, and resolution of land-use conflicts that could be disseminated to other parts of China facing similar threats to biodiversity conservation.

24. Risks. There are few technical risks, in view of the government's commitment to biodiversity conservation and excellent track record in managing complicated World Bank investment programs in forestry. The main risks include: (a) weak institutional capacity in DNR, which has been addressed by a comprehensive capacity building program comprising appointment of additional staff, new training programs, and TA; (b) delays in the recruitment of key experts under the TA program in the areas of management planning and community development, which has been addressed through agreement of a time-bound TA plan and advanced preparation of terms of reference; (c) inadequate participation of local communities in reserve management, which will be closely reviewed under the project's monitoring and evaluation program and supervised by Bank missions; and (d) inadequate provision of local counterpart funding during implementation, which has been addressed through an understanding that the failure of any county or provincial governments to provide local funds on a timely basis would result in the exclusion of the nature reserves under their jurisdiction in continued involvement in the project.

Schedule A

CHINA

NATURE RESERVES MANAGEMENT PROJECT

Estimated Costs and Financing Plan
($ million)

	Local	Foreign	Total
Estimated Project Cost			
Nature Reserves Component	4.7	2.5	7.2
Enterprise Restructuring Component	6.1	1.5	7.6
Capacity Building Component	2.7	1.7	4.4
Management Information Systems Component	1.1	0.5	1.6
Research Component	0.7	0.1	0.8
Base Cost	15.3	6.3	21.6
Physical contingencies	0.7	0.3	1.0
Price contingencies	0.8	0.2	1.0
Total Project Cost	16.8	6.8	23.6
Financing Plan			
GET Grant	11.1	6.8	17.9
Government	5.7	0.0	5.7
Total	16.8	6.8	23.6

Schedule B

CHINA

NATURE RESERVES MANAGEMENT PROJECT

Summary of Proposed Procurement Arrangements
($ thousand) [1]

Project Element	Procurement Method ICB	NCB	Other [2]	N.A.	Total Costs
1. Works					
1.1 Nature Reserves: Infrastructure			1,258.1		1,258.1
			(1,258.1)		(1,258.1)
1.2 Nature Reserves: Other			540.6		540.6
			(540.6)		(540.6)
1.3 Changqing Enterprise Construction			2,063.3	515.8	2,579.1
			(1,721.2)	(0.0)	(1,721.2)
Total Works			3,862.0	515.8	4,377.8
			(3,519.9)	(0.0)	(3,519.9)
2. Goods					
2.1 Vehicles	893.5	297.6	88.4		1,279.5
	(893.5)	(297.6)	(88.4)		(1,279.5)
2.2 Office Equipment	302.7	177.4	121.1		601.2
	(302.7)	(177.4)	(121.1)		(601.2)
2.3 Field/Research Equipment		143.3	417.7		561.0
		(143.3)	(417.7)		(561.0)
2.4 Changqing Enterprise Equipment	515.8	825.3	722.2	515.8	2,579.1
	(412.6)	(660.2)	(577.8)	(0.0)	(1,650.6)
Total Goods	1,712.0	1,443.6	1,349.4	515.8	5,020.8
	(1,608.8)	(1,278.5)	(1,205.0)	(0.0)	(4,092.3)
3. Services					
3.1 Consultancies			5,241.4		5,241.4
			(5,241.4)		(5,241.4)
3.2 Training and Study Tours			3,011.0		3,011.0
			(3,011.0)		(3,011.0)
3.3 Research Services	-		565.5		565.5
			(565.5)		(565.5)
Total Technical Assistance			8,817.9		8,817.9
			(8,817.9)		(8,817.9)
4. Other					
4.1 Recurrent Operating Expenses			439.3	3,666.1	4,105.4
			(439.3)	(0.0)	(439.3)
4.2 Changqing Relocation Packages			1,200.0		1,200.0
			(960.0)		(960.0)
4.3 Community Investment Grants			121.2		121.2
			(72.7)		(72.7)
Total Other			1,760.5	3,666.1	5,426.6
			(1,472.0)	(0.0)	(1,472.0)
TOTAL	1,712.0	1,443.6	15,789.8	4,697.7	23,643.1
	(1,608.8)	(1,278.5)	(15,014.8)	(0.0)	(17,902.1)

[1] Figures in parentheses represent the amounts financed by the GET grant, including contingencies.

[2] Other procurement methods include direct recruitment of labor, force account, national and international shopping, direct purchase, and consultancy services.

Schedule C

CHINA

NATURE RESERVES MANAGEMENT PROJECT

Disbursements

Category	Amount of credit ($ thousand)	% of expenditures to be financed
(1) Civil Works		
(a) For Biodiversity Corridor in Wuyishan	350.0	85%
(b) All Other Civil Works	1,448.7	85%
(2) Goods	2,441.7	100% of foreign expenditures, 100% of local expenditures, and 75% of local expenditures for other items procured locally
(3) Community Investment Grants	72.7	60%
(4) Sub-Loans for Changqing Enterprises	3,371.8	80%
(5) Relocation Packages for Changqing Enterprises	960.0	80%
(6) Operating Costs	439.3	100%
(7) Consultants' Services, Research Services, Training, and Study Tours	8,817.9	100%
Total	17,902.1	

Estimated Disbursements ($ million)

Bank Group FY	1996	1997	1998	1999	2000	2001	2002
Annual	2.6	5.7	4.3	2.2	1.5	1.2	0.4
Cumulative	2.6	8.3	12.6	14.8	16.3	17.5	17.9

Schedule C

CHINA

NATURE RESERVES MANAGEMENT PROJECT

Timetable of Key Project Processing Events

Step		Timing
(a)	Time taken to prepare the project:	25 months, April 1992 - December 1994
(b)	Prepared by:	MFO (with GEF PRIF-funded assistance of local and foreign consultants) and IDA
(c)	First Bank mission:	April 1992
(d)	Appraisal mission departure:	September 1994
(e)	Negotiations:	March 1995
(f)	Planned date of effectiveness:	September 1995
(g)	List of relevant PCRs and PPARs:	None

The Bank project team was led by Richard Scobey (Economist/Task Manager) and Susan Shen (Ecologist/Technical Advisor) and included Scott McCormick (Sociologist, Consultant), Lindsay Saunders (Resource Economist, Consultant), and Zhou Weiguo (Operations Officer, Consultant). Joseph Goldberg, Chief of EA2AG, and Nicholas C. Hope, Director of EA2, provided managerial oversight. The peer reviewers were Agi Kiss (AF2EA) and Scott Guggenheim (EA3RS). The outside experts who participated in the GEF Technical Review Panel were James Harris (International Crane Foundation) and Janice Alcorn (USAID/WWF/WRI Biodiversity Support Program).

Schedule D
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STATUS OF BANK GROUP OPERATIONS IN THE PEOPLE'S REPUBLIC OF CHINA

A. STATEMENT OF BANK LOANS AND IDA CREDITS
(As of December 31, 1994)

Loan/ Credit Number	FY	Bor-rower	Purpose	Amount (US$ million) (net of cancellations) Bank	IDA	Undisb.(a)
33 loans and 42 credits have been fully disbursed.				3,118.3	2,602.3	-
Of which SECAL:						
2967/1932	88	PRC	Rural Sector Adj.	200.0	93.2	-
2678/1680	86	PRC	Third Railway	160.0	(70.0)(b)	10.4
2723/1713	86	PRC	Rural Health & Preventive Med.	15.0	65.0	12.9
1764	87	PRC	Xinjiang Agricultural Dev.	-	70.0	1.9
2794/1779	87	PRC	Shanghai Sewerage	45.0	(100.0)(b)	6.6
2811/1792	87	PRC	Beijing-Tianjin-Tanggu Expressway	25.0	125.0	9.6
2812/1793	87	PRC	Gansu Provincial Dev.	(20.0)(b)	150.5	17.2
1835	87	PRC	Planning Support & Special Studies	-	20.7	5.2
2852	87	PRC	Wujing Thermal Power	190.0	-	8.2
2877/1845	88	PRC	Huangpu Port	63.0	(25.0)(b)	7.4
1885	88	PRC	Northern Irrigation	-	103.0	8.9
2943	88	PRC	Pharmaceuticals	127.0	-	0.8
2951/1917	88	PRC	Sichuan Highway	75.0	(50.0)(b)	22.7
2955	88	PRC	Beilungang II	165.0	-	22.3
2958	88	PRC	Phosphate Dev.	62.7	-	9.4
2968	88	PRC	Railway IV	200.0	-	13.4
1984	89	PRC	Jiangxi Provincial Highway	-	61.0	3.5
1997	89	PRC	Shaanxi Agricultural Dev.	-	106.0	18.8
2006	89	PRC	Textbook Development	-	57.0	0.4
2009	89	PRC	Integrated Reg. Health	-	52.0	14.4
3006	89	PRC	Ningbo & Shanghai Ports	76.4	-	9.2
3007	89	PRC	Xiamen Port	36.0	-	1.3
3022	89	PRC	Tianjin Light Industry	154.0	-	42.1
3060/2014	89	PRC	Inner Mongolia Railway	70.0	(80.0)(b)	9.0
3066	89	PRC	Hubei Phosphate	137.0	-	47.1
3073/2025	89	PRC	Shandong Prov. Highway	60.0	(50.0)(b)	21.8
3075	89	PRC	Fifth Industrial Credit	300.0	-	0.8
2097	90	PRC	Jiangxi Agric. Dev.	-	60.0	3.2
2114	90	PRC	Vocational & Tech. Educ.	-	50.0	5.5
2145	90	PRC	National Afforestation	-	300.0	89.9
2159	90	PRC	Hebei Agricultural Dev.	-	150.0	45.7
2172	91	PRC	Mid-Yangtze Agricultural Dev.	-	64.0	17.7
3265/2182	91	PRC	Rural Credit IV	75.0	200.0	39.6
3274/2186	91	PRC	Rural Indust Tech (SPARK)	50.0	64.3	28.0
3286/2201	91	PRC	Medium-Sized Cities Dev.	79.4	52.9	40.5
2210	91	PRC	Key Studies Development	-	131.2	45.3
2219	91	PRC	Liaoning Urban Infrastructure	-	77.8	10.6
3316/2226	91	PRC	Jiangsu Provl. Transport	100.0	(53.6)(b)	30.2
2242	91	PRC	Henan Agricul. Dev.	-	110.0	64.2
3337/2256	91	PRC	Irrig. Agricul. Intensif.	147.1	187.9	101.8
3387	92	PRC	Ertan Hydroelectric	380.0		47.3
2294	92	PRC	Tarim Basin	-	125.0	66.6
2296	92	PRC	Shanghai Metro Transport	-	60.0	20.0
3406	92	PRC	Railways V	330.0	-	127.5
3412/2305	92	PRC	Daguangba Multipurpose	30.0	37.0	14.6
2307	92	PRC	Guangdong ADP	-	162.0	111.5
3415/2312	92	PRC	Beijing Environment	45.0	80.0	76.0
2317	92	PRC	Infectious and Endemic Disease Cont	-	129.6	103.8
3433	92	PRC	Yanshi Thermal Power	180.0	-	32.2
2336	92	PRC	Rural Water Supply and Sanitation	-	110.0	68.8
2339	92	PRC	Educ. Development in Poor Provs.	-	130.0	70.8
3443	92	PRC	Regional Cement Industry	82.7	-	38.7

Schedule D
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Loan/ Credit Number	FY	Bor- rower	Purpose	Amount (US$ million) (net of cancellations) Bank	IDA	Undisb.(a)
3462	92	PRC	Zouxian Thermal Power	310.0	-	229.3
3471	92	PRC	Zhejiang Provincial Highway	220.0	-	137.3
2387	92	PRC	Tianjin Urban Devt. & Envir.	-	100.0	72.4
2391	92	PRC	Ship Waste Disposal	-	15.0	15.9
2411	93	PRC	Sichuan Agricultural Devt.	-	147.0	93.2
3515	93	PRC	Shuikou Hydroelectric II	100.0	-	68.5
2423	93	PRC	Financial Sector TA	-	60.0	53.5
3530	93	PRC	Guangdong Provincial Transport	240.0	-	178.0
3531	93	PRC	Henan Provincial Transport	120.0	-	83.0
2447	93	PRC	Ref. Inst'l and Preinvest.	-	50.0	43.5
3552	93	PRC	Shanghai Port Rest. and Devt.	150.0	-	132.3
2457	93	PRC	Changchun Water Supply & Env.	-	120.0	117.7
2462	93	PRC	Agriculture Support Services	-	115.0	98.7
3560/2463	93	PRC	Taihu Basin Flood Control	100.0	100.0	144.2
2471	93	PRC	Effective Teaching Services	-	100.0	98.2
3572	93	PRC	Tianjin Industry II	150.0	-	150.0
3582	93	PRC	South Jiangsu Envir. Prot.	250.0	-	235.9
2475	93	PRC	Zhejiang Multicities Devt.	-	110.0	97.4
3581	93	PRC	Railway VI	420.0	-	362.4
3606	93	PRC	Tianhuangping Hydroelectric	300.0	-	277.5
3624/2518	93	PRC	Grain Distribution	325.0	165.0	475.5
2522	93	PRC	Environmental Tech. Assist.	-	50.0	45.9
2539	94	PRC	Rural Health Workers Devt.	-	110.0	105.6
3652	94	PRC	Shanghai Metro Transport II	150.0	-	74.0
3681	94	PRC	Fujian Provincial Highways	140.0	-	122.6
3687	94	PRC	Telecommunications	250.0	-	250.0
2563	94	PRC	Second Red Soils Area Devt.	-	150.0	140.8
2571	94	PRC	Songliao Plain Agric. Devt.	-	205.0	195.1
3711	94	PRC	Shanghai Environment	160.0	-	157.0
3716	94	PRC	Sichuan Gas Devt & Conservatn.	255.0	-	255.0
3718	94	PRC	Yangzhou Thermal Power	350.0	-	350.0
3727	94	PRC	Xiaolangdi Multipurpose	460.0	-	400.6
2605	94	PRC	Xiaolangdi Resettlement	-	110.0	107.9
2616	94	PRC	Loess Plateau Watershed Devt.	-	150.0	144.2
2623	94	PRC	Forest Resource Devt. & Prot.	-	200.0	192.3
3748	94	PRC	National Highway	380.0	-	380.0
3773/2642	95	PRC	Ent. Housing/Soc Sec Reform	275.0	75.0	351.9
3781	95	PRC	Liaoning Environment (c)	110.0	-	110.0
3787	95	PRC	Xinjiang Prov. Highways (c)	150.0	-	150.0
2651	95	PRC	Basic Ed for Poor/Minorities (c)	-	100.0	100.3
3788	95	PRC	Shenyang Industrial Reform (c)	175.0	-	175.0
2654	95	PRC	Economic Law Reform (c)	-	10.0	10.0
2655	95	PRC	Comp Maternal/Child Health (c)	-	90.0	89.7
			Total	12,118.6	8,026.2	8,697.6
			of which has been repaid	1,005.7	14.2	
			Total now held by Bank and IDA	11,112.9	8,012.0	
			Amount sold: Of which repaid	-	-	
			Total Undisbursed	5,735.1	2,962.5	8,697.6

(a) As credits are denominated in SDRs (since IDA Replenishment VI), undisbursed SDR credit balances are converted to dollars at the current exchange rate between the dollar and the SDR. In some cases, therefore, the undisbursed balance indicates a dollar amount greater than the original principal credit amount expressed in dollars.
(b) Credit fully disbursed.
(c) Not yet effective.

8. STATEMENT OF IFC INVESTMENTS
(As of December 31, 1994)

Investment No.	FY	Borrower	Type of Business	Loan	Equity	Total
				(US$ Million)		
813/2178	85/86/91	Guangzhou Auto	Automobile	15.0	4.5	19.5
974	87/88	China Investment Co.	DFCs	3.0	-	3.0
1020	88/92/94	China Bicycles Bicycles Co. Ltd.	Bicycle Manufacture	17.5	3.4	20.9
1066	89	Crown Electronics	Electronics	15.0	-	15.0
1119	89	Shenzhen Solar	Electric Light/Power	2.0	1.0	3.0
3423	93	Shenzhen PCCP	Manufacturing	4.0	1.0	5.0
3150	93	Yantai Cement	Cement	28.7	2.0	30.7
3881	94	China Walden Mgt.	Capital Mkts.	-	7.5	7.5
	94	Dynamic Fund	Venture Capital	-	20.0	20.0
	94	Newbridge Inv.	Securities Mk Financing Instit.	-	8.0	8.0
	95	Dalian Glass	Glass	61.0	-	61.0
		Total Gross Commitments		146.2	47.4	193.6
		Less cancellations, terminations, repayments, write-offs, and sales		57.3	-	57.3
		Total Commitments now Held by IFC		89.0	47.4	136.4
		Total Undisbursed		17.5	28.4	45.9

1/20/95
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PART II: TECHNICAL ANNEX

CHINA

NATURE RESERVES MANAGEMENT PROJECT

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CHINA

NATURE RESERVES MANAGEMENT PROJECT

CHAPTER 1: BACKGROUND

A. Biological Diversity

1.1 China is one of the top five countries in the world in terms of the total variety of its biodiversity. The wealth of species is a result of China's large size, altitudinal, latitudinal and climatic variation and the great age of its terrestrial continuity. Major ecosystems include tropical, subtropical, temperate, alpine and tundra forests, grasslands and scrub ecosystems, swamps, cold deserts, hot stony and sandy deserts, steppe, meadowlands, savannas, great river systems, temperate and tropical coastline, coral reefs and deep and shallow seas. Although incomplete, inventories of species from this vast range of habitats and geographical area indicate that China probably contains over 10 percent of all living species on Earth (see Table 1.1).

Table 1.1: Numbers of Known Species in China and the World

Taxa	*Spp in China*	*Spp in World*	*Global %*
Mammals	*499*	*4,000*	*12.5*
Birds	*1,186*	*9,040*	*13.1*
Reptiles	*376*	*6,300*	*6.0*
Amphibians	*279*	*4,184*	*7.0*
Fishes	*2,804*	*19,056*	*12.1*
Insects	*40,000*	*751,000*	*5.3*
Bryophytes	*2,200*	*16,056*	*12.1*
Pteridophytes	*2,600*	*10,000*	*26.0*
Gymnosperms	*200*	*520*	*37.8*
Angiosperms	*25,000*	*220,000*	*11.4*
Fungi	*8,000*	*46,983*	*17.0*
Bacteria	*500*	*3,060*	*16.3*
Algae	*5,000*	*26,900*	*18.6*

1.2 To protect this vast biological heritage, the People's Congress in 1956 requested that the Ministry of Forestry (MFO) and the Chinese Academy of Sciences identify areas in China that were appropriate as nature reserves. China's first nature reserve was established in Guangdong Province. Over the next nine years eighteen more reserves were added, bringing the total area protected to 650,000 ha. The pace slowed from 1966 to 1976, during the Cultural Revolution period. However, the passing of a revised *Environment Protection Law* (in 1989, after initial enactment in 1979) and a revised *Forest Law* (in 1985, after initial enactment in 1979) paved the way for a more comprehensive system of protected areas. Since then the pace of expansion has increased rapidly, with nearly 100 new reserves being established each year at the national, provincial and county levels. More than 700 nature reserves are now established, with a total area of approximately 56 million hectares covering some 5.5 percent of the country. The plan is to extend the system to 800 reserves totalling 6 percent of the country by the year 2000.

1.3 Within this nature reserve system, forty reserves or regions of very high biodiversity value have been assigned a priority rating of "A," signifying a site of global significance.[1/] These 40 sites are

[1/] Existing reserves were ranked as part of a joint MFO and World Wide Fund for Nature Project in 1992. The ranking used criteria such as biodiversity value (based on endemism, species richness, diversity of habitat, presence of valuable species, size of the area, and uniqueness in protected area system), ecological viability, and potential for management success. Forty reserves of international significance and 100 of national importance were identified and a meeting, attended by nature reserve staff of all the provinces, was held in February 1992 to endorse the list.

well distributed to cover the greatest possible spectrum of ecosystems in the country. However, the richest biological sites are concentrated in the tropical and sub-tropical zones in the south and southwest of China. The project focuses on five reserve areas in this region, which are all of international significance and identified as top biodiversity priorities in the BAP: *Xishuangbanna*, a cluster of five sub-reserves in southwest Yunnan Province; *Poyang Lake*, China's most important wetland site in Jiangxi Province; *Wuyishan*, the highest and richest peak in southeast China straddling the borders of Fujian and Jiangxi Provinces; *Qinling* mountains of Shaanxi Province, consisting of four reserves (Foping, Niubeiliang, Zhouzhi, and Taibaishan) and their surrounding natural forest areas where healthy populations of giant pandas still reside; and *Shennongjia*, an area of very rich pristine forest in Hubei Province.

B. Nature Reserves in China

1.4 The nature reserve system in China permits several different types of land use, each involving different degrees of protection. Nature reserves are typically divided into a core zone area, which contains the most important biological diversity and is protected by comprehensive restrictions on human activity, and an experimental zone area, where people are allowed to reside and carry-out economic activities. Since local communities existed within the boundaries of most nature reserves prior to their establishment, the use of experimental zones allows villagers to continue to use reserve land as long as they do not undermine the biological diversity in the core zone. While a few nature reserves have developed buffer zones as a mechanism for strengthening protection outside reserve boundaries, the government has not generally relied on buffer zones in the national system. China does not follow the standard IUCN categories of protected land, such as natural parks, wildlife sanctuaries, etc.

1.5 Several different agencies are responsible for establishment and management of China's nature reserves: MFO manages about two-thirds of them, and the National Environmental Protection Agency (NEPA), the Ministry of Agriculture, the State Oceanography Administration, CAS, local governments, and other agencies administer the remainder.

1.6 Despite a strong commitment to biodiversity conservation, MFO's staff levels, management budgets, and training and performance standards have not kept pace with reserve expansion. Few areas are protected or managed effectively, and if current trends continue, biological diversity in many critical reserves will diminish dramatically. The main constraints include a weak guard force, excessive emphasis on capital-intensive infrastructure development, inadequate recurrent budgetary support, and an inadequately structured management system.

1.7 The guard force is generally ineffective because forest police seldom go into the forest and have no job security and limited allegiance. Guards who do go into the forest lack enforcement powers and incentives to apprehend law breakers. They often become unpopular in their villages if they become effective in their work. Monitoring and evaluation of the guards' work is inconsistent and ineffective. Guards who patrol rarely keep notes on what they observe; as a result, this information is not passed on to management divisions who need the information. Furthermore, guards lack the training, equipment, and transport to do their jobs; and guard stations are often located too far from the reserves for effective management.

1.8 Many nature reserves are based on a large degree of infrastructure development, relatively large staff levels, and centralized bureau locations. This results in less funds available for recurrent operating expenses for protection at the field level. Bureaus are located far from the reserves, usually

in towns, which improves access of staff to job related health care, education, and subsidized housing, but decreases access of the staff to the reserve.

1.9 Moreover, a number of management problems constrain the more efficient use of human and financial resources and contribute to unclear lines of authority. These include:

- lack of long-term strategic plans on biodiversity conservation within the reserves and at the provincial levels;
- insufficient staff with unclear roles and limited financial support in the Department of Forest Protection (especially the Division of Nature Reserves [DNR]) in MFO;
- a poorly designed information system that is inconsistent at different locations, reflecting the lack of common principles and guidelines in conservation management;
- poor communication between levels of institutions and among institutions actively involved in conservation issues;
- ineffective management systems for operational planning, strategic planning, accounting and financial reporting, management information, and staff accountability; and
- employee incentive structures that do not reward people for prosecuting law breakers, implementing improved management systems, developing innovative research ideas, or coordinating conservation/development activities among different agencies.

C. Associated World Bank Project

1.10 The proposed Nature Reserves Management Project (NRMP) is associated with the World Bank Forest Resource Development and Protection Project (FRDPP). FRDPP was approved by the Executive Directors in June 1994, with a total project cost (excluding NRMP) of $333 million and IDA financing equivalent to $200 million. NRMP was not approved at that time as the GEF I replenishment was not yet effective. The combined FRDPP/NRMP project is designed to introduce a new sectoral approach to sustainable resource planning and management in forestry. For the first time in China, the combined project addresses resource use in all four of the main forest types in China (timber plantations, watershed protection forests, natural forests, and nature reserves) and presents an integrated package of investment, policy reform, and technical assistance requirements designed to improve the efficiency and productivity of the sector as a whole. This comprehensive sectoral focus not only capitalizes on the critical economic and environmental linkages among different forest areas and land uses but also integrates national and global benefits into sector planning and management. This approach is an important step away from the Government's current ad hoc and unprioritized investment program in forestry. The FRDPP/NRMP project is a direct outgrowth of the Bank's Country Assistance Strategy presented to the Board in May 1995, as it supports income enhancement and sustainable environmental development in poor, remote areas across China.

1.11 The FRDPP/NRMP would comprise the following five components, in addition to the nature reserves program. The **Intensively Managed Plantation Component** would establish 620,000 hectares of plantations for timber, pulpwood, and pit props on barren or degraded land in sixteen provinces as the second phase of the improved plantation program initiated under the National Afforestation Project (NAP) (68 percent of total costs). The **Multiple-Use Protection Forest Component** would establish 280,000

hectares of watershed protection forests in the middle and upper reaches of the Yangtze River basin in Sichuan and Hubei Provinces based on new silvicultural models and improved land-use planning (13 percent of total costs). The **Planting Stock Development and Nursery Management Component** would raise the quality of planting materials through introduction of improved genetic material and nursery management technologies, and support the production of the 2.1 billion seedlings required under the project (12 percent of total costs). The **Research and Technology Transfer Component** would strengthen the operational focus of research and extension through provision of technical assistance and operating support for eleven priority research programs, demonstration plantations, and extension activities (1 percent of total costs). Finally, the **Institutional Capacity Building Component** would strengthen the capacity of forestry institutions through support for training and technical assistance, development of information management systems, development of a new private sector investment promotion agency, improved natural forest management, and policy studies (1 percent of total costs).

D. Lessons Learned From Previous Bank Group Involvement

1.12 Since the proposed project would be the first Bank Group or GEF investment in biodiversity in China, it draws on project experience from other countries under the GEF Pilot Phase and from NGOs in China. The key lessons include: (a) the importance of a national strategic framework for biodiversity investments; (b) the need to build in financial sustainability and long-term commitment from the government; (c) the need to involve local people in design and implementation; and (d) the key role of macroeconomic and sector policies in establishing an appropriate incentive framework for resource conservation. It also draws on the implementation experience of the GEF PRIF in China over the past two years, particularly the importance of twinning domestic and international technical assistance to ensure effective transfer of new ideas and technologies. Similarly, the project draws on related lessons from the 1991 Board paper on forestry, the 1991 Operations Evaluation Department report on forestry, and the 1994 Board paper on forestry project implementation: (a) the importance of integrating the management of protected and unprotected natural forest areas into regional forest management plans; (b) the importance of developing restructuring programs for inefficient state forestry enterprises; and (c) the need to expand the protected area system and improve management technologies for forests with high biodiversity and environmental services values. Finally, the community participation program supported under the project incorporates lessons learned from several on-going pilot activities in China managed by NGOs and the government, particularly (a) the importance of integrating local villagers into the assessment of community needs through participatory rural appraisal techniques, and (b) the need to establish clear, mutually agreed contracts that identify the respective rights and responsibilities of reserve staff and local communities in resource use within reserves.

CHAPTER 2: THE PROJECT AREA

A. Shennongjia Nature Reserve Project Area

2.1 *Biophysical Characteristics.* The project area in western Hubei Province consists of the 70,000 ha national nature reserve and about 100,000 ha of forested area outside of the nature reserve in the townships of Bancang, Changfang, Songluo and Chaoyang (a map of the project area is included in the back). The Shennongjia Nature Reserve comprises two blocks—one on the western and one on the eastern side of the Yichang to Muyuping road. Both the Shennongjia Nature Reserve and the larger Biodiversity Landscape Area of 100,000 ha are located within the Shennongjia Forestry District (about 325,000 ha). The entire forest cover of the Shennongjia Forestry District is 160,818 ha or 49 percent of the land area. The forest proportion in Shennongjia Nature Reserve is slightly higher at 53 percent and the adjacent Biodiversity Landscape Area is much higher at approximately 75 percent.

2.2 *Biodiversity Importance.* The mixed mesophytic forests of the Yangtze River valley contain biodiversity of great richness and global significance. These forest formations are far richer in species than any other temperate forest systems. For example, while the North American mixed mesophytic forests comprise 25 main species of 16 genera with a further 14 genera as occasional associates, the mixed mesophytic forests of China are much richer with 67 tree genera and some hundreds of species. These rich forests, however, have mostly been destroyed and only a few precious remnants remain.

2.3 The Shennongjia area is one of the largest surviving remnants of such forests. The high proportion of primitive and relict plants indicate that the area survived as a Pleistocene refuge during the temperate Ice Ages. Preliminary investigations record a total of 53 tree genera in this forest type or 80 percent of the generic richness of the Chinese mesophytic forests. Shennongjia has 53 out of China's 67 genera, while the United States has only 27 out of those 67 and only 3 genera not found in China. The reserve itself is also very rich in medicinal and useful plants and contains 32 nationally endangered plants as well as several local endemic species. The richest forests in Shennongjia are found at lowest altitude. However, this zone accounts for less than ten percent of the reserve area boundaries and continues to face heavy pressure from agriculture. The reserve contains 54 protected animals, including five of category I and 49 of category II. The most important animal in the reserve is the golden monkey, for which this reserve constitutes the extreme eastern limits of its range. Two butterflies *Bhutanitis mansfieldi* and *Leuhdorfia chinensis* are valuable rarities with potential for commercial rearing.

2.4 The area has a complete range of vegetation types. Sub-tropical mixed deciduous and evergreen forests occur below 800 m and deciduous warm temperate broadleaf forests between 800 and 1800 m. The lower parts of this range are composed of rich mixed mesophytic formations, and the higher elevations are of a colder temperate type with increasing proportions of conifers. Between 1800 and 2300 m, the forests are largely white pine (*P. armandi*) mixed with oaks, beech, maple, birch and poplar. From 2300-2600 m, the forests are largely fir (*Abies fargesii*) mixed with pines and birch and with an understory dominated by arrow bamboo (*Sinarundinaria nitida*). The highest elevations are almost pure fir with an understory of rhododendron and arrow bamboo; however, in many areas, cutting of fir followed by fire has given rise to sub-alpine meadows of grasses (*Arundinella hirta*) and dense thickets of the arrow bamboo.

2.5 The fauna is comparatively less rich than the flora and comprises a slightly impoverished extension of the Himalayan/Sichuan highland fauna, with a few elements characteristic of Central China.

Thus the area shares tiger, leopard, black bear, golden monkey, serow, goral, muskdeer, wolf and most birds with the Sichuan highlands but has lost giant panda, red panda, takin, sambar deer, eared pheasants, monal, blood pheasant and several other species. The presence of Reeve's Pheasant is an example of the small element of Central Chinese species in the area.

2.6 Villagers are allowed to farm land in the experimental zones of the reserve, located in the two northern valleys and southern valley of the larger western block and the southern valley of the eastern block. The nature reserve was logged as a production forest between 1970 and 1982, which has left an extensive network of forestry roads reaching almost all parts of the reserve. Most of the reserve has been seriously damaged by logging except some of the inaccessible and steep rugged areas of karst landscape. Vegetation recovery in the lower parts of the reserve is good and it appears that almost all plant species have survived and the forest is regenerating well. With reasonable protection from further cutting, these forests will retain almost all their original biodiversity.

2.7 On the upper slopes in the fir zone, however, the forest is regenerating very poorly. The survival rate of newly planted seedlings is poor and periodic fires have further hampered regeneration and produced extensive grassy meadows and bamboo thickets. Under current management it is unlikely that this vegetation zone will recover. The density of bamboo thickets prevents tree regeneration and occasional fires destroy all young tree seedlings. Restoration of this zone to its original condition will require an active program of reforestation over a long time period. Table 2.1 provides land-use data for the reserve.

Table 2.1: Land-use in the Shennongjia Project Area

Location	Area (ha)	% Forest	% Scrub	% Rock	% Agriculture	% Grass	% Other
Shennongjia Forestry Dist.	325,000	49	15	2	11	12	10
Nature Reserve	70,647	53	25	3	5	9	4
Biodiversity Landscape Area	100,000	75	10	3	4	5	3

2.8 *Socioeconomic Setting.* The Shennongjia Forestry District has a resident population of 77,274 people in 21 towns, including 8,203 people in 17 villages residing within the reserve and 34,892 people living in 100,000 ha of the "biodiversity landscape area" adjacent to the reserve. Table 2.2 illustrates the population distribution and agricultural land use in the reserve.

2.9 Most households residing within the reserve are agrarian. They cultivate corn, potatoes, and beans and supplement these food crops with the sale of honey and some medicinal herbs (such as *Eucommia uimodes* and *Grynostemma pentaphyllum*). Many keep a few animals, mostly pigs. Land for food production is scarce. Table 2.2 indicates that each person is allocated about 2 mu for food production. In the eastern section of the nature reserve, households appear to have, on the average, less land per capita. Each household also is allocated, by the village, an area for collecting and cutting fuelwood. Use rights for both the agricultural and forest areas are contracted with the village, generally for five years. However, the contracts have few limitations on the use of the resources and monitoring rarely occurs. In the eastern section of the reserve, firewood cannot be cut from the reserve's forests and households must now purchase their firewood. Some households have purchased locally made fuel-saving stoves in an effort to reduce their household consumption of firewood.

Table 2.2: Socio-Economic Data for Shennongjia Nature Reserve

Village	Population	Agricultural Land (mu)	Land/capita (mu/capita)	Output/capita (jin/capita)	Per Capita Income (yuan/cap.)
Muyu	63	118.9	1.9	230.1	257.0
Xi gou	487	887.6	1.8	232.5	284.9
Lu' yuan	191	378.5	1.9	229.9	285.0
Qing shu	559	1216.2	2.2	232.5	162.9
Xiang shu he	456	892.7	1.9	232.5	182.7
Ping qian	557	1231.8	2.2	232.5	224.6
Huang bai qian	948	1920.0	2.0	232.5	121.1
Er ping chen	468	1438.7	3.1	231.4	218.5
Dong qi	558	1233.8	2.2	232.5	154.8
Luo jia ya	68	157.5	2.3	232.5	223.8
San he	286	1116.1	3.9	232.5	316.4
Ying yu he	326	1152.0	3.5	232.5	260.8
Dui wo shi	72	270.2	3.7	231.9	275.0
San gu shui	925	1143.7	1.2	232.5	175.0
Bang qiao he	957	1464.2	1.5	225.1	196.6
Lao shui he	874	1195.6	1.4	230.8	177.7
Dong be kou	408	564.3	1.4	232.5	204.6

2.10 The Shennongjia Forestry District and township governments provide limited incentives for sustainable resource use to villagers residing inside the reserve. For example, the township government grants households tax subsidies in return for their cooperation in adhering to certain regulations, such as the restriction on the cutting of firewood. Similarly, extension staff from the Shennongjia Forestry District and the townships periodically visit-villages, but these staff lack skills in community needs assessment or community organization.

2.11 *Resource Degradation*. The following adverse impacts have occurred since Shennongjia was established in 1982:

- selective cutting of the lowland broadleaf forests, resulting in few remaining large specimens;
- the virtual removal of all fir forests in the higher altitudes;
- burning of the open ridges, resulting in a change from forest ecosystem to an alpine grassland ecosystem in association with dense bamboo stands;
- collection of plants and fuelwood;
- reduced water holding capacity that increases downstream runoff and the prevalence of flooding; and

- agricultural encroachment in the northwest region of the reserve.

2.12 Increasing pressure on land and forest resources is due to increasing populations, low agricultural productivity and incomes, and unavailable alternative fuel sources to fuelwood. Population growth rates have not been precisely determined from township level data, but interviews conducted in villages during preparation suggest an annual rate of increase of 1.5 percent. Per capita incomes are very low, at 150 to 250 yuan per annum. Access to land will become an increasing issue for agricultural households. Already, fields are being cultivated on 30 percent to 40 percent slopes in the eastern portion of the reserve, with yields estimated as low as 75 kg/mu for parcels on the hills, due to poor soils and management practices.

2.13 Local communities have benefitted little from the establishment of the reserve, apart from road access, tax subsidies, and some increased telecommunication service. They have had limited input into reserve planning. Poaching does occur due to the limited income-generating activities in the area, the lack of an effective protection system, and the limited incentives to guards to catch poachers.

B. Qinling Nature Reserves Project Area

2.14 *Project Area.* The Qinling group of reserves consists of 4 different nature reserves, one nature protection station for Crested Ibis, and some adjacent state forest farms (a map of the project area is included at the back). The total project area amounts to about 218,000 ha as shown in Table 2.3. The Qinling Reserve Group is an area of high species diversity, moderate endemism and particularly high numbers of special keystone species. Conditions vary greatly between the northern and southern faces of the Qinling range. The reserves protect 34 protected animal species, including eight of category I and 36 of category II (the diversity of species is summarized in Table 2.4). The category I animals are giant panda, golden monkey, cloud leopard, leopard, takin, black stork, crested ibis and golden eagle. The flora is rich in single species genera, relict species, local endemics, and over 350 medicinal plant species are also found. Many species of *Rubus, Prunus, Ribes, Actinidia, Diospyros* and other relatives of fruit cultivars are found in the reserves.

Table 2.3: Land Area of Qinling Reserve Group

Protection Status	Name of Subreserve	Area (ha)	Percent Forest Cover
National Reserve	Foping	29,240	74
National Reserve	Taibai	56,325	88
Provincial Reserve	Zhouzhi	50,599	86
Provincial Reserve	Nuibeiliang	16,500	80
Protected Forest	Corridor	12,000	70
Protection Station	Nipponia	22,968	10
Unprotected	Changqing	29,906	na

Table 2.4: Species Diversity in Qinling Reserve Group

Location	Mammals	Birds	Amphibians	Reptiles	Plants
Foping	49	162	11	19	1575
Taibaishan	62	192			2272
Zhouzhi	59	111	6	17	619
Nuibeiliang		86	6	10	
Qinling Reserves	70	194	11	19	2576
Whole Qinling Area	87	338	16	25	c. 3000

2.15 *Biophysical Conditions*. The Foping Nature Reserve is quite small but encompasses a wide range of altitudinal zones of the southern face of the Qinling mountains. The highest ridges 2200-2904 m are rocky with light cover of fir trees and grassy meadows of *Arundinella hirta*. These are the summer feeding area of the takin, *Budorcas taxicolor*. These forests have not been officially designated as logging areas but nonetheless appear to have lost some trees. Between 1400 and 2200 m there is a zone of broadleaf deciduous forest dominated by oaks and chestnuts with pines and birch colonizers. This zone has been cut over by local farmers over the past century but is presently well stocked and regenerating well. The central valley still has a few farms, but the two outer rivers have no human settlements and the forest there is more undisturbed. Most *Rhus* trees have been tapped heavily for the valuable turpentine resin and many pine trees have also been overtapped for lac resin. In the main valley, the forests are mixed with many oaks, chestnuts and other warm temperate broadleaf trees, with two species of pine and opened areas being colonized by birch, aspen and willows. Below 1400 m down to the lowest part of the reserve at 980 m, the reserve becomes botanically richer with very mixed formations including several sub-tropical semi-evergreen species such as *Lindera, Litsea, Cyclobalanopsis, Cinnamomum, Castanopsis*, and *Dalbergia*. The bamboo understory is extensive, with seven species in the reserve dominated by *Fargesia nitida* above 2000 m and *Bashania fargesii* below that altitude. These species are the main food of the giant panda that uses the Fargesia zone between June and September and the Bashania zone for the rest of the year. Both species showed some flowering and death in the 1980's but large areas of healthy bamboo remain. The flowering has caused a temporary disconnection of the Foping panda population from the neighboring Changqing population to the west but this is not a serious problem. The Foping panda population is estimated at about 60 animals.

