COMPOSITION OF THE FINAL REPORT

The Final Report for "The Master Plan Study for Watershed Management in Upper Magat and Cagayan River Basin in the Republic of the Philippines" consists of the following:

Volume I	Main Text	
Volume II	Pilot Study	
Volume III	Appendix 1	Forest Management
	Appendix 2	Institutions, Legislations and Policies
	Appendix 3	Local Society and capability of POs, NGOs and Supporting Government
	Appendix 4	Agriculture, Agroforestry and Livestock
	Appendix 5	Soil and Water Conservation
	Appendix 6	Socio-Economy
	Appendix 7	Monitoring and Evaluation
	Appendix 8	Break down of Unit Costs for Cost Estimation

February 2004

THE MASTER PLAN STUDY FOR WATERSHED MANAGEMENT IN UPPER MAGAT AND CAGAYAN RIVER BASIN IN THE REPUBLIC OF THE PHILIPPINES

FINAL REPORT

Volume I: MAIN TEXT

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List of Abbreviation

Abbreviation	Term
A&D	Alienable and Disposable Land
AAC	Annual Allowable Cuts
ADB	Asian Development Bank
ADSDPP	National Ancestral Domain Sustainable Development and Protection Plans
ALMA	Agroforestry Land Management Agreement
ANR	Assisted Natural Regeneration
AO	Assisting Organization
AO	Administrative Order
ARED	Assistant Regional Executive Director
ASU	Administrative Supporting Unit
ATIK	Agroforestry Information Technology Kit
AWP	Annual Work Plan
BFD	Bureau of Forest Development（DENR）
BOD	Board of Director
BOT	Build, Operate and Transfer
BWMP	Barobbob Watershed Management Project
BWOA	Barobbob Watershed Occupants Association
CADC	Certificate of Ancestral Domain Claims
CADT	Certificate of Ancestral Domain Title
CALC	Certificate of Ancestral Land Claims
CALMA	Community-Based Agroforestry Land Management Agreement
CALT	Certificate of Ancestral Land Title
CAP	Community Action Planning
CAR	Cordillera Autonomous Region
CARP	Comprehensive Agrarian Reform Program
CASCADE	Caraballo and Southern Cordillera Agricultural Development Program
CBFM(A/P)	Community-Based Forest Management (Agreement/Program)
CCFS	Certificates of Community Forest Stewardship
CDA	Community Development Assistant
CDA	Cooperatives Development Authority
CDO	Community Development Officer
CECAP	Central Cordillera Agricultural Program
CENRO	Community Environment and Natural Resources Office/r (DENR)
CEP	Costal Environment Program
CFMA	Community Forest Management Agreement
CFP	Community Forestry Program
CFP-Q	Philippine-German Community Forestry Project-Quirino
CI	Conservation International
CLOA	Certificate of Land Ownership Award
CLUP	Comprehensive Land Use Plan

Abbreviation	Term
CMIPP	Casecnan Multipurpose Irrigation and Power Project
CNRMP	Comprehensive Natural Resources Management Program
CO	Community organization
COSU	Community Organization and Strengthening Unit
CPEU	Center for People's Empowerment in the Upland
CRMF	Community Resource Management Framework
CSC	Certificate of Stewardship Contract
CSM	Cost Sharing Mechanism
CTF	Communal Tree Farming
CU	Certificate of Usufruct
DA	Department of Agriculture
DANIDA	Danish International Development Assistance
DAO	Department Administrative Order
DAR	Department of Agrarian Reform
DBM	Department of Budget and Management
DENR	Department of Environment and Natural Resources
Df/R	Draft Final Report
DFNSIP	RP-German Debt-for-Nature-Swap Initiative Program
DILG	Department of Interior and Local Government
DOE	Department of Energy
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DPWH	Department of Public Works and Highways
DTI	Department of Trade and Industry
ECA	Environmentally Critical Area
ECC	Environmental Compliance Certificate
ECP	Environmentally Critical Project
EGF	Environmental Guarantee Fund
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMB	Environmental Management Bureau (DENR)
EMF	Environmental Monitoring Fund
ENRO	Environment and Natural Resources Office/r (LGU)
EO	Executive Order
EPA	Exploration Permit Application
ERDB/S	Ecosystems Research and Development Bureau/Services (DENR)
ERP	Earthquake Rehabilitation Programme
EU	European Union
ESU	Extention Services Unit
ExP	Exploration Permit
ExPA	Exploration Permit Application
F/R	Final Report