2.16 The lowest altitude of the Niubeiliang Nature Reserve is about 1100 m and highest peaks are at 2571 and 2802 m. The lower slopes are well forested but the highest ridges are mostly covered in grass and scrub of birch, roses and willows. Upper valleys are clothed in forests of silver birch, red birch and pines with a few remaining firs, and lower slopes are dominated by oak (*Quercus variabilis*). The land contours are extremely steep and the scenery is spectacular. No one lives inside the reserve and there are only eight villages within 10 km of the boundary. Officials indicate that villagers are well educated about conservation and that there is little poaching. The extreme west end of the reserve, a large part of the south-east of the reserve, and the main ridge crest are said to be primary forests. The northern and southern flanks have been lightly logged but over twenty years ago. They appear in good condition and should support good wildlife populations. The main species of interest in the reserve is the golden takin (*Budorcas taxicolor)* of which there are estimated to be more than one hundred. A faunal inventory was conducted in 1981, but no species lists have yet been produced. However, it is clear that this area supports most of the rare fauna and flora of the high Qinling mountains.

2.17 The Niubeiliang Nature Reserve was only established in 1987 and has only eight staff. The total area is 16,500 ha divided among the three counties of Zuoshui, Changan and Ningshaan. The staff currently occupy temporary offices in the town of Zashuixian about 30 km from the reserve. Marker posts, boards and signs have been placed along 88 kilometers of reserve boundary.

2.18 **Zhouzhi Nature Reserve.** Zhouzhi Nature Reserve was established as a national level reserve for the protection of golden monkeys. It is located between 107° 33'-108° 02' longitude and 33° 33'-33° 56' latitude, in the mid-section of the Qinling mountains, adjacent to Foping Reserve to the South. It stretches to Xinglongling peak and links up with Taibai Nature Reserve to the west, with a total area of 50,599 ha. and a forest cover of 90.5 percent, containing mainly warm temperature mixed coniferous and broadleaf forests dominated by the flora elements of central China and Northern China.

2.19 The reserve possesses 535 species of angiosperms falling into 100 Families, 8 species of gymnosperms falling into 3 Families and 76 species of pteridophytes falling into 16 Families. There are 22 species that have been listed under the national protection. There are also 199 species of vertebrates of 23 orders and 59 Families, which include 59 species of mammals, 111 species of birds, 5 species of fish, 7 species of amphibians and 17 species of reptiles. There are about 1,540 golden monkeys, making it one of the most concentrated areas for this species in the country. It is also believed that there are 15 giant pandas and about 500 golden takins within the reserve. The Reserve Bureau is set up in Erqu town, Zhouzhi county and presently staffed with 35 people.

2.20 It is proposed that a 2 km-wide and 60 km-length wildlife corridor linking Nuibeiliang and Zhouzhi be established to rationalize the fragmented protection areas. At the Nuibeiliang end of the corridor, the main road from Xian to Shagou crosses the ridge with little impact but a side road leads off to the west up a steep hill to a television relay station that could deter wildlife. Regeneration of these slopes appears moderate and conditions for wild animals are good as the area is steep and rocky and difficult for human penetration. Forests to the north of the corridor were logged lightly many years ago but appear to be in excellent condition. The corridor should be made as wide as possible, especially at the east end where the roads weaken the habitat link. It is recommended that by using gradient criteria, all adjacent slopes above the prohibited cutting slope be identified and mapped into the protected corridor.

2.21 **Taibaishan Nature Reserve** is a famous sacred mountain with some 28 temples of Dao and Buddhist origin scattered along the main trail up and over the peak of the mountain (3767 meters). It is also known as one of the four important Chinese medicinal mountains. Twenty-four species of the 30 Class II medicinal plants approved by the State Administrative Bureau of Medicine and 14 species of the 34 species considered the most important in China are found in Taibai. Representative of these plants are *Fritillaria taibaiensis*, *Paphne spp.*, *Gymnadenia conopses*, and *Eucommia uimodes*. Other plants with potential economic value include 79 species of fiber plants, 119 species of starches, 231 oil plants and 90 tannin plants. The forests range from oak forests through a birch forest zone, to coniferous forests on the highest altitudes with bare open alpine meadows and rock screes above the treeline at about 3000 meters. The general condition of the forest appears to be good and there are only two households living in the reserve. In addition to the scenic, botanical and religious interests of the reserve, there are some special geological interests in the form of glacial remains and a glacier lake near the summit of the mountain. There is a major protection post at the entrance to the reserve at Hoapingzi where 14 staff are stationed and a small economic tree garden is established, but the main bureau has been moved further away from the reserve to the county town of Meixian.

2.22 **Nipponia Nature Station** is not designated as full-scale nature reserve but as a small protection post for *Nipponia nippon* (Crested Ibis). The crested ibises live in some large old oak trees in a cemetery nearby a farming village. A station has also been established to try to promote captive breeding. At present only 30 crested ibis inhabit the area. Protection of the nest trees and ensuring farmers do not disturb or kill feeding birds are the key steps for building the population of crested ibis.

2.23 *Socioeconomic Setting of the Qinling Nature Reserves Group*. All of the reserves except Niubeiliang face pressure from contiguous communities. Zhouzhi, Foping, and Nipponia have resident populations within their boundaries, but Taibaishan and Nuibeiliang are sparsely inhabited. Officially, Taibaishan only has two households living within the reserve. However, each of the Tao or Buddhist temples located within the reserves have one or two people at each who are responsible for maintaining and protecting its cultural and spiritual aspects. Table 2.5 shows the population resident in and outside of each of the reserves and the population densities within the reserves.

Table 2.5: Population Data for Qinling Nature Reserve Group

Location	Population in Reserve	Population outside Reserve	Reserve Size (ha)	Population Density (/km2)
Taibai Reserve	5	93623	56325	0.00
Yintou	5	20406		
Xinofayi		18175		
Fangyu		17500		
Zeitou		21744		
Huangboyuan		1173		
Taochyuan		6633		
Yinge		7932		
Foping Reserve	371	24243	29240	0.12
Longchaopin	371	1587		
Changjaoba		2607		
Liziba		2290		
Yueba		2020		
Huayang		7691		
Maopin		8048		
Zhouzhi Reserve	877	7958	50599	0.02
Banfangzi	133	1270		
Yiaowongjian	191	1370		
Houzhengzi	196	2236		
Anjaei	206	1436		
Shoungmiaozi	151	1626		
Nipponia Nature Station	9499	53189	22968	0.20
Yaopin	1219			
Yangpin	1157			
Huayuan	1255			
Guandi	3131			
Baliguan	2737			
Wujian		6019		
Qionuan		8981		
Yishua		7842		
Nija		6477		
Xiecuen		11455		
Qishi		9480		
Balong		2935		
Niubeiliang Reserve		11572	16500	
Shibianyu		2117		
Weizipin		2597		
Guanhojie		3412		
Laolin		1678		
Taihe		1768		
Total	10747	179013	175632	0.07

2.24 *Resource Degradation.* The main threat to biodiversity comes from the operations of two forest farms under the **Changqing Forestry Bureau**, which is located at the mid-section of the Qinling Mountain's southern slope, to the west of the Foping Nature Reserve. The Bureau was established in 1968 to manage about 30,000 ha of mature natural forests, located adjacent to the reserves, that contain

about four million cubic meters of standing volume. The two forest farms have pursued an aggressive harvesting program over the past two decades, with a total offtake of 470,000 cubic meters of sawlogs between 1968 and 1992, equivalent to an average cut of 19,000 cubic meters per year. Annual harvest levels over the past three years have been even greater, approaching almost 30,000 cubic meters per year. These levels have significantly exceeded the mean annual growth of the forest; consequently, the forest cover has shrunk and the standing volume of the natural forest has declined to about three million cubic meters. The Bank estimates that the forest farms would completely cut out the entire forest within thirty years if this rate of extraction continues.

2.25 This harvesting program has created significant stress on several endangered species, particularly the giant panda population in Foping Nature Reserve, which periodically cross into the natural forest area managed by the Bureau to forage for food. Panda sightings in this area have greatly declined over the past few years, particularly after the Bureau constructed a logging road in a pristine forest area and damaged some bamboo sites favored by the pandas. The National Conservation Management Plan for the Giant Panda (the "Panda Master Plan"), which was prepared jointly by the MFO and the World Wide Fund for Nature, lists the improved management of the Changqing habitat as one of the most pressing investment priorities in the national strategy to protect pandas.

2.26 All levels of government, from the County Forestry Bureau to MFO agree on the importance of reducing harvesting levels at Changqing in line with sustainable forest yields and protection of the panda habitat. However, restructuring efforts have been hampered by the extremely complicated social and economic issues involved in state enterprise reform. As reviewed in the 1993 World Bank Country Economic Memorandum (Report No. 11932-CHA), enterprises in China are burdened with large social costs related to the provision of subsidized housing, social security, health care and other benefits. Despite the strong commitment to enterprise reform, Chinese firms are not able to shed redundant labor and must still provide "lifetime employment" to workers. In the case of Changqing, the reduction in harvesting levels in line with sustainable yields would lead to a significant loss in the revenue base of the two harvesting enterprises. As a result, they would have insufficient funds to meet its social welfare responsibilities to its current labor force of 2,262 people, which includes 1,713 workers and 549 retirees. Hence, the government has indicated that it would only be possible to reduce harvesting in Changqing if alternative sources of employment can be found for the redundant workers.

2.27 In addition to the Changqing Forestry Bureau operations, the Qinling Reserve Group also faces a number of other land use conflicts. The southern edge of the **Foping Reserve** is more densely inhabited and threatened by human encroachment, wood cutting, and hunting. Fire is rare but can occur in secondary forest areas during the driest times of year. Hunters often penetrate to the remotest parts of the reserve to trap animals. The central valley of Foping has several small cleared farming areas, similar to that at Sanguangmiao village. There has been a continuous occupation of the valleys since the Qing Dynasty, when several hundred people lived in the valley. Carved stone slabs, parts of old bridges and some granite buddhas remain in the valley. The present population of only 371 people is much smaller than in the Qing Dynasty and appears to be decreasing through emigration. Farmers raise maize, potatoes, soya beans, "wood ear" mushrooms, tree crops, as well as livestock and honey bees. The impact of these activities on the total reserve is probably not serious and is limited to small areas in the central valley. The main human impacts inside the core area of Foping are hunting, forest fires, dog disturbances that affect giant pandas, cattle grazing, the cutting of trees on steep slopes for agricultural expansion and fuelwood, mushroom rearing on cut birch logs, and fuelwood cutting.

2.28 In the **Taibaishan Nature Reserve**, the main threats consist of agricultural encroachment around the periphery of the reserve and uncontrolled levels of tourism, which are disturbing to wildlife,

damaging to forest, and disturbing to the religious temple masters. There are also six state timber enterprises located in close proximity to the reserve.

2.29 At the Nipponia Nature Station, the bird population is growing as fast as natural reproduction allows. Hunting and shortage of quiet nesting sites is probably to blame for the decline of the species, rather than food supply or quality.

C. Xishuangbanna National Nature Reserve Project Area

2.30 *Project Area.* The national reserve consists of five different sub-reserves in three different counties of the Autonomous Prefecture of Xishuangbanna in the southwest corner of Yunnan Province in the tropical zone of China (a map of the project area is included in the back). The Prefecture consists of Jinghong, Menghai, and Mengla Counties. Table 2.6 shows the sizes of these different reserves, which total about 241,000 ha or 12.6 percent of the entire prefecture.

Table 2.6: Land Area of Xishuangbanna Nature Reserve

County	Sub-reserve Name	Area (ha)	Core Area (ha)
Menghai	Menggoa	7,300	0
Mengla	Mengla	92,000	30,500
	Shangyong	30,600	26,100
	Menglun	7,800	7,500
Jinghong	Menglun	3,400	2,100
	Mengyang	99,800	60,300

2.31 *Biophysical Conditions.* The biodiversity richness of Xishuangbanna is undisputed. It has more species of almost every taxonomic group, more endangered species of all classes, and more economical species than any other reserve in China; similarly, it has very high levels of local endemism. Since the species lists for the reserve area are outdated, it is not possible to say how many species on the lists are still found in the reserve area without a new inventory. The reserve comprises several types of vegetation, notably tropical lowland rainforest (approximately 500 ha), tropical montane rainforest (approximately 2,500 ha), tropical seasonal rainforest (13,919 ha), monsoon evergreen broadleaf forest (179,831 ha), Mossy evergreen broadleaf forest (470 ha) and other types—including forest on limestone—(43,680 ha). The very small area of *Parashorea chinensis* dipterocarp rainforest at Bubang is very precious and unique. The less rich montane forests on Nangongshan are also very special. Limestone forests are the most threatened. The fauna of the reserve is tropical moist forest with such large animals as tiger, leopard, elephant and guar and sambar deer with monkeys, gibbons, monitor lizards, civets and a wide range of tropical birds—hornbills, pheasants, peacock, parrots, sunbirds, and broadbills. The fauna is very rich at all altitudes but faces heavy pressure from hunting.

2.32 *Socioeconomic Setting Inside the Reserve.* Yunnan Province is often called the land of the minorities. Dai, Hani, Bulang, Lahu, Yao, Zhuang, and Jinuo minorities groups are resident in Xishuangbanna reserve, with the Dai, Yao, and Hani representing the majority of groups in the reserve. There are 28 administrative villages consisting of 99 sub-villages in the five sub-reserves. These villages are located in 14 different townships in the three counties of Menghai, Mengla, and Jinghong. Approximately 15,000 people reside inside of the reserves. Table 2.7 illustrates the population distribution figures inside the five sub-reserves.

2.33 Agriculture, forestry, animal production, fisheries, and small-scale commercial enterprises provide the main economic activities and employment for those residing in the reserve. Approximately 50 percent of the total gross economic output for residents within the reserves comes from the rearing

of livestock. Approximately 10,000 head of cattle and 15,000 pigs are raised inside the reserve. Crop production contributes about 44 percent of the gross output, and therefore, livestock and crop production represent 94 percent of the total output of households in the reserve. Forestry represents only 2.6 percent of gross output and other economic activities—such as brick making, rice milling and processing, and bamboo processing—represents less than 1 percent of the gross economic output.

Table 2.7: Population Data for Xishuangbanna Nature Reserve (1990 Figures)

Reserve Name	Population	Percent of Total
Total Sub-Reserves	15,010	100.0
Mengyang	4,550	30.3
Menglun	120	0.8
Mengla	7,590	50.6
Menggoa	2,750	18.3

2.34 Food production occurs on 3,790 ha of reserve land. An additional 1,296 ha of land is in plantation production—cinnamon (593 ha), rubber (376 ha), tea (269 ha), and fruit orchards (59 ha). Therefore, the total land under cultivation in the reserves is 5,086 ha—about 2.1 percent of the total reserve land. Rice is the main crop and about 70 percent of the land in the reserves is in dryland rice production and the remaining 30 percent in wet paddy. The average yield per hectare (in 1990) was estimated to be 2392 kg, with a per capita yield of 589 kg per annum. Agricultural output data for the five sub-reserves is given in Table 2.8.

2.35 Slash and burn agriculture has been the norm in Xishuangbanna, with fallow periods historically lasting seven years. It appears that more land is coming under production each year, with an increase of 664 hectares from 1990 to 1986 (representing a 21 percent increase). Per capita land cultivation has also increased, from 0.21 ha in 1986 to 0.25 ha in 1990, which may indicate decreasing fertility of existing plots. Plantation agriculture increased by about 700 hectares between 1989 and 1990. However new regulations in 1992 prohibited all rubber and tea plantations from expanding their land areas.

Table 2.8: Economic Output Data for Xishuangbanna Nature Reserve (1990 Figures)

Crop	Output (10,000 yuan)	Percent of Total
Food crops	496	68.2
Sugar Cane	110	15.1
Cinnamon	48	6.6
Tea	39	5.5
Fruit	32	4.5
Rubber	1	0.1

2.36 The volume of standing forest inside the reserve was approximately 40 million m^3 in 1990. Natural forest represents about 80 percent of this total. Logging in the reserve is prohibited and the cutting of trees for fuelwood has consumed about 1 percent of the mean annual increment of the forests in the reserve. Hunting within the reserve was prohibited about three years ago by the provincial government.

2.37 *Socio-economic Setting of the Buffer Zone.* Xishuangbanna Nature Reserve is contiguous to three counties with 24 townships, 149 administrative villages and about 1200 sub-villages. This area, officially classified as the buffer zone for the reserve, had a 1990 population of 354,000. Agriculture is the dominant economic activity of households in the buffer areas. Approximately 58,000 ha of land is in paddy and 33,000 ha in dryland field crops, leading to an average per capita land holding of about 0.20 ha. Plantations consist mostly of rubber (22,000 ha) and tea (7,300 ha), although fruits and herbal medicines are grown on about 6,300 ha of land. In 1990, agriculture contributed a gross output of 154 million yuan (approximately $27 million), including 90 million yuan from food production, 11 million

yuan from sugarcane, 2.3 million yuan from fruit, 1.5 million yuan from tea, and approximately 1 million yuan from herbal medicines (mostly from *Amomum villosum*). Seven national forest farms operate in the buffer zone area, covering a total area of 79,000 ha, and produce timber and bamboo. In 1990, 18,400 m^3 of timber and 3.11 million bamboo poles were produced.

2.38 *Existing Tourism in Xishuangbanna.* Increasing tourism at the Xishuangbanna Nature Reserve is the major development objective of the prefecture government. Between 1986 and 1990, 23,000 international tourists visited Xishuangbanna Prefecture. During the current five year development plan, the following key activities have been proposed:

- Jinghong will be developed to handle increased levels of tourists with enhanced facilities, such as a new international air routes and new hotel facilities; in addition, international marketing will be improved with the opening of new offices in Bangkok and Hong Kong;
- the Mekong River will be improved as a tourist route through the building of lodges along the river and increasing and improving tourism boat traffic; and
- 22 scenic spots within the prefecture will be improved.

2.39 *Current Management of the Reserve.* The reserve is completing a large five-year investment program in its physical infrastructure. About 15 million yuan (10 million yuan from central government and 5 million yuan from provincial government) have been spent on this development, in addition to the annual recurrent budgetary allocation of 1.2 million yuan. This level of investment is extremely large for China, as it equals the entire amount of recurrent and development expenditure program for all other forestry activities in the whole of Yunnan Province.

2.40 Each of the five sub-reserves has its own management division, although Shangyong has no director's office. To coordinate activities among the reserves and the different levels of government, there is a Xishuangbanna National Nature Reserve Bureau situated in the prefectural capital of Jinghong. This bureau is relatively large for its function, comprising 6,400 m^2 of buildings and 55 staff; absorbs a large share of the reserve budget (70 percent of development and 75 percent of recurrent); and is located far the actual sub-reserves. At the sub-reserve level, it is evident that performance in some areas is less than satisfactory as a result of weak supervision, lack of inspection, poor communications and lack of clear instructions – all of which are exacerbated by the distance of the coordinating bureau from the five sub-reserves.

2.41 *Resource Degradation.* Principal threats to the biodiversity riches of Xishuangbanna are continued shifting cultivation, the collection of firewood and construction timber, and hunting. All these factors are exacerbated by a population growing by nearly 3 percent per year, the diverse ethnic make-up of the population, and the different ethnic rights and traditions that depend on forest use. The location of 90 villages in and around the reserve place direct pressures on the forests inside the reserve, which are clearly still being degraded as a result of tree cutting, fires and hunting in many areas.

2.42 A major threat in the past has been the clearance of new forest for the planting of rubber. This threat seems now to be reduced as a result of a provincial instruction to halt the further extension of rubber plantations. The large quantities of fuel needed to process the existing production of rubber, however, continues to create pressures on forest land use.

2.43 Generally, the core areas of the reserves are still in good condition and not facing immediate pressure. However, this is due more to the fact that population has not reached these areas rather than to good protection or stewardship. Resource degradation will no doubt increase as the local population grows and places more demands on scarce land resources. Similarly, tourism is creating land-use conflicts. On the one hand, it generates income for the region and can help finance reserve management costs. On the other hand, large numbers of people are already creating deleterious effects on precious areas of the reserve, through soil compaction, damage to vegetation, littering and spoiling the scenic and natural values of the area.

D. Wuyishan Nature Reserve Project Area

2.44 *Project Area.* Wuyishan Nature Reserve encompasses a total area of 61,099 ha and straddles two provinces, with the larger part located in Fujian Province and the smaller part in Jiangxi; an additional 262,000 ha are classified as a buffer zone (a map of the project area is included in the back). The reserve is located in the Wuyi Mountain range and rises to the peak of Mt. Huanggang, at 2158 m the highest peak in southeast China. Lowest elevations of the reserve are between 400 and 600 m and mean elevation is about 1200 m. The entire area consists of some 133 peaks above 1500 m and intervening rolling hills and deep valleys. The Fujian part lies on the southeastern slopes of the range and is drained by south-flowing tributaries of the Min river. The Jiangxi section lies on the northeast facing side of the range and its single river Xin drains north, eventually reaching Poyang Lake and the Changjiang river system.

2.45 *Biophysical Condition.* Wuyishan, probably the richest and most complete remaining example of south-east China subtropical evergreen forest ecosystem, has been consistently recognized by Chinese scientists as a priority area for species conservation. The reserve was listed as a Man and Biosphere (MAB) Reserve in September 1987 and has been paid much attention by the Chinese MAB Committee and other institutes of the CAS as well as local universities. The flora and fauna have been comparatively well documented. Lists of higher plants (1446 spp), lower plants (840), birds (256), mammals (71), fish (40), amphibians (34) and insects (4557) all attest to the richness and importance of the locality. An added interest is that this was one of the early collecting localities of the French missionary and biologist Pere Armand David and is thus the type locality of about 100 species of animals. Many of these are endemic to southeast China and as a result of the severe threat faced by original forests in eastern China, the species lists contain a very high proportion of the nationally listed protected species. Several of these species are listed as threatened or endangered in the International Red Data lists of International Union for the Conservation of Nature (IUCN) and several are also listed as protected under the appendices of CITES. The most important species include the South China Tiger (*Panthera tigris*), the rare endemic pheasant (*Tragopan caboti*) and one of the rarest butterflies in the world (*Taeniopalpus aureus*), for which the reserve is especially famous.

2.46 *Socio-Economic Setting.* According to 1990 statistics, there are 45 inhabited areas consisting of 514 households of 2,519 people inside the reserve. Two inhabited areas with 8 households of 39 people are in the core area; 2 inhabited areas with 19 households of 110 people are in the buffer zone; and 41 inhabited areas with 487 households of 2,370 people are in the experimental area. There are eight townships with a population of 128,055 located outside the reserve. The growth rate of the population between 1980 and 1990 was 2.2 percent.

2.47 In order to protect the biological resources and prevent the natural landscape from damage, the economic activities of the residents in the reserve have been restricted mainly within the designated production zones of the experimental area. The main operations are mao bamboo and tea cultivation

(with related small-scale processing activities), and thinning and sanitation cutting in some forest stands to produce small amounts of timber. In 1991, the total income from the reserve areas reached about 10.3 million yuan, including 4.5 million yuan from forestry operation and 3.9 million yuan from tea and other crop processing (see Table 2.9). In the surrounding areas, tea cultivation accounts for the largest share of gross domestic product (67 percent), followed by tea and other crop processing (15 percent) and animal breeding (12 percent) (see Table 2.10).

Table 2.9: Economic Output Data for Wuyishan Reserve
(000 yuan)

Activities	1988		1989		1990		1991	
Forestry	4,593.2	52%	3,738.3	47%	3,690.8	40%	4,479.4	44%
Processing industries	2,072.1	23%	2,628.2	33%	3,694	40%	3,905	38%
Cultivation	1,354.9	15%	823	10%	350.5	3%	355.3	3%
Animal breeding	445.2	5%	352	4%	350.5	3%	355.3	3%
Other	371	4%	433.4	6%	526.3	6%	624.5	5%
Total	8,836.4	100%	7,974.9	100%	9251.8	100%	10,336.4	100%

Table 2.10: Economic Output Data for Wuyishan District
(000 yuan)

Activities	1988		1989		1990		1991	
Forestry	31,692	17%	28,298	23%	28,041.6	19%	2,227.6	2%
Processing industries	79,679	43%	14,396	12%	17,419	12%	19,491	15%
Cultivation	54,4149	29%	55,403	45%	74,376	50	88,220	67%
Animal breeding	18,121	10%	22,259	18%	25,244	17%	16,161	12%
Tourism	1,650	1%	1,850	1%	2,000	1%	2,200	2%
Mining			1,262	1%	808	1%	615	0%
Collection							2,320	2%
Other					455			
Total	185,556	100%	123,468	100%	148,343.6	100%	131,234.6	100%

2.48 *Resource Degradation.* The most serious problem threatening the biodiversity value of Wuyishan is the rapid spread of mao bamboo. A large mosaic of bamboo monoculture has evolved as a result of the active cutting of other trees that were formerly mixed in this zone and the annual clearing of undergrowth. The resultant bamboo groves are poor for wildlife, providing almost no food or cover. For example, while 62 bird species were identified in the reserve during field visits during project preparation, only one species was seen in the bamboo groves. The result of this development is the loss of some of the richest habitat areas in the reserve, particularly within the subtropical evergreen broadleaf forests. This will lead to the reserve being cut in two and a break in the continuity of altitudinal wildlife habitat, forcing many wintering species outside the reserve.

2.49 Other human disturbances include burning of grassland and collection of ferns, which has led to stunted forest vegetation in the higher and more exposed peaks and ridges; some logging and wood slides in the coniferous zone; and hunting both inside and outside the reserve. However, current hunting pressure seems to be low, so populations should be able to recover.

E. Poyang Lake Migratory Bird National Nature Reserve Project Area

2.50 *Project Area.* This national nature reserve consists of nine lakes in the northwest corner of the Poyang Lake between 115 55'-116 03'E by 29 05'-29 15'N (a map of the project area is included in the back). Poyang reserve had a total area of 22,400 ha at the time of establishment, which was expanded to 33,600 ha in 1993. In summer, all the lakes join the main Poyang lake and almost the entire reserve is flooded. In winter, the water level drops and villagers cut the reeds and grass that grow on the gradually exposed dry land. Villagers also graze buffalo on these lands. Some of the sub-lakes have fish farm enterprises that manage commercial fish operations. This regime creates a mosaic of open water, bare mud and short grassland and provides an attractive winter refuge for large numbers of wetland birds migrating south from the tundra regions. The reserve bureau has been established at the small town of Wucheng at the junction of the Gan and Xiu rivers. A rough road can be used only in the driest months of the year. At other times, the reserve is accessible by road from Nanchang to Yongxiu and then by boat to Wucheng.

2.51 *Biophysical Conditions.* The reserve has been consistently identified as China's most important wetland site by both national and international reviews. It is possibly the most important wetland site in all of East Asia. Although figures for the richness of plants and mammals are not high (due to flooding for half of the year), the richness of fish (122 spp) and mollusks (56 spp) is high. More important, however, is the variety and numbers of visiting winter waterfowl. A total of 284 bird species have been recorded in the reserve. Many are only transient but about 150 species are regular winter visitors. Some species are present in spectacular numbers, particularly Swan Geese. Poyang protects about 95 percent of the entire world population of wintering Siberian cranes (*Grus leucogeranus*) and by far the largest population of Swan Geese (*Anser cygnoides*). Other globally endangered species dependent on the reserve include the white stork (*Ciconia boyconia*) and Japanese marsh warbler (*Megalurus pryeri*). Other species occurring in the reserve and listed on China's category I protection list include hooded crane, great bustrad, black stork, merganser and three eagles.

2.52 The exact reasons for the number of migratory birds using the Poyang Lake habitat are unknown. It appears that the existing variety of land use in the Poyang Lake may provide a combined water and terrestrial habitat attractive to the birds. Any attempts to manipulate this environment without detailed data would no doubt decrease the attractiveness of the habitat.

2.53 *Socioeconomic Setting and Resource Degradation.* The alteration of Poyang Lake has had very significant in terms of wetland impacts. Virtually all of the catchment and the immediate lake margins have been modified by local communities through buffalo grazing, cutting grass, and paddy production. The nature of the degradation takes many forms. Wuychen City is located within the reserve and serves as a major transportation port in the provincial river system. Significant pollution is generated from local manufacturing enterprises and the river-based transport industry. This includes fuel spills, wave motion and the resultant river bank erosion, the pollution of water systems from boat discharge, and non-point pollution arising from associated land use. There is some indication of eutrophication, which could

Table 2.11: Land Use in Poyang Lake

Area	Inside Reserve	Adjacent Towns/Farms
Total Area	33,600	91,057
Forest	1,920	4,909
Cultivated Area	1,443	14,375
Water	29,597	47,773
Other	640	24,000

be a threat to the lake system if the lake level is lowered. Table 2.11 provides data on land use within and in the immediate vicinity of the reserve.

2.54 The population inside the reserve has grown from 14,454 in 1987 to 15,165 in 1990, an annual increase of 1.7 percent. This is the same annual growth rate as outside of the reserve, which reached 172,816 people in 1990. The total cultivated land area inside the reserve amounts to 1,443 hectares and this has not changed in the last four years largely because extra land is unavailable. Outside the reserve, the demand for land continues to increase but at less than 1 percent per annum. Rice is the main crop produced with increasing use of insecticides and herbicides. No comprehensive data exist on the extent and impact of agrochemicals on the ecosystem.

2.55 Fishing is the main activity that impacts on the immediate environment for some of the fish feeding waterfowl. The direct competition for fish and the methods of fishing in the smaller lakes, which are drained to remove the fish, reduce the food supply and change the immediate habitat of waterfowl. The lake drainage has a particularly adverse impact on the Siberian and White-Naped Cranes, as they will not feed on dry mudflats and are likely to leave the protection of the reserve to find suitable feeding areas where they will be more vulnerable to poaching. In addition, draining the lakes early for fish harvesting reduces the feeding habitat for much of the winter, which is particularly damaging if the winter proves to be dry. Total catches for Poyang Lake of 25,000 tons were recorded in 1989. During interviews conducted as part of project preparation, households reported lower fish catches and agricultural yields along with an increased level of effort to attain these yields. Although survey data do not exist, it appears that the local fishery is under increasing pressure from over-fishing.

2.56 Other impacts from local communities include the planting of poplar and willows, which could reduce water levels, and the continued hunting of birds outside, and to a limited degree, inside the reserve. In addition, the grazing of buffalo on river banks and other productive activities has led to limited soil erosion and increased siltation and sedimentation, which has been calculated to average 2 to 3 mm of siltation per annum. Water monitoring data indicate the presence of some copper, zinc, and manganese contamination from upstream industry. Poorly enforced pollution regulations has enabled industries to discharge directly into waterways.

2.57 The nature reserve has moved to take over control of the fish farms located within the reserve boundaries as part of the overall management of the reserve. However, this activity has become a financial liability for the reserve due to declining fish yields, e.g., 78,000 jin in 1992 compared to 113,000 jin in 1988. Income levels from the catches have also dropped, from 81,450 yuan in 1988 to 38,000 yuan in 1992. A winter fishing ban has been established by the reserve to protect the feeding grounds of migratory birds. However, the use of these bans could be avoided by earlier draining of the smaller lakes, which would have little or no impact on the migratory bird habitat.

CHAPTER 3: THE PROJECT

A. Project Objectives

3.1 The main objective is to enhance biodiversity conservation through testing of innovative approaches to organization, planning, skills development, information management, and the integration of local communities into reserve management. This will directly address major constraints in the sector, such as inadequately defined and structured nature reserve management systems, ineffective field-level guard force, and a resource allocation system that favors large infrastructure development and high staffing levels at the expense of adequate operating budgets for protection at the field level. The project's main focus will be on developing skills, human resources, and processes for improving protection and management at the field level.

B. Detailed Project Description

3.2 The project will include the following five components.

Component One: Strengthening Management of Nature Reserves

3.3 The objective of this component is to strengthen protection, planning, organization, and community participation in five pilot reserve areas of international significance that have been identified as top biodiversity priorities in the BAP. As reviewed below, the key investment activities include: (a) preparation and implementation of new management plans; (b) strengthening of field-level protection through financing of guard posts, new communications systems, field kits and other miscellaneous equipment; and (c) expanding the role of local communities living within and adjacent to nature reserve sites in the planning and management of reserves.

Sub-component: (a) Enhancing Reserve Management

3.4 Current reserve management will be enhanced through the introduction of strategic planning, more accountable organization management structures, and improved administration. The following specific activities will be supported:

- developing or revising management plans in the five reserve areas. Technical assistance (TA) will be provided to assist in the preparation of specific management plans at Shennongjia and Qinling nature reserves. TA will also be provided to train staff at the other three reserves, the Office of Nature Reserves (ONR) of the Yunnan Provincial Forestry Department (YPFD), and the DNR of MFO, who will subsequently revise or develop their own management plans.

- preparing reserve tourism plans that determine appropriate levels and types of tourism for the specific biophysical conditions and overall objectives for each reserve; and

- strengthening the organizational management of the reserves, especially at the field protection level, by developing systems for accountability and responsibility, strengthening

incentive systems for job performance, and preparing guidelines for strategic and operational planning.

3.5 One of the major goals of the project is to strengthen planning skills and structures at the nature reserve level. This will be accomplished by developing reserve management, land-use, organizational management, and tourism development plans that, together, will form a strategic blueprint for each of the reserves. The reserve management plans are the most critical planning documents for establishing the framework in which long- and short-term decisions are made for land-use development and management (a sample outline for a reserve management plan is included in Annex 1).

3.6 To ensure effective implementation of this sub-component, *the following assurances were obtained at negotiations: (a) nature reserve management plans, incorporating time-bound implementation schedules, descriptions of any civil works required, and environmental assessments carried out in accordance with guidelines acceptable to the Bank Group, will be prepared and furnished to the Bank Group for comment for the Shennongjia Nature Reserve and the four Qinling Nature Reserves by December 31, 1996, and for Wuyishan, Poyang Lake, and Xishuangbanna Nature Reserves by December 31, 1997; and thereafter implemented taking into account the comments of the Bank Group; and (b) no civil works construction in the nature reserves will commence until they have been provided for and agreed in the nature reserve management plans.*

Subcomponent (b): Improving Field Level Protection Systems

3.7 This subcomponent will strengthen the effectiveness of field-level protection based on the recommendations developed from the reserve management plans. The five reserve areas will receive support for appropriate equipment and infrastructure for guards, supervisors, researchers and management staff to carry out their work. Support will be provided for:

- guard posts, boundary markers, observation posts, and miscellaneous equipment for field protection staff;
- field kits for research and protection staff to facilitate the collection of field data; and
- improved communications technology and equipment to improve reserve administration.

Subcomponent (c): Augmenting Community Participation

3.8 In areas where people reside within or adjacent to nature reserves, integrating communities into reserve management is essential for effective protection and sustainable management of scarce natural resources. However, in China, local communities do not play any direct role in the planning or management of land in reserves and face limited incentives for biodiversity conservation. As a result, the core zones of most reserves are encountering increasing pressure from agricultural encroachment, hunting, fuelwood collection, livestock grazing, and other economic activities. Some reserves have responded to these pressures by introducing some community involvement in monitoring resource degradation in reserves. For example, Zhouzhi Nature Reserve in the Qinling Group has established a local committee in the Banfangzi Township to protect the forest from fire, Poyang Lake has established local committees to monitor birds, and Xishaungbanna and Taibaishan Reserves have made efforts to address the special concerns of minority and religious groups in the use of resources. In addition, some reserves have developed alternative income-generating activities for communities based on non-consumptive, sustainable use of resources in the reserves. However, nature reserve staff lack skills and

training in community organization, conflict resolution, and extension. As a result, some of the community development programs have evolved without a clear understanding of community needs and without a mutually agreed program to redress resource management conflicts.

3.9 Under this subcomponent, a process will be developed for nature reserve staff, and other appropriate extension staff, to plan with communities the use of natural resources within the experimental zones of nature reserves (a detailed description of the co-management program is included in Annex 2). This process, which will draw on the implementation experience available in China and in neighboring countries, will be tested in a total of eight pilot communities in four reserves, in order to develop a model for wider dissemination throughout China. It will lead to the development of community resource management plans (CRMP) that will form the basis for Co-Management Contracts between the communities and respective nature reserves. These contracts will identify the respective roles and responsibilities in resource use in reserves. Support will be provided for:

- developing and testing participatory rural appraisal (PRA) and group facilitation approaches for assessing community needs, resource uses, and conflicts;
- conducting extensive field-training in PRA as part of community organization efforts in Shennongjia and Qinling Nature Reserves. Key staff from the five reserve areas, the DNR and selected provinces will assist in the implementation of PRAs in these two reserves, supported with technical assistance. They will then return to their own areas and carry out PRAs in other communities based on the training and experience learned in the first two reserves;
- facilitating CRMPs that divide responsibilities between nature reserves and communities for co-management of natural resources. These plans will be legitimized in detailed contracts signed by the nature reserves and local communities, which will be approved by local government and monitored by local multi-institutional leading groups;
- implementing income-generating activities for the pilot communities through Community Investment Grants (CIGs) that are based on the CRMPs; the CIGs will only support non-consumptive economic activities consistent with sustainable resource use;
- financing equipment and training for summer and winter camps for schoolchildren where interactive conservation instruction is provided;
- preparing displays within the reserves that demonstrate conservation issues;
- financing equipment and training for conservation information centers, which demonstrate the relationships among general biological processes, the specific ecological conditions of the five nature reserves, and human interventions;
- financing equipment and training for mobile conservation education workshops for members of communities and local officials; and
- providing technical expertise to assist in developing the co-management process and supporting MFO monitoring and evaluation efforts.

3.10 Detailed operational guidelines for the CIG program have been agreed with government and are summarized in Annex 3. *The following assurances were obtained at negotiations: (a) the CIG program will be established in a total of eight pilot communities in four nature reserves (Shennongjia, Xishuangbanna, Poyang Lake, Qinling); (b) the CIG program will operate in accordance with guidelines acceptable to the Bank Group, which will include the following provisions: grants will be used to finance alternative income-generating investments that reduce the need for communities to harvest protected flora and fauna in nature reserves, grants will be approved by provincial ONRs, and each grant will be made under a contract between the recipient and the nature reserve administration on the basis of a model contract acceptable to the Bank Group; and (c) a report evaluating the experience of the CIG program will be prepared and furnished to the Bank Group for comment by September 1, 1999.* To ensure the financial sustainability and replicability of the CIG program, the government will finance a higher share of this activity (40 percent) than the other components (15 percent).

Subcomponent (d): Nature Reserves Investment

3.11 The project will also support a small amount of civil works, equipment, and vehicles necessary to improve protection in the five reserve areas, in line with the different objectives and management plans for each of the reserves, as reviewed below.

3.12 The objective for the **Shennongjia Nature Reserve** is to establish a model "Biodiversity Landscape Area" where the dual aims of nature protection and economic development can be harmonized within the Chinese context. This includes rehabilitation and upgrading of reserve facilities; developing sustainable land-use programs to conserve biodiversity in 100,000 ha just outside the nature reserve; and designing and executing a monitoring and evaluation program to meet land-use planning and management needs and measure impacts of the project. The nature reserve management plan will determine the exact investment requirements for Shennongjia. However, the likely areas of support will be: (a) guard posts, equipment and infrastructure to expand the coverage of protection and develop a positive incentive system tied to enforcement; (b) reforestation of the fir zone of the nature reserve; and (c) rationalization of land use in the contiguous Biodiversity Landscape Area.

3.13 The objective for the **Qinling Nature Reserve Group** is the development of a coordinated network of protection areas covering representative ecosystems of the Qinling Mountains. Key activities include:

- strengthening the protection of biological and religious values of the Taibaishan Nature Reserve through integration of protection with religious authorities;
- strengthening the protection and research capabilities in the Foping National Nature Reserve;
- strengthening technical capabilities of *Nipponia* protection staff;
- planning and developing the nature reserves of Zhouzi and Niubeiliang with emphasis on wildlife protection but including a capability to conduct management-related research on important species; and
- undertaking a regional land-use plan with adequate provisions for controlled tourist development and socio-economic self-sufficiency of local villages.

3.14 The project will also finance the demarcation and revegetation of a 60 km wildlife corridor between the Zhouzi and Niubeiliang Reserves. The corridor is presently uninhabited as a result of the harsh and hilly terrain. For most of its length, a width of 2 kilometers will be adequate to allow animal movements and exchange between the two reserves, but the width of the corridor will be widened at each end where it is crossed by major highways and where habitat continuity is weakest. The exact method of establishment – whether through natural regeneration or reforestation – will be determined during through the preparation of nature reserve management plan.

3.15 An important feature of the project will be increased sharing of resources across the different reserve administrations, particularly with regards to research. The four reserves will no longer continue to pursue separate research programs, and, instead, the provincial bureau will establish a single Qinling research unit and assign staff from the various reserves to different research topics. For example, panda research will be concentrated at Foping and Changqing; golden monkey research at Zhouzi; takin research at Niubeiliang; and botanic research and studies of medicinal plants at Taibaishan.

3.16 The primary objective for **Xishuangbanna National Nature Reserves** is to develop management approaches that integrate ethnic minorities in conservation, support ecotourism, and coordinate research programs. Provisions would be made to:

- develop ecotourism facilities that help pay for and justify protection activities without endangering the biodiversity resource base;
- develop processes for assisting villages in and around the reserve to reduce their dependence on forest resources, strengthen their involvement in forest protection and protect their ethnic rights and features;
- conduct scientific research on tropical biodiversity resources, particularly the impact of human interventions on flora and fauna; and
- forge cooperative linkages with other institutions involved in agriculture, forestry, tourism, and research in the area.

3.17 The project will provide limited investment in infrastructure to fill in gaps in the protection system, particularly at the Mengyang and Shangyong reserves. Key requirements include vehicles, computers, training, and a program of assistance to buffer zone villages that will build on existing principles of the "longshan" or dragon hill concept already well developed among local Dai and other minority groups in the region.

3.18 The objective for the **Wuyishan Nature Reserves** is to develop improved models to integrate research, village development, and infrastructure development with biodiversity conservation. Specific activities include:

- strengthening protection on the Fujian side of the reserve;
- developing the village extension and environmental education activities as models for training of other village groups and reserve staff in China;
- expanding the core area of the reserve by linking the existing two core areas with a corridor; and

- implementing a program to control the encroachment of mao bamboo on the natural forest.

3.19 Little additional infrastructure is required at Wuyishan, which already contains extensive facilities. Four new guardposts are proposed: one in Jiangxi and three in Fujian. The construction of more multi-purpose observation stations and permanent monitoring posts is not recommended, it is better to leave monitoring points as undisturbed as possible. Reserve staff will visit only when necessary to resurvey such areas and use tents if longer periods of work are needed. A limited number of vehicles, radio equipment, computers, office equipment, binoculars, cameras, video equipment and field kits are needed by the reserve to improve routine operation.

3.20 A model reserve database and data handling capability will be developed for Wuyishan that builds on the existing nascent GIS (supported under Component Four). The data center will be able to handle inventory, survey and census data, habitat monitoring, routine patrol data, and socioeconomic data. Data management will evolve from the design and use of manual report forms and manual files to the analysis of data on spreadsheets and database files and the integration of relevant data into a computerized system. The emphasis of the database is to handle data that are needed for routine management decisions in the reserve and ensure that information is presented in a useful format to those who need it.

3.21 Wuyishan management has already been working with local villages on introducing alternative income-generating activities to reduce pressures on the reserve. Mao bamboo trials and an extension program have been supported by the reserve in order to intensify production on limited land and maximize returns. Some additional activities in support of trials of high value crops within the reserve will be supported. Similarly, funds will be provided to develop handicraft industries that fully utilize the mao bamboo and other commercial crops. In addition, the project will support a variety of community education and awareness programs for the reserve; one promising example is the on-going effort of women's groups at Outou village to develop their own conservation awareness program.

3.22 One project activity in Wuyishan, however, may involve some resettlement. As noted above, the project will develop a corridor linking two core areas within the reserve. This would promote greater exchange of flora and fauna among the core areas, which would support the maintenance of a viable gene pool for preservation of biodiversity. The exact size and shape of the corridor will be reviewed and determined in the nature reserve management plan, which will be prepared in the second year of the project. There are presently about 35 households located near the proposed corridor area who are engaged in the cultivation of 600 ha of tea and bamboo. Depending on the final proposal for the size of the corridor area, it is possible that some present land use may be restricted and some compensation for lost agricultural production and resettlement of households required. It has been agreed that MFO will provide the following materials to the Bank Group in the event that the creation of the corridor area will involve any taking of agricultural land or resettlement: (a) a detailed map based on ground truthing of the important habitats to be included in the corridor; (b) detailed information regarding present land use in the corridor, including the location of households, the amount of land under agriculture, valuation of current income generating activities, and the type and amount of infrastructure; and (c) a comprehensive resettlement plan that conforms to the Bank's Operational Directive 4.30. *An assurance was obtained at negotiations that any involuntary resettlement of persons arising under the project would be carried out in accordance with procedures and principles satisfactory to the Bank Group. To that end, if any resettlement is expected as a result of the corridor development in Wuyishan, the completion of a resettlement action plan satisfactory to the Bank Group will be a condition of disbursement for the development of the biodiversity corridor in Wuyishan.*

3.23 The objective for the **Poyang Lake Migratory Bird National Nature Reserve** is to strengthen the protection of the wetland area without curtailing the large and varied economic activities underway in and around the reserve. This will involve three tasks. First, a mobile protection system to protect birds from hunting and poisoning will be developed. Second, on-going research efforts, especially in the area of land-use and waterbird ecology, will be supported. Third, facilities for education, awareness and visitor use will be developed to demonstrate the value of wild bird protection and promote conservation awareness.

3.24 The following specific activities would be supported:

- construction of a small amount of infrastructure: two small guardposts (equipped with wells and small generators), two floating houseboat guardposts, a mobile boat quay, and a dormitory to house researchers and bird watching volunteers.
- financing of overseas bird enthusiasts on a volunteer basis to work for 2 to 4 months in the reserve each winter to provide training in bird identification, construction of hides, and monitoring to guard and research staff;
- procurement of equipment: two fast motor patrol boats equipped with radio communication equipment and searchlights, one transport boat, two houseboats to be used as mobile protection stations, and equipment needed for routine protection such as radios, field kits, and tents;
- hiring of a small plane two times during project implementation to survey the entire Poyang Lake area to get a better understanding of these other wintering sites and to extend protection to key sites each winter; and
- development of a database to store and analyze the bird count data, ringing data, and other useful data. Database managers will receive training in data management and computer use (supported under Component Three) and equipment and software will be supplied when a manual data management system is functional.

Component Two: Restructuring Timber Harvesting Enterprises

3.25 This component would restructure the management of natural forests adjacent to the Qinling Reserve Group as a pilot exercise to resolve biodiversity land use conflicts. As reviewed in para. 2.24 - 2.26, two forest farms under the Changing Forestry Bureau have over-cut natural forest areas adjacent to the Foping Nature Reserve, which has degraded a small but important corridor for the passage of Giant Pandas outside of the reserve boundaries. The component would develop a restructuring program for the two farms based on a significant reduction in harvesting activities and the transfer of workers to more environmentally sustainable employment. This program – the first of its kind in China – is expected to establish a model for sustainable land-use management and enterprise restructuring that would be disseminated to other protected areas in China. The following policy reforms and investment requirements would be supported.

Subcomponent (a): Development of the Changqing National Nature Reserve

3.26 The natural forest area currently managed by the Changqing Forestry Bureau would be legally designated as a national level nature reserve, with a core zone of 11,000 ha and an experimental

zone of 19,000 ha. The core zone would comprise the main panda habitat and all harvesting, road construction, and other human interventions would be prohibited there. The government has already stopped these activities as of December 1, 1993 in preparation of the project, and has been paying the salaries of the idled labor force out of other income since then. The project would support the improved management of the core zone through preparation of a management plan, development of biophysical and socioeconomic inventories, establishment of guard posts with related equipment, and training of protection staff. The experimental zone would be managed on a sustainable basis. The two forest farms would still be permitted to harvest timber in this area, but the following new conditions would apply: (a) the annual cut would not exceed the mean annual growth of the forest; and (b) new silvicultural management practices would be introduced to maintain the biodiversity value of the zone, including selective cutting, natural regeneration, and enrichment planting with appropriate broadleaf species. This new management system will lead to a 60 percent reduction in the annual harvest amount, to 7,000 cubic meters of sawlogs under the project. The project would support improved management of the experimental zone through preparation of a management plan, establishment of a broadleaf species nursery, reforestation of harvested areas, and training and technical assistance in improved silvicultural management techniques.

3.27 *State Council approval of the designation of the Changqing forestry area as a national level nature reserve will be a condition of disbursement for the job creation program and worker relocation program in Changqing.* In addition, *the following assurances were obtained at negotiations: (a) the nature reserve management plan, including a time-bound implementation schedule, description of any civil works required, and environmental assessment carried out in accordance with guidelines acceptable to the Bank Group, will be prepared and furnished to the Bank Group for comment by December 31, 1996; and thereafter implemented taking into account the comments of the Bank Group; and (b) no civil works construction in the nature reserve will commence until it has been provided for and agreed in the nature reserve management plan.*

Subcomponent (b): Enterprise Restructuring and Job Redeployment

3.28 The labor force of 1,713 workers in the two forest farms would be restructured in line with the reduction in harvesting. The 1,314 workers involved in cutting and related activities (transportation, storage, road construction, reforestation) would be reduced to 370 under the project; and the 399 workers involved in management, administration, and services would be reduced to 150. This restructuring would create 1,193 surplus workers, of which 1,043 would be redeployed to new, environmentally sustainable employment under the Forestry Bureau and 150 would receive a relocation package and leave the Changqing area. *An assurance was obtained at negotiations that the surplus workers would voluntarily select which restructuring option they prefer; if there is excess demand for the relocation package, selection would be on the basis of a lottery.* Detailed operational guidelines for the job creation program and the relocation program are included in Annex 4 and summarized below.

3.29 Job Creation Program. The project would finance the civil works, machinery and equipment, and technical assistance required to create new employment opportunities for redundant workers at existing and new enterprises. The Changqing Forestry Bureau has already identified the preliminary enterprises and investment requirements to support the establishment of the 1,043 new jobs. These include an expansion of the mushroom production capacity at the Changqing Bio-Product Plant, a rehabilitation of the herbal tonic beverage line in the Changing Healthy Food Plant, the development of a building materials factory, and the development of a commercial trading company and tourist accommodations. Detailed feasibility studies for these and other proposals will be prepared during the first year of the project and reviewed by a Technical Advisory Group (TAG) convened by MFO. The TAG will include provincial or national experts in forestry, engineering, environmental protection,

finance, and at least one representative from a non-governmental organization, such as a local wildlife society or a university.

3.30 The project would only finance investments that meet the following specific technical, financial, and environmental standards. Any investment receiving GEF funding would generate a financial rate of return of at least 10 percent, be demonstrated to be technically feasible on the basis of a feasibility study approved by the Bank Group, and be shown to have no adverse environmental impacts on the basis of an environmental assessment (EA) carried out in accordance with guidelines acceptable to the Bank Group. The government has reported that none of the proposed investments involve any land acquisition under the project; as noted in paras. 5.13-5.14, the status of the existing land-use will be reviewed and confirmed during the EA. In addition, the project would only support firms with a demonstrated commitment to enterprise reform. To this end, all enterprises receiving GEF funding would be legal entities, be permitted to borrow funds under their charters, be managed on an independent basis, and have separate financial statements and accounts subject to auditing by an independent auditor and following the new accounting standards introduced in 1993.

3.31 All GEF funds provided to enterprises will be in the form of concessional loans in order to enhance the sustainability of the job creation program and ensure efficient investment selection. Loans will be extended for a maturity of not more than twelve years, including not more than four years of grace, accrue interest at 4 percent per year, and be denominated and payable in local currency, with the foreign exchange risk borne by the Shaanxi Provincial Forestry Department.

3.32 The procedures for investment review have been agreed with the government. The sub-loan package furnished to the Bank Group for approval would include the following documents: the feasibility study, including the description of the enterprise and a breakdown of the expenditures proposed to be financed by GEF; the proposed terms and conditions of the sub-loan; and the environmental assessment. In addition, the standard Bank requirements for on-lending in financial intermediation projects have been reviewed and agreed with the government. All sub-loans made by the Changqing Forestry Bureau would require: (a) the enterprise to carry out and operate the sub-project with due diligence and efficiency and in accordance with sound technical, financial, and managerial standards and to maintain adequate records; (b) goods and services financed with GEF funds to be procured in accordance with project procurement guidelines and to be used only for implementation of the agreed sub-projects; (c) the enterprise to take out and maintain insurance against risks and in amounts consistent with sound business practices, including hazards incident to the acquisition, transportation and delivery of goods financed with GEF funding to the place of use; (d) the enterprise to allow the Bank Group to inspect the sub-project and to provide information to the Bank Group about sub-project implementation; and (e) the suspension or termination of the sub-loan in the event the enterprise fails to perform its obligations. *Assurances were obtained at negotiations that the criteria, terms and conditions for subloans, and procedures would be as set out in paras. 3.30-3.32 above.*

3.33 Relocation Program. The project would also finance relocation packages for 150 workers. These people will either return to their home villages and develop household agricultural or commercial activities, or move to towns outside of Changqing for employment in other enterprises. The relocation package is designed to ensure that labor transfer occurs efficiently and equitably, based on the principle that the redundant workers should not experience any long-term loss in their living standards as a result of the enterprise restructuring. The package therefore includes measures that both redress the significant barriers to labor mobility that exist in China and meet the economic development requirements of redundant workers. Two recent Bank sector reports, Reports No. 10266-CHA and 11785-CHA, provide extensive background on these labor market and enterprise reform issues.

3.34 The relocation package would include the following specific items: (a) **worker and family relocation costs**, including transportation and moving costs, interim accommodation fee, new housing construction costs, settling-in allowance, and registration fees; (b) **worker retraining and placement costs**, including training costs, enterprise registration fees, and labor contract deposit; and (c) **livelihood development**, including small-scale investment in agriculture, aquaculture, livestock, and off-farm income-generating activities such as restaurants and shops.

3.35 The actual relocation package for a redundant worker would be tailored to fit the specific situation of the worker. Therefore, the Shaanxi Provincial Forestry Department, under the supervision of MFO, will conduct a baseline survey of the redundant workers' current living standards and relocation plans in order to determine the appropriate basis for the amount of funds paid to each worker. The results of the survey will be used to prepare an overall report that summarizes (a) the principles and methodology used to calculate all the specific items in the relocation packages; (b) the exact composition and cost of each relocation package; (c) disbursement arrangements; and (d) monitoring and evaluation arrangements. A contract would then be signed between each redundant worker and the Changqing Forestry Bureau specifying the terms and conditions of the relocation package. Preliminary survey work completed as part of project preparation indicates that the average relocation package would amount to about $8,000 per worker, which is in line with average unit costs paid for comparable activities in resettlement programs in China supported under Bank projects.

3.36 To ensure effective implementation of the relocation program, *the following assurances were obtained at negotiations: (a) the relocation package will only finance costs from a list of expenditure items acceptable to the Bank Group; (b) the baseline survey will be carried out in accordance with terms of reference and timing acceptable to the Bank Group; and (c) the terms and conditions of the relocation package for each worker will be specified in a contract in form and substance satisfactory to the Bank Group. In addition, the completion of an overall relocation report acceptable to the Bank Group will be a condition of disbursement for the relocation program.*

3.37 Sustainability. The sub-component is designed to develop a model for enterprise restructuring and includes several features that enhance sustainability and replicability. First, the government will finance a higher share of this sub-component (40 percent) than the other components (15 percent), broken down as follows. It will finance 20 percent of the relocation program, 35 percent of the job creation program, and all of the wages of the 1,193 redundant workers up until the restructuring program is implemented. Second, a new revolving fund would be established from the debt service repayments that would support comparable enterprise restructuring projects in the future. To this end, *the following assurances were obtained at negotiations: (a) Shaanxi Provincial Forestry Department will use repayments of sub-loans to finance restructuring activities similar to the Changqing program in other nature reserves and environmentally sensitive areas in Shaanxi Province; and (b) an implementation plan for this activity will be furnished to the Bank Group for comment by January 1, 1999.* Third, a comprehensive evaluation and monitoring program for the sub-component has been agreed with government, in order to support analysis of implementation experience and development of recommendations for dissemination of sub-component activities to other protected areas in China. To this end, *an assurance was obtained at negotiations that MFO will furnish an evaluation report, prepared in accordance with terms of reference acceptable to the Bank Group, on the sub-component to the Bank Group by September 1, 1999.*

Component Three: Developing Institutional Capacity

Sub-component (a): Organizational Development

3.38 The project will provide support to DNR to develop a Nature Reserve Training Team (NRTT) for the design, preparation, and delivery of an in-service training program for nature reserve personnel, as reviewed below. Six trainers from provincial institutes will be seconded to DNR, plus one existing training coordinator in DNR, to serve as the staff of the NRTT. They will be assisted by a long-term resident advisor who will transfer skills in training needs assessment, course development, course delivery, and evaluation. This on-the-job, in-country training will be supplemented by long-term overseas training in protected area management, land-use and other planning, ecology, organizational management (especially personnel relations, planning, and administration), database management and computer skills, socio-economics and PRA, and public awareness and conservation education. One of the NRTT staff will receive more training in teaching methods, compared to other technical specialist areas, and assume some administrative and managerial functions. *An assurance was obtained at negotiations that the NRTT will be established in DNR by October 1, 1995, with functions and responsibilities acceptable to the Bank Group, and with competent staff in adequate numbers.*

3.39 The project will also support the preparation of an overall conservation plan for the national nature reserve system. This plan will assess the role of the MFO and other relevant public and non-governmental organizations in protected area management, review national needs and constraints in the nature reserve system, and prepare a time-bound action plan to improve conservation (an outline for the national plan is included in Annex 5). *An assurance was obtained at negotiations that an overall conservation plan for the national nature reserve system, including a time-bound implementation schedule, will be prepared and furnished to the Bank Group for comment by December 31, 1998; and thereafter implemented taking into account the comments of the Bank Group.*

3.40 The project will also support a comprehensive policy studies program designed to address the key policy issues that emerge out of the preparation of the various nature reserve management plans. The main topics are likely to include:

- a review of incentives and disincentives for sustainable use and management of natural forests;
- the level and impact of economic rents in logging and processing activities, and options for redistributing some of rents to finance the adverse environmental impacts generated by these activities;
- opportunities to reduce the impact of selective logging on residual timber stands through landscape planning;
- options for strengthening enforcement and penalties for violation of logging regulations;
- sustainable utilization of wetland vegetation for livestock and other uses;
- the watershed protection value of biodiversity conservation in Qinling mountains;
- the economic potential of non-timber forest products, and issues related to the commercialization of valuable genetic material; and
- the role of guards in property rights management, and the skills required to move away from a narrow policing philosophy.

An assurance was obtained at negotiations that all policy studies will be carried out in accordance with terms of reference and timing acceptable to the Bank Group, and will be furnished to the Bank Group for comment.

3.41 The project will also strengthen institutional capacity for improved reserve planning and management at the provincial level. Yunnan Province was selected as a pilot province, due to its rich biodiversity resources and the large area of land under protection (a review of Yunnan's biodiversity is included in Annex 6). The project would build capacity within the ONR of YPFD to coordinate and supervise the protection of the thirty provincial-level nature reserves, which contain a high proportion of the country's biodiversity. Funding would be provided to:

- construct new office facilities and upgrade office equipment for ONR;
- prepare management plans for five important Category "A" nature reserves, covering a wide range of ecosystem diversity;
- prepare a provincial nature reserve conservation plan, including an outline of the current situation of conservation in Yunnan, an assessment of tourism potential and impact, and an action plan for increased protection of biodiversity in the province;
- conduct programs of education and awareness; and
- develop a provincial nature reserve geographic information system.

3.42 This capacity building program will require additional human resources in ONR. The province has therefore agreed to recruit an additional ten technical staff for ONR, including one chief of the project management office, one deputy chief, and eight people responsible for the provincial nature reserve management plan, protection activities (two people), community development, data collection and analysis, public education and research, training, administration. To ensure effective implementation of the Yunnan capacity building program, *the following assurances were obtained at negotiations: (a) the provincial nature reserve conservation plan, including a time-bound implementation schedule, will be prepared and furnished to the Bank Group for comment by December 31, 1999; and thereafter implemented taking into account the comments of the Bank Group; and (b) ten additional staff members will be employed in ONR by January 1, 1996.*

Sub-component (b): Training and Skills Development

3.43 The objective of this sub-component is to develop and conduct courses for nature reserve staff that will lead to increased levels of understanding of field level protection, planning, organizational management, database management, and principles of ecology and management of protected areas (a review of current training needs and programs in the protected areas system is included in Annex 7). Training will be provided by the NRTT for guards, reserve managers, research and data management staff, socioeconomic and extension workers, and national and provincial policy makers.

Table 3.1: Course Output of NRTT

Course	PY1	PY2	PY3	PY4	PY5	PY6	Total No.
Guard Training	0	9	9	0	0	0	18
Reserve Management	1	3	4	0	4	0	12
Research Methods	0	2	3	2	4	0	11
Computer Skills	0	3	3	0	0	0	6
Data Management	0	5	4	2	0	0	11
Community Edu./Ext.	0	0	3	0	5	0	8
Planning	0	0	2	0	0	0	2
Ecology	0	0	0	1	1	0	2
Total	1	22	28	5	14	0	70

3.44 Approximately 900 person months of in-service training will be delivered to existing nature reserve staff in the following course modules: guard training; nature reserve management, including developing awareness and skills in organizational management; researchers course; data management; socio-economics and public awareness; computer skills; planning course; and ecology. Table 3.1 illustrates the proposed schedule for course delivery by course type. In addition, the project will support staff development through: six short courses in the Asia Region in various topics in protected areas management; domestic study tours for sharing and disseminating information relevant to protected area management; a one month training course in existing global, regional, and country databases; and the provision of equipment and materials to implement the training program. To ensure effective implementation of this sub-component, *an assurance was obtained at negotiations that all local and overseas training and study tours would be carried out in accordance with a training program acceptable to the Bank Group.*

Sub-component (c): Project Management

3.45 The project will support supervision and management requirements to ensure effective coordination and implementation of project activities. The GET grant will finance a small amount incremental expenditures related to: (a) office equipment, such as fax machines, photocopying machines, computers, typewriters; (b) recurrent operating support for the World Bank Loan Project Management Center in MFO (PMC) and the project-management offices in the provincial forestry departments related to travel and subsistence for field work, communications expenses, and office consumables; and (c) 10 person months of short-term technical assistance in a variety of specialized areas. All other recurrent operating costs, such as staff salaries and bonuses, will be financed by the government through local counterpart funding.

Component Four: Developing Information Systems

Subcomponent (a): Data Management

3.46 The project will provide technical assistance, training, and equipment at the national, provincial, and reserve levels to support the development of an information database for improved biodiversity management. Data and application needs will be assessed, a consistent database structure will be designed and introduced, data maintenance standards will be established, and mechanisms for data sharing and acquisition will be established. Staff from the reserves, provinces, and the DNR will receive training (under Component Three) in data collection, analysis, and maintenance and work with manual data management systems prior to the installation of the computer systems. After establishing database structures and maintenance procedures, computer systems will be installed in each of the reserve sites, three key provincial nature reserve protection offices, and at the national DNR. Additionally, technical assistance will be provided to design a biodiversity database structure (including socioeconomic and organizational modules) and an integrated nature reserve management information system (NRMIS). Finally, a geographic information systems (GIS) will be developed at Wuyishan, Yunnan ONR, and DNR.

Subcomponent (b): Inventories and Monitoring Systems

3.47 Reserve managers require a comprehensive monitoring system in order to determine the impacts of programs and actions on the resources of the reserves. This project promotes the concept of monitoring as an integral and continuous activity that will be institutionalized in the nature reserve system. Support is provided for:

- conducting biophysical and socioeconomic baseline inventories and periodic monitoring in the project reserve areas;

- conducting aerial surveys of key areas, notably Poyang Lake, for use in planning and monitoring; and

- the acquisition of climatic recording equipment for data collection at the reserves.

3.48 Much of the biodiversity baseline data for the five reserve areas are out of date and not evenly distributed across the project area. New biological and socioeconomic inventories will be needed to determine the species contained in the reserves and in surrounding areas and provide baseline data for future management. The emphasis of the biological inventory will be on the remapping of vegetation; establishing of long-term monitoring plots in each vegetation type; correlation of bird faunal communities to vegetation type in different seasons; reserve mammals including their distribution, densities, and seasonal movements; the reinventory of fish, amphibians and reptiles; the continued collection of insects and invertebrates; and the routine sampling of moths using standard moth traps.

Component Five: Supporting Nature Reserve Research

Subcomponent (a): Reserve Research Program

3.49 The project will build capacity for scientific research at the five reserve areas. The project will finance specialized technical and scientific equipment for all five reserve areas; one small field laboratory at both Shennongjia and Wuyishan (each 60 sm m in size); and four small research offices in Qinling (each 100 sq m in size).

Subcomponent (b): Small Research Grants Program

3.50 A small research grants program will be established to provide data necessary for reserve management; give nature reserve technical staff the experience (and the incentives) in running their own projects; and give local reserve employees training (by doing) in simple data collection and research methods. Priority would be given to research conducted on ecological and socioeconomic topics leading to more effective management and protection of the reserves. The grants program will be open to (a) staff from all nature reserves in China and (b) collaborative teams of nature reserve staff and external researchers. It will be based on a competitive award process administered by a panel of experts, including one representative from DNR, one representative from PMC, and three senior level experts from local universities or institutes, such as the Chinese Academy of Forestry, the Chinese Academy of Sciences, and a non-forestry university. Individual grants will not exceed US$5,000. Operating guidelines for the program are included in Annex 8. *An assurance was obtained at negotiations that the small grants research program will be carried out in accordance with guidelines acceptable to the Bank Group, with research carried out under contracts with competitively selected researchers.*

CHAPTER 4: PROJECT COST AND FINANCING

A. Project Costs

4.1 Total project costs are estimated at $23.6 million, including incremental costs eligible for GEF financing estimated at $17.9 million, or about 76 percent of total costs. These incremental costs were calculated by: (a) identifying the "baseline" investment and recurrent expenditures that the Government would have made in support of global biodiversity in the project area in the absence of a GEF project ($5.7 million); (b) calculating the cost of implementing the new FRDPP/NRMP approach to nature reserve management in the selected reserve areas ($23.6 million); and (c) subtracting the baseline expenditures from the "global" project costs to isolate the GEF incremental costs ($17.9 million). The baseline situation was developed in conjunction with MFO, the Ministry of Finance (MOF), and the State Planning Commission and was derived from sectoral investment priorities set out in the BAP and detailed budget projections included in the Eighth Five-Year Development Plan for 1991-95.

4.2 The total project costs include a foreign exchange component of $6.8 million or about 29 percent of total costs. Cost estimates are based on quantities derived from technical discussions during preparation and appraisal missions, and unit prices currently prevailing for similar construction works and materials in project areas and from actual price quotations provided by local tendering companies for equipment. Price contingencies of $1.0 million are included. Price contingencies for costs expressed in yuan are based on annual domestic escalation rates of 9 percent for 1995, 8 percent for 1996, 7.2 percent for 1997, 6.5 percent for 1998-99, and 6 percent for 2000. Price contingencies for costs expressed in US dollars are based on annual international escalation rates of 2.0 percent for 1995, 2.5 percent for 1996, 2.7 percent for 1997, 2.5 percent for 1998, 2.6 percent for 1999, and 2.7 percent for 2000. Physical contingencies of $1.0 million are included, based on an average rate of 5 percent for goods and services. Taxes and duties are not included in costs. Detailed project cost tables are given in Annex 9.

B. Financing

4.3 The financing plan is summarized in Table 4.1. The proposed GET grant of $17.9 million would cover 76 percent of total project costs, including 100 percent of foreign exchange costs and 66 percent of local costs. Counterpart funding would finance the balance of project costs, including $2.4 million from the central government, $1.6 million from provincial governments, and $1.7 million from county governments. All counterpart funding would come from budgetary revenues and would account for less than one percent of the annual budgetary allocation for wildlife conservation.

Table 4.1: Project Financing

	Local	Foreign	Total
	($ million)		
GET Grant	11.1	6.8	17.9
Central Government	2.4	0.0	2.4
Provincial Governments	1.6	0.0	1.6
County Governments	1.7	0.0	1.7
Total Financing	16.8	6.8	23.6

C. Procurement

4.4 The procurement arrangements are summarized in Table 4.2 and reviewed below. Civil works worth $4.4 million would be required in the project, which amount to 19 percent of total project costs and comprise nature reserve infrastructure ($1.3 million), reforestation and other works in nature reserves ($0.5 million), and civil works related to the development of enterprises in Changqing ($2.6 million). These works are small and widely scattered, and, consequently, would not be suitable for competitive contract bidding. All of the works in nature reserves will be carried out on force account or by casual labor paid on a piece-work basis under the supervision of forestry bureau or nature reserve staff. The civil works related to enterprise development will largely be carried out by existing staff of the enterprises or the forestry bureau under force account ($0.5 million of these civil works are expected to be for enterprises that do not meet the investment criteria reviewed in para. 3.30 and will therefore be ineligible for GEF funding). The Bank Group reviewed these procedures at appraisal and found them acceptable.

4.5 Goods worth $5.0 million would be required for the project, which amount to 21 percent of total project costs and comprise vehicles ($1.3 million), office equipment ($0.6 million), field and research equipment ($0.6 million), and machinery and equipment for the Changqing enterprises ($2.5 million). **ICB procurement** procedures would apply to all contracts for items or groups of items estimated to cost $200,000 or more. This would include a portion of the vehicles (patrol cars, mini-buses), a portion of office equipment (computers, printers), and some contracts for Changqing enterprises, for a total of $1.7 million or 34 percent of all goods. A margin of preference equal to 15 percent of the c.i.f. price of imported goods or the actual customs duties and import taxes, whichever is less, will be allowed to domestic manufacturers bidding under ICB procedures. **National Competitive Bidding (NCB) procurement** procedures acceptable to the Bank Group would apply to all contracts for items or groups of items estimated to cost less than $200,000 and more than $75,000. This would include a portion of the vehicles (pick-ups, mobile education units, education vehicle, motorbikes), a portion of office equipment (photocopiers, typewriters, fax machines), a portion of field equipment (walkie talkies, radios), and some contracts for Changqing enterprises, for a total amount of $1.4 million. Previous project experience has shown that these items in small quantities are available locally at prices significantly below those of the international market. Foreign bidders would therefore not be interested in bidding for them, although they would be allowed to participate in the bidding process if desired. **Shopping procurement** procedures would apply to all contracts for items or groups of items estimated to cost $75,000 or less and $1.4 million in aggregate, since small quantities of diverse equipment are required. Contracts would be awarded on the basis of comparisons of price quotations solicited from at least three qualified suppliers, as described in Bank guidelines. $0.5 million of the machinery and equipment are expected to be for enterprises in Changqing that do not meet the investment criteria reviewed in para. 3.30 and will therefore be ineligible for GEF funding.

4.6 Services worth $8.8 million would be required for the project, which amount to 37 percent of total project costs and comprise research services ($0.6 million), consulting services ($5.2 million), and training services ($3.0 million). Consultants would be employed in accordance with Bank Group Guidelines for the Use of Consultants. Local training, overseas training, study tours, and research services would be procured by procedures acceptable to the Bank Group.

4.7 Other activities amount to $5.4 million, which account for 23 percent of total costs and comprise recurrent operating expenditures ($4.1 million), the relocation packages in Changqing ($1.2 million), and the community investment grants program ($0.1 million). The GET grant would fund $0.44 million of incremental recurrent operating expenses over six years related to project staff travel and

subsistence for field work, communications expenses, and office consumables; these goods and services will be procured by procedures acceptable to the Bank Group. The remaining $3.7 million in recurrent expenses consists primarily of staff salaries and bonuses, which will be financed by the government on force account. The GET grant would fund $0.96 million of the relocation packages and $0.072 million of the community investment grants, based on guidelines acceptable to the Bank Group.

4.8 Bank Group Review. All contracts for goods would be grouped into bid packages whenever possible to attract competition and permit bulk purchasing. Standard bidding documents approved by Bank Group would be used. All contracts for goods in excess of $200,000 would be subject to prior review by the Bank Group, which would cover about 50 percent of the total goods by value. All contracts for consultants' services in excess of $100,000 for engagement of firms and $50,000 for engagement of individuals would be subject to prior review by the Bank Group, which would cover about 75 percent of the total consultants' services by value. Other contracts for goods and services would be subject to ex-post review by the Bank Group supervision missions. ICB procurement will be handled by a central procurement section in the PMC, which will engage the China National Instrument Import and Export Corporation as its procurement agent.

D. Disbursement

4.9 Funds from the grant would be disbursed on the following basis:

(1) Civil Works
  (a) for biodiversity corridor in Wuyishan Nature Reserve ($0.350 million): 85%;
  (b) all other civil works ($1.449 million): 85%;

(2) Goods ($2.442 million): 100% of foreign expenditures, 100% of local expenditures (ex-factory cost), and 75% of local expenditures for other items procured locally;

(3) Community Investment Grants ($0.072 million): 60%;

(4) Sub-Loans for Changqing Enterprises ($3.372 million): 100%;

(5) Relocation Packages for Changqing Enterprises ($0.960 million): 80%;

(6) Operating Costs ($0.439 million): 100%; and

(7) Consultants' Services, Research Services, Training, and Study Tours ($8.818 million) million): 100%.

4.10 Disbursements would be made against statements of expenditure (SOEs) for expenditures relating to: (a) contracts for goods not exceeding $200,000 equivalent; (b) works; (c) sub-loans, community investment grants, relocation packages, and operating costs; (d) research services, training and study tours; and (d) contracts for individual consultants not exceeding $50,000 equivalent and for consultants' services with firms not exceeding $100,000 equivalent. The supporting documents for SOEs would be retained by the provincial project management offices and the central project management office in MFO could retrieve them as required for supervision missions. In the case of contracts for goods and services above these thresholds, disbursements would be made against the full documentation with the contracts themselves and other supporting documents.

4.11 The project will include the following conditions of disbursement: (a) if any resettlement is expected as a result of the corridor development in Wuyishan, the completion of a resettlement action plan satisfactory to the Bank Group will be a condition of disbursement for the corridor development (para. 3.22); (b) State Council designation of the Changqing forestry area as a national-level nature reserve, and the completion of a relocation report acceptable to the Bank Group will be conditions of disbursement for the relocation program under the Changqing enterprise restructuring component (paras. 3.27 and 3.36); and (c) State Council designation of the Changqing forestry area as a national-level nature reserve, and the provision of sub-loans in accordance with the agreed procedures and terms and conditions will be conditions of disbursement for the job creation program under the Changqing enterprise restructuring component (paras. 3.27 and 3.30-3.32).

4.12 In order to disburse the grant proceeds efficiently, a special account would be opened by MOF in US dollars in a bank acceptable to the Bank Group with an initial deposit of $1.25 million, equivalent to the grant's financing of average expenditures for four months during the first three years of the project. Applications for replenishment of this account will be submitted monthly, or whenever the account is drawn down by 50 percent, whichever comes first. Retroactive financing of up to SDR 340,000 ($500,000 equivalent) would be provided against expenditures made between September 1, 1994 and the date of signing of the Grant Agreement for enterprise feasibility studies for the job creation program in Changqing, the baseline survey for the relocation program in Changqing, training, and technical assistance.

4.13 The project is expected to be completed by June 30, 2001 and the closing date would be June 30, 2002. The estimated schedule of disbursement is given in Annex 9. About 70 percent of all disbursements will be made during the first three years, reflecting the large amount of technical assistance, training, and planning required to build capacity and prepare improved management plans during the early years of the project; relatively small amounts will be disbursed for specific investment requirements during the final two years. The project disbursement schedule is consistent with the general disbursement profile for Bank Group agricultural and forestry development projects in China.

Table 4.2: Procurement Profile
($ thousand) [1]

Project Element	Procurement Method ICB	NCB	Other [2]	N.A.	Total Costs
1. Works					
1.1 Nature Reserves: Infrastructure			1,258.1		1,258.1
			(1,258.1)		(1,258.1)
1.2 Nature Reserves: Other			540.6		540.6
			(540.6)		(540.6)
1.3 Changqing Enterprise Construction			2,063.3	515.8	2,579.1
			(1,721.2)	(0.0)	(1,721.2)
Total Works			3,862.0	515.8	4,377.8
			(3,519.9)	(0.0)	(3,519.9)
2. Goods					
2.1 Vehicles	893.5	297.6	88.4		1,279.5
	(893.5)	(297.6)	(88.4)		(1,279.5)
2.2 Office Equipment	302.7	177.4	121.1		601.2
	(302.7)	(177.4)	(121.1)		(601.2)
2.3 Field/Research Equipment		143.3	417.7		561.0
		(143.3)	(417.7)		(561.0)
2.4 Changqing Enterprise Equipment	515.8	825.3	722.2	515.8	2,579.1
	(412.6)	(660.2)	(577.8)	(0.0)	(1,650.6)
Total Goods	1,712.0	1,443.6	1,349.4	515.8	5,020.8
	(1,608.8)	(1,278.5)	(1,205.0)	(0.0)	(4,092.3)
3. Services					
3.1 Consultancies			5,241.4		5,241.4
			(5,241.4)		(5,241.4)
3.2 Training and Study Tours			3,011.0		3,011.0
			(3,011.0)		(3,011.0)
3.3 Research Services			565.5		565.5
			(565.5)		(565.5)
Total Technical Assistance			8,817.9		8,817.9
			(8,817.9)		(8,817.9)
4. Other					
4.1 Recurrent Operating Expenses			439.3	3,666.1	4,105.4
			(439.3)	(0.0)	(439.3)
4.2 Changqing Relocation Packages			1,200.0		1,200.0
			(960.0)		(960.0)
4.3 Community Investment Grants			121.2		121.2
			(72.7)		(72.7)
Total Other			1,760.5	3,666.1	5,426.6
			(1,472.0)	(0.0)	(1,472.0)
TOTAL	1,712.0	1,443.6	15,789.8	4,697.7	23,643.1
	(1,608.8)	(1,278.5)	(15,014.8)	(0.0)	(17,902.1)

[1] Figures in parentheses represent the amounts financed by the GET grant, including contingencies.
[2] Other procurement methods include direct recruitment of labor, force account, national and international shopping, direct purchase, and consultancy services.