Abbreviation	Term
F/S	Feasibility Study
FAR	Family Approach to Reforestation
FASPO	Foreign Assisted and Special Projects Office （DENR)
Fd/R	Field Report
FINNIDA	Finnish International Development Agency
FL	Forestland
FLGLA	Forest Land Grazing Lease Agreement
FLGMA	Forest Land Grazing Management Agreement
FLMA	Forest Land Management Agreement
FMB	Forest Management Bureau (DENR)
FMS	Forest Management Section
FOMP	Forest Occupancy Management Program (DENR)
FPA	Forest Production Area
FPP	Forest Production Project
FRG	Federal Republic of Germany
F/S	Feasibility Study
FSI	Forest Stand Improvement
FSP	Forestry Sector Project
FTAA	Financial and Technical Assistance Agreement
GDP	Gross Domestic Product
GIS	Geographic Information system
GNP	Gross National Product
GOJ	the Government of Japan
GOP	the Government of the Republic of the Philippines
GPS	Global Positioning System
GRDP	Gross Regional Domestic Product
GVA	Gross Value Added
I/A	Implementing Arrangement
I/P	Implementation Program
Ic/R	Inception Report
ICC	Indigenous Cultural Community
IEE	Initial Environmental Examination
IFMA/P	Integrated Forest Management Agreement/Program
IPAS	Integrated Protected Area System
IPO	Indigenous People's Organization
IPRA	Indigenous Peoples' Rights Act
ISF(P)	Integrated Social Forestry (Program)
ITTO	International Timber Trading Organization
It/R	Interim Report
IUCN	International Union for Conservation of Nature and Natural Resources
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency

Abbreviation	Term
JOFCA	Japan Overseas Forestry Consulting Association
KfW	Kreditanstalt fuer Weiderautbau (German Financial Cooperation)
LGU	Local Government Unit (Provincial, Municipal, etc.)
LMA	Land Management Agreement
LMFMO	Lower Magat Forest Management Office
LMFMP	Lower Magat Watershed Management Project
LWD	Local Water District
M&E	Monitoring and Evaluation
M/P	Master Plan
MAO	Municipal Agricultural Office
MDP	Master Development Plan
MFPC	Multi-sectoral Forest Protection Committee
MGB	Mines and Geosciences Bureau (DENR)
MOA	Memorandum of Agreement
MOE	Maintenance Operating Expense
MPCI	Multipurpose Cooperative, Inc.
MPFD	Master Plan for Forestry Development
MPSA	Mineral Production Sharing Agreement
MRFR	Magat River Forest Reserve
NAPOCOR	National Power Corporation (DOE)
NCIP	National Commission on Indigenous Peoples
NCR	National Capital Region
NEDA	National Economic and Development Authority
NFDO	National Forestation Development Office
NGO	Non-Government Organization
NIA	National Irrigation Administration (DA)
NIPAS	National Integrated Protected Area System（Law)
NTFP	Non-Timber Forest Products
NWRB	National Water Resources Board (DPWH)
ODA	Official Development Assistance
OECF	Overseas Economic Cooperation Fund
OGA	Other Government Agency
OISCA	The Organization for Industrial, Spiritual and Culture advancement-International
ONCC	Office for Northern Cultural Communities （NCIP)
OPA	Office for Provincial Agricultural
P/R	Progress Report
PA	Protected Area
PAENRO	Provincial Agricultural, Environment and Natural Resources Office（Ifugao)
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST)
PAMB	Protected Areas Management Board
PASU	Protected Areas Superintendent

Abbreviation	Term
PAWB	Protected Area and Wildlife Bureau (DENR)
PAWD	Protected Area and Wildlife Division
PCDP	Provincial Comprehensive Development Plan
PD	Presidential Decree
PENRC	Provincial Environmental and Natural Resource Committee
PENRO	Provincial Environment and Natural Resources Office/r (DENR)
PLA	Pasture Lease Agreement
PMO	Project Management Office/Officer
PNREO	Provincial Natural Resources and Environment Office (Quirino)
PO	Peoples' Organization
POCB	PO Capacity Building
PPDO	Provincial Planning and Development Office/r
PPFP	Provincial Physical Framework Plan
PPMO	Pilot Project Management Office/r
PPSO	Policy and Planning Service（DENR）
PRA	Participatory Rural Appraisal
PRRM	Philippine Rural Reconstruction Movement (NGO)
PSLS	Philippine Selective Logging System
PWPA	Philippine Wood Products Association
RA	Republic Act
RDC	Regional Development Council
RED	Regional Executive Director
REFO-A	Reforestation by Administration
REFO-C	Reforestation by Contract
RO	Regional Office
RP-G	RP-German Debt-for-Nature-Swap Initiative Program
RPFP	Regional Physical Framework Plan
RRA	Rapid Rural Appraisal
RTD	Regional Technical Director
RUP	Resource Use Plan
SAFDZ	Strategic Agricultural and Fishery Development Zone
SALT	Sloping Agricultural Land Technology
SEC	Security and Exchange Commission
SCU	State Colleges and Universities
SIFMA	Socialized Industrial Forest Management Agreement
SMBCP	Sierra Madre Biodiversity Corridor Project
SO	Special Order
SOP	Standard Operation Procedure
SPA	Seed Production Area
SUSIMO	Subproject Site Management Office （FSP）
SWS	Sub-watershed
TA	Technical Assistant

Abbreviation	Term
TAT	Technology Acquisition and Transfer
TFL（P)	Tree for Legacy Program
TLA	Timber License Agreement
TLRC	Technology and Livelihood Resources Center
TNA	Training Need Analysis
TOR	Terms of Reference
TSI	Timber Stand Improvement
TTU	Technical Transfer Unit
TWG	Technical Working Group
UNDP	United Nations Development Program
USAID	United States Agency for International Development
USLE	Universal Soil Loss Equation
WB	World Bank
WMC	Watershed Management Council
WRP	Watershed Rehabilitation Project

Exchange Rate

USD 1 = ₱ 54.6

Measurements

km^2	Square kilometers
ha	Hectares
m^2	Square meters
mm	Millimeter
MT	Million tons

Summary

SUMMARY

1. Introduction

1.1 **Authority:** In accordance with the Implementing Agreement (I/A) on the Master Plan Study for Watershed Management in Upper Magat and Cagayan River Basin (the Study), JICA assigned a study team (the Study Team) to undertake the Study.

1.2 **Objectives of the Study:** The objectives of the Study are as follows**:**

(1) To formulate a master plan (M/P) for watershed rehabilitation and management, with a target year of 2015, which would show, among others, priority areas for reforestation, based on the results from a survey on natural and socio-economic conditions.

(2) To transfer relevant technology to the Philippine counterparts with on-the-job training in the course of the Study.

1.3 **Study Area:** The Study area covers the watershed of the Upper Magat and Cagayan River Basin, which encompasses Ifugao Province in the Cordillera Autonomous Region (CAR) and Quirino, Nueva Vizcaya and Isabela Provinces in Region 2, with a total area of approximately 880,000 ha.

1.4 **Scope of the Study:** The Study consists of two phases and include the Phase 1 for the Master Plan Study and Phase 2 for the Pilot Study.

2. Regional Socio-economy and Regional Physical Framework Plan

2.1 Population and Income

(1) The population density of the four provinces in the Study area ranges from 154.5 to 245.6 person/km^2, which is lower than the national average. Quirino has the lowest population density but has the highest population growth rate of 2.50%.

(2) Annual household income in Cordillera Autonomous Region (CAR) increased from ₱33,800 in 1988 to ₱112,400 in 1997, while in Region 2 it increased from ₱33,000 to ₱86,800 during the same period. Poverty incidence in CAR over the period of 1988-1997 was from 41.9% to 42.4 %. That of Region 2 for the same period was from 40.4% to 32.1%.

2.2 Regional Physical Framework Plan (RPFP)

(1) It was proposed in Region 2 that the total production forest be reduced from 811,103 ha to 751,045 ha by 2022. Reduction size will be 8,309 ha for Nueva Vizcaya and 8,651 ha for Quirino.

(2) The production forest of CAR is likely to consist of public land greater than 18% in slope but do not belong to protection forest. The proposed protection forests of the region by 2020 are 712,404 ha or 39% of the total areas of the region. The RPFP of the region also proposed a reduction of 41,768 ha in areas of national parks and forest reserves.