CHAPTER 5: PROJECT IMPLEMENTATION

A. Organizational Structure and Responsibilities

5.1 The project would be implemented by MFO, five provincial forestry departments, and nine nature reserves. Most of the project management structure is already operational, as it draws heavily on the existing Department of Forest Protection in MFO and the organizational arrangements for the associated project, the Forest Resource Development and Protection Project (FRDPP). As with most projects in China, a leading group would be responsible for policy and strategic management issues at the national level, and project management offices would be responsible for detailed planning, management, and supervision of project activities. Detailed implementation arrangements at the national, provincial, and reserve levels are reviewed below.

5.2 The national leading group is chaired by the Minister of Forestry and consists of two vice-ministers; the director of the PMC, which coordinates all World Bank forestry projects in China; and the directors of relevant departments and agencies in MFO. This group sets the principles and policies for the project, approves the overall implementation plan, and coordinates inter-ministerial discussions with the National Environmental Protection Agency, MOF, and other relevant agencies.

5.3 The actual day-to-day management would be jointly carried out by the PMC and the DNR in the Department of Forest Protection. The PMC would handle work plans, financing, procurement, disbursement, accounting, auditing, and administrative activities. The PMC, which manages the on-going National Afforestation Project and the associated FRDPP, has a staff of 25 in the areas of silviculture, environmental management, economics, procurement, accounting and finance, and information management. PMC has demonstrated excellent institutional capacity for project management and is viewed as one of the strongest implementing agencies in China. The DNR would be responsible for all technical management, including management plans, monitoring and evaluation, and training and technical assistance. While DNR has displayed good technical competency in managing its limited portfolio of activities, it requires further staffing to implement the proposed project. Consequently, four additional staff were appointed to DNR prior to negotiations in the areas of project management, research, data management, and management plans, which provides a sufficient management team for implementation. Detailed terms of reference for PMC and DNR are included in Annex 10 and the organizational structured is summarized in Figure 5.1.

5.4 The same division of responsibilities would occur at the provincial forestry department, where the existing FRDPP project management offices (PMO), which report to the PMC, would work closely with the ONR, which report to the DNR (see Figure 3.2). The institutional capacity at the provincial level is good, though some capacity building is required in two areas. First, for Shaanxi Province, where no FRDPP PMO exists, a small new PMO would be created within the ONR to manage project activities. Second, as reviewed in para. 3.42, the ONR of the YPFD has insufficient staffing to implement the pilot program of improved planning and management of provincial biodiversity resources and will be strengthened under the project.

5.5 During the first two years of the project, the PMOs in each of the five provinces will work closely with PMC and the nature reserves in managing project activities. It is expected that PMO staff will divide their time between the provincial office and the nature reserve administrations, which will

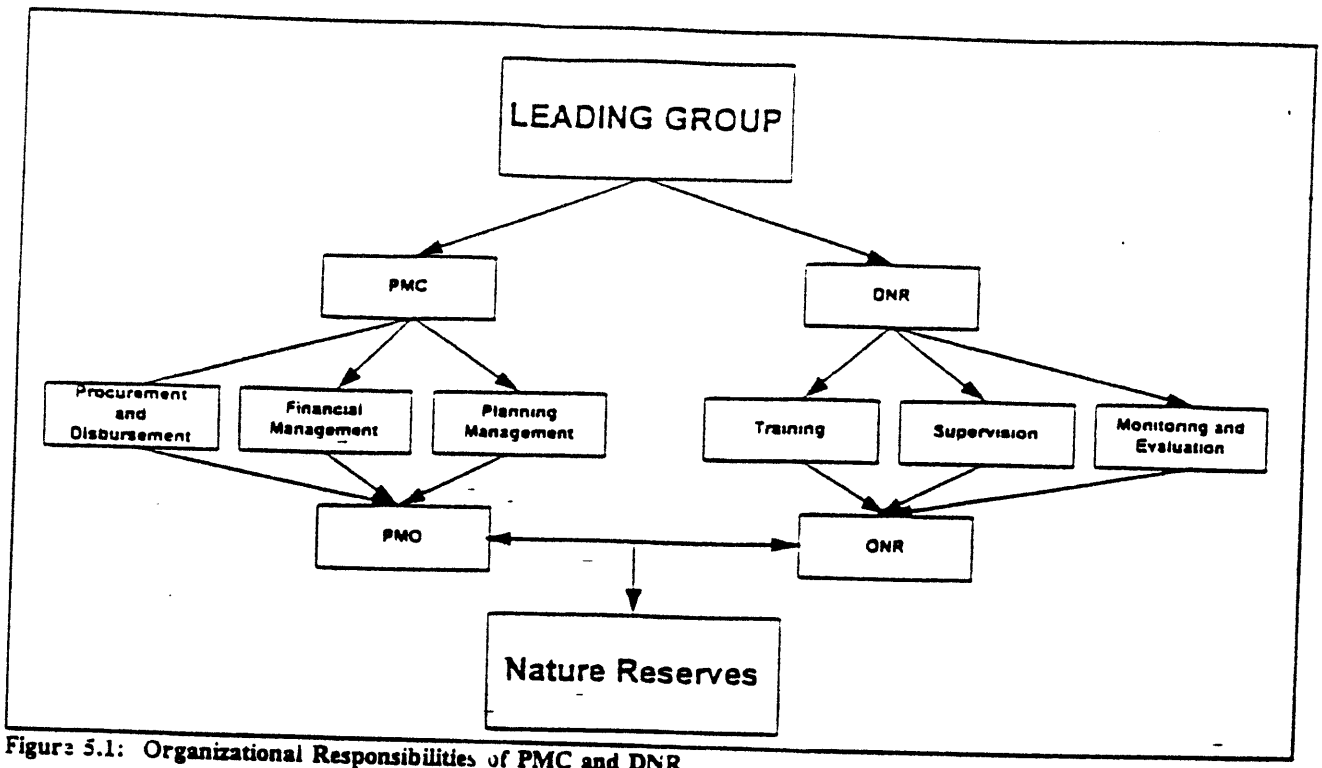

Figure 5.1: Organizational Responsibilities of PMC and DNR

5.5 During the first two years of the project, the PMOs in each of the five provinces will work closely with PMC and the nature reserves in managing project activities. It is expected that PMO staff will divide their time between the provincial office and the nature reserve bureau office, which will facilitate capacity building at the reserve level. Beginning in the third year, project management responsibilities would be transferred to four of the five nature reserve sites. Shaanxi Province would retain its PMO unit within ONR because of the need to coordinate the four sub-reserves of the Qinling Nature Reserve Group.

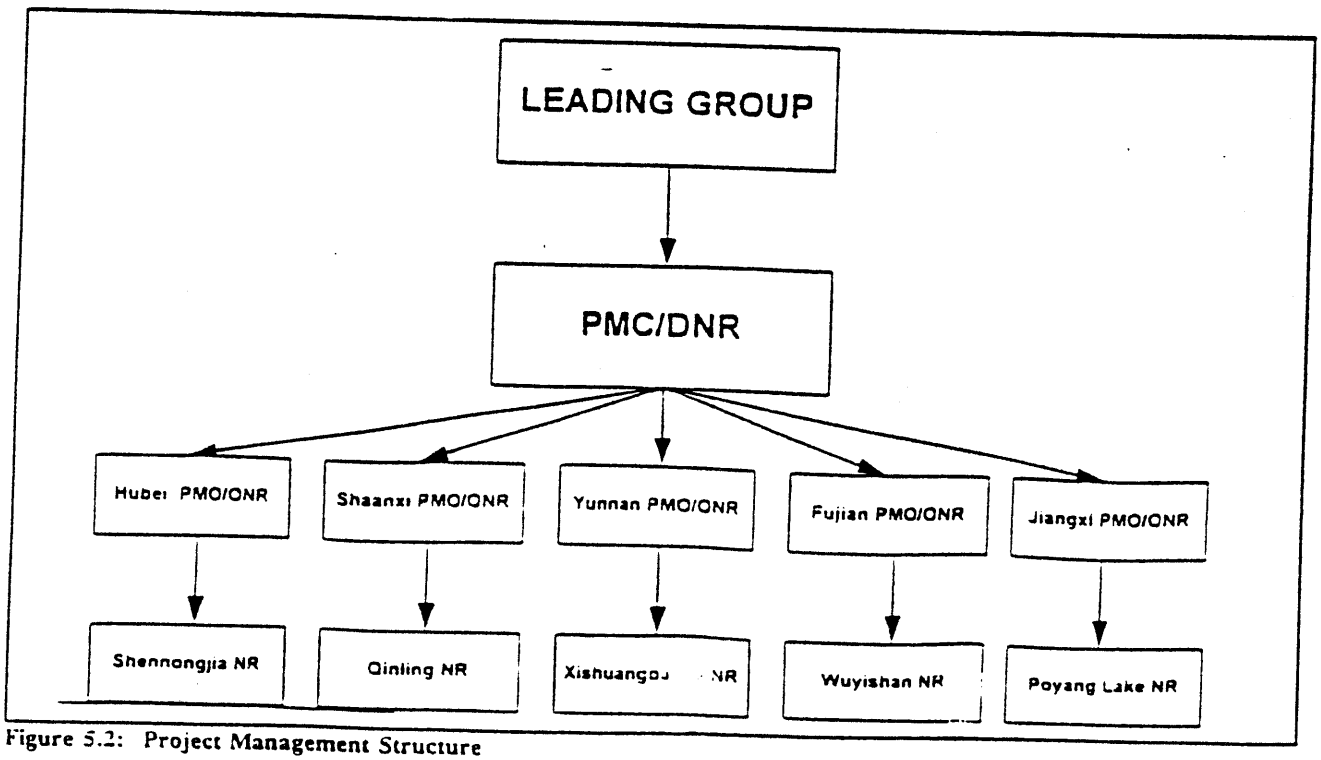

Figure 5.2: Project Management Structure

5.6 To clarify implementation arrangements, MFO will prepare Project Implementation Rules (PIR) delineating the respective roles of the forestry agencies at the national, provincial, and nature reserve levels in the technical and financial management of the project. The PIR would also specify the standards and conditions under which the provincial forestry departments and nature reserves agree to carry out the project. In particular, the PIR would identify the respective roles and responsibilities of reserves and local communities in implementing the co-management program in the project. MFO would issue the PIR to the provinces under cover of a document that would also include an acceptance letter to be signed by each province. The acceptance letter would be specific for each province and would include the amount of the grant, the project components, and an agreement to abide by the PIR in project implementation. Detailed project implementation schedules are included in Annex 12.

5.7 To ensure effective implementation arrangements, *the following assurance was obtained at negotiations: the PMC in MFO, the PMOs in the provincial forestry departments, and the PMOs in the reserves shall be maintained with functions and responsibilities acceptable to the Bank Group, with competent staff in adequate numbers, and with appropriate arrangements for coordination with DNR at the national level and ONRs at the provincial level. In addition, the issuance of PIR acceptable to the Bank and the provision of written acceptances from all project provinces would be a condition of effectiveness of the GET grant.*

B. Technical Assistance

5.8 The project involves the introduction of many new conservation techniques and processes that have never been utilized in China before. To ensure effective technology transfer, the project includes 160 person months of short-term domestic and international experts, and two foreign resident advisors for 44 person months in the critical areas of community development and training. In addition, funds are provided to sub-contract policy studies, biophysical inventories, and socio-economic baseline studies to local research institutes as needed. The TA program is designed to train and build institutional capacity at the start of the project, with a heavy emphasis on in-service training and domestic experts, in order to ensure effective and sustainable transfer of technical and managerial expertise. The two resident advisors will transfer their skills during their assignments to local counterparts who have already been identified, who will then assume full responsibility for managing community development and training issues in the project. The implementation schedule for the TA program has been agreed with the Bank Group and is summarized in Annex 13. The terms of reference for the key technical assistance assignments are summarized in Annex 14.

C. Involvement of NGOs and Local Communities

5.9 NGOs in China consist mainly of professional, academic, and scientific organizations; unlike NGOs in other countries, they have close administrative ties to government agencies. The China Wildlife Conservation Society, with a membership of 30,000, has similar functions as conservation NGOs in other countries and has branches in each province. Others include the Ecological, Zoological, Botanical, Geological, Oceanographic, Meteorological, Geographical, Land, Soils Societies of China, the Soil and Water Conservation Society, and the Ecological Environmental Protection for Agriculture Organization. These NGOs appear to be involved mostly in academic, scientific, and technological exchanges and increasing public awareness.

5.10 Several international NGOs have been involved in conservation in China. The World Wide Fund for Nature (WWF) has supported research on the giant panda at Wolong Nature Reserve in Sichuan, assisted in the preparation of the Panda Master Plan, and provided technical assistance for the

development of conservation information centers and preparation of reserve management plans. Also of relevance to this project is the training program supported by WWF. Between 1985 and 1992, WWF held 14 courses in China, concentrating on training of guards, general and panda ecology, and wetlands management. The Wildlife Conservation Society (WCS) has contributed to research on the panda and currently is assisting with training and environmental education in Yunnan Province. The International Crane Foundation (ICF) has assisted Poyang Lake Nature Reserve staff with bird identification and research. The Ford Foundation supports training in Participatory Rural Appraisal (PRA) for community forestry, both to field level foresters in Yunnan Province and to Beijing Forestry University. OXFAM and CARE have rural poverty alleviation programs in Yunnan and elsewhere in China. The lessons learned from NGO's implementation experience have been reflected in the design of the project, particularly with regard to the co-management program.

5.11 NGOs are expected to be a valuable resource for the project. To ensure their effective integration into project implementation, the project will convene a bi-annual meeting for NGOs and donors to enhance coordination and cooperation. These meetings would discuss project progress, lessons learned, and additional investment and technical requirements for supplemental activities.

5.12 During the preparation of the project, extensive consultations using group and household interviews were conducted with communities in each of the project's five pilot nature reserve areas. The interviews provided detailed information on needs, natural resources use and conflicts, and agricultural and economic activities. Socio-economic profiles of the communities were prepared and used to develop a process for including communities in the planning process and the management of the reserves. As reviewed in para. 3.9, community involvement will be included in the project at each of the reserve sites in the following ways during implementation:

- Socio-economic baseline surveys will be developed for each of the reserves that will describe their socio-economic and production situations, corroborate secondary township level data, and monitor project impacts;

- Reserve staff will conduct PRAs in pilot communities at four of the five nature reserve sites in order to determine community needs, resource use and conflicts, and prepare community and institutional profiles. In the other reserve, Wuyishan, a detailed management plan will be developed jointly with the village of Tong Mu using PRA procedures;

- Based on the results of the socio-economic surveys and the PRA profiles, staffs of the reserves will negotiate community resource management plans (CRMPs) with the pilot communities in order to co-manage the resources of the reserve that they use in common; and

- Community investment grants (CIGs) will be disbursed to the communities to finance agreed-upon economic development activities proposed under the CRMP.

D. Environmental and Social Aspects

5.13 The project is expected to have a positive environmental impact through the improved management and protection of approximately 625,000 hectares within the five pilot reserve sites, and the introduction of new land use and conservation measures on an additional 100,000 ha of contiguous biodiversity landscapes. However, the project may support some activities with potentially adverse minor impacts, such as small-scale civil works construction in nature reserves and development of new enterprises as part of the Changqing restructuring program. Therefore, the project requires the

preparation of individual environmental assessments (EA) carried out in accordance with guidelines acceptable to the Bank Group for the nine nature reserve management plans and for all Changqing enterprises.

5.14 Since a few of the project areas contain important historical or religious sites, the EAs for the nature reserves will pay particular attention to the impact of project activities on cultural property and the development of sound mitigation measures to ensure adequate protection. Similarly, the project will closely monitor the needs of ethnic minorities living within or adjacent to project areas (notably in Xishuangbanna in Yunnan Province). In particular, the terms-of-reference for EAs, nature reserve management plans, and tourism development plans will require detailed review of minority issues to ensure that they are not adversely affected by project activities and that the social and economic benefits they receive are consistent with their cultural preferences. As reviewed in para. 3.9, minorities will participate directly in the design and implementation of project activities through stakeholders committees, Community Resource Management Plans, and Co-Management Contracts. Finally, the EAs for the Changqing enterprises will include a review of existing land-use in order to confirm that the development of new enterprises involves no land acquisition; as reviewed in para. 3.22, any involuntary resettlement of persons arising under the project would be carried out in accordance with procedures and principles satisfactory to the Bank Group.

E. Financial Management

5.15 MOF will channel the GET grant through the PMC, which will in turn disburse the funds to the various central agencies, provincial forestry departments, and nature reserves involved in implementation. The central and provincial governments would be responsible for identifying and raising local counterpart funds, which will all be provided in the form of grants. Provincial finance departments would play no role in fund raising, disbursement or accounting. The Bank of China (BOC) and its branches will serve as the project's channel for disbursing grant and counterpart funds. Each PMO will open a project account at the local BOC branch, which will maintain sub-accounts for the different financing sources.

5.16 No fees or charges will be added to the GEF grant as it passed from MOF to MFO to the provincial forestry departments to the nature reserves, except for the job creation program at Changqing. As reviewed in para. 3.31, in order to ensure the sustainability and replicability of the Changqing component, all GEF funds provided to enterprises for job creation will be in the form of concessional loans, on terms and conditions acceptable to the Bank Group. Loans will be extended for a maturity of not more than twelve years, including not more than four years of grace, accrue interest at 4 percent per year, and be denominated and payable in local currency, with the foreign exchange risk borne by the Shaanxi Provincial Forestry Department. As reviewed in para. 3.37, future debt service payments for these activities would accrue to the Shaanxi Provincial Forestry Department, under the supervision of MFO. These funds would be recycled in the future to comparable job restructuring projects designed to reduce timber harvesting pressures in critical biodiversity areas.

5.17 The nature reserves, provincial PMOs, the PMC, and the relevant branches of BOC would each maintain separate accounts for project funds. The provincial audited accounts would be submitted to PMC within four months of the end of the financial year. PMC would submit to the Bank Group within six months of the end of the financial year a consolidated audit report by the State Audit Administration (or another independent auditor acceptable to the Bank Group) containing a summary of the findings of the provincial audit reports and a report on the accounts maintained by PMC. The audited accounts would include details of withdrawals from the Special Account made on the basis of Statements of Expenditure, and the auditor's opinion about whether these withdrawals were against expenditures

eligible for reimbursement by the Bank Group. *The following assurances were obtained at negotiations: (a) consolidated accounts for all components would be maintained for annual auditing by independent auditors acceptable to the Bank Group; and (b) the consolidated project accounts together with the auditor's report would be submitted to the Bank Group within six months of the close of each financial year.*

F. Monitoring, Evaluation and Reporting

5.18 The project will implement a comprehensive monitoring and evaluation program (the overall program is summarized in Annex 11, and additional details for co-management are found in Annex 2, community investment grants in Annex 3, and the Changqing restructuring program in Annex 4). Each nature reserve will monitor impacts of project activities, using the results of inventories, community consultation, and applied research. The project monitoring process will be written into the individual management and development plans of each reserve. Baseline biophysical and socio-economic inventories will be conducted for the monitoring program. Data will be stored in the NRMIS and used by reserve, provincial, and DNR staff for project tracking and impact assessment.

5.19 Each nature reserve management plan will include a section on monitoring and evaluation requirements. In addition to the primary gathering of background information at each site during the planning process, each plan will specify additional surveys or inventories that are needed to complete the resource inventory to form the baseline data against which future project success and impact can be measured. Indicator parameters will be identified for regular (at least annual) resampling and will form the basis for monitoring trends in biotic and socio-economic factors and evaluating the effectiveness of the management prescriptions being applied or tried in the project. Each management plan will be required to identify its own specific goals and success indicators which can serve as targets against which to measure project progress. In addition, each management plan will specify an annual review and revision meeting and a final evaluation in the last year of implementation. These final evaluation reports will be brought together to form the overall project evaluation report.

5.20 The data management systems that will be developed in each reserve will channel data on vegetation cover and changes, species incidence and distribution, human impacts, socio-economic developments, staff details, and budgetary matters to the national data center. This will further facilitate close monitoring of the progress and performance of the project. In every case, comparison of vegetation cover at the beginning and end of the project as revealed by remote sensing images will be made to evaluate effectiveness of the project in terms of protecting natural vegetation. Trends inside reserves will be compared against background trends in similar habitats outside the reserves and between different land-use zones inside reserves.

5.21 The guard-force will be used to collect basic monitoring data. Management and training will be organized so that the guard-force in its routine patrolling becomes the most regular and reliable source of information on what is going on in each reserve. Guards will be required to make regular patrols and fill out patrol report forms that will record data on three main subjects—condition of habitat, signs and sightings of indicator wildlife, and levels of human activity. Each report form will be coded for date and sector so that the results can be analyzed over time as well as by locality.

5.22 Periodic overall monitoring and evaluation will be carried out by PMC and DNR with assistance from international experts. The project has provided 10 person-months for this activity. To ensure effective monitoring and evaluation, *the following assurances were obtained at negotiations: (a) adequate policies and procedures will be maintained to monitor and evaluate project implementation and*

achievement of objectives on an ongoing basis, in accordance with indicators satisfactory to the Bank Group; and (b) a monitoring and evaluation plan will be prepared and furnished to the Bank Group for comment by April 1, 1996, and implemented thereafter taking into account the Bank Group's comments.

5.23 The PMC, in coordination with DNR, will be responsible for reporting progress according to the agreed implementation timetables, which are summarized in Annex 12. Semi-annual reports will be submitted to the Bank showing progress assessment of all activities against agreed annual work programs and targets and will include a review of procurement activities. These reports will serve as a basis for Bank supervision missions and for preparation of the next year's work program and budget. To ensure effective reporting, *the following assurances were obtained at negotiations: (a) progress reports will be furnished to the Bank Group for review by July 1 and January 1 of each year, beginning with January 1, 1996; and (b) an annual work plan and financing plan for project activities for the next calendar year will be furnished to the Bank Group for review by November 1 of each year, beginning with November 1, 1995.*

5.24 The project will be supervised by the Bank twice a year. Supervision will be more technically oriented, with a core team consisting of a task manager, a biodiversity specialist, and a social scientist. As required, the core team will be supplemented by other specialists, in such areas as institutional development, parks management, and management information systems. Whenever possible, local professionals and non-governmental organizations will be recruited as short-term consultants to assist Bank supervision missions. The first supervision mission is proposed for June 1995 to launch the project and ensure the timely preparation of the work plan and budget for the following year. A mid-term review of the project is planned by January 1, 1998. To ensure effective preparation of the mid-term review, *the following assurances were obtained at negotiations: (a) a mid-term report that summarizes the results of the monitoring and evaluation program, assesses progress achieved in project implementation, and makes recommendations to ensure efficient implementation of the remainder of the project and achievement of project objectives will be prepared and furnished to the Bank Group by December 1, 1997; and (b) the government will review the mid-term report with the Bank Group by January 1, 1998, and thereafter take all measures required to ensure efficient completion of the project and achievement of project objectives, taking into account the conclusions and recommendations of the mid-term report and the Bank Group's comments on the report.*

CHAPTER 6: BENEFITS, JUSTIFICATION, RISKS

A. Benefits

6.1 The project would generate the following benefits: (a) a wide variety of environmental benefits, including increased protection of rare biodiversity, improved water catchment protection (all five reserve areas drain into major river systems), and increased carbon sequestration from afforestation activities; (b) employment opportunities for low-income households involved in community management of reserves and the Changqing restructuring program (the incidence of absolute rural poverty is much greater in project areas than throughout the rest of the provinces as a result of limited access to productive land and limited off-farm income near nature reserves); and (c) strengthening of human resources and sector institutions, which would raise the overall productivity of resource use in the sector. Most importantly, the project would provide new models for improved nature reserve management, human resource development, and resolution of land-use conflicts that could be disseminated to other parts of China facing similar threats to biodiversity conservation.

B. Justification for GEF Involvement

6.2 The proposed project meets the eligibility criteria and program priorities agreed at the recent Conference of the Parties to the Convention on Biological Diversity, as follows. The project strengthens conservation, management, and sustainable use of ecosystems and habitats that have been identified as national priorities by the government in the BAP and NEAP; increases the involvement of local communities in the planning and management of nature reserves, addressing in particular the social and economic requirements of poor households in poverty areas; introduces a new, innovative economic incentive program to reduce biodiversity land-use conflicts in critical habitats that involves enterprise restructuring and job redeployment; builds institutional capacity for preparation of conservation plans and implementation of sustainable land-use programs; develops new research mechanisms and priorities to encourage scientific excellence and facilitate international exchange; expands the role of local and international NGOs in sector planning and management; and promotes conservation of endemic species, such as the Giant Panda and other plants and animals unique to China. GEF involvement in the development of FRDPP/NRMP has made possible a combined approach to resource use in the four main forest types in China that integrates national and global benefits into sector planning and management. Without GEF funding, MFO would continue to maintain a minimum level of reserve protection and management, with little community involvement, on the basis of ad hoc, unprioritized investment programs in the forestry sector.

C. Risks

6.3 There are few technical risks, in view of the government's commitment to biodiversity conservation and excellent track record in managing complicated World Bank investment programs in forestry. The main risks include: (a) weak institutional capacity in DNR, which has been addressed by a comprehensive capacity building program comprising appointment of additional staff, new training programs, and TA; (b) delays in the recruitment of key TA for management planning and community development, which has been addressed through agreement of a time-bound TA plan and advanced preparation of terms of reference; (c) inadequate participation of local communities in reserve

management, which will be closely reviewed under the project's monitoring and evaluation program and supervised by Bank missions; and (d) inadequate provision of local counterpart funding during implementation, which has been addressed through an understanding that failure to provide local funds on a timely basis would result in the exclusion of the nature reserve in continued involvement in the project.

CHAPTER 7: AGREEMENTS

7.1 At negotiations, assurances were obtained from the Grantee that:

(a) (i) nature reserve management plans, incorporating time-bound implementation schedules, descriptions of any civil works required, and environmental assessments carried out in accordance with guidelines acceptable to the Bank Group, will be prepared and furnished to the Bank Group for comment for the Shennongjia Nature Reserve and the five Qinling Nature Reserves by December 31, 1996, and for Wuyishan, Poyang Lake, and Xishuangbanna Nature Reserves by December 31, 1997; and thereafter implemented taking into account the comments of the Bank Group; and (ii) no civil works construction in the nature reserves will commence until they have been provided for and agreed in the nature reserve management plans (paras. 3.6 and 3.27);

(b) conservation plans, including time-bound implementation schedules, will be prepared and furnished to the Bank Group for comment for the national nature reserve system by December 31, 1998, and for the Yunnan Provincial nature reserve system by December 31, 1999; and thereafter implemented taking into account the comments of the Bank Group (paras. 3.39 and 3.42);

(c) with regard to Community Investment Grants (CIG): (i) the CIG program will be established in a total of eight pilot communities in four nature reserves (Shennongjia, Xishuangbanna, Poyang Lake, Qinling); (ii) the CIG program will operate in accordance with guidelines acceptable to the Bank Group, which will include the following provisions: grants will be used to finance alternative income-generating investments that reduce the need for communities to harvest protected flora and fauna in nature reserves, grants will be approved by provincial ONRs, and each grant will be made under a contract between the recipient and the nature reserve administration on the basis of a model contract acceptable to the Bank Group; and (iii) a report evaluating the experience of the CIG program will be prepared and furnished to the Bank Group for comment by September 1, 1999 (para. 3.10);

(d) any involuntary resettlement of persons arising under the project would be carried out in accordance with procedures and principles satisfactory to the Bank Group (para. 3.22);

(e) workers made redundant under the Changqing enterprise restructuring component would voluntarily select which restructuring option they prefer; if there is excess demand for the relocation program, selection would be on the basis of a lottery (para. 3.28);

(f) with regard to the job creation program under the Changqing enterprise restructuring component: (i) the investment criteria, terms and conditions for sub-loans, and operational procedures would be as set out in paras. 3.30-3.32; and (ii) sub-loan repayments would be used to finance restructuring activities similar to the Changqing program in other nature reserves and environmentally sensitive areas in Shaanxi Province, and an implementation plan for this activity would be furnished to the Bank Group for comment by January 1, 1999 (para. 3.37);

(g) with regard to the relocation program under the Changqing enterprise restructuring component: (i) the relocation package will only finance costs from a list of expenditure items acceptable to the Bank Group; (ii) the baseline survey will be carried out in accordance with terms of reference and timing acceptable to the Bank Group; and (iii) the terms and conditions of the relocation package for each worker will be specified in a contract in form and substance satisfactory to the Bank Group (para. 3.36);

(h) MFO will furnish an evaluation report, prepared in accordance with terms of reference acceptable to the Bank Group, on the job creation program and the relocation program under the Changqing enterprise restructuring component to the Bank Group by September 1, 1999 (para. 3.37);

(i) the small grants research program will be carried out in accordance with guidelines acceptable to the Bank Group, with research carried out under contracts with competitively selected researchers (para. 3.50);

(j) all policy studies will be carried out in accordance with terms of reference and timing acceptable to the Bank Group, and will be furnished to the Bank Group for comment (para. 3.40);

(k) all local and overseas training and study tours would be carried out in accordance with a training program acceptable to the Bank Group (para. 3.42);

(l) the PMC in MFO, the PMOs in the provincial forestry departments, and the PMOs in the reserves shall be maintained with functions and responsibilities acceptable to the Bank Group, with competent staff in adequate numbers, and with appropriate arrangements for coordination with DNR at the national level and ONRs at the provincial level (para. 5.7);

(m) the Nature Reserve Training Team will be established in DNR by October 1, 1995, with functions and responsibilities acceptable to the Bank Group, and with competent staff in adequate numbers (para. 3.38);

(n) an additional ten staff members will be employed by January 1, 1996 at the ONR of YPFD (para. 3.42);

(o) (i) consolidated accounts for all components will be maintained for annual auditing by independent auditors acceptable to the Bank Group; and (ii) the consolidated project accounts together with the auditor's report would be submitted to the Bank Group within six months of the close of each financial year (para. 5.17);

(p) (i) adequate policies and procedures will be maintained to monitor and evaluate project implementation and achievement of objectives on an ongoing basis, in accordance with indicators satisfactory to the Bank Group; and (ii) a monitoring and evaluation plan will be prepared and furnished to the Bank Group for comment by April 1, 1996, and implemented thereafter taking into account the Bank Group's comments (para. 5.22);

(q) (i) progress reports will be furnished to the Bank Group for review by July 1 and January 1 of each year, beginning with January 1, 1996; and (ii) an annual work plan and financing

plan for project activities for the next calendar year will be furnished to the Bank Group for review by November 1 of each year, beginning with November 1, 1995 (para. 5.23); and

(r) (i) a mid-term report that summarizes the results of the monitoring and evaluation program, assesses progress achieved in project implementation, and makes recommendations to ensure efficient implementation of the remainder of the project and achievement of project objectives will be prepared and furnished to the Bank Group by December 1, 1997; and (ii) the government will review the mid-term report with the Bank Group by January 1, 1998, and thereafter take all measures required to ensure efficient completion of the project and achievement of project objectives, taking into account the conclusions and recommendations of the mid-term report and the Bank Group's comments on the report (5.24).

7.2 The issuance of PIR acceptable to the Bank Group and the provision of written acceptances of the PIR from all project provinces would be a condition of effectiveness (para. 5.7).

7.3 The project would include the following conditions of disbursement: (a) if any resettlement is expected as a result of the corridor development in Wuyishan, the completion of a resettlement action plan satisfactory to the Bank Group will be a condition of disbursement for the corridor development (para. 3.22); (b) State Council designation of the Changqing forestry area as a national-level nature reserve, and the completion of a relocation report acceptable to the Bank Group will be conditions of disbursement for the relocation program under the Changqing enterprise restructuring component (paras. 3.27 and 3.36); and (c) State Council designation of the Changqing forestry area as a national-level nature reserve, and the provision of sub-loans in accordance with the agreed procedures and terms and conditions will be conditions of disbursement for the job creation program under the Changqing enterprise restructuring component (paras. 3.27 and 3.30-3.32).

OUTLINE OF NATURE RESERVE MANAGEMENT PLANS

Part One: Description

This section describes the locality, size, boundaries, zones, administrative details, human resident details, physical condition, habitat types, habitat condition, historical background, species interests, current problems and constraints of the reserve. The section should be limited to highly pertinent detail only.

Part Two: Evaluation, Discussion and Conclusions

This section evaluates the data presented in section one, discusses the various options for management, reaches conclusions about the best approach and, identifies the detailed goals for management of the reserve. The section should consider the importance of the biotic resources for conservation against other potential uses of the resources for water conservation, sustainable use, agricultural conversion, tourism and research uses, need for highways or other national infrastructure (ie hydropower or communications) and levels and types of harvest by local people. Discussion of options should lead to conclusions about the type of reserve status, levels of protection, utilization, and development that seem appropriate and lead on to the formulation of clear reserve objectives.

Part Three: Prescription

This section describes the plan for achievement of reserve management objectives. The section should clarify any changes in status, boundaries, zoning and regulations. This section should also describe the different programs that make up the whole management package - protection, research, monitoring, external relations, buffer zone development, community extension and organization, tourism development, education and awareness, infrastructure development, staff management, staff recruitment and training schedules. A special section should outline the management structure, reporting channels, responsibilities and specific job descriptions of key positions. A section should address the need for proper maintenance of reserve infrastructure, vehicles, and equipment to ensure that adequate budgets for maintenance are made available and proper procedures for use of equipment are put in place to prevent their abuse or damage. This section should also include a description of the mechanisms by which the reserve management can coordinate closely with other agencies of local government, research institutes, other departments with interests in the reserve and neighboring land-users.

Part Four: Budget

Detailed cost estimates should be provided for the implementation program of the nature reserve management plan. Lists of equipment purchases and unit cost estimates can be relegated to annexes.

Part Five: Annexes

Contains technical material supporting the main report, such as maps, species lists, climate data and other supporting data. Also includes detailed lists and costs of proposed equipment and infrastructure investments.

DESCRIPTION OF CO-MANAGEMENT PROGRAM IN NATURE RESERVES

A. Co-Management Program

A process for co-management of nature reserves will be developed for four nature reserves, which outlines the sharing of responsibilities for management decision-making, implementation, and evaluation. The development of this process will be flexible and iterative. It will be developed and monitored in eight pilot communities and lessons learned will be used to refine the process for wider dissemination throughout the nature reserve system in China.

A range of options exist for implementing co-management. Under the project, communities and nature reserve bureau will explore some or all of the following options:

- identify and assess constraints and opportunities for natural resource use;
- develop community resource management plans;
- design and implement environmental education programs;
- develop land-use plans and regulations;
- design tourism programs and activities; and
- monitor and evaluate the impact of community development and conservation programs.

It is unrealistic to expect each of the demonstration communities to undertake all of these options, in view of the varying levels of interest and expertise and the different development requirements in each area. The project approach will be to develop joint natural resource management plans for the community that are well integrated with the overall biodiversity objectives of the nature reserve in which they reside. However, opportunities for linking communities with applied research efforts within each of the five reserves will be pursued under Component Five - Supporting Nature Reserve Research. Other opportunities such as developing joint tourism plans and ventures will also be explored. Research efforts that include communities will be promoted under the small research grants program. Several communities within Wuyishan Nature Reserve could be linked with research staff in exploring the impacts of mao bamboo production of overall reserve levels of biodiversity. This type of interactive applied research effort could also allow communities to become involved in monitoring their own resources.

Figure 1 illustrates the co-management process to be developed and tested in this project. Table 1 provides the preliminary steps anticipated for developing a co-management agreement. A preparatory phase is required to introduce the concepts of co-management to local government and nature reserve officials and staff. This is represented in Table 1 by activities 1 through 4. The co-management development stage commences with activity 5 of the table, with the establishment of stakeholder management committees.

In four of the reserves, the Leading Group, representing relevant local government institutions and assisted by Co-Management Facilitators, will establish a Management Forum (MF), representing all stakeholders from each of the demonstration communities and from the respective nature reserve bureau. The members of the MF, as stakeholders, will conduct all participatory planning activities and make

recommendations, in the form of a Community Resource Management Plan (CRMP), for sustainable natural resource management at the community level. The Leading Groups will provide oversight for the co-management process and provide guidelines for integrating the results of the co-management work into the formal management plans for the reserves. Each MF will participate in the community PRA and the development of a CRMP. This process will be facilitated by relevant rural extension staff who will receive intensive training under the project. The data collected during the PRA will be used by the community to develop a draft CRMP. The CRMP will review natural resources conflicts and recommendations for alleviating these from the community's perspective.

Using the CRMP as a guide, the MF will draft contracts for the use of specific resources within the reserve under the jurisdiction of the community. Since the legal basis for these contracts requires further clarification, the project provides technical assistance from local legal experts to review the relevant laws and regulations and identify the appropriate legal basis for the contracts. Initially, the MF, and the facilitators, will concentrate on one resource under threat. The most relevant is fuelwood that the community uses and it is expected that the MF will develop their initial contracts around the use of fuelwood. Once drafted, the contracts will be reviewed and approved by the Leading Group, thereby legitimatizing the process. Monitoring of the contracts will be conducted by the MF and the Leading Group will have responsibility for resolving conflicts over the contracts. The community will receive Community Investment Grants (CIGs) for support in adapting more sustainable management of natural resources and in generating income from their use, as reviewed in Annex 3.

B. Co-Management Experience in China

Currently in China, there are several on-going pilot programs involving co-management. Some reserves have introduced some community involvement in monitoring resource degradation in reserves. For example, Zhouzhi Nature Reserve in the Qinling Group has established a local committee in the Banfangzi Township to protect the forest from fire, Poyang Lake has established local committees to monitor birds, and Xishaungbanna and Taibaishan Reserves have made efforts to address the special concerns of minority and religious groups in the use of resources. In addition, some reserves have developed alternative income-generating activities for communities based on non-consumptive, sustainable use of resources in the reserves.

The Yangtze River Protection Forest Project aims at developing forest management systems as partnerships with local government, forestry bureaus, and individual households. Under this project, households are brought into the planning process through the use of adapted participatory data collection methods, such as social soundness analysis and RRA. The project is attempting to move away from a forest protection system based on compulsion or coercion (through fines and taxes) to one that provides farmers with incentives to participate and benefits from joint management. The Yunnan Uplands Management Project has similarly integrated communities into the management of upland areas. Staff from the Yunnan Forestry Department, in conjunction with facilitators from the Yunnan Academy of Social Sciences, have developed agro-forestry projects on the basis of contracts negotiated with the communities and approved by the relevant levels of local government. This project has carried out village level surveys, provided training to local communities, developed experimental land use projects, and regularly monitored project impacts.

The results of these programs will be assessed by NRMP staff during the first year of implementation. Lessons learned and successful models will be accumulated and examined as the first step in further developing the proposed co-management approach.

C. Training

Nature reserve bureaus and some local government staff will receive in-service and on-the-job training in participatory extension and planning methods. First, they will apply these skills in facilitating the co-management process in two of the reserves, Shennongjia and Qinling, and then in their own reserves. Staff from Yunnan ONR will also participate in the co-management process in Shennongjia and Qinling so that they can lead similar efforts in the reserves of their province. Community members will receive appropriate training in planning, monitoring, and applied research, as relevant. In Shennongjia and Qinling, training will be supplied initially by TA with experience in PRA and participatory planning. Eventually, nature reserve staff should be able to transfer their skills to communities during the process of developing a co-management plan.

D. Monitoring and Evaluation

The programs in each of the nature reserves will be monitored to determine the impacts of project interventions on the socioeconomic conditions of the pilot communities. Baseline information from other communities, collected with the support of Component Four, will be used as a control and to evaluate any future expansion of economic development and natural resources co-management planning activities.

Oversight of the co-management process, including assessing the impact of the CIGs, will be the responsibility of the Leading Group, in coordination with DNR. The MF, with input from communities, to the extent possible, will monitor the impacts of the co-management process on communities and their nature resource base for the Leading Group. Lessons learned and impact assessment data will be maintained in the nature reserve management information systems.

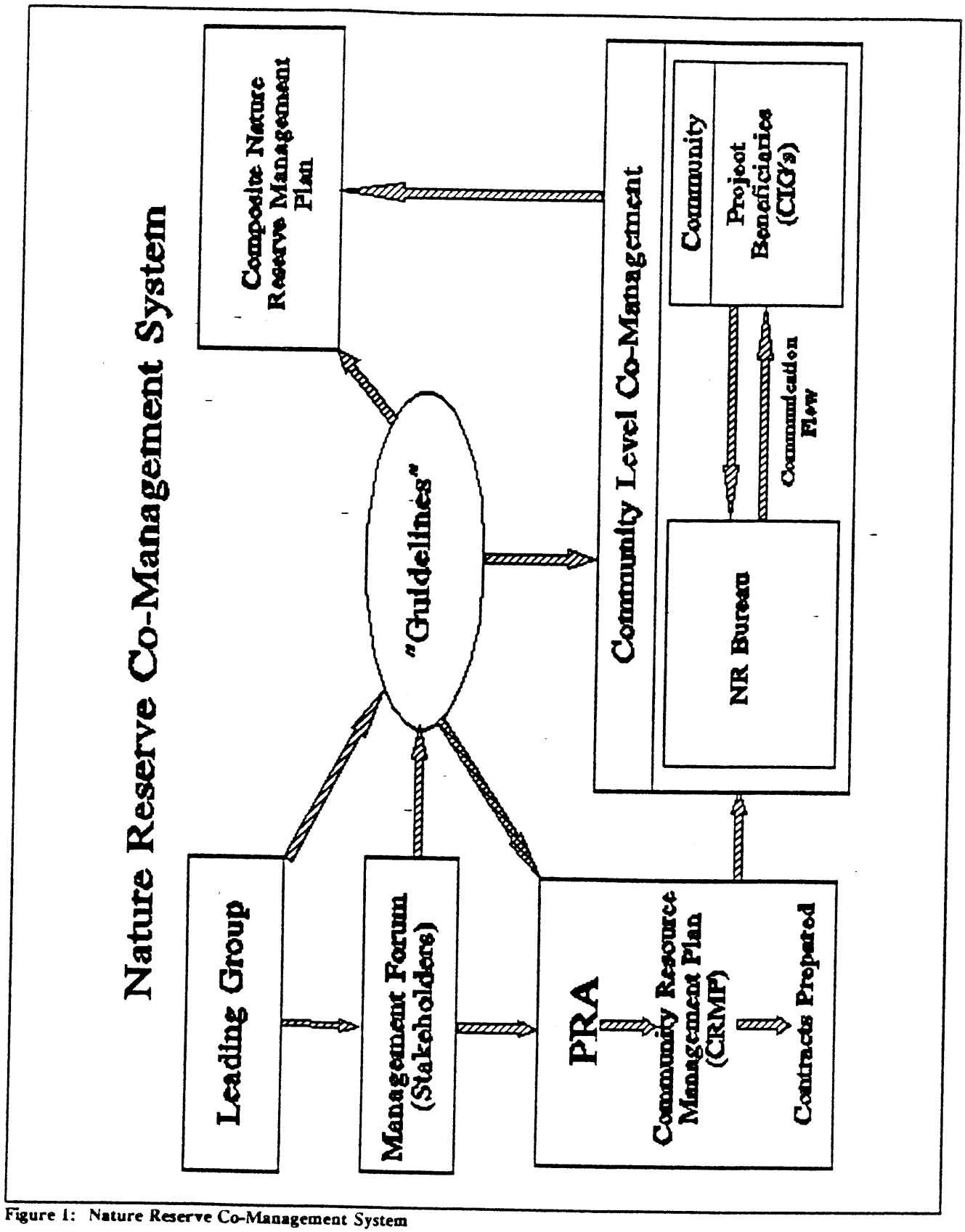

Figure 1: Nature Reserve Co-Management System

Table 1: Co-Management Process for Nature Reserve Management with Communities

Activity	Personnel	Tasks	Outcomes
Preparation Phase			
1. Establish Leading Group	• Lead - DNR, Nature Reserve and appropriate level of Local Government • Assistance from - MFO and PRA Specialist	• Identity (preliminary stage) key issues to be addressed in "representative" communities • Propose appropriate institutions to participate on Leading Group according to level of necessary authority and issues to be addressed • Identify and propose appropriate institutional and staff facilitators	• Members of Leading Group identified, contacted, and committed • Facilitators' time committed for process
2. Convene Leading Group - Initial meetings	• Lead - DNR, Nature Reserve and appropriate level of Local Government • Assistance from - MFO and PRA Specialist	• Hold initial meetings • Present co-management concepts, approach and objectives • Develop plan of action	
3. Prepare Guidelines for Co-Management of Specific communities natural resources	• Lead - Leading Group • Assistance from - MFO and PRA Specialist • Lead - Leading Group • Assistance from - MFO and PRA Specialist	• Finalize process for development of co-management - PRA leading to CRMP and legitimization with contracts between communities and NRB • Propose guidelines (and responsible staff) for monitoring and information exchange between NRB and communities • Propose mechanism and procedures for conflict resolution	• Guidelines for developing, monitoring and enforcing co-management of nature reserves
4. Select Demonstration Communities	• Lead - Leading Group • Assistance from - MFO and PRA Specialist	• Prepare criteria for community selection • Prepare list of candidate communities inside NRB or on periphery • From selection criteria, short list communities • Consult with communities over interest in participating. The PRA team presents concept of Co-management to community and outlines responsibilities of the community and benefits (CIGs) • Select final communities	• Demonstration communities for co-management: - 2 in Shennongjia - 3 in Qinling - 2 in Xishuangbanna - Wuyishan (will use skills as part of Nature Reserve integrating its core) - 1 adjacent to Poyang • Initial consultation

Table 1: Co-Management Process for Nature Reserve Management with Communities

Activity	Personnel	Tasks	Outcomes
Implementation Phase			
1. Establish Management Forum (MF) (stakeholder committee	• Leading Group facilitators with assistance from the PRA Specialist	• Identify stakeholders - nature reserve, community representatives, other community members with interests in NRM, timber units, etc • Determine role of MF and individual members - how will it function and how will members interact with each other? • Determine role of MF in data collection, analysis, and developing a community resource plan from the data	
2. Collect date using PRA	• Management forum assisted by the Leading Group facilitators and the PRA Specialist	• Collect spatial, temporal, socio-institutional, and technical data using some combination of the following PRA tools: - sketch mapping - wealth ranking - village transects - semi-structured interviews for needs analysis and other investigations - seasonal calendar preparation - history timeline of community - trend analysis - institutional inventory and profiles - institutional linkages and relationships	• Needs analysis • Community conflicts identified • Community profiles
3. Data Synthesis and Analysis	• Management forum assisted by the Leading Group facilitators and the PRA Specialist	• Develop tables of community natural resource problems, present coping strategies, constraints, and opportunities • Prepare community maps • Prepare data in forms useful for Management Forum (MF) discussions	• Maps • Time lines • Institutional inventories and profiles
4. Ranking Problems and Community Needs	• Management forum assisted by the Leading Group facilitators and the PRA Specialist	• Develop and implement ranking process • Prioritize problems and constrains relevant to NRM issues	• Priority lists of problems and community constraints
5. Rank and Evaluate Opportunities for Overcoming Problems	• Management forum assisted by the Leading Group facilitators and the PRA Specialist	• For priority problems, list opportunities for overcoming problems • Using PRA techniques, rank solutions • Evaluate technical feasibility of solutions • Determine costs	• Understanding of communities' problems and conflicts

Table 1: Co-Management Process for Nature Reserve Management with Communities

	Activity	Personnel	Tasks	Outcomes
6.	• Prepare and Adopt Community Resource Management Plan (CRMP)	• Management forum assisted by the Leading Group facilitators and the PRA Specialist	• Prepare plan that outlines solution, inputs required, who will do it, and timing • Present CRMP to Leading Group	• Completed CRMP submitted to Leading Group
7.	• Negotiate and Approve Contracts	• Management forum assisted by the Leading Group facilitators and the PRA Specialist	• Determine parties to be contracted • Prepare contracts • Parties agree to contracts • Presented to Leading Group for approval • Parties sign contracts	• Solutions and responsibilities outlined and agreed on
8.	• Sign Contracts	• Leading Group		• Signed contracts
9.	• Develop Monitoring and Information Exchange Process	• Leading Group	• Prepare plan for monitoring compliance with contracts and process for grievance negotiation • Develop simple M & E plan for evaluating results of co-management process	• Monitoring process in place

IMPLEMENTATION ARRANGEMENTS FOR COMMUNITY INVESTMENT GRANTS PROGRAM

Purpose. The CIG program will provide small-scale grants to local communities to finance environmentally sustainable economic activities that contribute to a reduction in land-use pressures and in consumption of protected resources in nature reserves. The grants will generally support alternative income-generating activities that reduce the need for communities to harvest protected flora and fauna for income, particularly in the core zones of reserves. All activities supported by CIGs will be reviewed and approved as priority requirements during preparation of the co-management program for the nature reserves: they will be identified during the Rural Participatory Appraisal exercise, included in the list of permissible community resource use in the Community Resource Management Plans, and approved on terms and conditions spelled out in the Co-Management Contracts. Indicative activities include sustainable harvesting of medicinal herbs, production of fuel-saving stoves, aquaculture, production of handicrafts, production of domesticated mushrooms and other non-timber forest products, and development of household timber and fuelwood lots. The program will be implemented in a total of eight communities that will be selected to participate in the overall co-management program in the four nature reserves areas of Shennongjia, Qinling, Xishuangbanna, and Poyang Lake.

Application and Review Procedures. Applications for CIGs will be prepared by individuals, groups of individuals, or local institutions located within the eight pilot communities. The application will include a detailed description of the proposed activity, implementation arrangements, project costs and benefits, and environmental impact, particularly how the activity will contribute to a reduction in resource degradation in the nature reserve. The application will be submitted to the village committee or township government for review and approval; then submitted to the Nature Reserve Leading Group for review and approval (the Leading Group is described in Annex 2 and includes representatives from the nature reserve, local government, technical bureaus, and local communities); and then submitted to the Office of Nature Reserves (ONR) in the provincial forestry department for final approval. ONR will ensure that all CIG proposals meet the agreed criteria, particularly that they are environmental sustainable and directly contribute to a reduction in land-use pressure in the reserve.

Implementation Procedures. After ONR approves a proposal, the nature reserve will sign a contract with the relevant township government or village committee based on a model contract acceptable to the Bank Group; they will in turn sign a comparable contract with the individual or group of individuals who submitted the grant proposal. The contract will specify the amount, terms and conditions of the grant, particularly the requirement that the funds are used only for the specified purposes. The individuals or groups of individuals who submit the applications will have full responsibility for implementation, under the guidance of the village committee or township government.

Financial Management. GEF will finance no more than 60 percent of any one CIG, up to a maximum amount of $75,000 for the whole program; the remainder will be financed by local counterpart funding from the government or the beneficiaries themselves.

Monitoring and Evaluation. The nature reserve will regularly supervise the implementation of the CIGs and will provide semi-annual progress reports to the ONR, with copies to the Ministry of Forestry. The ONR will be responsible for overall supervision of the CIG program and for verifying the accuracy of the information included in the progress reports, under the guidance of MFO. MFO will provide an evaluation report to Bank Group for review by September 1, 1999 that analyzes the implementation

experience of the overall CIG program and provides recommendations to support its dissemination to other protected areas in China.

IMPLEMENTATION ARRANGEMENTS FOR CHANGQING ENTERPRISE RESTRUCTURING COMPONENT

A. TIMBER HARVESTING ENTERPRISE

Worker Selection. The Changqing Forestry Bureau (CFB) will have the responsibility for selecting the 520 workers who will remain employed at the Maoping and Huayang Forest Farms, based on skills, work performance, and age of service, and the 1,193 workers who will be terminated from its employment. However, the 1,193 terminated workers will voluntarily select if they prefer to be transferred to a new enterprise within Changqing or receive a relocation package. If there is excess demand for either option, selection will be on the basis of a lottery administered by the Shaanxi Provincial Forestry Department (SPFD).

Harvesting. The two forest farms will continue to voluntarily maintain the complete ban on all harvesting, road construction, and other human interventions in the area that will be designated as the core zone of the new Changqing National Nature Reserve until the State Council approves the establishment of the new nature reserve; thereafter, the ban will be a legal requirement. In addition, the farms will harvest no more than 7,000 m^3 per year in the area designated as the experimental zone, in order to ensure that the annual harvest does not exceed the mean annual growth of the forest.

B. JOB CREATION PROGRAM

Eligibility Criteria for Enterprise Investments

All enterprises proposed for GEF investment funds under the job creation program in Changqing will meet the following criteria. Enterprises investments that are financed entirely by local counterpart funds are not subject to these requirements; however, they must be consistent with the overall project objectives and follow the standard government investment criteria.

Environmental Impact. All investments will be environmentally sound and sustainable, and generate no diverse or significant environmental impacts, as demonstrated by a comprehensive environmental assessment (EA) prepared by an institute certified by NEPA. The Eas will be carried out in accordance with guidelines acceptable to Bank Group and will include the following components: (a) a description of the project; (b) a review of the baseline biological and socio-economic conditions; (c) the positive and negative environmental impacts likely to result from the project; (d) analysis of alternative design options to minimize adverse impacts; (e) a time-bound action plan to mitigate adverse impacts; (f) environmental management and training requirements; and (g) an environmental monitoring plan.

Financial Rate of Return. All investments will generate a financial rate of return of at least 10 percent determined in accordance with internationally accepted techniques of project appraisal.

Enterprise Reform. All enterprises will be legal entities, be permitted to borrow funds under their charter, be managed on an independent basis, and have separate financial statements and accounts subject to auditing by an independent auditor and following the new accounting standards introduced in 1993.

Feasibility Study. All investments will be technically feasible, as demonstrated by a comprehensive

feasibility study prepared by a provincial level design institute, under the supervision of SPFD. The feasibility study will pay particular attention to the current status of the enterprise, the choice of technology, scale of development proposed, market analysis of principal products, availability of inputs (raw materials, energy, packing materials), past and projected financial performance, working capital requirements, management and staffing arrangements, commitment to enterprise reform, and the results of the environmental assessment.

Review of Enterprise Investment Proposals

MFO will have primary responsibility to verify whether (a) the feasibility studies have been properly carried out and (b) the proposed investments meet the criteria for GEF funding and counterpart funding. It will convene a Technical Advisory Group (TAG) to assist in the review of the technical aspects of the feasibility studies. The TAG will include provincial or national experts in forestry, engineering, environmental protection, finance, and at least one representative from a non-governmental organization, such as a local wildlife society or a university. After MFO review and approval, the following documents will be provided to Bank Group for review and approval: the feasibility study, including the description of the enterprise and a breakdown of the expenditures proposed to be financed by GEF; the proposed terms and conditions of the sub-loan; and the environmental assessment.

Financial Management

GEF will finance no more than 65 percent of the total cost of all enterprise investments, up to a maximum amount of $3.4 million; the remainder will be financed by local counterpart funding from the government or the enterprises. In addition, GEF will finance no more than 80 percent of the cost of any one enterprise investment.

GEF funds for enterprise investment will be in the form of concessional loans. CFB will on-lend the funds to the enterprises on terms and conditions acceptable to Bank Group. Funds will be on-lent in local currency at an annual interest rate of 4 percent; there will be no grace period for interest payments. The total loan repayment period and the grace period on loan repayments during start-up will be determined on the basis of the estimated cash flow of the enterprise investments; however, the total loan repayment period will not exceed twelve years (including the grace period) and the total grace period on loan repayments will not exceed four years. The loans will be denominated and payable in local currency, with the foreign exchange risk borne by Shaanxi Provincial Forestry Department.

The interest and principal repayments on enterprise loans will accrue to SPFD, who will establish a new revolving fund from these debt service payments to support comparable enterprise restructuring projects in Shaanxi Province in the future. SPFD will provide a workplan and operational guidelines for this revolving fund to Bank Group for review by January 1, 1999.

Loan Conditions

The loans will include the following standard Bank requirements for on-lending in financial intermediation projects. All sub-loans made by CFB will include provisions that require: (a) the enterprise to carry out and operate the sub-project with due diligence and efficiency and in accordance with sound technical, financial, and managerial standards and to maintain adequate records; (b) goods and services financed with GEF funds to be procured in accordance with project procurement guidelines and to be used only for implementation of the agreed sub-projects; (c) the enterprise to take out and maintain

insurance against risks and in amounts consistent with sound business practices, including hazards incident to the acquisition, transportation and delivery of goods financed with GEF funding to the place of use; (d) the enterprise to allow the Bank Group to inspect the sub-project and to provide information to the Bank Group about sub-project implementation; and (e) the suspension or termination of the sub-loan in the event the enterprise fails to perform its obligations.

C. RELOCATION PROGRAM

Eligible Expenditures. The relocation package will pay for specific costs related to the termination and transfer of redundant workers outside of Changqing. The following items will be eligible for GEF financing: (a) **worker and family relocation costs**, including transportation and moving costs, interim accommodation fee, new housing construction costs, settling-in allowance, and registration fees (such as family planning card, identification card, temporary residential card, and provincial border card); (b) **worker retraining and placement costs**, including training costs, enterprise registration fees, and labor contract deposit; and (c) **livelihood development**, including smallscale investment in agriculture, aquaculture, livestock, and off-farm income-generating activities such as restaurants and shops. The actual severance package for a redundant worker would be tailored to fit the specific situation and specific costs of the worker.

Financing Plan. GEF will finance no more than 80 percent of the cost of all relocation packages, up to a maximum amount of $960,000; the remainder will be financed by local counterpart funding from the government.

Baseline Survey. SPFD, under the supervision of MFO, will conduct a baseline survey for all the redundant workers who choose to receive the relocation package. The survey will review their current living standards (ie, wage and benefits level, years of service, housing quality, etc.) and relocation plans (ie, returning to home village to farm or joining a new enterprise, needs new housing or not, needs job training or not, etc.) in order to determine the detailed relocation requirements and the appropriate basis for the amount of compensation paid to each worker. The baseline survey will be carried out in accordance with terms-of-reference and timing acceptable to Bank Group.

Relocation Report. SPFD, under the supervision of MFO, will prepare a report based on the baseline survey that summarizes (a) the principles and methodology used to calculate all the specific items in the relocation packages; (b) the specific composition and cost of every relocation package; (c) the timing and basis for disbursement; and (d) monitoring and evaluation arrangements. The final report will be provided to Bank Group for review and Bank Group 's acceptance of the report will be a condition of disbursement for the relocation program.

Contract. CFB, under the supervision of SPFD and MFO, will sign a contract in form and substance acceptable to Bank Group with every worker receiving a relocation package. The contract will specify the amount, terms and conditions of the relocation package, including the requirements that the worker will leave the Changqing area upon receipt of the package and will use the funds for only the specified purposes. Duly executed copies of the contracts will be made available to Bank Group.

Follow-Up Survey. MFO will complete an independent evaluation of the implementation of the relocation program by September 1, 1999, based on terms-of-reference and consultants acceptable to Bank Group. In particular, the evaluation will review if the workers used the relocation funds in line with the agreed uses, if the workers experienced any short-term or medium-term declines in living standards as

a result of the enterprise restructuring, and what, if any, changes would be required in the operational guidelines for broader dissemination of the program. The results of this report will be included in the overall evaluation report of the component, which is described below.

D. MONITORING AND EVALUATION

CFB will provide semi-annual reports on the implementation of the component to SPFD, with copies to the Ministry of Forestry and the World Bank. The progress report will include information on: (a) preparation and implementation of the nature reserve management plan, (b) implementation of the protection program for the core zone, (c) level of harvesting in the experimental zone, (d) implementation of the new silvicultural management program for the experimental zone, (e) preparation and implementation of the job creation program, and (f) preparation and implementation of the relocation program. SPFD will be responsible for supervising the implementation of the component and verifying the accuracy of the information included in the progress reports, under the guidance of MFO. MFO will provide an evaluation report to Bank Group for review by September 1, 1999 that analyzes the implementation experience of the overall component and provides recommendations to support its dissemination to other protected areas in China.

OUTLINE OF CONSERVATION PLAN FOR NATIONAL NATURE RESERVE SYSTEM

Objective: Plan the national system of nature reserves to safeguard the conservation of China's unique wealth of biodiversity, including geographic design of the provincial system as well as management, staffing, training, equipment, data management, budgetary needs, identification of priorities and plan of action. The plan will be designed to disseminate valuable lessons learned during the project into the wider national context. The development of the plan will involve all ministries and agencies involved in nature reserve management, including MFO, the Ministry of Agriculture, the State Oceanographic Agency, the National Environmental Protection Agency, Chinese Academy of Science, etc.

Contents of Plan: The plan will have the following five parts.

Part One: Description. This section will outline the biological richness of the country, including a map of the various biogeographic units and different habitat types, pertinent details of numbers of species, protected and endemic species, threatened species and species of special economic importance, and an evaluation of this biotic wealth in both the national and global contexts.

Part Two: Analysis and Conclusions. This section will analyze data on the rates of forest and other ecosystem loss and resource utilization, other threats, and species demographic issues to assess the level of threat faced by individual habitat types and particular species. The section will evaluate the current coverage of nature reserves in respect to representational coverage of all major ecosystem (habitat) types and the species of particular concern. It will identify particular gaps in that coverage and additional constraints such as inter-sectoral conflicts, shortages of manpower, funds, equipment or other resources or weaknesses in policy, regulations, law enforcement, management, organization, etc.

Part Three: Revised National Nature Reserve System Plan. This section should prescribe and clarify what revisions are proposed to the national nature reserve system in terms of needs of new reserves, reserve extensions, boundary revisions, reserve linkages and corridors, reserve zonation, policy for development of buffer zones and identification of priorities in terms of urgency and importance for action. The section will provide a brief overview of each province, followed by a short review of each reserve within the province, with principal recommendations for improvement.

Part Four: Plan of Action. This section will lay out an action plan to strengthen the nature reserve system in each province, including a timetable and costing of actions such as development of management plans, reserve development, manpower development, training program, education awareness program, research program, buffer-zone development program, and the related costs. The plan should clarify where external agencies' support—both national and international—is needed. The plan should clearly be integrated into the National Biodiversity Action Plan and not be a stand-alone sectoral plan. Particular linkages with tourism, highways, catchment protection, population demography, and similar related sectors would be developed.

Part Five: Annexes. This section will contain lists, maps, regulations, a bibliography, and so forth.

REVIEW OF BIODIVERSITY IN YUNNAN PROVINCE

Yunnan Province has a total area of 383,000 sq.km. and stretches from the extreme south of the country in the tropical zone to areas of permanent glaciers above 6000 meters in the northwest of the province.

This wide range of natural conditions gives the province a great richness of natural habitats and wild species of flora and fauna. Diversity is enhanced by the wedging effect of the convergence of three major rivers—Salween (Nujiang), Mekong (Lancang) and Jinshajiang through the province, which has allowed the free exchange of species into the region from hugely divergent downstream catchments.

In total Yunnan has approximately 60% of all living species in China. It has by far the longest lists of rare, endangered, precious and protected species of any province.

The flora is estimated to exceed 14,000 species or 50% of the country's total, including 4 first class protected species and 60 of the second class. Both species richness and endemism value based on the endangered and protected plants of the country rank first of all provinces. Endemism ratio is also high. Over 2100 species of ornamental flowering plants and 1000 timber and economically important trees are found here.

The faunal richness also comes first of all Chinese provinces. The vertebrate fauna is estimated at 1638 species, including 145 reptiles, while insects amount to over 10000 species, both constitute to more than 60% of the country's total.

More than half the country's protected mammals are found here, including 25 species under the first class list and 29 of the second. The birds, with 11 first class protected species and 96 of the second class make up just less than half of the protected bird list.

The four first class protected plants in the province are Alsophila spinulosa, Davidia involucrata, Parashorea chinensis and Taiwania flousiana. All four are of high scientific value due to their primitiveness. T. flousiana has a narrow distribution in Yunnan, west Hunan and northern Burma while P. chinensis is a high quality dipterocarp timber tree of the tropics only found here and in western Guangxi.

The province is rich in endemic and primitive plants. Xishuangbanna alone has 153 species of endemic plants including Manglietia microgyne, Cyathocalyx yunnanensis, Polyalthia cheliensis, Beilschmeidia yunnanensis, Cinnamomum austo-yunnanensis, etc. Two species of the primitive Magnolia family, Magnolia dawsoniana and M. wilsonii are endemic to China. Other endemic plants include the Dove tree Davidia involucrata, Yunnan Cherry Prunus yunnanensis, and Consolida ajacis etc.

The Malay Bushbeech Gmelinaarborea and Siamese Senna Cassia siamea are two more valuable trees. Numerous other species including Angelica sinensis, Gastrodia elata, Coptis chinensis are highly priced for their medicinal values while others such as Xishuangbanna's Fragrant Cananga odorata, Dali's Bailan Michelia alba and the widespread palm trees are exploited for their fragrant oils or fibers.

Of the 15 protected primate species, Yunnan has 10, all of which are under the first class list. The Black Snub-nosed Monkey Rhinoptithecus bieti, for example, is confined to the Nujiang Lancang Gorges area (biounit 39f) of NW Yunnan and the southern tip of Xizang, while almost all the others have an indo-China distribution. Nonetheless, most of these have narrow distributions in China; the Pig-tail

Macaque Macaca nemestrina, Concolor Gibbon Hylobates concolor, Hoolock Gibbon H. hoolock and White-handed Gibbon H. lar are restricted to Yunnan while the Slow Loris Nycticebus coucang is also found in W. Guangxi in low numbers.

Other first class protected mammals that are not found elsewhere in China or also found rarely in SE Xizang include the Lesser Mouse Deer Tragulus javanicus which is only recorded in Xishuangbanna, Binturong Arctictis binturong, Malay Sun-bear Helarctos malayanus and Gaur Bos gaurus.

Of the 11 first class birds, many, though not endemic, have very restricted ranges in the country. These include the Green Peafowl Pavo muticus and Sarus Crane Grus antigone which are not found elsewhere in China. Grey Peacock Pheasant Polyplectron bicalcaratum which is only found in S. Yunnan and Hainan, Indian White-back Vulture Gyps bengalensis in Yunnan and SE Xizang (biounits 39f and 10), and Sclater's Monal Pheasant Lophophorus sclateri and Black-necked Bartail Pheasant Syrmaticus humiae in N. Yunnan, S. Xizang and S. Sichuan. The Great Indian Hornbill Buceros bicornis, Rufous-necked Hornbill Aceros nipalensis and Malabar Pied Hornbill Anthracoceros coronatus, though only belonging to the second class of the protected list, are in fact very rare and are restricted to the south and SW of China, from S. Yunnan to SE Xizang. The latter species has also been recorded in Guangxi.

This richness of species is nominally well protected by a provincial system of 30 nature reserves augmented by another 40 protected areas at county level. These reserves have a total area of 1.21 million hectares.

Analysis of Habitat Coverage

Table 1 shows the status of wildlife habitats for the province.

Table 1 Habitat Details for Yunnan Province

Habitat	*Original (sq km)*	*Remaining (sq km)*	*%*	*Protected (sq km)*	*%*	*Proposed (sq km)*	*%*
CUL		22,257		808		2	
RIV	4,782	4,782	100	41	0.9	0	0.0
SAV	46,811	22,909	49	0	0.0	0	0.0
SBS	13,095	89,522	684	2,241	17.1	451	3.4
SCF	90,464	20,185	22	1,758	1.9	350	0.4
SEB	92,681	12,141	13	7,328	7.9	564	0.6
SLS	15,959	9,575	60	2,248	14.1	381	2.4
TSE	34,799	12,068	35	371	1.1	0	0.0
TLF	6,369	1,185	19	756	11.9	8	0.1
FWL	700	700	100	250	35.7	350	50.0
HCF	10,414	4,166	40	161	1.5	0	0.0
LWE	30,000	1,000	3	370	1.2	0	0.0
TCF	12,987	7,075	54	188	1.4	0	0.0
TLS	2,027	3,016	149	0	0.0	0	0.0
TSG	9,388	42,700	455	858	9.1	100	1.1
MEO	3,202	2,586	81	55	1.7	52	1.6
SWG	7,182	5,027	70	0	0.0	0	0.0
CCF	15,593	10,259	66	1,769	11.3	272	1.7
RHO	6,169	5,175	84	410	6.6	0	0.0
TOTALS	402,644	121,849	30	19,612	4.9	2,530	0.6

Overall Loss of Natural Habitat = 70 %
Original Forest Cover = 75 %
Remaining Forest Cover = 19 %
Currently Protected Area = 5 %

REVIEW OF TRAINING NEEDS AND PROGRAMS IN NATURE RESERVE MANAGEMENT

Approximately 15,000 people are employed in all the nature reserves under the Ministry of Forestry, and another 2,650 are employed in wildlife conservation or nature reserve management offices operated by other agencies at the national, provincial, prefectural or county levels. The Ministry of Forestry's preliminary figures show that at the nature reserve level 25% of the staff have completed middle or technical school, and 6% are university graduates. At the national, provincial, prefectural, and county levels between 95% and 100% have completed middle or technical school and between 70% and 80% are university graduates. Most nature reserves are staffed at high levels, but many of the nature reserve management offices at the national level and provincial level are understaffed.

While training is needed at all levels, the most urgent priority is for protection skills at the nature reserve level. Guards need to be trained, but previous experience has shown that without changes in the management and incentive structures, training will be ineffective. Identification and provision of such incentives concurrently with the proposed training is thus an important part of this project. There is a lack of knowledge of natural biological systems, principles of reserve management and rural socio-economics among the reserve managers. Ideally this should be acquired in undergraduate or diploma courses, but the present courses do not provide material sufficient to train staff in these topics.

There are three Forestry Universities (at Harbin, Beijing and Nanjing), eight Forestry Colleges (in Fujian [Nanping], Zhejiang [Ningan], Inner Mongolia [Huhehot], Jilin, Shaanxi [Wugong], Hebei [Baoding], Yunnan [Kunming] and Hunan [Zhongnan Forestry College, Zhuzhou]) and numerous Forest Technical Schools.

Pre-service training for nature reserve management and research personnel is centered at North-East Forestry University, in Harbin. Graduates from the four year Wildlife Management course at Harbin (about 75 per year) are employed in reserves all over China. Nanjing Forestry University has a two year certificate course (60 graduates per year) in Nature Reserve Management, and South West Forestry College in Kunming has been including wildlife studies under its forestry degree course for some years, and is about to begin a four year undergraduate course in Wildlife and Nature Reserve Management in July 1993. This course will start with an intake of 30 students per year but will increase the intake rapidly. South West Forestry College already teaches 60 hours of wildlife and nature reserve management (2 percent of the total) in the Forestry and Forestry Protection courses.

In recent years a number of short term training courses for reserve staff have been run in these and other institutions, or in the field. North East Forestry University runs training courses for nature reserve personnel on a two to three week residential basis during the University vacations in February and August, and also some courses by correspondence. The University runs three forestry plantations, one of them protecting some original Korean Pine forest, and uses two of them for teaching and research. Six journals are published by the University in Chinese and one in English, and there is an extensive library with many foreign and Chinese journals. One or more international conferences on Forestry or Wildlife are held each year, and research and teaching exchange contacts are maintained with universities and institutions from 12 countries. Several staff members have studied for short periods at overseas universities and there are some collaborative wildlife research projects with U.S. universities and the U.S. Fish and Wildlife Service.

South West Forestry College has run annual 4-6 week training courses for reserve guards and managers since 1988 in collaboration with the World Wide Fund for Nature, and also ran a one year in-service

course for staff of Yunnan nature reserves in 1989, funded by the Yunnan Forest Bureau. They are keen to run more courses if they can be funded, and are in a good position to do so, having just moved into new premises (80,000 sq m) in Kunming, where there is ample accommodation and teaching space. They are planning to expand from the present 840 students to 2000 students by 1997, and will maintain their present levels of adult education in various subjects.

Among the facilities is a laboratory of remote sensing that does work on contract for government departments or prefectures. Exchange visits have been arranged with a number of foreign universities, including Kasetsart University, Bangkok, University of the Philippines, Los Banos and Gent University, Belgium. The Ford Foundation, Winrock International, FAO and WWF-I have supported training courses or overseas study for staff members.

Nanjing Forestry University has a two year diploma course in Nature Reserve Management (about 60 entrants a year), and the College of Adult Education has run three short training courses for nature reserve staff in the college and some more in nearby nature reserves. There is dormitory space for 160 students, a library and a computer center, and about 100 of the 750 teachers in the University have been involved in either the Diploma or the short training courses on Nature Reserve Management. The students who major in Forestry also take 50 hours of lectures on Nature Reserve Management over their four year degree course.

East China Normal University in Shanghai has a small zoology department with an ecology research group of five lecturers who have established a number of short training courses in collaboration with outside organizations. The actual degree course in Zoology includes only 10 hours of lectures on wildlife conservation. There is an annual six week training course on Wildlife Conservation for 20 trainees, including 10 from overseas. There are normally four to five local teachers and up to six from overseas, and the course has been funded largely by the Smithsonian Institution. There is a biennial three week course on Zoo Biology and Management in Shanghai, which is also funded and partly taught by the Smithsonian Institution. Apart from these regular courses, there have been occasional wetland conservation training courses run in collaboration with the World Wide Fund for Nature and the Asian Wetland Bureau, and the North American Environmental Education Association has been training teachers in environmental education, first through four day workshops, and, in 1993 through a two week course.

The Department of Biology at North West University has run three two year Diploma courses in Wildlife Conservation and Management (1986-88), and at present runs short (one to three months) training courses for reserve staff from the north western provinces (mainly Shaanxi) once or twice per year, with 30 trainees per course. Some of these courses and the practical exercises they involve are cause for concern because they encourage large scale collections of specimens, including mammals and birds.

Occasional short training courses are run by Beijing Normal University, North-East Normal University, Yunnan University and Kunming Institute of Zoology.

IMPLEMENTATION ARRANGEMENTS FOR SMALL GRANTS RESEARCH PROGRAM

Background and Objectives

Most nature reserves have scientists on staff who are unable to carry out management-related research projects due to shortage of funding. As a result, much of the research work done inside nature reserves is carried out by scientists from research institutes who rarely leave behind the research data or collaborate with reserve researchers. In addition, many of the research topics have no direct and immediate relevance to day-to-day reserve management. Therefore, to develop and enhance the research capabilities of nature reserve staff and to gather necessary information to strengthen on-the-ground management, a small research grants program will be established under the project.

The program will fund research proposals of up to US$5,000 per year on a competitive basis. The program will be open to nature reserve staff as well as collaborative research teams comprising reserve staff and outside researchers. The emphasis will be on applied research to solve practical management problems. Therefore, preference will be given to the following focal areas: (a) studies on rare and protected flora and fauna ecology residing in the area; (b) monitoring of key species; (c) ecosystem management studies; (d) biological resources inventory, development and use; (e) nature reserve management systems; (f) data management systems; (g) community development and extension of co-management technologies; and (h) alternative income-generating activities to benefit biodiversity protection.

Selection Process

Since MFO manages more than two-thirds of the total nature reserves, 70% of the research funds will be targeted to nature reserves under MFO while the remaining 30% will be targeted to nature reserves under other jurisdictions, such as the Ministry of Agriculture, the National Environmental Protection Agency, and the State Oceanographic Administration. Disbursement are expected to amount to 30% PY1; 25% PY2; and 15% PY3, PY4, and PY5.

Proposals will be solicited by each of the participating ministries using a standard format developed by DNR. The ministries will screen and submit all the proposals to a central Research Grants Appraisal Panel, which will be established under the coordination of DNR to evaluate proposals on an annual basis. The Research Grants Appraisal Panel will report directly to the project Leading Group and will consist of including one representative from DNR, one representative from PMC, and three senior level experts from local universities or institutes, such as the Chinese Academy of Forestry, the Chinese Academy of Sciences, and a non-forestry university. A minimal application fee will be charged to cover processing expenses. Contracts will be signed with each grant recipient that identifies the terms and conditions of the grant.

Monitoring, Evaluation, Dissemination

The selected researchers will report directly to the line provincial departments and host nature reserves. The researchers will be required to submit semi-annual progress reports to allow the relevant ministries and the DNR to monitor and supervise implementation of the research projects. An evaluation of the research will be required within six months of completion and will be reviewed by the Appraisal Panel. DNR will be responsible for dissemination of research results. It is expected that a publication summarizing research funded by this program will be produced at year six of the project.