3. Institutional and Legislative Conditions and Policies on Forestry

3.1 Jurisdictions in the Study Area

(1) In the Philippines, the public domain belongs to the State (the 1987 Philippine Constitution). The overall jurisdiction and authority over forestlands, grazing lands and forest reservations including watershed reservations were lodged to the Bureau of Forest Development, which is now referred to as the Forest Management Bureau, in 1975 (PD 705). Executive Order (EO) 192 placed primary responsibility for the conservation, management and development and proper utilization of natural resources including watersheds to DENR in 1987.

(2) There are recently enacted laws that have placed jurisdiction of the Study area under different government agencies, which include:

- National Integrated Protected Areas System (NIPAS Act: R.A. 7586): DENR
- Philippine Mining Act (R.A. 7942): Mines and Geosciences Bureau of DENR
- Indigenous Peoples' Rights Act (R.A. 8371): National Commission on Indigenous Peoples (NCIP)

(3) Other Government Agencies have been granted to manage watershed areas within the Study area such as the National Irrigation Administration (NIA) and the National Power Corporation (NAPOCOR). Watershed areas have also been devolved to Local Government Units (LGUs) to manage, and the DENR and LGUs are also co-managing areas within the watershed.

3.2 Tenurial Instruments for Forestland and Resource Management

(1) Different programs of DENR allow occupancy and tenure over areas within the Study area. Tenurial instruments include Community-based Forest Management Agreement (CBFMA), Industrial Forest Management Agreement (IFMA), Socialized Industrial Forest Management Agreement (SIFMA), and Forest Land Grazing Management Agreement (FLGMA). Duration of tenure is 25 years renewable for another 25 years. LGUs also award tenure over devolved areas.

3.3 Organization and Functions of DENR

(1) The DENR is the primary government agency responsible for conservation, management, development and proper use of environment and natural resources. It regulates the utilization of these resources to ensure equitable share of the benefits derived from them.

(2) The DENR pursues its functions through the Regional Environment and Natural Resources Offices (ENRO), Provincial ENROs and Community ENROs. The Regional Offices primarily implement laws, policies, programs and projects, supports and monitors the PENROs and CENROs in their delivery of services. PENROs coordinate environment and natural resources management activities in the province and supports and monitors the activities of the CENROs.

3.4 Budgeting System

(1) The annual budget of DENR has ranged from ₱ 4.27 billion to ₱ 4.76 billion from 1997 to 2001. In 2001 the budget of DENR is about ₱ 4.55 billion. The Forestry Sector was allocated the highest budget for 2001 among the various sectors of DENR, amounting to ₱ 1.50 billion or about 33% of the total department budget. At the regional level, Region 2 had a budget of ₱ 257.44 million for 2001. Of this amount, the Forest Management Services had an allocation of ₱138.35 million or close to 54% of the total budget of the region.

(2) Despite the high proportion of budget allocation to forest management in the region, the budget for Maintenance and Operating Expenses (MOE) was only ₱ 17.1 million for the entire region in 2001 or equivalent to only 6.6%. At the CENRO level, the different units, such as the CBFM and Forest Protection Units, had very limited funds to implement their programs and projects.

4. Present Conditions of the Study Area

4.1 Natural Conditions

(1) **River System:** The Cagayan River flows from south to north for 220 km within the Study area along the foothills of the Sierra Madre Mountains on the eastern side. The tributaries on the east are generally steep in slope and small in scale. Main tributary of the river is the Magat River, which forms one of the major watersheds in the Study area. The Addalam River is another tributary of the Cagayan River, forming a smaller sized watershed. The Study area is divided into the three watersheds where the Upper Magat River watershed holds the largest portion (48% or 417,663 ha) of the total Study area followed by the Upper Cagayan River watershed (39% or 342,166 ha) and Addalam River watershed (13% or 114,773 ha).

(2) **Climate:** The Study area is affected by two tropical monsoons of the southwest and the northeast. The southwest monsoon brings a large portion of the annual rainfall. Major storms including typhoons often strike the Area from July to December. Overall annual rainfall of the Cagayan River Watershed is estimated at 2,600 mm.