PROJECT COST TABLES

China
Nature Reserves Management Project
Table 1: Total Project Costs By Components (S)

The People's Republic of China
Nature Reserves Management Project
Components Project Cost Summary

	(Yuan)					(US$)				
	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
A. Nature Reserves										
1 Reserve Management	5,309,008	4,616,484	9,925,492	47	5	610,231	530,630	1,140,861	47	5
2 Field Level Protection	21,553,676	11,174,916	32,728,542	34	17	2,477,428	1,284,473	3,761,901	34	17
3 Community Participation	14,059,764	5,681,125	19,740,889	29	10	1,616,065	653,003	2,269,068	29	10
Subtotal Nature Reserves	40,922,398	21,472,525	62,394,923	34	33	4,703,724	2,468,106	7,171,830	34	33
B. Enterprise Restructuring										
1 Core Zone Protection	2,440,095	891,403	3,331,498	27	2	280,471	102,460	382,931	27	2
2 Experimental Zone Protection	1,102,677	310,214	1,412,892	22	1	126,745	35,657	162,401	22	1
3. Worker Redeployment										
New Job Creation	39,306,905	11,514,146	50,821,050	23	27	4,518,035	1,323,465	5,841,500	23	27
Relocation Packages	10,440,000	-	10,440,000	-	6	1,200,000	-	1,200,000	-	6
Subtotal Worker Redeployment	49,746,905	11,514,146	61,261,050	19	33	5,718,035	1,323,465	7,041,500	19	33
Subtotal Enterprise Restructuring	53,289,676	12,715,763	66,005,440	19	35	6,125,250	1,461,582	7,586,832	19	35
C. Capacity Building										
1. Organisational Development										
Yunnan Province	3,459,772	2,326,437	5,786,209	40	3	397,675	267,407	665,081	40	3
National	4,567,680	2,853,205	7,420,884	38	4	525,021	327,955	852,975	38	4
Subtotal Organisational Development	8,027,451	5,179,642	13,207,093	39	7	922,696	595,361	1,518,057	39	7
2 Training and Skills Development	11,043,387	7,374,924	18,418,311	40	10	1,269,355	847,692	2,117,047	40	10
3 Administration/Supervision	4,511,910	1,835,393	6,347,303	29	3	518,610	210,965	729,575	29	3
Subtotal Capacity Building	23,582,748	14,389,959	37,972,708	38	20	2,710,661	1,654,018	4,364,679	38	20
D. Management Information System										
1 Data Management	1,315,182	3,298,706	4,613,887	71	2	151,170	379,162	530,332	71	2
2 Inventories and Monitoring Systems	8,876,454	1,502,882	10,379,336	14	6	1,020,282	172,745	1,193,027	14	6
Subtotal Management Information System	10,191,636	4,801,588	14,993,224	32	8	1,171,452	551,907	1,723,359	32	8
E. Research										
1 Reserve Research Program	1,779,121	669,004	2,448,125	27	1	204,497	76,897	281,394	27	1
2. Small Reserch Grants Program	4,158,430	353,844	4,512,274	8	2	477,981	40,672	518,652	8	2
Subtotal Research	5,937,551	1,022,848	6,960,399	15	4	682,477	117,569	800,046	15	4
Total BASELINE COSTS	133,924,009	54,402,604	188,326,693	29	100	15,393,564	6,253,182	21,646,746	29	100
Physical Contingencies	5,726,629	2,720,134	8,446,763	32	4	658,233	312,659	970,892	32	4
Price Contingencies	24,491,213	7,975,091	32,466,304	25	17	783,517	241,977	1,025,494	24	5
Total PROJECT COSTS	164,141,852	65,097,908	229,239,760	28	122	16,835,315	6,807,818	23,643,132	29	109

China
Nature Reserves Management Project
Table 2: Total Project Costs By Expenditure Accounts ($)

The People's Republic of China
Nature Reserves Management Project
Expenditure Accounts Project Cost Summary

	(Yuan)				(US$)				
	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
I Investment Costs										
A. Civil Works										
Infrastructure	8,339,836	1,437,646	9,777,483	15	5	958,602	165,247	1,123,849	15	5
Rehabilitation	1,613,135	178,735	1,791,869	10	1	186,110	20,544	206,654	10	1
Other Works	19,934,844	3,397,228	23,332,072	15	12	2,291,361	390,486	2,681,847	15	12
Subtotal Civil Works	29,893,835	5,013,609	34,907,444	14	19	3,436,073	576,277	4,012,350	14	19
B. Equipment										
Production Equipment	11,842,838	7,961,892	19,804,730	40	11	1,372,740	815,160	2,287,900	40	11
Field Equipment	1,709,555	1,634,848	3,344,403	49	2	196,501	190,212	386,713	49	2
Research Equipment	660,677	515,056	1,175,732	44	1	75,940	59,202	135,142	44	1
Office Equipment	1,012,408	4,772,730	5,785,139	82	3	116,369	548,590	664,958	82	3
Subtotal Equipment	15,325,477	14,904,526	30,230,004	49	16	1,761,549	1,713,164	3,474,713	49	16
C Research	3,890,033	411,838	4,301,871	10	2	447,130	47,338	494,468	10	2
D Planning/Management										
Management Planning	15,848,559	701,076	16,549,634	4	9	1,821,673	80,583	1,902,257	4	9
Investigation	9,291,720	1,495,959	10,787,678	14	6	1,068,014	171,949	1,239,963	14	6
Project Management	1,244,970	131,805	1,376,775	10	1	143,100	15,150	158,250	10	1
Subtotal Planning/Management	26,385,248	2,328,840	28,714,088	8	15	3,032,787	267,683	3,300,470	8	15
E. Vehicles										
Cars	-	6,410,117	6,410,117	100	3	-	736,795	736,795	100	3
Motorbikes	-	788,617	788,617	100	-	-	81,010	81,010	100	-
Other Vehicles	378,784	2,743,521	3,122,315	88	2	43,540	315,347	358,887	88	2
Subtotal Vehicles	378,784	9,953,255	10,332,048	96	5	43,540	1,144,052	1,187,592	96	5
F. Technical Assistance										
1 Local Specialists	2,349,544	300,375	2,649,919	11	1	270,063	34,526	304,588	11	1
2 Foreign Specialists										
Project Preparation, Implementation	296,220	1,599,401	1,895,621	84	1	34,048	183,839	217,887	84	1
Institutional Development	3,049,328	14,099,181	17,148,509	82	9	350,497	1,620,596	1,971,093	82	9
Subtotal Foreign Specialists	3,345,548	15,698,582	19,044,130	82	10	384,546	1,804,435	2,188,980	82	10
Subtotal Technical Assistance	5,695,092	15,998,957	21,694,049	74	12	654,608	1,838,961	2,493,569	74	12
G. Training										
Conservation Education	5,524,813	2,100,651	7,625,464	28	4	635,036	241,454	876,490	28	4
Community Processes	3,436,738	377,526	3,814,262	6	3	624,912	43,394	668,306	6	3
Staff Development	7,868,568	2,989,243	10,857,811	28	6	904,433	343,591	1,248,024	28	6
Subtotal Training	18,830,117	5,467,419	24,297,537	23	13	2,164,381	628,439	2,792,820	23	13
H Relocation Packages	10,440,000	-	10,440,000	-	6	1,200,000	-	1,200,000	-	6
Total Investment Costs	110,838,597	54,078,443	164,817,041	33	88	12,740,069	6,215,813	18,955,982	33	88
II. Recurrent Costs										
A Incremental Staff										
Salaries	2,434,746	-	2,434,746	-	1	279,856	-	279,856	-	1
Management Expenses	3,062,626	324,240	3,386,867	10	2	352,026	37,269	389,295	10	2
Subtotal Incremental Staff	5,497,373	324,240	5,821,613	6	3	631,882	37,269	669,151	6	3
B Operating Costs	2,289,337	-	2,289,337	-	1	263,142	-	263,142	-	1
C Maintenance	15,298,702	-	15,298,702	-	8	1,758,472	-	1,758,472	-	8
Total Recurrent Costs	23,085,412	324,240	23,409,652	1	12	2,653,496	37,269	2,690,765	1	12
Total BASELINE COSTS	133,924,009	54,402,684	188,326,693	29	100	15,393,564	6,253,082	21,646,746	29	100
Physical Contingencies	5,728,629	2,720,134	8,448,763	32	4	658,233	312,658	970,892	32	4
Price Contingencies	24,491,213	7,975,091	32,466,304	25	17	783,517	241,817	1,025,494	24	5
Total PROJECT COSTS	164,141,852	65,097,908	229,239,760	28	122	16,835,315	6,807,818	23,643,132	29	109

China
Nature Reserves Management Project
Table 3: Total Project Costs By Financiers (S)

The People's Republic of China
Nature Reserves Management Project
Components by Financiers
(US$)

	GEF		Government		Total		For. Exch.	Local (Excl. Taxes)	Duties & Taxes
	Amount	%	Amount	%	Amount	%			
A. Nature Reserves									
1 Reserve Management	1,225,370	100.0	0	-	1,225,370	5.2	570,144	655,225	-
2 Field Level Protection	2,575,627	61.5	1,612,294	38.5	4,187,920	17.7	1,383,555	2,804,366	-
3 Community Participation	2,265,376	89.0	278,661	11.0	2,544,037	10.8	713,004	1,831,033	-
Subtotal Nature Reserves	6,066,373	76.2	1,890,954	23.8	7,957,327	33.7	2,666,703	5,290,624	-
B. Enterprise Restructuring									
1 Core Zone Protection	340,504	80.6	81,967	19.4	422,471	1.8	110,234	312,236	-
2 Experimental Zone Protection	141,256	80.1	35,132	19.9	176,388	0.7	37,903	138,486	-
3. Worker Redeployment									
New Job Creation	3,371,752	54.5	2,815,365	45.5	6,187,116	26.2	1,418,509	4,768,607	-
Relocation Packages	960,000	80.0	240,000	20.0	1,200,000	5.1	-	1,200,000	-
Subtotal Worker Redeployment	4,331,752	58.6	3,055,365	41.4	7,387,116	31.2	1,418,509	5,968,607	-
Subtotal Enterprise Restructuring	4,813,511	60.3	3,172,464	39.7	7,985,975	33.8	1,566,646	6,419,329	-
C. Capacity Building									
1. Organisational Development									
Yunnan Province	646,174	86.1	104,487	13.9	750,661	3.2	297,591	453,071	-
National	852,543	89.5	99,510	10.5	952,053	4.0	363,618	588,435	-
Subtotal Organisational Development	1,498,717	88.0	203,997	12.0	1,702,715	7.2	661,209	1,041,506	-
2 Training and Skills Development	2,087,387	89.7	240,582	10.3	2,327,969	9.8	922,833	1,405,136	-
3 Administration/Supervision	739,958	89.5	86,688	10.5	826,646	3.5	241,472	585,174	-
Subtotal Capacity Building	4,326,062	89.1	531,268	10.9	4,857,330	20.5	1,825,514	3,031,816	-
D. Management Information System									
1 Data Management	555,097	93.7	37,605	6.3	592,701	2.5	423,806	168,895	-
2 Inventories and Monitoring Systems	1,344,890	100.0	0	-	1,344,890	5.7	194,703	1,150,187	-
Subtotal Management Information System	1,899,987	98.1	37,605	1.9	1,937,591	8.2	618,509	1,319,082	-
E. Research									
1 Reserve Research Program	311,329	100.0	0	-	311,329	1.3	84,030	227,299	-
2 Small Reserch Grants Program	484,832	81.7	108,748	18.3	593,580	2.5	46,415	547,165	-
Subtotal Research	796,161	88.0	108,748	12.0	904,909	3.8	130,445	774,464	-
Total Disbursement	17,902,095	75.7	5,741,038	24.3	23,643,132	100.0	6,807,818	16,835,315	-

China
Nature Reserves Management Project
Table 4: Total Project Costs by Years (S)

The People's Republic of China
Nature Reserves Management Project
Project Components by Year – Totals Including Contingencies
(US$)

	Totals Including Contingencies						
	1996	1996	1997	1998	1999	2000	Total
A. Nature Reserves							
1. Reserve Management	595,974	577,417	38,181	13,798	-	-	1,225,370
2. Field Level Protection	1,072,008	771,629	693,022	731,462	469,203	450,596	4,187,920
3. Community Participation	317,277	545,092	525,529	531,626	427,885	196,628	2,544,037
Subtotal Nature Reserves	1,985,259	1,894,138	1,256,731	1,276,887	897,088	647,224	7,957,327
B. Enterprise Restructuring							
1. Core Zone Protection	99,677	159,297	50,065	29,269	61,688	22,455	422,471
2. Expedimential Zone Protection	81,008	59,384	9,719	10,177	9,199	6,901	176,388
3. Worker Redeployment							
New Job Creation	3,388,547	2,798,570	-	-	-	-	6,187,116
Relocation Packages	1,200,000	-	-	-	-	-	1,200,000
Subtotal Worker Redeployment	4,588,547	2,798,570	-	-	-	-	7,387,116
Subtotal Enterprise Restructuring	4,769,231	3,017,251	59,784	39,467	70,887	29,356	7,985,975
C. Capacity Building							
1. Organisational Development							
Yunnan Province	899	145,073	278,945	109,238	175,199	41,307	750,661
National	80,380	283,663	281,412	120,809	100,414	85,375	952,053
Subtotal Organisational Development	81,280	428,736	560,356	230,047	275,613	126,682	1,702,715
2. Training and Skills Development	456,687	908,653	475,337	252,528	210,751	24,013	2,327,969
3. Administration/Supervision	102,570	108,662	160,388	147,816	151,586	155,604	826,646
Subtotal Capacity Building	640,536	1,446,071	1,196,081	630,391	637,951	306,299	4,857,330
D. Management Information System							
1. Data Management	-	183,872	219,024	93,990	83,214	12,600	592,701
2. Inventories and Monitoring Systems	228,298	334,001	121,760	114,136	243,278	303,417	1,344,890
Subtotal Management Information System	228,298	517,873	340,784	208,127	326,492	316,017	1,937,591
E. Research							
1. Reserve Research Program	-	193,351	53,660	19,269	22,230	22,819	311,329
2. Small Reserch Grants Program	5,163	91,082	114,946	124,225	127,394	130,770	593,580
Subtotal Research	5,163	284,433	168,606	143,494	149,624	153,590	904,909
Total PROJECT COSTS	7,628,488	7,159,765	3,021,986	2,298,365	2,082,042	1,452,486	23,643,132

China
Nature Reserves Management Project
Table 5: Estimated Disbursement Schedule

IDA Fiscal Year/ Semester	Disbursement Semestral (US$ Million)	Disbursement Cumulative (US$ Million)	Disbursement Cumulative %	Disbursement Profile a/ Yr/Semester	Disbursement Profile a/ %
1996				Year 1	
First (July-Dec, 1995)	0.0	0.0	0	First	0
Second (Jan-June, 1996)	2.6	2.6	15	Second	30
1997				Year 2	
First (July-Dec, 1996)	2.6	5.3	29	First	38
Second (Jan-June, 1997)	3.0	8.3	46	Second	46
1998				Year 3	
First (July-Dec, 1997)	3.0	11.3	63	First	58
Second (Jan-June, 1998)	1.3	12.6	70	Second	66
1999				Year 4	
First (July-Dec, 1998)	1.3	13.9	78	First	74
Second (Jan-June, 1999)	0.8	14.8	82	Second	82
2000				Year 5	
First (July-Dec, 1999)	0.8	15.6	87	First	90
Second (Jan-June, 2000)	0.7	16.3	91	Second	94
2001				Year 6	
First (July-Dec, 2000)	0.7	17.1	95	First	96
Second (Jan-June, 2001)	0.4	17.5	98	Second	96
2002				Year 7	
First (July-Dec, 2001)	0.4	17.9	100	First	98
Second (Jan-June, 2002)				Second	100

a/ Disbursement profile for China - Agriculture Sector. The World Bank Financial Information Center, September 21, 1994.

completion date: June 30, 2001
Closing date: June 30, 2002

TERMS OF REFERENCE FOR MINISTRY OF FORESTRY IN PROJECT IMPLEMENTATION

Project Management Center (PMC)

- Cooperates with DNR in organizing, coordinating and supervising the implementation of the project so as to ensure efficient operation among central, provincial and nature reserve levels;

- Develops annual work plans in line with the requirements of the project feasibility report; inspects and supervises the implementation of the annual work plans, and if necessary, makes adjustments;

- Carries out procurement—bidding and tendering, preparing necessary contracts, inspections, delivery of items;

- Manages financial accounts through PMOs in the first two years of the project. This includes establishment of financial management system, disbursement, withdrawal application, account establishment, document maintenance, supervision of fund utilization and organization of audit, etc.. From the third year on, directly supervises nature reserves in financial affairs (except for Shaanxi province, which retains its PMO);

- Liaises with the WB, UNDP and other relevant international and domestic agencies; cooperates with DNR in arranging short-term and long-term technical assistance, including preparation of terms of reference, contracts and logistical support;

- With DNR, develops monitoring and evaluation plans for the project and ensures implementation of these; and

- Prepares semi-annual reports on project progress to the World Bank.

Division of Nature Reserves (DNR)

- Works closely with PMC in formulating and adjusting annual work plans, and organizing their implementation;

- Guides the project provinces, the five nature reserves, and the Changing Forestry Bureau in the technical aspects of project implementation;

- Prepares national strategies and plans for nature reserve development and management;

- Reviews and suggest revisions in the five nature reserve and provincial management plans prepared under the project;

- Conducts supervision and inspection for the implementation of all activities;

- Organizes and coordinates Chinese and foreign experts to provide technical supports for project implementation;

- Develops and implements training and research grant programs and establishes a nature reserve management information system; and

- Develops a nature reserve monitoring and evaluation system to measure impacts and benefits of the project, and, with PMC, submits periodic reports on project implementation to the WB.

Project Management Office (PMO)

- Provides training to project and financial management staff from nature reserves, during the first two years of the project;

- Organizes manpower, material resources and counterpart funds to guarantee the implementation of the plans, in accordance with the annual work plans jointly formulated by PMC and DNR;

- Supervises and monitors project implementation, and periodically reports on project implementation to PMC and DNR, in accordance with the annual work plans;

- Reports on fund management and use to the PMC. Undertakes disbursement and withdrawal applications as required, and ensure that nature reserves will be able to manage most of the activities independently from the third year onward[1/];

Office of Nature Reserve Management (ONR)

(An already-existing unit in each provincial forestry department responsible for managing nature reserves)

- Organizes, coordinates, instructs and supervises project implementation;

- Coordinates with the PMO in determining tasks for nature reserves; organizes experts for project implementation for such activities as baseline surveys; development of management, land-use, and ecotourism plans; and co-management with communities;

- Organizes and coordinates the related units to participate in project implementation of those activities that need joint efforts of different units; checks and approves execution of various contracts and agreements.

- Cooperates with the PMO to periodically report on project implementation to the PMC and the DNR;

Nature Reserves

- Participates in developing and implementing annual project work plans;

- Organizes nature reserve staff and the related units and establishes responsibility system to ensure smooth implementation;

- Coordinates communication with local communities; and in conjunction with the

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1/ During the life of the project, Shaanxi Province will remain the same.

communities, establishes effective co-management systems;

- Organizes nature reserve technicians to handle and maintain the equipment and infrastructure procured under the project and to ensure their maintenance.

- Makes local arrangements for TA experts and arranges to have counterparts assigned to them;

- Periodically reports on the project progress and submits monitored data to the next level of responsible agency.

- With project specialists, revises reserve organization and management systems to effectively accomplish agreed-upon long-term conservation goals and objectives.

MONITORING AND EVALUATION PROGRAM

The main objective of monitoring and evaluation activities is to provide information to reserve managers (and MFO planners and coordinators) that will improve management decision-making in the field. The goal of the project is to develop a project monitoring and evaluation system that becomes part of operations for each of the reserves, relevant provincial organizations, and the DNR in the MFO. This will be accomplished in several ways:

- baseline and end of project biophysical and socio-economic baseline surveys will be conducted;
- organizational management interventions will make protection staff more accountable, with supervisory staff more knowledgeable of field-level conditions and events;
- guards will be trained to observe and record information during their patrols that is useful to the management staff of the reserves;
- reserve staff will use Participatory Rural Appraisal (RRA) for the periodic collection of information from communities within and contiguous to reserves;
- project implementation tracking—accomplished by providing regular technical and administrative supervision during the six years of the project; and
- a nature reserve management information system (NRMIS) will be set up to store and integrate information collected by the above methods. This information will be used by nature reserve managers, provincial planners, and national-level MFO technical staff to plan, coordinate, and implement nature reserve conservation efforts.

Table 1 indicates possible monitoring variables, sampling time periods, tools, and location for monitoring to occur over the life of the project.

TABLE 1: MONITORING AND EVALUATION INDICATORS
BIODIVERSITY

TARGET VARIABLE	TIME INTERVAL FOR SAMPLING	TOOLS	LOCATIONS				
			S	Q	X	W	P
BASELINE STUDIES							
I. REGIONAL LANDSCAPES							
a. Distribution of major habitat types	Baseline	Remote sensing data, maps	x	x	x	x	
b. Patchiness and fragmentation of habitat	Baseline	Remote sensing data, maps	x	x	x	x	
c. Corridors and linkages	Baseline	Ground truth		x		x	
d. Historical local climate effects	Baseline	Weather station records				x	
e. Land use trends in adjacent areas	Baseline	WP, ground surveys	x	x	x	x	x
f. Natural and man-induced disturbances regimes	Baseline	Ground truth surveys	x	x	x	x	x
g. Management policies and current level of integration in regional planning	Baseline	Policy analysis	x	x	x	x	x
II. COMMUNITY/ECOSYSTEM							
a. Identification of fragile ecosystems	Baseline	Ground surveys, inventories	x		x	x	
b. Distribution of ecosystems and habitats	Baseline	Ground surveys, remote sensing	x	x	x	x	x
c. Proportion of ecosystem protected	Baseline	Land use maps, remote sensing data	x	x	x	x	x
d. Diversity of ecosystems and habitats	Baseline	Habitat classification studies			x		
e. Patchiness and fragmentation of habitat	Baseline	Remote sensing	x	x	x		
f. Human impact to habitat or area	Baseline	Land use maps, inventories, ground truth	x	x	x	x	x
III. SPECIES/POPULATION							
a. Fauna and flora inventories	Baseline	Inventories, counts, censuses	x	x	x	x	x
b. Proportion of endemic, exotic, and endangered species	Baseline	Inventory, analysis	x	x	x	x	x
c. Life history parameters of keystone and/or threatened species	Baseline	Census, field study	x	x	x	x	x

TABLE 1: MONITORING AND EVALUATION INDICATORS
BIODIVERSITY

TARGET VARIABLE	TIME INTERVAL FOR SAMPLING	TOOLS	LOCATIONS				
			S	Q	X	W	P
d. Current and part rate of offtake of keystone and/or threatened species	Baseline	Demographic studies			x	x	
c. Habitat and dietary needs of keystone and/or threatened species	Baseline	Habitat use, habitat surveys					x
IV. PROTECTED AREA MANAGEMENT							
a. Demarcation and zoning	Baseline	Administrative/judicial records, community consultation	x	x	x	x	x
b. Buffer zone and core area delineation	Baseline	Administrative/judicial records, community consultation	x	x	x	x	
c. Infrastructure development	Baseline	Field visit, inventories	x	x	x	x	x
	MONITORING PROGRAM						
I. REGIONAL LANDSCAPE							
Long-term Threats							
a. Degree of isolation and fragmentation	Annual	Remote sensing analysis	x	x	x	x	
b. Annual or seasonal climate variation or change	Annual, seasonal	Meteorological data	x	x	x	x	x
c. Maintenance of habitat corridors and linkages	Annual	Remote sensing, ground surveys		x		x	
d. Integration into regional landscape planning	Annual review	Policy analysis	x	x	x	x	x
Short-term Threats							
e. Uncontrolled burning	Annual	Ground surveys,	x		x		
f. Land degradation	Annual	Ground survey	x		x	x	x
g. Pollution (release of pollutants, if appropriate)	Variable	Sampling data					x
Other Features							
h. Annual natural disturbances regimes							
i) Fire (forest and savannah)	Annual	Ground surveys, remote sensing, measure coverage lost	x	x		x	

TABLE 1: MONITORING AND EVALUATION INDICATORS BIODIVERSITY

TARGET VARIABLE	TIME INTERVAL FOR SAMPLING	TOOLS	LOCATIONS				
			S	Q	X	W	P
ii) Flood or drought pattern	Variable	Ground surveys, remote sensing, measure coverage lost					x
i. Productivity of surrounding lands	Annual, seasonal	Agricultural surveys, government statistics	x	x	x	x	x
II. COMMUNITY/ECOSYSTEM							
Long-term Threats							
a. Changes in successional status, integrity of areas	Baseline, endpoint	Land use maps, remote sensing data	x	x	x	x	
b. Patchiness and fragmentation of habitat	Baseline, endpoint	Remote sensing data	x	x	x	x	
c. Proportion of critical habitat protected	Baseline, endpoint	Remote sensing data used	x	x	x	x	
d. Sustainability of human use of multiple-use areas	Annual, seasonal	Monitoring of demographic trends for species				x	x
Short-term Threats							
e. Rate of illegal encroachment on critical (core) or protected areas	Monthly	Patrol data	x	x	x	x	x
f. Maintenance of vegetative cover and distribution	Annual, biannual	Vegetation sampling	x	x	x	x	
g. Restoration and maintenance of fragile ecosystems	Annual	Techniques for monitoring ecosystem processes, rate of incursions, decline of species	x				x
III. SPECIES/POPULATIONS							
Long-term Threats							
a. Threshold for sustainability	Annual, seasonal	Demographic analyses				x	x
b. Small population sizes—demographic trends	Annual, seasonal	Demographic analyses, population viability analyses					x
c. Abundance of keystone and/or threatened species	Annual, seasonal	Inventories, transect counts. filed survey, patrol data	x	x	x	x	x
d. Age/sex composition of keystone and/or threatened species	Annual, seasonal	Census, demographic analyses		x		x	
e. Recruitment rate	Annual	Demographic analyses	x	x	x	x	x
f. Rate of offtake of keystone and/or threatened species	Annual, seasonal	Hunter yields			x	x	x
IV. PROTECTED AREA MANAGEMENT							

TABLE 1: MONITORING AND EVALUATION INDICATORS
BIODIVERSITY

TARGET VARIABLE	TIME INTERVAL FOR SAMPLING	TOOLS	LOCATIONS				
			S	Q	X	W	P
Long-term Threats							
a. Infrastructure development	Baseline, endpoint	Inventories, field visits	x	x	x	x	x
b. Management plans	Annual	Review of management plan	x	x	x	x	x
Short-term Threats							
c. Demarcation and zoning	Baseline, endpoint	Administrative and judicial records, patrolling community consultation	x	x	x	x	x
d. Buffer zone and core area delineation	Baseline, endpoint	Administrative and judicial records, patrolling community consultation	x	x	x	x	x
	BASELINE STUDIES						
I. POPULATION AND DEMOGRAPHY							
a. Number of communities	Baseline	Town statistics	x	x	x	x	x
b. Population of communities	Baseline	Town statistics	x	x	x	x	x
c. Age, gender, and wealth composition	Baseline	Town statistics, SEBS, RRA	x	x	x	x	x
d. Ethnicity	Baseline	Town statistics	x	x	x	x	x
e. In/out migration	Baseline	Town statistics	x	x	x	x	x
f. Population growth rates	Baseline	Town statistics	x	x	x	x	x
II. SOCIAL INFRASTRUCTURE AND INSTITUTIONS							
a. Schools	Baseline	Town statistics	x	x	x	x	x
b. Health facilities	Baseline	Town statistics	x	x	x	x	x
c. Spiritual and religious centers	Baseline	RRA, SEBS	x	x	x	x	x
d. Transportation network	Baseline	Town statistics	x	x	x	x	x
e. Communications systems	Baseline	Town statistics	x	x	x	x	x
f. Electricity	Baseline	Town statistics	x	x	x	x	x
g. Shops, markets, and commercial/industrial sectors	Baseline	Town statistics, RRA	x	x	x	x	x

TABLE 1: MONITORING AND EVALUATION INDICATORS BIODIVERSITY

TARGET VARIABLE	TIME INTERVAL FOR SAMPLING	TOOLS	LOCATIONS				
			S	Q	X	W	P
h. Social and political institutions	Baseline	RRA, SEBS	x	x	x	x	x
Household Consumption and Income							
a. Household expenditures and consumption	Baseline	SEBS, RRA	x	x	x	x	x
b. Household income (disaggregated by source: agriculture, wildlife, forest products, off-farm income)	Baseline	SEBS, RRA	x	x	x	x	x
c. Other household assets (in-kind income, fixed assets)	Baseline	SEBS, RRA	x	x	x	x	x
Traditional/Community Land Tenure and Use							
a. Traditional and historical land tenure and use	Baseline	Key informant, ethnography	x	x	x		x
b. Formal/legal (de jure) land tenure system	Baseline	Key informant, ethnography, RRA	x	x	x		x
c. De facto land tenure rules	Baseline	RRA	x	x	x		x
d. Type, size, and distribution of individual land holdings (disaggregated by gender, income/assets, and other key factors including production statistics from land units	Baseline	Town statistics, SEBS	x	x	x	x	x
e. Collective/communal land holdings	Baseline	Town statistics, SEBS, RRA	x	x	x	x	x
f. Area cultivated or cleared	Baseline	Remote sensing, RRA, maps	x	x	x	x	x
Resource Use and Key Economic Indicators							
a. Local natural resource utilization (description of hunting, fishing, gathering, logging, etc.)	Baseline	RRA, SEBS	x	x	x	x	x
b. Gender roles in resource use	Baseline	RRA, SEBS	x	x	x	x	x
c. Available resources, present yields, and consumption patterns for each use	Baseline	RRA, inventory	x	x	x	x	x
d. Rules and institutions regulating the use of natural resources and effect on protection at field level	Baseline	RRA	x	x	x		x
e. Conflicts and litigation (both frequency and types) over resource use	Baseline	RRA	x	x	x		x

TABLE 1: MONITORING AND EVALUATION INDICATORS BIODIVERSITY

TARGET VARIABLE	TIME INTERVAL FOR SAMPLING	TOOLS	LOCATIONS				
			S	Q	X	W	P
f. Opportunities, needs, and desires for alternative community economic activities	Baseline	RRA	x	x	x		x
I. POPULATION AND DEMOGRAPHY							
a. Communities' population dynamics	Midpoint, endpoint	Town statistics	x	x	x	x	x
b. Labor migration	Midpoint, endpoint	Town statistics	x	x	x	x	x
II. SOCIAL INFRASTRUCTURE AND INSTITUTIONS							
a. Changes in infrastructure and institutions	Variable, endpoint	SEBS, RRA	x	x	x	x	x
III. SOCIO-ECONOMIC PARAMETERS							
Household Consumption and Income							
a. Change in expenditure and consumption patterns	Endpoint	SEBS	x	x	x	x	x
b. Change in household income (levels and sources)	Endpoint	SEBS	x	x	x	x	x
Land Tenure, Land Use, and Access Rights							
a. De facto land tenure rules and access to land (disaggregated by strata and gender)	Variable	RRA	x	x	x		x
b. Type, size, distribution, and use of individual land holdings (disaggregated by gender, income/assets, and other key factors, including production statistics from land units)	Endpoint	SEBS	x	x	x	x	x
c. Collective/communal land holdings	Variable	RRA, inventory	x	x	x	x	x
d. Area cultivated or cleared	Variable	Inventory, RRA	x	x	x	x	x
Changes in Resource Use and Key Economic Indicators							
a. Local natural resource utilization (description of hunting, fishing, gathering, logging, etc.)	Annual	RRA	x	x	x		x
b. Gender roles in resource use	Variable	RRA	x	x	x	x	x
c. Available resources, present yields, and consumption patterns for each use	Endpoint	SEBS	x	x	x	x	x

TABLE 1: MONITORING AND EVALUATION INDICATORS
BIODIVERSITY

TARGET VARIABLE	TIME INTERVAL FOR SAMPLING	TOOLS	LOCATIONS				
			S	Q	X	W	P
d. Rules and institutions regulating the use of natural resources and effect on production at field level	Variable	RRA	x	x	x		x
e Opportunities, needs, and desires for alternative community economic activities	Variable	RRA, Extension Service	x	x	x		x
Impacts of Improved Management and Protection							
a. Benefits derived from co-management	Midpoint, endpoint	RRA, SEBS	x	x	x	x	x
b. Benefits of economic development activities	Midpoint, endpoint	RRA, SEBS	x	x	x	x	x
c. Costs of co-management							
i) to reserve bureau	Variable	Interviews	x	x	x		x
ii) to develop management plan	Variable	RRA, management planning	x	x	x		x
iii) transaction costs of conflict resolution	Variable	RRA	x	x	x		x
	BASELINE STUDIES						
I. ACCOUNTING FOR DIVERSE INTERESTS							
a. Identification of ethnic, socio-economic, and gender group interests	Baseline	RRA, SEBS	x	x	x	x	x
b. Interaction and conflicts between groups	Baseline	RRA, SEBS	x	x	x	x	x
II. STIMULATING AND SUSTAINING COMMUNITY SUPPORT							
a. Extent of community roles in enforcement of protection measures	Baseline	RRA, SEBS	x	x	x	x	x
b. Community role in NRM planning	Baseline	RRA, SEBS	x	x	x	x	x
III. INFORMATION AND IDEA EXCHANGE							
a. System of traditional knowledge	Baseline	RRA, SEBS	x	x	x	x	x
b. Flow of information in the community	Baseline	RRA, SEBS	x	x	x	x	x
c. Dialogue between reserve management and communities	Baseline	RRA, SEBS	x	x	x	x	x

TABLE 1: MONITORING AND EVALUATION INDICATORS
BIODIVERSITY

TARGET VARIABLE	TIME INTERVAL FOR SAMPLING	TOOLS	LOCATIONS				
			S	Q	X	W	P
d. Dialogue between communities and other extension services or agencies	Baseline	RRA, SEBS	x	x	x	x	x
I. ACCOUNTING FOR DIVERSE INTERESTS: Changes in:							
a. Ethnic, socio-economic, and gender group interests	Midpoint, endpoint	Midterm evaluation, SEBS, RRA	x	x	x	x	x
b. Interaction and conflicts between groups	Midpoint, endpoint	Midterm evaluation, SEBS, RRA	x	x	x	x	x
II. STIMULATING AND SUSTAINING COMMUNITY SUPPORT							
a. Development of co-management systems between reserve management and communities	Midpoint, endpoint	Midterm evaluation, SEBS, RRA	x	x	x	x	x
b. Evidence of community roles in enforcing protection of nature reserve	Midpoint, endpoint	Midterm evaluation, SEBS, RRA	x	x	x	x	x
c. Integration of reserve protection with community development needs and efforts	Midpoint, endpoint	Midterm evaluation, SEBS, RRA	x	x	x	x	x
d. Evidence of individual and group incentives for co-management	Midpoint, endpoint	Midterm evaluation, SEBS, RRA	x	x	x	x	x
e. Mechanisms available for conflict resolution	Midpoint, endpoint	Midterm evaluation, SEBS, RRA	x	x	x	x	x
III. INFORMATION AND IDEA EXCHANGE							
a. Increased equity of information exchange, both within the community and between the community	Midpoint, endpoint	Midterm evaluation, SEBS, RRA	x	x	x	x	x
b. Information freely accessible, useful, and equitable between community and nature reserve management	Midpoint, endpoint	Midterm evaluation, SEBS, RRA	x	x	x	x	x
c. System of accountability and responsibility for protection and management of nature reserves clearly defined and understood by all actors	Midpoint, endpoint	Midterm evaluation, SEBS, RRA	x	x	x	x	x
d. Improved access to extension information for communities	Midpoint, endpoint	Midterm evaluation, SEBS, RRA	x	x	x	x	x
		BASELINE STUDIES					
I. ORGANIZATIONAL ACCOUNTABILITY							

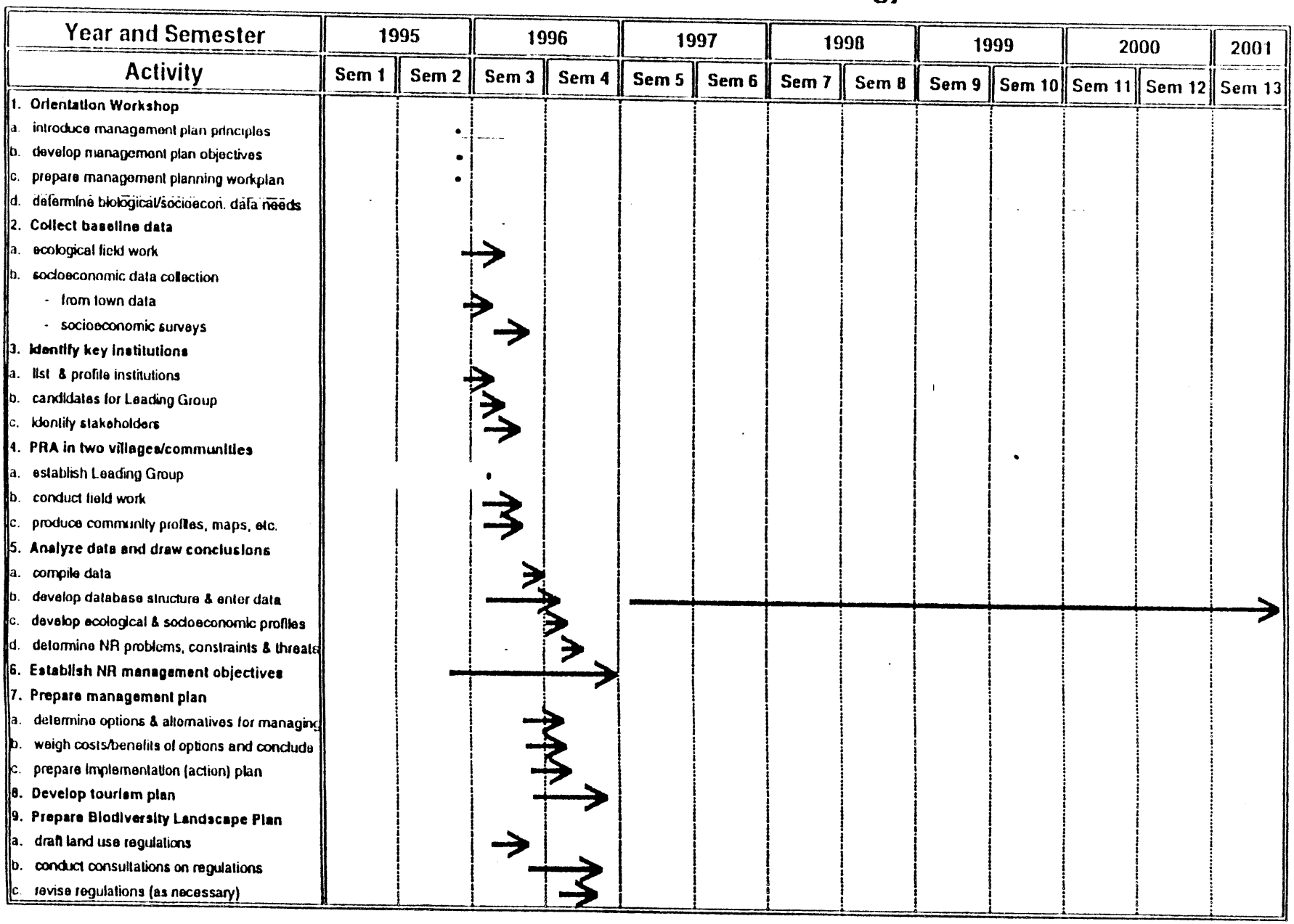
TABLE 1: MONITORING AND EVALUATION INDICATORS BIODIVERSITY

TARGET VARIABLE	TIME INTERVAL FOR SAMPLING	TOOLS	LOCATIONS				
			S	Q	X	W	P
a. Organizational Mandate							
i) legislation directing organization	Baseline	Staff interviews	x	x	x	x	x
ii) clear statement and understanding of conservation goals and requirements	Baseline	Staff interviews	x	x	x	x	x
iii) degree to which mandate understood and operationalized	Baseline	Staff interviews	x	x	x	x	x
b. Organizational Structure: Evidence of							
i) personnel levels	Baseline	Staff interviews	x	x	x	x	x
ii) job descriptions, responsibilities	Baseline	Staff interviews	x	x	x	x	x
iii) supervisory structure	Baseline	Staff interviews	x	x	x	x	x
c. Communication/Information Flow							
i) degree of information needed for conservation	Baseline	Observation, interviews	x	x	x	x	x
ii) type and amount of information collected	Baseline	Observation, interviews	x	x	x	x	x
iii) degree of information flow within organization	Baseline	Observation, interviews	x	x	x	x	x
iv) degree of inter-organization	Baseline	Observation, interviews	x	x	x	x	x
v) information available for management decisions	Baseline	Observation, interviews	x	x	x	x	x
d. Organizational Planning Systems							
i) management planning/strategic planning	Baseline	Observation, interviews	x	x	x	x	x
ii) operation planning capability	Baseline	Observation, interviews	x	x	x	x	x
iii) project management capability	Baseline	Observation, interviews	x	x	x	x	x
	MONITORING PROGRAM						
I. ORGANIZATIONAL ACCOUNTABILITY							
a. Organizational Mandate							
i) legislation directing organization	Annual, endpoint	Interviews, observation	x	x	x	x	x

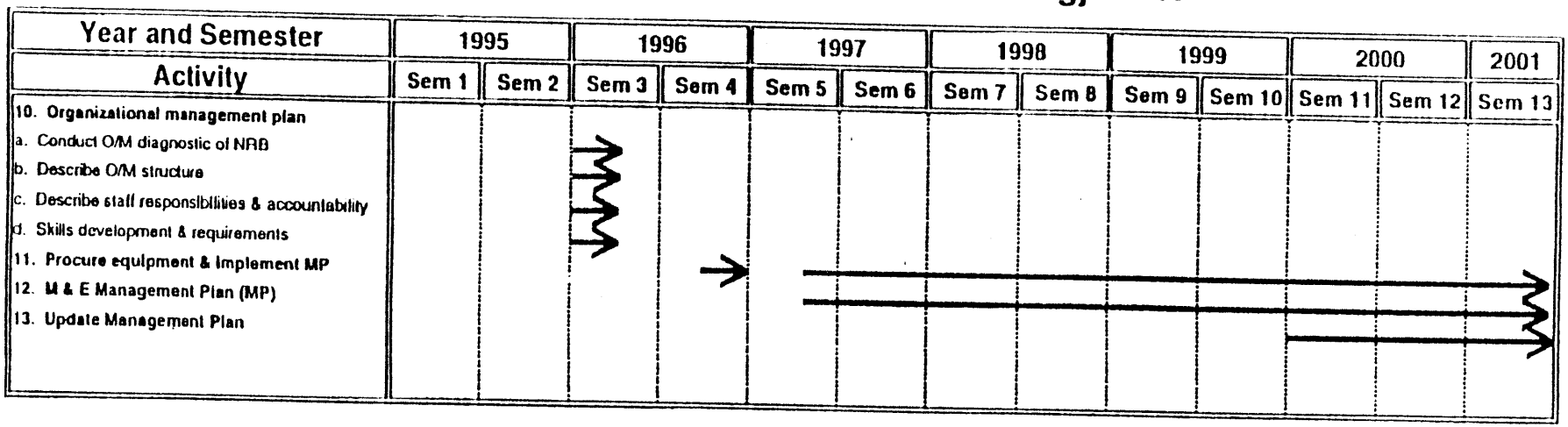
TABLE 1: MONITORING AND EVALUATION INDICATORS BIODIVERSITY

TARGET VARIABLE	TIME INTERVAL FOR SAMPLING	TOOLS	LOCATIONS				
			S	Q	X	W	P
ii) clear statement and understanding of conservation goals and requirements	Annual, endpoint	Interviews, observation	x	x	x	x	x
iii) degree to which mandate understood and operationalized	Annual, endpoint	Interviews, observation	x	x	x	x	x
b. Organizational Structure: Evidence of:							
i) personnel levels	Annual, endpoint	Interviews, observation	x	x	x	x	x
ii) job descriptions, responsibilities	Annual, endpoint	Interviews, observation	x	x	x	x	x
iii) supervisory structure	Annual, endpoint	Interviews, observation	x	x	x	x	x
c. Communication/Information Flow							
i) degree of information needed for conservation	Annual, endpoint	Interviews, observation	x	x	x	x	x
ii) type and amount of information collected	Annual, endpoint	Interviews, observation	x	x	x	x	x
iii) degree of information flow within organization	Annual, endpoint	Interviews, observation	x	x	x	x	x
iv) degree of inter-organization	Annual, endpoint	Interviews, observation	x	x	x	x	x
d. Organization Planning Systems							
i) management planning/strategic planning capability	Annual, endpoint	Interviews, observation	x	x	x	x	x
ii) operational planning capability	Annual, endpoint	Interviews, observation	x	x	x	x	x
iii) project management capability	Annual, endpoint	Interviews, observation	x	x	x	x	x

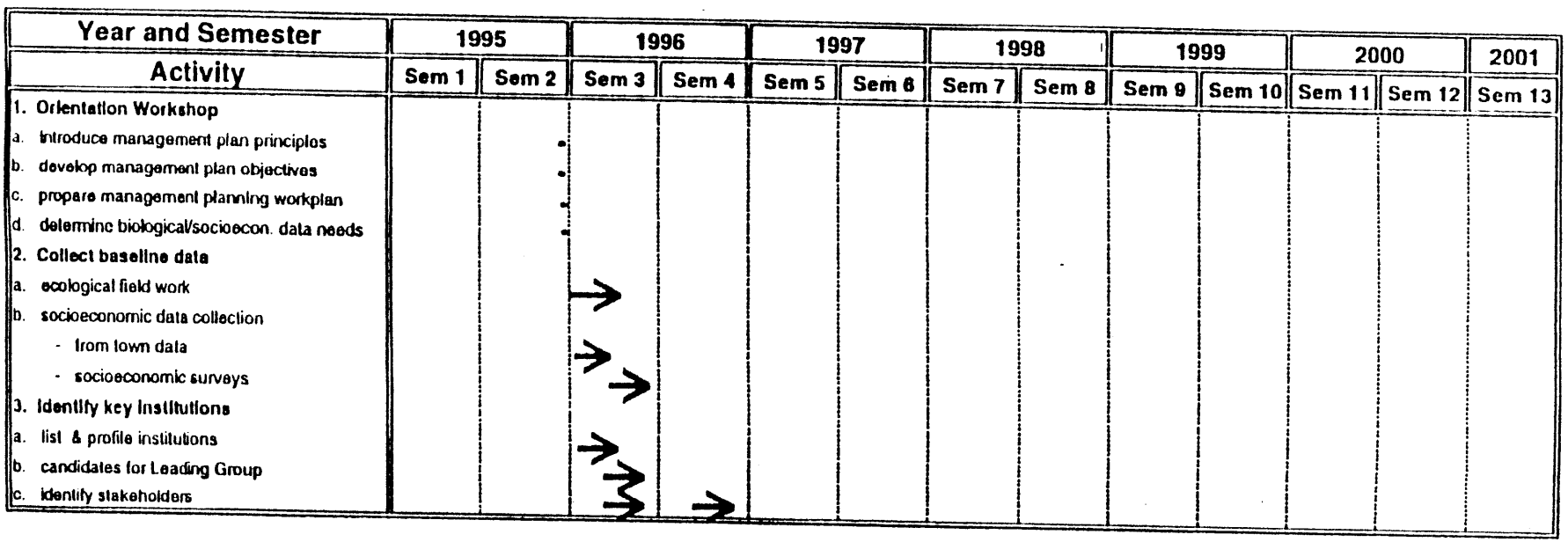
Implementation Schedule
Component One: Management Planning Process - Shennongjia NR



Implementation Schedule
Component One: Management Planning Process - Shennongjia NR

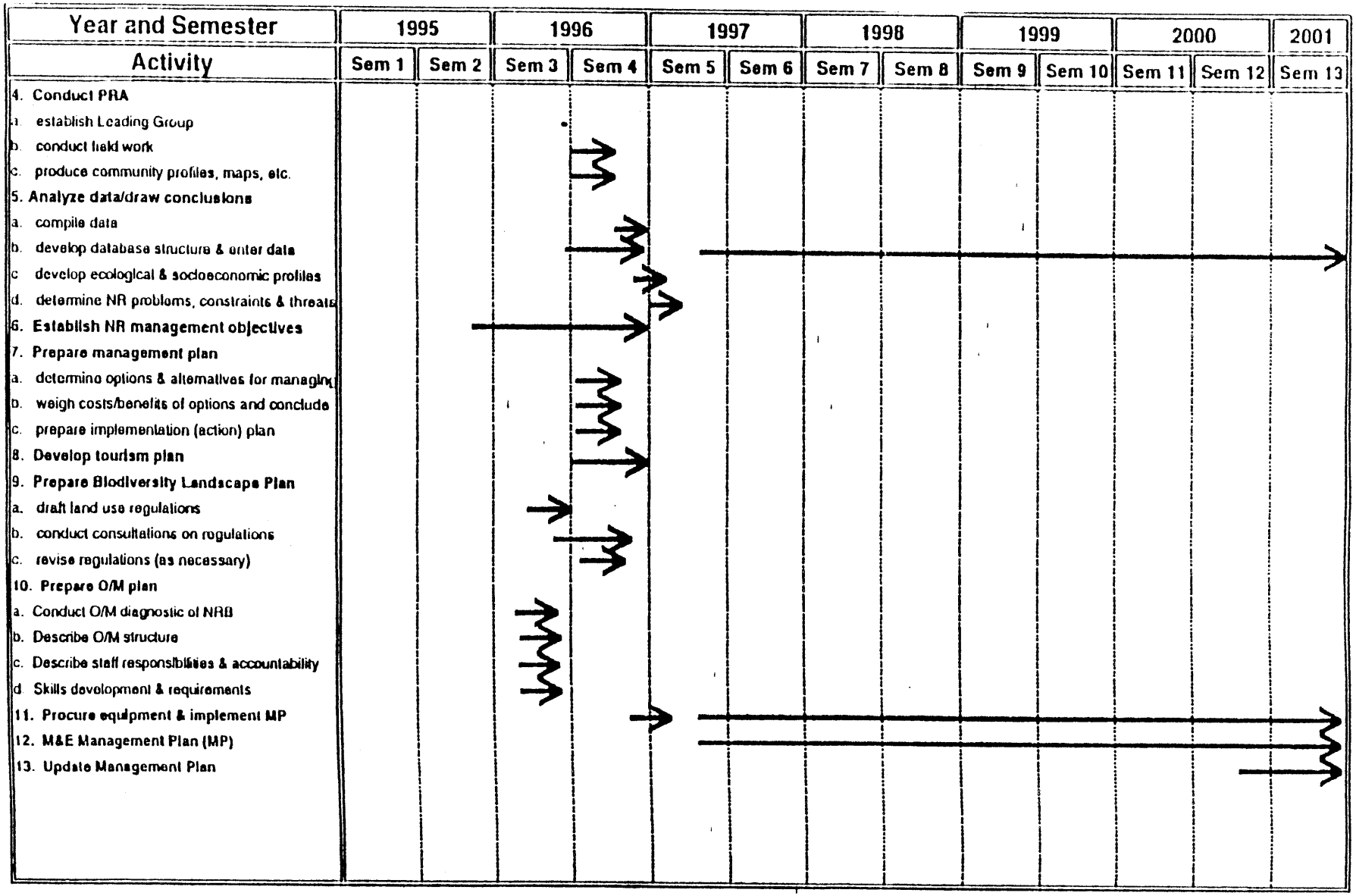


Implementation Schedule
Component One: Management Planning Process - Qinling NR

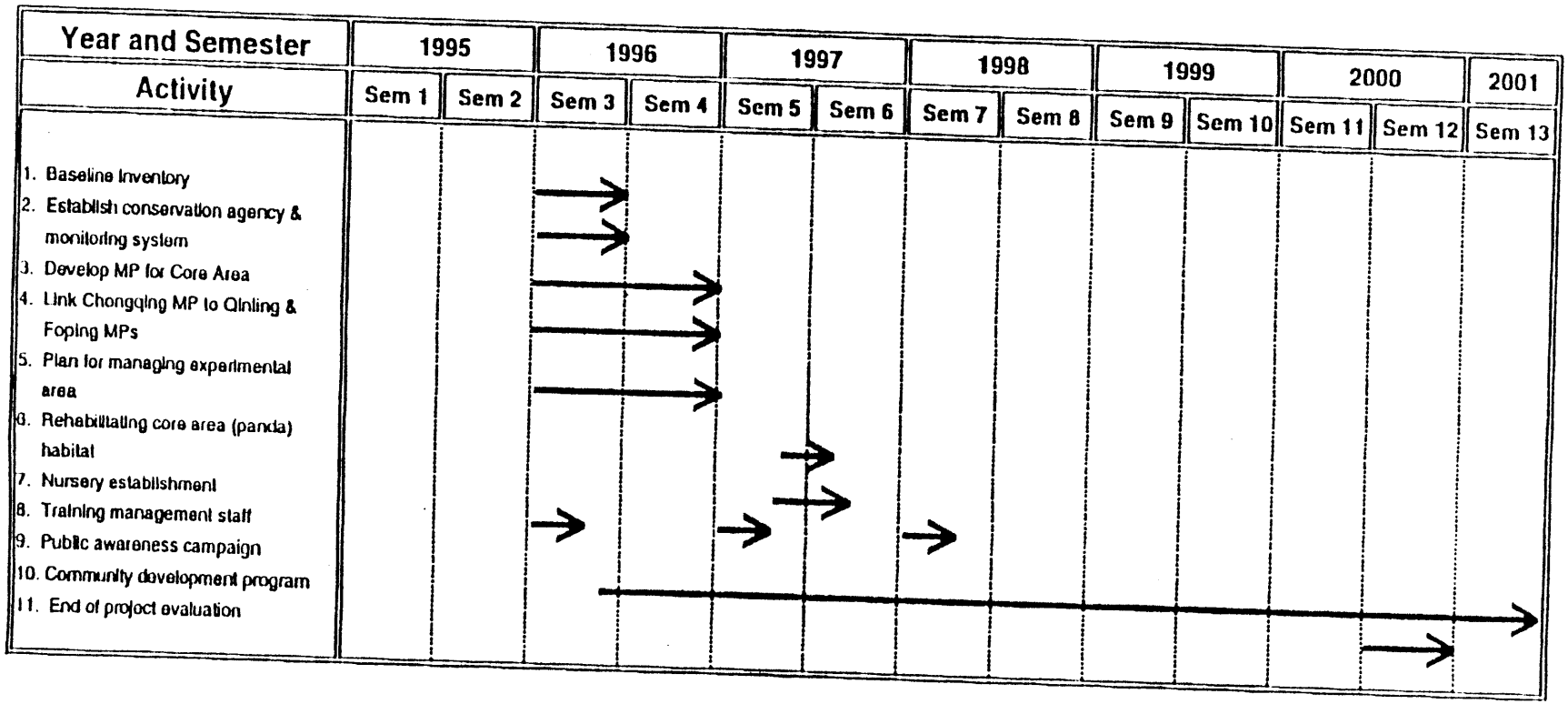


Implementation Schedule

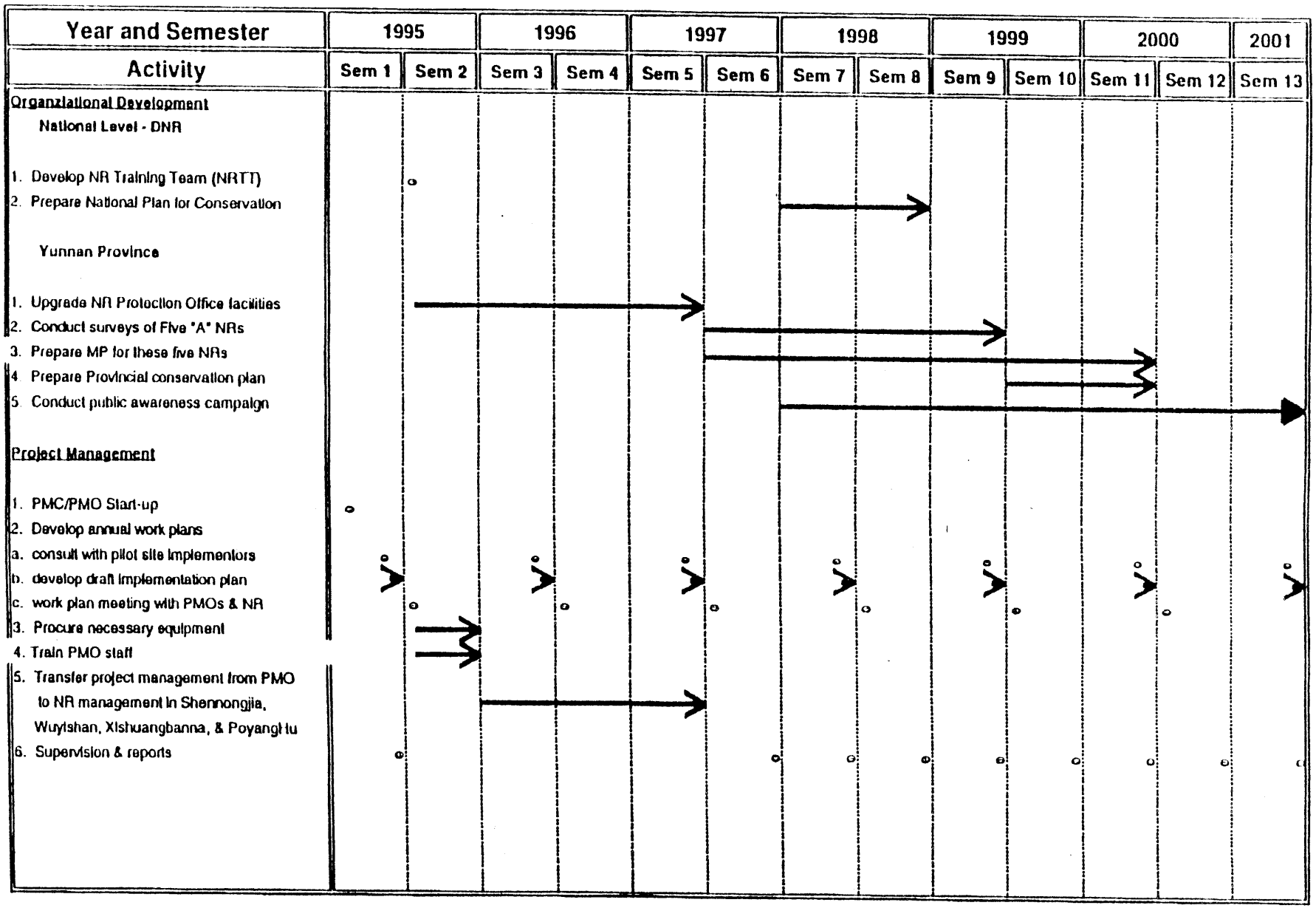
Component One: Management Planning Process - Qinling NR



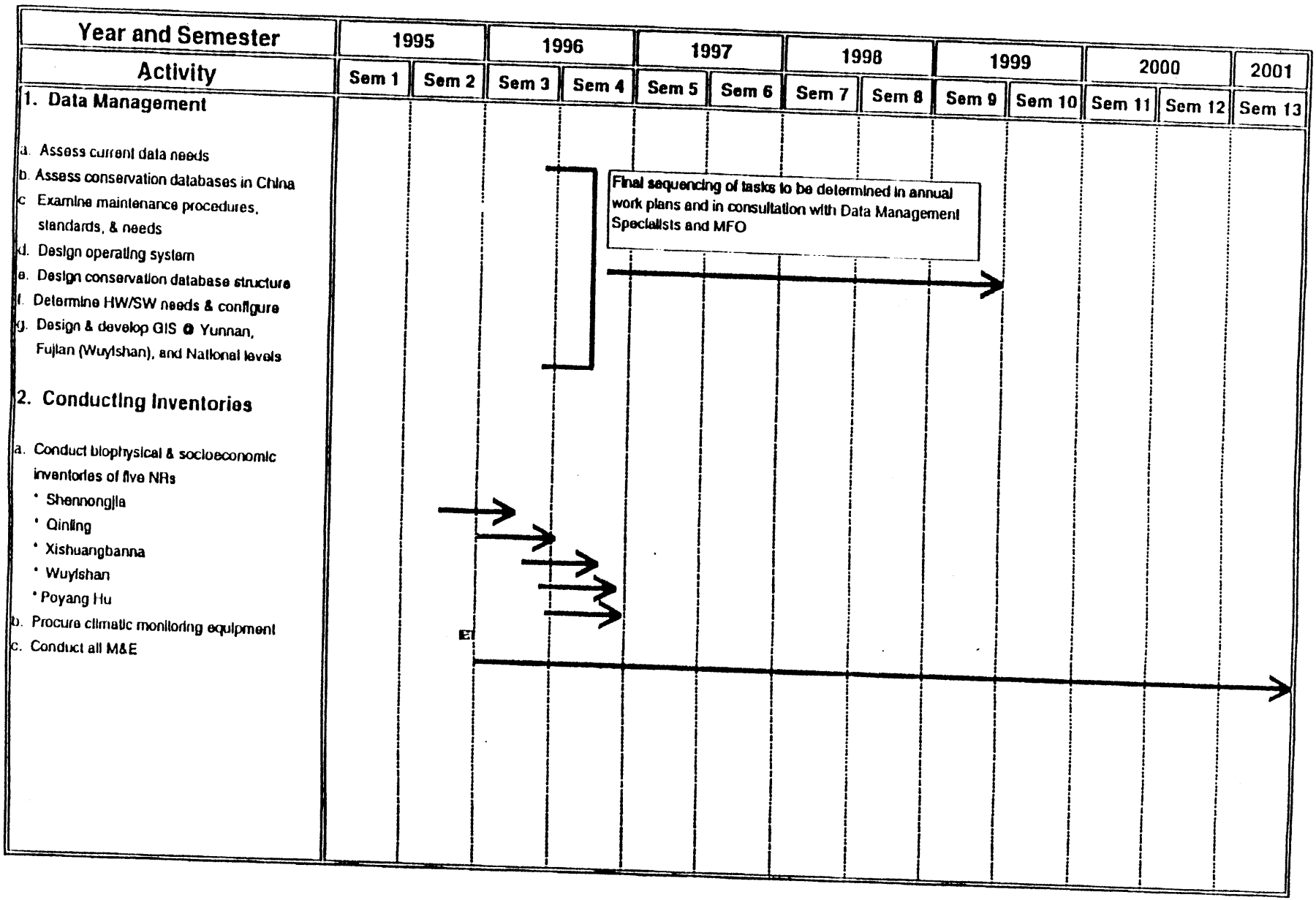
Implementation Schedule
Component Two: Reducing Land Pressure



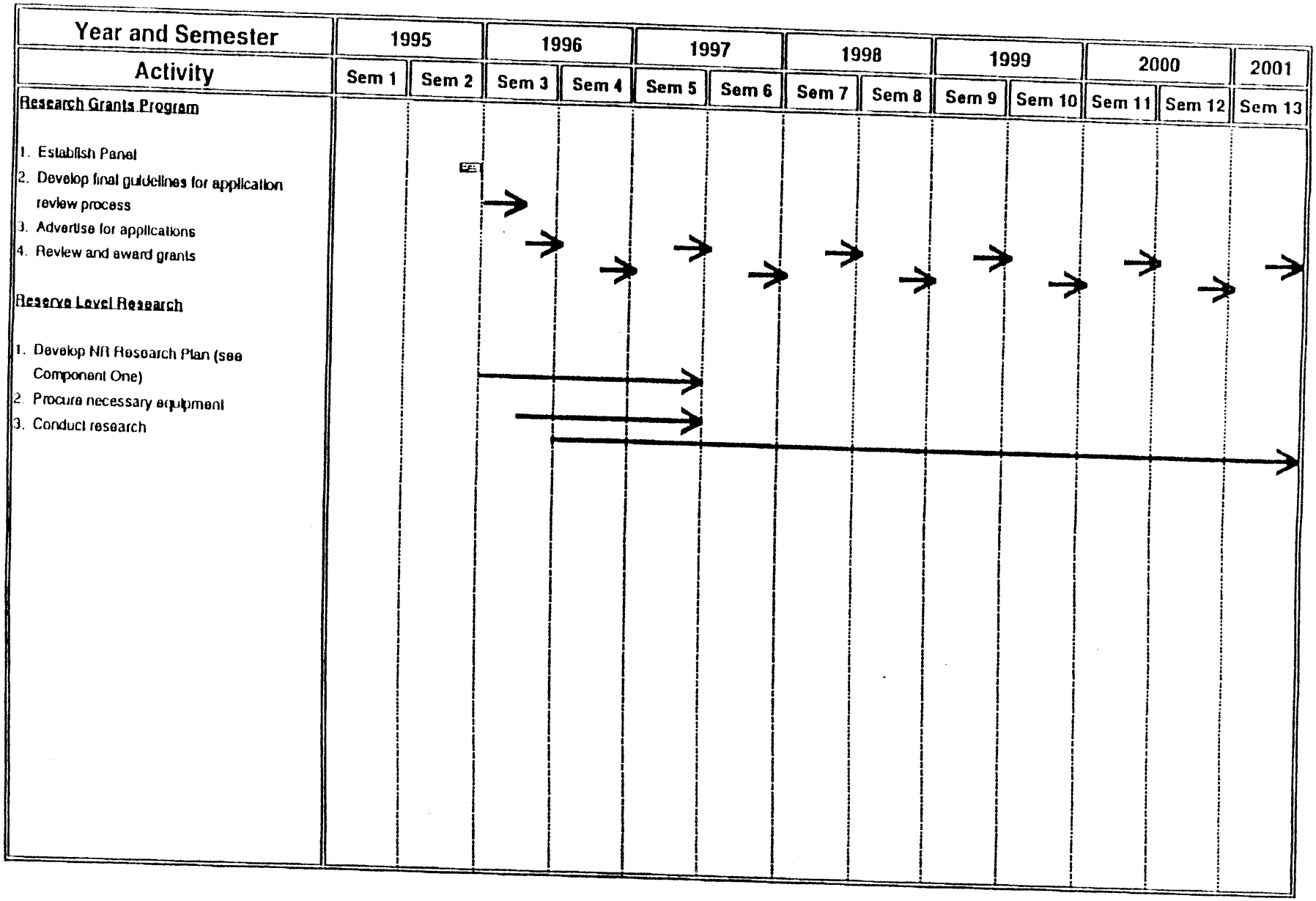
Implementation Schedule
Component Three: Developing Institutional Capacity



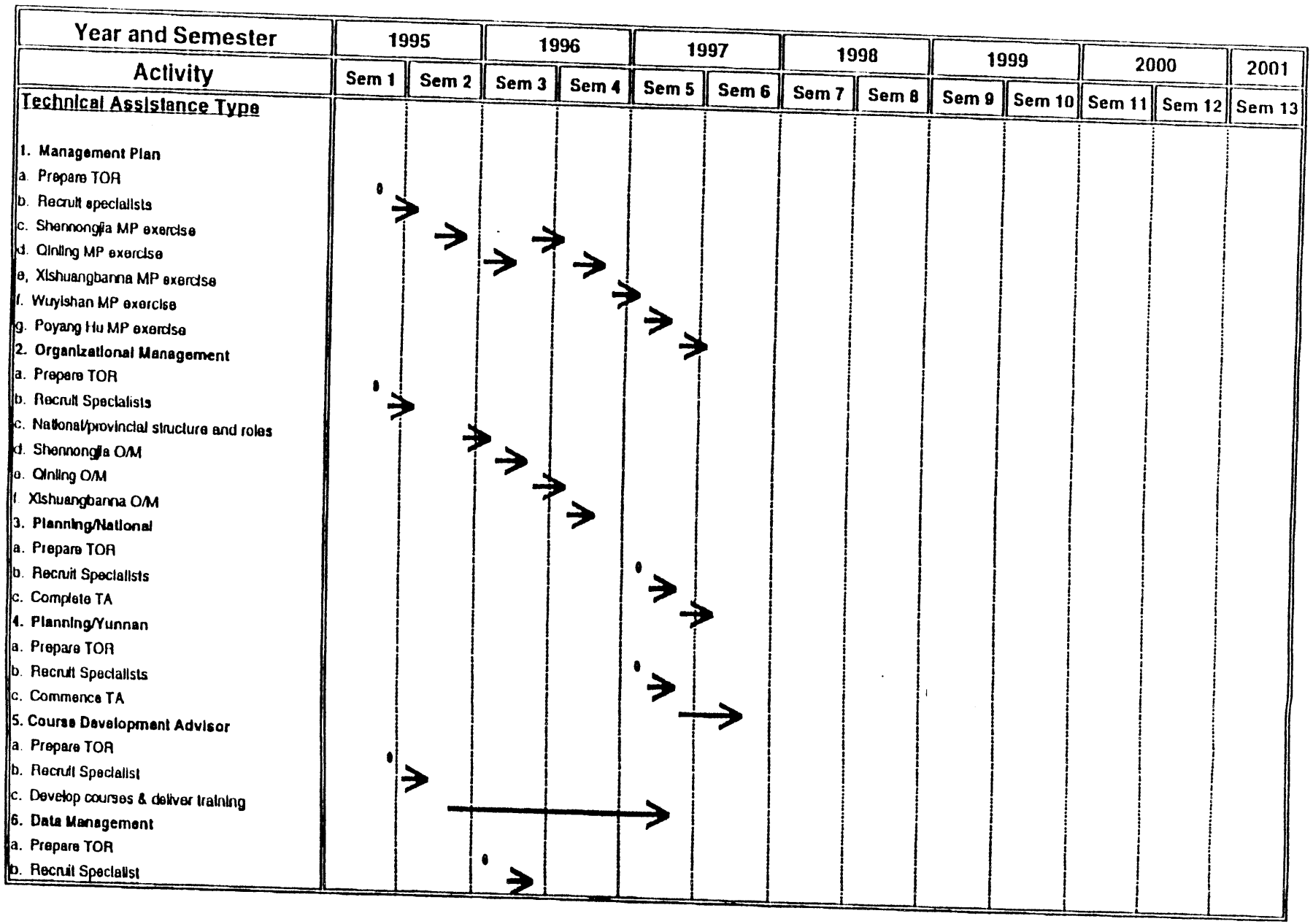
Implementation Schedule
Component Four: Developing a Nature Reserve Management Information System (NRMIS)



Implementation Schedule
Component Five: Supporting Nature Reserve Research

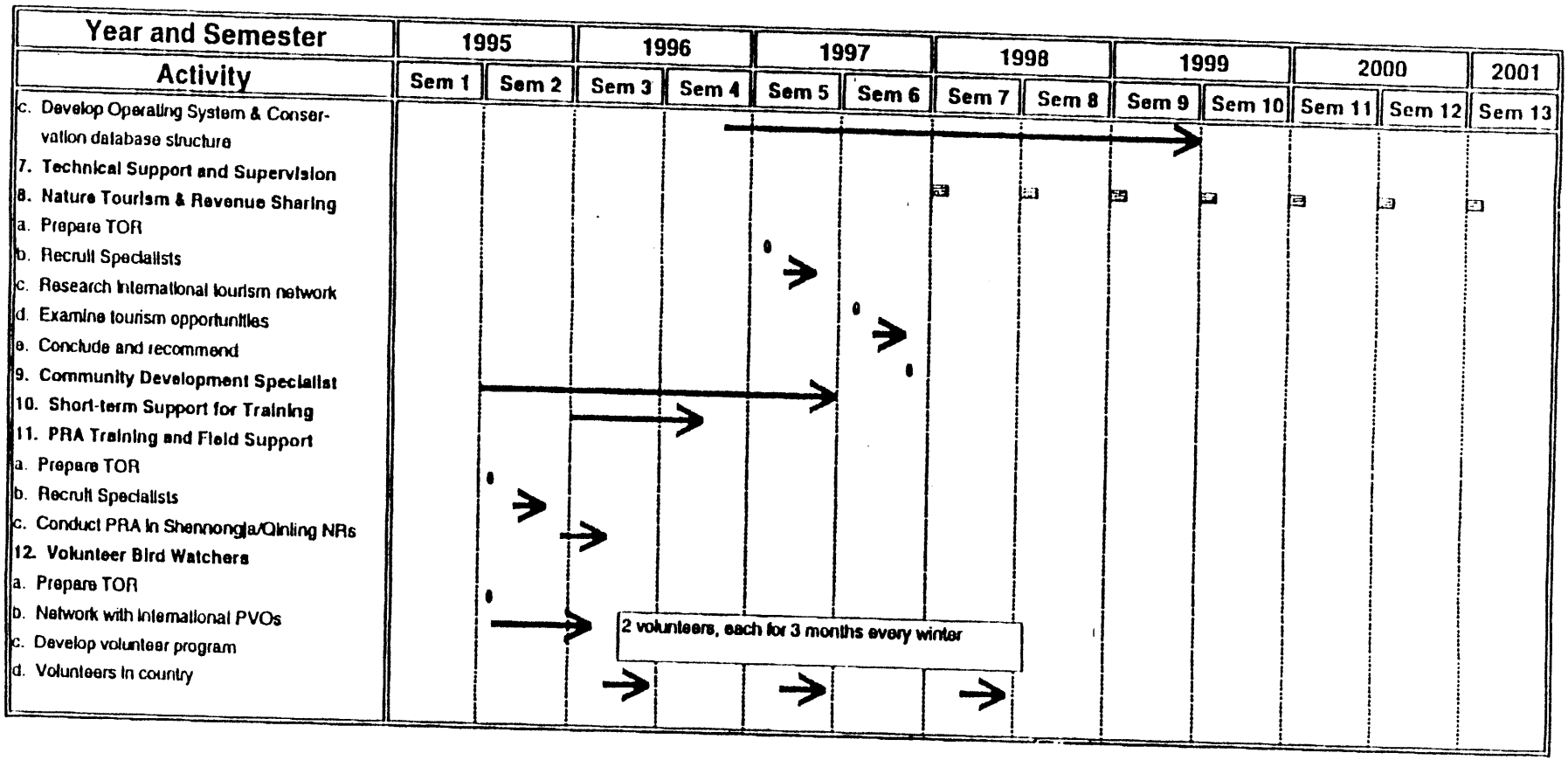


Implementation Schedule
Technical Assistance Timing



Implementation Schedule
Technical Assistance Timing

Notes: All technical assistance comprises international and domestic consultants



IMPLEMENTATION SCHEDULE FOR TRAINING OF TRAINERS

Mobilization Schedule for Training Unit Members	Year 1				Year 2				Year 3				Year 4				Year 5				Year 6			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
TRAINING UNIT MEMBERS																								
A. DNRM TRAINING STAFF																								
1. Protected Area Management Trainer	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞		⁞⁞	⁞⁞	⁞⁞
2. O/M Trainer	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞		⁞⁞	⁞⁞	⁞⁞
3. Computer/Data Management Trainer	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞		⁞⁞	⁞⁞	⁞⁞
4. Ecology Trainer	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞		⁞⁞	⁞⁞	⁞⁞
5. Research Methods Trainer	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞		⁞⁞	⁞⁞	⁞⁞
6. Community Participation and Public Awareness/Extension Trainer	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞		⁞⁞	⁞⁞	⁞⁞
7. DNR Trainer of Trainers	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	■	■	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	
B. LONG-TERM TECHNICAL ASSISTANCE																								
1. Course Development Advisor		⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞⁞	⁞															

⁞⁞ In-Country Conducting Training Courses ■ On Overseas Training Course

SUMMARY TERMS OF REFERENCE FOR KEY TECHNICAL ASSISTANCE

Technical assistance under this project will provide both international and domestic specialists for the following activities:

- development of nature reserve management plans;
- development of conservation plans (national and provincial-Yunnan levels);
- development of sustainable forest management plan in Changqing;
- organizational/institutional management assessment and planning;
- in-service course development;
- participatory planning (including Rapid Rural Appraisal [PRA]) and socio-economic baseline inventories; and
- monitoring and evaluation.

The following Terms of Reference (TOR) are intended as guidelines for developing more specific TORs during project start-up.

Nature Reserve Management Planner(s)

Proposed Activities. Annex 1 includes an outline for the development of a nature reserve management plan. This is provided as a guide for the development of management plans for Shennongjia, Qinling, Wuyishan, and the five Yunnan nature reserves. It should also be used to guide the revisions of the management plans for Poyang Lake and Xishuangbanna nature reserves. Technical assistance will be provided for the development of the Shennongjia and Qinling management plans. Nature reserve staff from Xishuangbanna, Wuyishan, Poyang Lake, and the five Yunnan nature reserves will either develop or revise their own management plans based on the experience learned from the other two reserves.

The foreign and local nature reserve management planners provided as technical assistance will be responsible for assisting Shennongjia and Qinling nature reserves to develop management plans while training staff from all five of the reserves management planning. These staff will participate in the management planning process for a period of up to six months during the first year of project implementation. The technical assistance level of effort for these planners totals 36 person-months of short-term international and local experts. The activities to be completed by these technical assistance specialists include assisting nature reserve staff in completing the following:

- conducting introductory workshops on developing a nature reserve management plan, including developing a workplan for developing the management plans for Shennongjia and Qinling nature reserves;
- determining data required to describe the baseline conditions of the reserves;

- the collection of biophysical and socio-economic inventory data;
- coding, analysis and storage of these data;
- by consulting with relevant parties, clarify objectives and develop options for conservation management of the reserves;
- link options and objectives with other plans—such as the tourism development plans and existing land-use plans for the reserves and the region;
- develop action plans for meeting these objectives;
- present options and action plans to relevant stake holders and revise as necessary; and
- develop appropriate budget and prioritization for implementing the management plans.

Skills and Qualifications. The specialist(s) to conduct the management planning exercises in Shennongjia and Qinling should possess the following:

- graduate-level training in ecology, protected areas management, land use planning, natural resources management, forestry, or other relevant disciplines;
- extensive experience with protected areas management planning and/or the management of protected areas;
- training experience;
- ability to work cooperatively with nature reserve staff and different stakeholders; and
- preferably, proficiency in Chinese and experience in China or elsewhere in Asia.

Conservation Planner

Proposed Activities. The project supports the development of nature reserve conservation plans for both Yunnan Province and for the entire nature reserve system under the supervision of MFO. In Yunnan, staff of the Office of Nature Reserves (ONR) will develop a provincial nature reserve plan and also develop management plans for five category "A" nature reserves in the province. Technical assistance is provided in the project to assist staff in these activities. The five management plans for Yunnan Province can be accomplished using the TOR for nature reserve management planning outlined above. Six person-months of international and local TA will be provided for the national conservation plan and the Yunnan provincial conservation plan. For the conservation planning (both the national and provincial Yunnan levels), the following will be completed by a conservation planner in cooperations with planning staff for DNR and provincial ONR:

- collect, analyze, and present data that describe the biological richness of the country and the province, in tabular and map formats;
- determine overall use of natural resources and threats to biodiversity—in general and

specifically by habitat and species (especially those of concern);

- identify gaps in conservation protection in the province and nationally, and the institutional, infrastructural, or policy reasons for these gaps;

- define conservation objectives and propose revisions in the system of biodiversity protection in order to overcome these constraints and close the gaps; and

- determine priorities for action and develop strategies for national and provincial action, including institutional linkages and responsibilities.