4.2 Land Use and Vegetation

Land Use and Vegetation by Land Classification: Most of the natural forests such as old growth and mossy forest occur in Protected Areas (89,067 ha) and Forestland (571,505 ha) of the Study area. The largest vegetation cover in the Protected Areas is residual forest (37%), which also occupies the largest area (32%) of the Forestland.

Present Land Use and Vegetation Type of the Land Classification within the Study Area

(Unit: ha)

Category	Protected Area	Forestland	Civil Reservation	A & D	Total
1. Old Growth Forest	29,321	118,636	614	2,060	150,631
2. Mossy Forest	2,555	4,665	2	26	7,248
3. Residual Forest	33,334	183,595	1,775	14,428	233,132
4. Sub-marginal Forest	3,608	19,652	52	4,573	27,885
5. Pine Forest	28	613	0	56	697
6. Reproduction Brush	8,453	75,515	571	21,485	106,024
7. Other Plantation	302	9,492	19	7,607	17,420
8. Grass Land	7,313	97,635	965	64,319	170,232
9. Agricultural Land	3,262	50,514	349	75,485	129,610
10. Bare/Rocky Land	834	10,839	108	18,596	30,378
11. Built-up Area	3	2	0	253	258
12. Water body	45	199	0	687	931
13. Unidentified	9	147	0	0	156
Sub-Total	89,067	571,505	4,455	209,575	874,602
Magat Reservoir					5,356
TOTAL					879,958

Source: Study Team

4.3 ***Barangays*:** There are 631 *barangays* that are entirely or partly included in the Study area. Out of the 603, 408 *barangays*, which have Protected Areas and/or Forestland occupying more than 20% of the entire administrative area, have been identified as target *barangays* for Study.

4.4 People's Organization (PO) and Non-Governmental Organization (NGO)

(1) **POs in the Study Area:** There exits at least 1,500 POs within the Study area. Some of them are practically inactive. Most of them were organized through governmental programs or the initiatives of NGOs or donors.

(2) **Result of the Survey:** PO/NGO inventory survey revealed that both the POs with CBFMA and the same without CBFMA have not reached established/satisfactory level in its management capability while that of sample NGOs is satisfactory.

(3) **Action Environment of POs:** Through Participatory Rural Appraisal (PRA) conducted on the eight sample communities, it was found, among others that:

a) Population in upland communities has been rapidly increasing since the 1960s, and the constant population growth has been the major cause of environmental destruction in the area.

b) At a community level, natural resources and land used to be utilized and maintained arbitrary by individual villagers without established policy, regulation, ordinance or managing authorities. There is low or no control over the slash and burn farming, which has been causing the distraction of their environment.

c) Existing conflicts at a community level are extremely delicate and controversial. Many conflicts are political or ethnic in nature.

4.5 Present Watershed Management

(1) **Government Forest Management:** Direct responsibility for management of the Forestlands and the Protected Areas rests with DENR. However, the government has accorded tenurial agreement on many parts of the Forestlands with communities, upland dwellers and various private entities for joint management, for which the government provides them with various services.

Forest management activities are implemented by PENRO and CENRO based on their authorities and mandates. Main functions of PENRO are to conduct planning, coordination, controlling and updating plans for the various activities in the province and also provide guidance, supervision, advising and logistics to CENRO operations.

The following government agencies are vested part of authority and responsibility for implementing watershed-related programs in coordination with DENR:

a) National Irrigation Administration (NIA): The NIA was vested with authority to manage, develop and rehabilitate the watershed areas of the Pantabangan and the Magat dams.

b) National Commission on Indigenous Peoples (NCIP): Matters concerning Indigenous Peoples (IPs) in the Study area are under the administration of the Office for Northern Cultural Communities (ONCC) which is part of the NCIP. In the Study area the NCIP is presently responsible for administration of existing nine Certificates of Ancestral Domain Claims (CADCs), which covers the aggregated area of 232,600 ha.

c) Local Government Units (LGUs): To effectively implement the devolved functions, LGUs are encouraged (by the Code) to organize Environment and Natural Resources Offices (ENRO) at Provincial level.

d) LGU-DENR Co-Management of Watershed Area: The Provincial Government of Nueva Vizcaya and DENR have been co-managing 24,000 ha of Lower Magat Watershed Forest Reserve since 2000. This project shows that the national and local governments can work together in managing the Forestlands and similar project should be encouraged.