Skills and Qualifications. The specialists to assist the Yunnan Province ONR and the MFO DNR should possess the following:

- graduate-level training in ecology, protected areas management, land use planning, natural resources management, forestry, or other relevant disciplines;

- extensive experience with protected areas management planning and/or the management of protected areas;

- policy review and development experience in natural resources or protected areas management; and

- preferably, proficiency in Chinese and experience in China or elsewhere in Asia.

Habitat Inventory Planner

Proposed Tasks. The Changqing Forestry Bureau has been in operation since 1968 and presently is operating a non-sustainable forestry enterprise contiguous to the western boundary of the Foping Nature Reserve in Shaanxi Province. At least 25 species in the Foping/Changqing area have been listed as endangered, including the giant panda. A resident panda population exists in both Changqing and Foping, but faces severe threats from the continued logging occurring in Changqing.

Under the GEF project, the Changqing Forestry Bureau will be used to demonstrate alternative methods of operation that combine protection and sustainable harvesting. A core area of 11,000 hectares will be established contiguous to the western boundary of the Foping Nature Reserve to protect habitat for panda and other species. In addition, an experimental area of approximately 19,000 hectares will be demarcated in which logging will be allowed according to stricter guidelines and monitoring mechanisms to ensure sustainable harvesting. A management plan for both the core and experimental areas will be developed during the second year of the project.

The Habitat Inventory Planner is expected to assist in developing a plan for sustainable forestry operations in the experimental area so that it is compatible with the management plan objectives of the core area. Specifically, the Habitat Inventory Planner will complete the following:

- review national forestry legislation, regulations, and current practices related to determining allowable and sustainable cuts;

- consult with key research staff from relevant institutions (for example, Beijing University)

in order to identify key constraints to sustainable management of the experimental areas;

- assist the Changqing Forestry Bureau in developing the annual (and 5-year) forestry operations plan. S/he should review assumptions and calculations for sustainable annual allowable cut (and species mix) and plans for reforestation and make recommendations, if necessary, to ensure that the plan is sustainable and compatible with the objectives of the core area management plan and habitat restoration; and

- develop a monitoring plan for assessing the condition and status of the experimental area, especially with respect to determining degree of impact on the core area.

Skills and Qualifications. The Habitat Specialist should possess the following skills and qualifications:

- a graduate degree and at least 10 years experience in terrestrial ecology, forest ecology, biology, or another relevant discipline;

- substantial knowledge of and experience with vegetative and terrestrial ecology of China;

- demonstrated experience with habitat restoration, especially in Asia, and the development of forest management plans; and

- ability to work collaboratively with nature reserve management staff and other stakeholders.

- Proficiency in Chinese would be preferred but is not required to complete these tasks.

Organizational Management Specialist

Proposed Activities. Critical activities are being supported by the project to improve nature reserve management in field-level protection. In order to improve the effectiveness of nature reserve organizations to better protect biodiversity, organizations management specialists are being provided to assess and propose revisions to the operations of the Shennongjia, Qinling, and Xishuangbanna nature reserves. Sixteen person-months of short-term international and local TA will be provided. Working closely with counterpart staff from these nature reserves, these specialist(s) will complete the following tasks in Shennongjia, Qinling, and Xishuangbanna nature reserves:

- assess the objectives and strategies for implementing their functions, including a review of organizations structures, staffing, budgets, and resource needs;

- assess existing procedures and policies for asset management, personnel management, and the design of incentives along with job descriptions and accountability systems, the development of financial planning systems and the associated reporting systems, communications channels, and financial reporting and monitoring systems;

- using the results of these assessments and in consultation with relevant staff and government representatives, recommend methods and procedures for management planning, management by objectives, asset management, strategic management, financial management, effective communication, conflict management, job definition, and personnel management;

- recommend means for the development of information systems that support the functions

of each level of organization;

- development workshops and seminars for outlining these approaches to organizational management; and
- recommend training programs options for nature reserve staff in consultation with the NRTT.

Skills and Qualifications. These specialists should possess the following:

- graduate training in organization management, preferably with a specialization of public sector organizations in developing countries;
- extensive experience assessing organizations and in designing more effective management systems in developing countries;
- experience with natural resources management or conservation issues;
- training experience;
- ability to work cooperatively with nature reserve staff and different stakeholders; and
- preferably, proficiency in Chinese and experience in China or elsewhere in Asia.

Training Course Development Advisor (CDA)

Proposed Activities. An international specialist will be resident in China for 20 months in order to further assess and refine training needs for nature reserve staff, develop appropriate in-service courses, deliver and evaluate courses, and train trainers for continued in-service training. Using the results of the needs survey conducted during project preparation, this specialist will:

- further refine and define training needs of nature reserve staff in China;
- develop a detailed training workplan for the six years of the project;
- using the results of the needs assessment and sector specialists available as short-term technical assistance, develop with other members of the NRTT courses for training of the target populations identified in Component Three;
- with the NRTT, deliver courses according to the outlines of Component Three and the training workplan;
- evaluate and revise courses as necessary; and
- review and revise the training workplan during a return trip to China as a short-term consultant in PY4.

Skills and Qualifications. The CDA should possess:

- graduate level training in training, adult education, conservation education or relevant specialization;
- extensive experience in the assessment, development, and delivery of training programs in nature conservation or natural resource management;
- experience in adult education and in-service training;
- ability to fully utilize sector technical specialists in ecology, database management, organizational management, and other sectors as necessary; and
- preferably, proficiency in Chinese and experience in China or elsewhere in Asia.

Socio-economic Baseline Inventories and/or PRA

Proposed Activities. During the preparation of the management plans, baseline socio-economic data will be collected. These data will also be used as the basis for the monitoring and evaluation efforts of the project. The project provides support for these inventories by Chinese research institutes. However, it is not yet known to what extent these organizations will require technical assistance in the design and conducting of baseline socio-economic inventories. As well, the project supports the use of PRA consultants, either internationally or locally, for the training of nature reserve staff in PRA methods.

During the preparation, it was assumed that the skills and experience to conduct socio-economic baseline inventories existed within China. However, the project also provides additional technical assistance for PRA training and socio-economic inventory development. Detailed TORs for these activities should be determined after that monitoring and evaluation plan is developed in the first quarter of PY1. At that time, the approach to collecting these data and conducting the RRA training activities will be more clear and detailed TORs can be more fully developed.

Community Development Specialist

Proposed Tasks. During the project a process will be developed for nature reserve staff and other appropriate extension staff to plan with communities the use of natural resources within the experimental areas of nature reserves. This process will be tested in a number of communities and to train nature reserve staff in needs assessment, participatory rural appraisal (PRA), and conflict resolution. This consultative and collaborative process will result in community resource management plans that form the basis for co-management contracts between the communities and respective nature reserves. The DNR of the Ministry of Forestry will refine and develop a generic process that can be used and adapted by the extension staff of all nature reserves and respective local government for the sharing of natural resources management between communities and government agencies.

The Community Development Specialist (CDS) will be an international specialist resident in China for the first two years of project implementation to assist the DNR in the conceptualization, development, and institutionalization of a nature reserve co-management process for integrating biodiversity conservation with appropriate economic development. S/he will assist in the coordination of other key aspects of the project, especially those requiring social science input, such as the organizational management review, design of the Nature Reserve Management Information System (NRMIS), preparation of training modules and material, development strategic and operational plans, and designing

and conducting socio-economic baseline surveys. In addition, the CDS will assist the PMC by developing suitable workshop methods for the preparation of annual work plans that allow for the participation of nature reserve staff and community members and provide input into the development of a project monitoring and evaluation (M&E) plan.

The CDS will be based at the Ministry of Forestry (MFO) and will work directly with the DNR. The CDS is expected to approach the tasks by:

- facilitating discussion and dialogue on critical biodiversity issues in China;
- identifying and introducing technical and management approaches that have been attempted elsewhere in the world;
- identifying and institutionalizing linkages with the project between Chinese researchers and nature reserve management and international specialists in biodiversity conservation;
- insuring the integration of the biophysical and socio-economic aspects of the project towards meetings its objectives; and
- providing on-the-job training so that key technical and management concepts developed under the project during the first two years are institutionalized.

Specifically, in consultation and collaboration with the DNR, the CDS is expected to:

- further define, develop, and revise a process and methodology for integrating communities, local governments, and nature reserve management in co-management of natural resources;
- coordinate co-management activities at pilot sites in the five project nature reserves. Co-management activities are specifically detailed in the feasibility report and include organizing and training leading and stakeholder groups, conducting and analyzing rapid socio-economic surveys, negotiating resource management plans and agreements, and establishing community investment grants;
- actively participating in the preparation and revision of annual work plans;
- assist in the development of the project monitoring and evaluation plan, and the accumulation and assessment of data collected in fulfilling the M&E plan;
- facilitate liaison between donors and other agencies, as well as establish a network of international biodiversity organizations;
- provide social science input to DNR during the development of a national strategy and plan for nature reserve management;
- assist others in the development of management plans for Shennongjia and Qinling nature reserves (and the other three as appropriate during the first 24 months of the project);
- assist in the identification and conducting of any policy studies;

- assist in the identification of required international technical assistance and the preparation of subsequent Terms of Reference; and

- recommend options for institutionalizing co-management into the nature reserve system in China.

Skills and Qualifications. The CDS should possess the following:

- a graduate degree and at least 15 years experience in the social sciences related to an interdisciplinary approach to natural resources management;

- substantial experience working with communities and government agencies on community-based natural resources management projects in developing countries, preferably in Asia;

- demonstrating project management and technical implementation experience with World Bank and/or other donor-assisted natural resources management projects;

- ability to work collaboratively with nature reserve management staff and other stakeholders;

- training experience;

- experience in China with biodiversity conservation issues and projects; and

- proficiency in Chinese or the desire and ability to develop competent language skills.

Project Monitoring and Evaluation (M&E) Specialist

Proposed Tasks. Monitoring of project implementation and evaluation of its biophysical, socio-economic, and organization impacts is outlined in Annex 11 of the Feasibility Study. Two broad categories of M&E will be accomplished during the project. Project implementation will be tracked to determine the degree to which component activities are being completed according to timelines proposed in annual work plans. In addition, project impacts will be assess to ascertain the impact of component activities on meeting project objectives. In general, it is expected that project implementation tracking will be the responsibility of the PMC and project impact assessment the responsibility of the DNR. However, it is expected that substantial coordination and collaboration will be required between these two units, as well as with the staff of the five nature reserves being supported under the project.

During the first two years of the project, the Community Development Specialist (CDS) will assist DNR and PMC in the development of the M&E plan and review and assess both project implementation tracking and impact assessment of project interventions, For the subsequent four years of project implementation, periodic monitoring and evaluation will be conducted by an international specialist every year. It is expected that the external monitoring will allow review of progress and impact so that DNR and PMC can adjust implementation if necessary and desirable, as well as analyzing the data so that it can be used by GEF for comparisons with other biodiversity conservation projects worldwide.

Specifically, the M&E specialist will assist DNR to complete the following, as necessary:

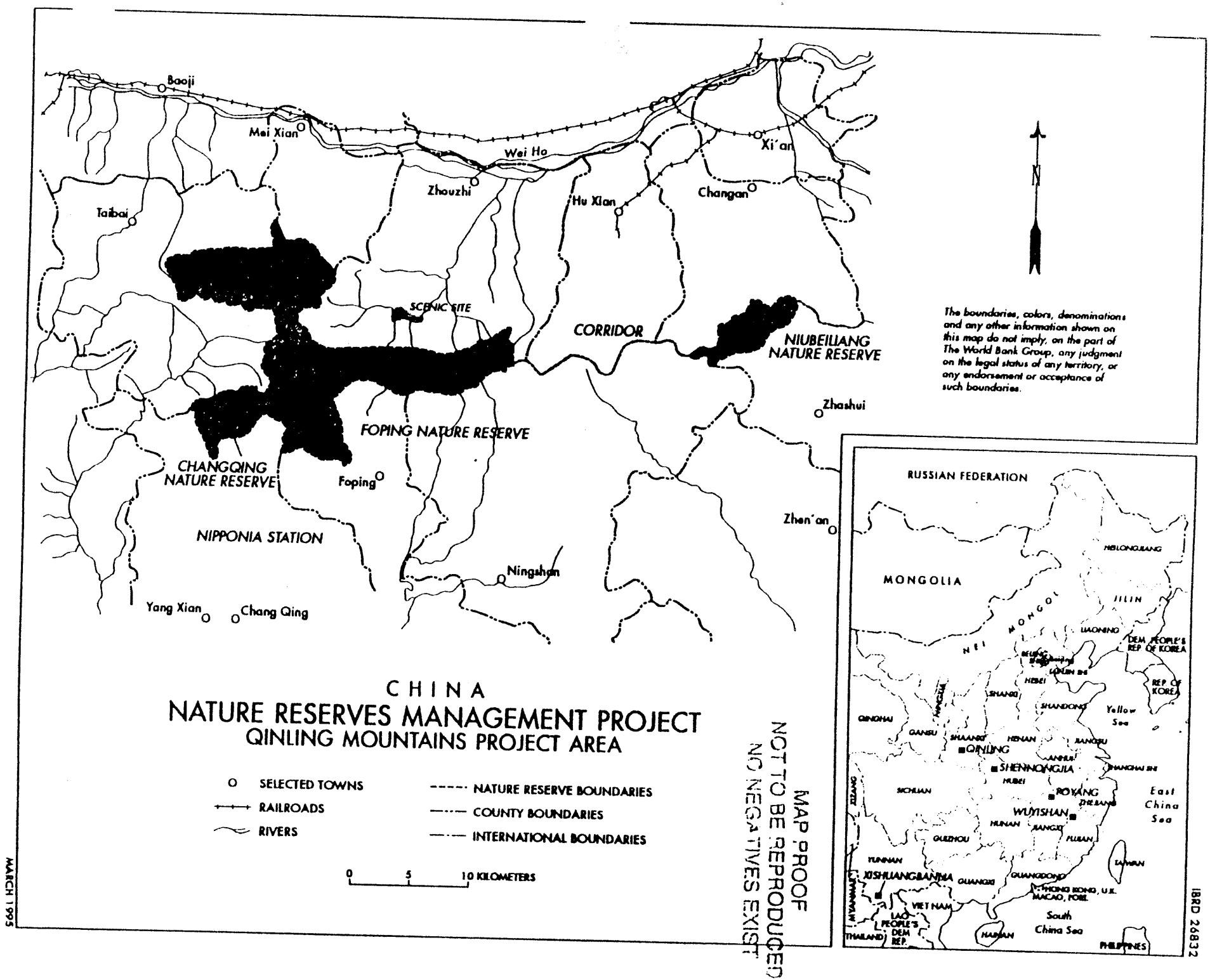
- assess quantitative and qualitative data collected in terms of its completeness, reliability, and

usefulness in tracking project implementation and impact;

- assess progress and effectiveness of the Nature Reserve Management Information System (NRMIS), specifically which data are being input and used, the degree to which databases are being maintained, skills and training required, and the relevance of data being input to determining the degree to which the project is meeting its objectives;
- analyze data and draw conclusions concerning the biophysical, socio-economic, and institutional impacts of project interventions;
- develop recommendations and revise monitoring indicators, area of coverage, or intervals for data collection, in order to refine the M&E program;
- determine methods for using monitoring data to redirect project and program activities;
- prepare reports that can be used to fulfill requirements for monitoring and evaluation required by GEF and the World Bank, or that can be disseminated to the global biodiversity community, for comparison of lessons learned and impact assessment.

The M&E specialist should possess the following:

- graduate-level training in ecology, protected areas management, socio-economics, community forestry, or another relevant discipline;
- extensive experience with protected areas management and/or natural resources management;
- comprehensive data acquisition, analysis, and presentation skills;
- knowledge of database development and maintenance procedures;
- experience designing and developing monitoring and evaluation plans and programs for natural resources management or biodiversity conservation projects;
- ability to work collaboratively with nature reserve management staff and other stakeholders;
- experience in China with biodiversity conservation issues and projects; and
- proficiency in Chinese or the desire and ability to develop competent language skills.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Mei Xian
Wei Ha
Xi'an
Zhouzhi
Hu Xian
Changan
Taibai
SCENIC SITE
CORRIDOR
NIUBEILIANG NATURE RESERVE
Zhashui
FOPING NATURE RESERVE
CHANGQING NATURE RESERVE
Foping
NIPPONIA STATION
Zhen'an
Ningshan
Yang Xian
Chang Qing
N
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RUSSIAN FEDERATION
MONGOLIA
HEILONGJIANG
JILIN
NEI MONGOL
LIAONING
DEM. PEOPLE'S REP OF KOREA
BEIJING
TIANJIN
HEBEI
REP OF KOREA
SHANXI
SHANDONG
Yellow Sea
QINGHAI
GANSU
SHAANXI
HENAN
JIANGSU
QINLING
ANHUI
SHENNONGJIA
SHANGHAI
SICHUAN
HUBEI
ROYANG
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WUYISHAN
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FUJIAN
GUIZHOU
YUNNAN
TAIWAN
XISHUANGBANNA
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HONG KONG, U.K.
MACAO, PORT.
VIET NAM
LAO PEOPLE'S DEM REP.
THAILAND
South China Sea
HAINAN
PHILIPPINES
CHINA
NATURE RESERVES MANAGEMENT PROJECT
QINLING MOUNTAINS PROJECT AREA
SELECTED TOWNS
RAILROADS
RIVERS
NATURE RESERVE BOUNDARIES
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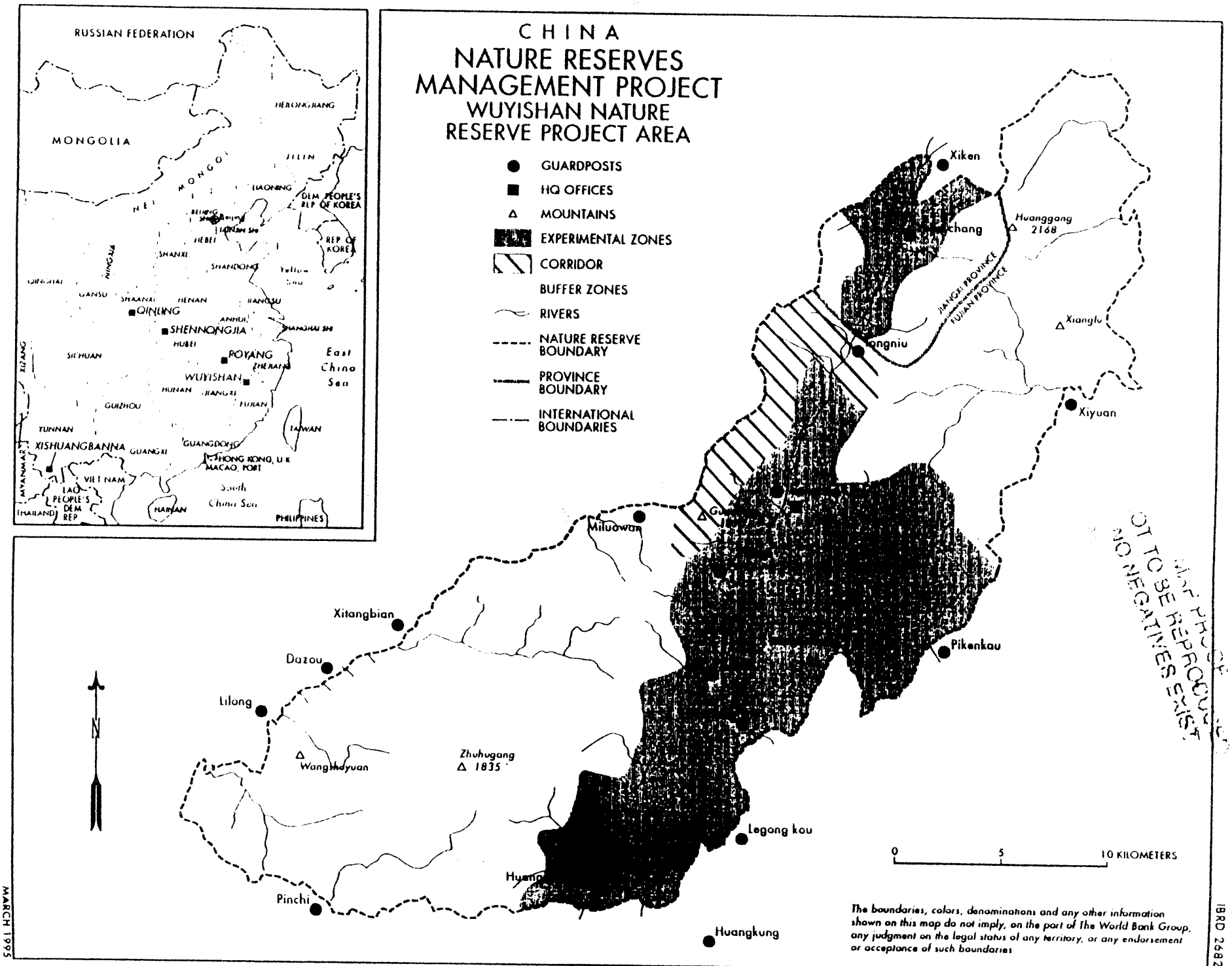
CHINA
NATURE RESERVES MANAGEMENT PROJECT
WUYISHAN NATURE RESERVE PROJECT AREA
GUARDPOSTS
HQ OFFICES
MOUNTAINS
EXPERIMENTAL ZONES
CORRIDOR
BUFFER ZONES
RIVERS
NATURE RESERVE BOUNDARY
PROVINCE BOUNDARY
INTERNATIONAL BOUNDARIES
RUSSIAN FEDERATION
MONGOLIA
HEILONGJIANG
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BEIJING
TIANJIN SHI
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SHANXI
NINGXIA
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Yellow Sea
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POYANG
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East China Sea
WUYISHAN
HUNAN
JIANGXI
FUJIAN
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GUANGDONG
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THAILAND
MYANMAR
South China Sea
HAINAN
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Xiangfu
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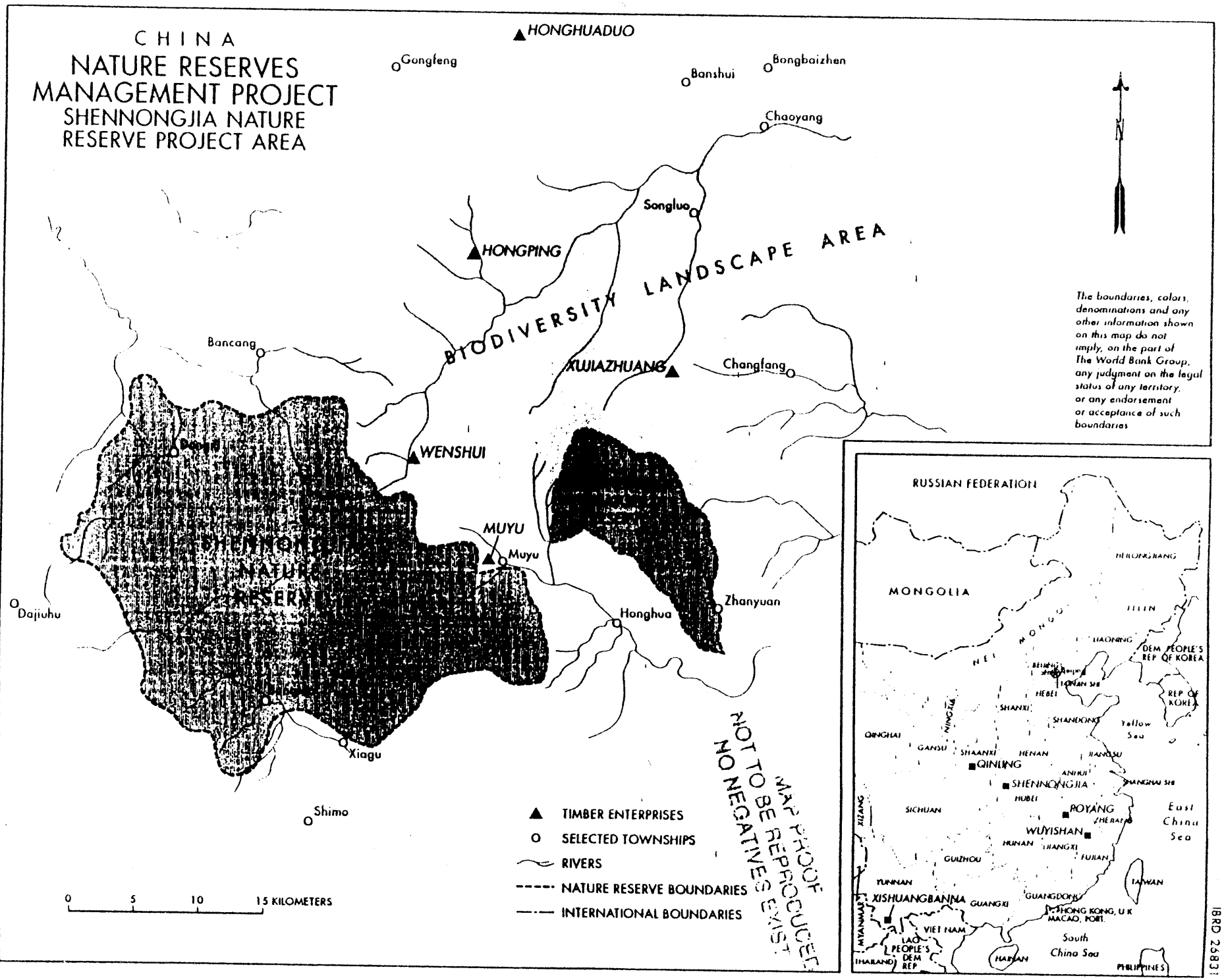
CHINA
NATURE RESERVES MANAGEMENT PROJECT
SHENNONGJIA NATURE RESERVE PROJECT AREA
HONGHUADUO
Gongfeng
Banshui
Bongbaizhen
Chaoyang
Songluo
HONGPING
BIODIVERSITY LANDSCAPE AREA
XUJIAZHUANG
Changfang
Bancang
WENSHUI
MUYU
Muyu
Dajiuhu
Honghua
Zhanyuan
Xiagu
Shimo
TIMBER ENTERPRISES
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RIVERS
NATURE RESERVE BOUNDARIES
INTERNATIONAL BOUNDARIES
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MARCH 1995
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GUANGDONG
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MACAO, PORT.
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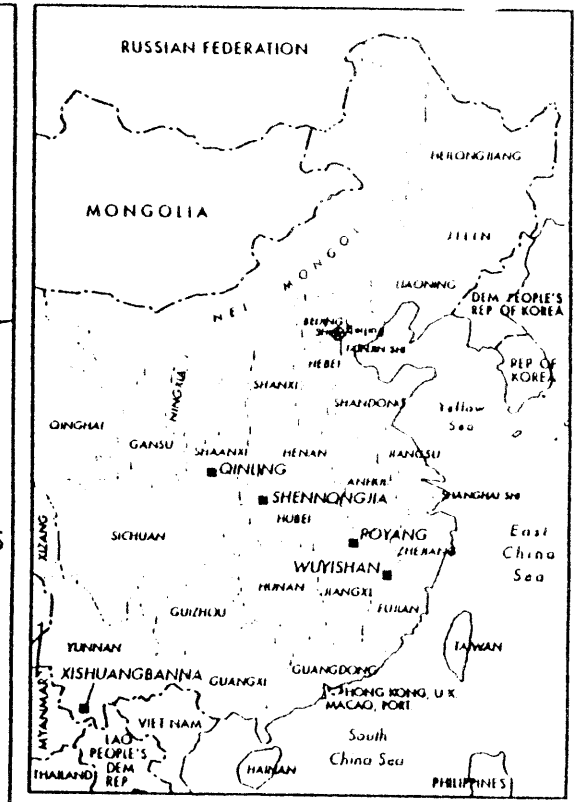
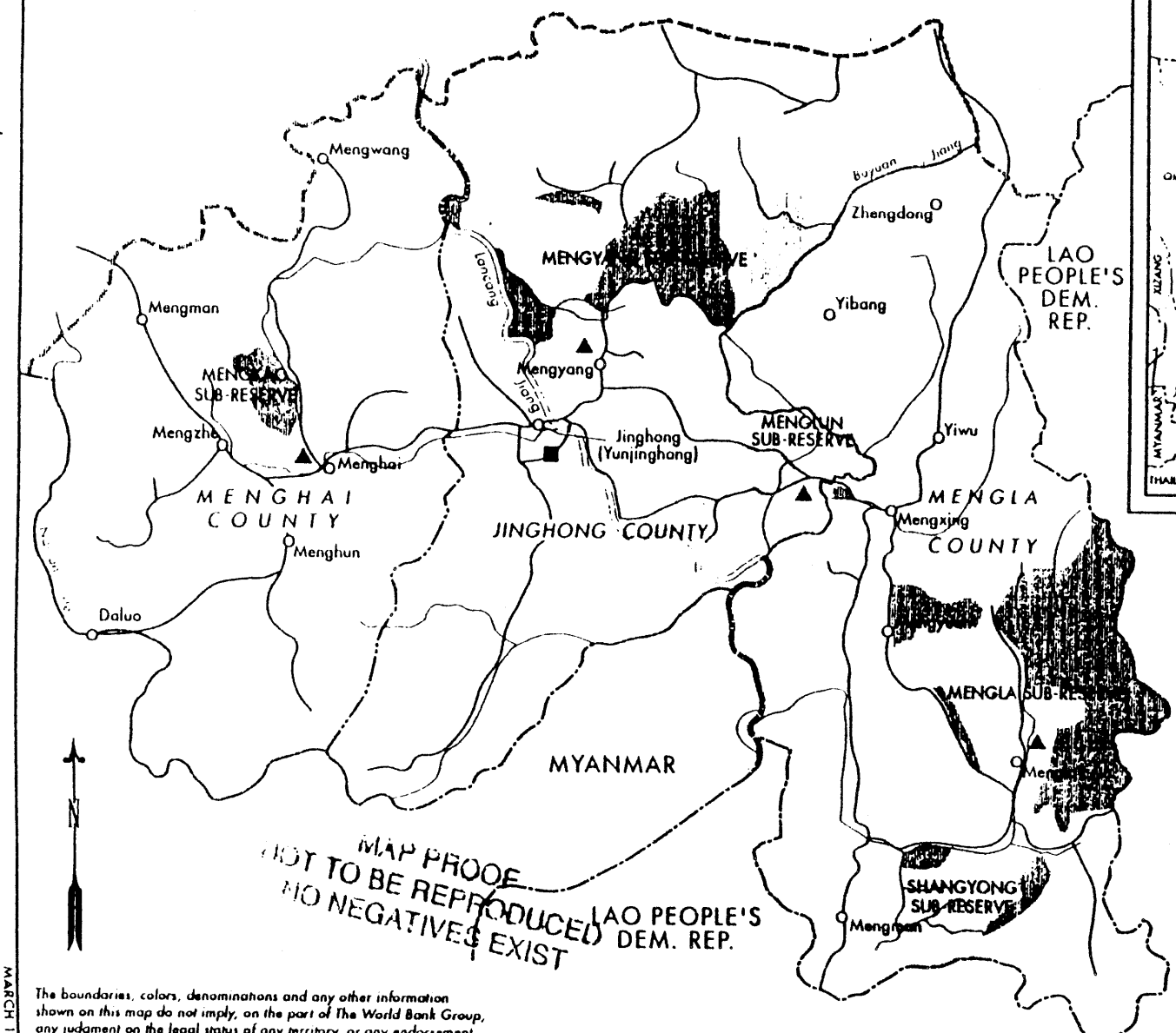
CHINA
NATURE RESERVES MANAGEMENT PROJECT
XISHUANGBANNA NATURE RESERVE PROJECT AREA





CORE ZONES
EXPERIMENTAL ZONES
SUB-RESERVE BUREAUS
RESERVE BUREAU
SELECTED TOWNS
ROADS
RIVERS
COUNTY BOUNDARIES
PREFECTURE BOUNDARY
INTERNATIONAL BOUNDARIES

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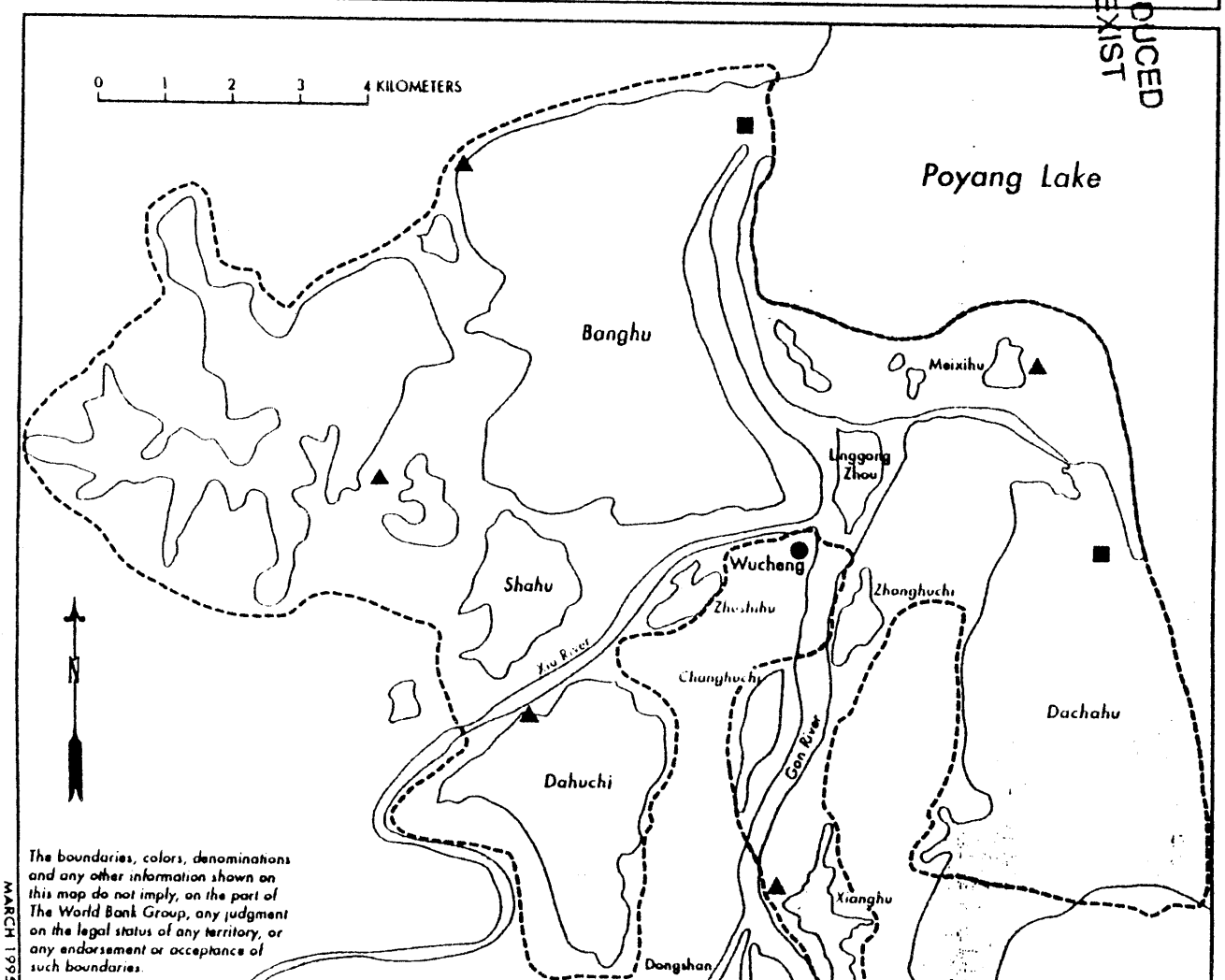
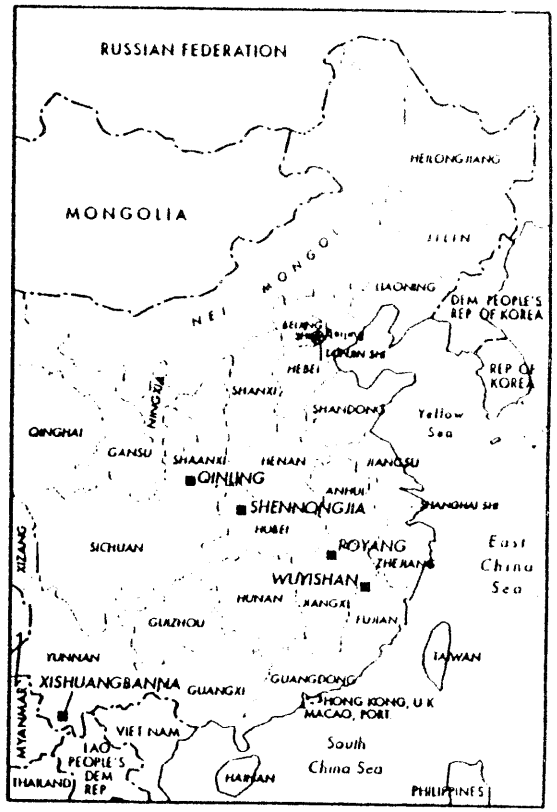
CHINA
NATURE RESERVES MANAGEMENT PROJECT
POYANG LAKE NATURE RESERVE PROJECT AREA

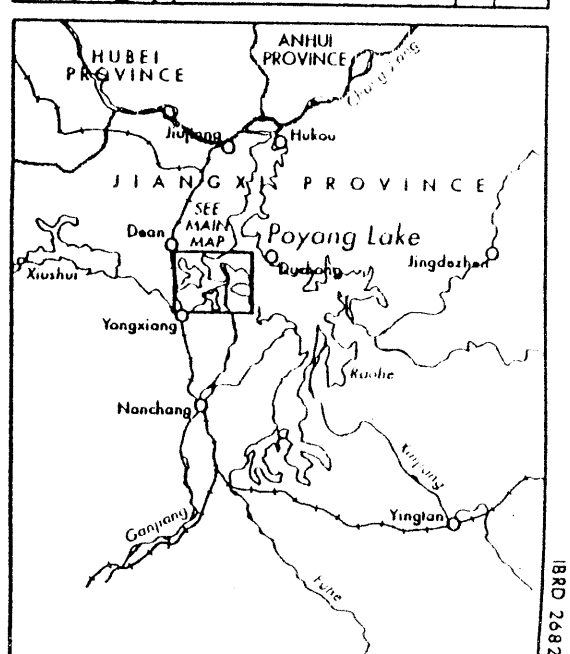
- POSTS
- HEADQUARTERS
- MOBILE HOUSEBOATS
- RAILROADS
- SELECTED CITES
- RIVERS
- NATURE RESERVE BOUNDARY
- PROVINCE BOUNDARIES
- INTERNATIONAL BOUNDARIES



The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.

MARCH 1995





IBRD 26829

GLOBAL ENVIRONMENT FACILITY

MOHAMED T. EL-ASHRY
CHIEF EXECUTIVE OFFICER AND CHAIRMAN

May 15, 1995

Mr. Ken Newcombe
Global Coordinator
World Bank
1818 H Street
S-2141
Washington, D.C.
FAX: (202) 522-3256

Dear Mr. Newcombe:

I have reviewed the proposed project document, *People's Republic of China: Nature Reserves Management Project*, and I am pleased to endorse it for final approval in accordance with World Bank procedures.

The proposed project is consistent with the proposal included in the work program approved by the Council at its February 1995 meeting and with GEF policies and procedures. I also find the proposed level of GEF financing appropriate in light of the project's objectives.

Sincerely,

Mohamed T. El-Ashry