(2) **Land Tenure in the Forestlands/Protected Areas:** Various forms of tenurial instruments have been forged and promulgated to apply for different purposes of land management in the public land through people-oriented programs. The people-oriented programs started with Forest Occupancy Management, Family Approach to Reforestation, and Communal Tree Farm in 1970s. In the 1980s, Integrated Social Forestry (ISF) Program was introduced. These programs have been being integrated and unified under the CBFM program in accordance with DENR Administrative Order No. 96-30.

The tenurial instruments implemented in the Study area are 30,809 ha of Certificate of Stewardship Contract (CSC), 59,303 ha of CBFMA, 911 ha of SIFMA, 2,927 ha of Pasture Lease Agreement (PLA), 658 ha of Forest Land Grazing Lease Agreement (FLGLA), 882 ha of Forest Land Grazing Management Agreement (FLGMA).

Two settlement lands have been proclaimed under the administration and disposition of DAR. One was issued for 40,000 ha in the Forestlands known as Conwap Valley in

September 1975. Of the 40,000 ha, 6,500 ha was re-classified as A&D by DENR. However, Department of Agrarian Reform (DAR) has issued Certificate of Land Ownership Award (CLOA) for 20,000 ha.

(3) **Forestry Technology:** In the Study area, yemane is the most extensively planted species. At present, there are no timber stand improvement (TSI) operations in the Study area. Application of assisted natural generation (ANR) is indicated in the community resource management framework (CRMF) plans under CBFMA.

4.6 CBFM Program

(1) **Integration of CSCs into CBFMAs:** In the Study area, CSCs and Community Forest Management Agreements (CFMAs)/Community Forest Stewardship Agreements (CFSAs) were issued on respective aggregated areas of 30,809 ha and 3,963 ha respectively in the Forestland, out of which respective 17,965 ha and 1,341 ha were incorporated into the subsequently accorded CBFMAs.

(2) **CBFM Projects in the Study Area:** Within the Study area, there were 38 CBFM projects, covering 59,303 ha, occupying 9.0 % of the total Protected Areas and Forestland in the Study area. A variety of foreign agencies assisted with initial and maintenance funds for the CBFM projects. Such agencies included World Bank, ADB, ITTO, EU, JBIC (OECF), KfW, and USAID. Among the 38 CBFM projects, 10 projects were implemented with DENR regular fund, covering 4,518 ha of the 59,303 ha. Meanwhile, 55,209 ha have been assisted with foreign funds. The largest size of the CBFM projects in the Study area is 6,420 ha with 59 PO members, while the smallest one is 20 ha with 25 PO members. The largest number of the PO members of the CBFM projects in the Study area is 836 with the project area of 2,000 ha, while the smallest one is 25 with 20 ha and 25 with 274 ha. The average management size per PO member of the CBFM projects is largest in Quirino, 28.4 ha, followed by 27.9 ha in Isabela, 10.4 ha in Nueva Vizcaya. The same in Ifugao is as small as 4.4 ha/member.

4.7 Risk of Soil Erosion and Slope Failure

(1) **Soil Erosion:** According to a potential soil erosion analysis by the Study Team, the watersheds in the upper reaches of the Magat River basin have a higher potential risk of soil loss requiring urgent soil conservation work. These watersheds include the upstream reaches of the Ibulao, Matuno, Santa Cruz, Santa Fe and the Matana Rivers and their tributaries. In the Cagayan River basin relatively higher potential soil erosion risk is seen in the basins of the Dibuluan, Dabubu and the Ngilinan Rivers. The risk of soil erosion in the Addalam River basin is moderate.

(2) **Sedimentation in the Magat Reservoir:** The sedimentation in the reservoir of the Magat Dam is in progress. The dead space of the reservoir was originally 300 million m^3. Due to increased sediment load from the upper basin, the dead space of the reservoir has been reduced to116.4 million m^3 after 17 years (from 1982 to 1998) according to a report on sedimentation survey in the Magat Reservoir. The report revealed that an average annual sedimentation rate before the 1990 earthquake (1982-1989) was 6.13 million m^3/year, drastically increased to 21.7 million m^3/year between 1989-1995, and declined to 6.7 million m^3/year between 1995 and 2000, which is almost same level as that of before the 1990 earthquake.

4.8 Capability of DENR Local Offices, ENROs-LGU and Personnel: A training need analysis (TNA) was conducted for 184 staff members from the CENROs and ENRO-LGUs concerned. The result of 167 TNA respondents out of the 184 indicated that: i) their competencies to their duties/responsibilities are inadequate; ii) value orientations and work ethics of employees at their offices are a significant factor that hinders better performance and services; and iii) a limited number of respondents at CENROs expressed the gap between their duties/responsibilities and their qualifications, which implies that their duties/responsibilities are designed for the moderately qualified personnel. Therefore, providing more training and educational opportunity to CENRO officials can be only justified by an equality reason, and one can argue that it is inefficient and ineffective for the improvement of DENR public services, unless DENR reviews and reformulate their duties and responsibilities as to match the higher qualifications.

5. The Pilot Study

5.1 Objectives and Scope

(1) **The objectives of the Pilot Study were:** i) to obtain data/information that would allow the Study Team to formulate more realistic Master Plan for implementation; and ii) to partly support the implementation for the CBFM program formulated in the Phase 1 Study.

(2) **The scope of the Pilot Study included:** i) selection of target communities for the Pilot Project; ii) designing the Pilot Study and Pilot Project; iii) establishment of an institutional setup and operation mechanism for the Pilot Study and Pilot Project; iv) implementation and monitoring of the Pilot Project; v) evaluation of the Pilot Project; vi) analysis and synthesis of findings and lessons learned; and vii) recommendations to further refinement of the Master Plan.

5.2 Selection of the Pilot Study Sites

(1) **Selection Process:** The JICA Study Team conducted a comparative study on all the POs in the watersheds to select POs for the Pilot Study. All the POs were evaluated and compared with the aspects of i) natural condition, ii) PO capability, and iii) development potential.

Ten candidate POs were listed up by the Study Team using the results of the screening, and the final selection was made by the Steering Committee in September, 2001. The following four POs with CBFMA and two POs without CBFMA were selected.

(2) **Selected POs with CBFMA:** The following first 4 communities were the POs with CBFM Agreement (CBFMA). Main activity was to implement the area development and management.

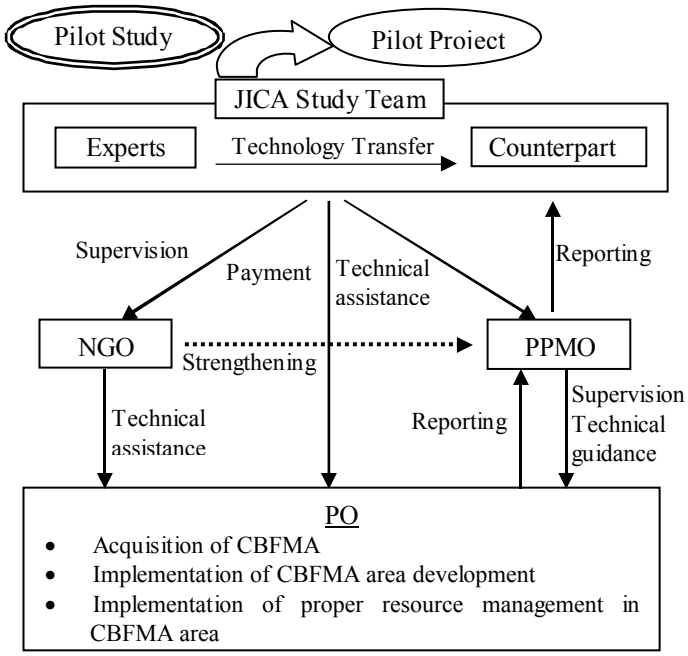
1. Banila Community-Based Cooperative Inc., Dupax del Sur, Nueva Vizcaya
2. Balligui Community Forestry and Dev. Cooperative Inc., Maddela, Quirino
3. Ayangan Dapiz Agro-Forestry Development Association Inc., S. Agustin, Isabela
4. Nunhabatan Greeners Livelihood Association Inc., Lamut, Ifugao

(3) **Selected POs without CBFMA:** The following 2 POs were non-CBFM POs. Unlike POs with a CBFMA, activities of these POs involved only community organizing and CBFMA acquisition.

1. Macate Watershed Eco. & Dev. Multipurpose Coop. Inc., Diffun, Quirino
2. Haliap Multipurpose Coop. Inc., Asipulo, Ifugao

5.3 Implementation Framework

The Pilot Project for the Pilot Study was implemented based on a contract between the JICA Study Team and POs/NGO such as i) contracts with POs on the CBFMA area development and management and ii) a contract with a local NGO on the PO capability building and strengthening of DENR/LGU.



DENR established four Pilot Project Management Offices (PPMOs) to supervise and provide technical guidance to the POs and the NGO in implementation of the Pilot Project, and dispatched four counterpart personnel. Overall implementation framework for the Pilot Project/Study is illustrated rightward.

The Study Team supervised and monitored NGO and PO. Major role of the Study Team was to manage and evaluate the Pilot Project through examining, analyzing and generalizing its process and results, and to refine the draft M/P.

5.4 Results of the Pilot Study

(1) **Area Development:** The following table summarizes the outcome of the area development implemented by the four POs.

Accomplishment of Area Development

Component		Accomplishment of Pilot Project				
		Banila Area	Balligui Area	Dapiz Area	Nunhabata n Area	Total
1	Forest Tree Plantation Establishment	65 ha	25ha	14 ha		104 ha
2	Agroforestry Plantation Establishment	5ha	25 ha	38 ha	31 ha	99 ha
3	Demo Farm Establishment	-	1.0 ha	1.0 ha	1.0 ha	3.0 ha
4	Fire Control					
-	Fire line establishment and maintenance	1 km	-	-	1.6 km	2.6 km
-	Firebreak establishment and maintenance	1.5 km	-	-	3.0 km	4.5 km
-	Lookout tower construction	2m x 2m	-	-	2m x 2m	2 unit
-	Patrol	Watchman	-	-	Watchman	-
5	PO Building construction	Renovation	6 m x 6m	6m x 6m, 6m x 6m	6m x 6m	5 unit
6	Rehabilitation of Feeder Roads	3.5km	3.5 km			7.0 km
7	Community-Based Enterprise Development	2 net house for cut flower production	Cattle breeding 11 head	Cattle breeding 15 head	Cattle breeding 13 head	2 net hous, 39 head cattle

Source: JICA Study Team

(2) **PO Capability Building:** PO capability building (POCB) was contracted out to a local NGO. The NGO conducted Training Needs Analysis (TNA) and provided 48 training sessions and 3 field trips to the total of some 1,400 participants for the 6 POs covering the following topics.

1) Training on Leadership, Duties and Responsibilities of Members & Officers I, II
2) Training on M&E
3) Financial Management Training I, II, III
4) PO Internal Audit Training
5) Cooperative Management Training
6) Others

The result of a Training Needs Analysis (TNA) is shown in the following table, which indicates increase in knowledge and skills through the training program.

Result of Pre/Posttest of PO Training

	Banila	Balligui	Dapiz	Nunhabatan
Pretest Total Score	720	451	417	489
Posttest Total Score	1,123	939	864	763
Difference	403	488	447	274
Improvement per participants	4.7/15	5.5/15	5.1/15	4.0/15

Source: JICA Study Team

(2) **Strengthening of DENR/LGU:** Selected personnel from DENR and LGUs were organized into the PPMOs and exposed to hands on experiences and on-the-job training during the course of the Pilot Study. The main trainings included:

1) Training on Public Sector Management Capacity Assessment
2) Community Organizing Training
3) Participatory Development Training

4) Training of Trainers
5) Organizational By-laws Formulation Training
6) Others

The scores of pre- and posttest at the beginning and end of training shows 43 PPMO staff members and 17 non-PPMO participants improved their understanding of the training topics.

6. Constraints on Sustainable Watershed Management

6.1 Policy and Legislative Constraints

(1) **Overlapping Land Classifications and Zoning:** There are some jurisdictional overlaps, which brings confusion and hampers the implementation of watershed management. The overlaps include NIPAS, CADC, CLOA, Strategic Agriculture and Fishery Development Zones (SAFDZ) and others.

(2) **Land Use in the Magat River Forest Reserve:** Most part of the watershed of the Magat Dam is encompassed in the Magat River Forest Reserve proclaimed in 1969 and classified as the critical watershed by virtue of PD 705 in 1975. It is therefore not open for development activities despite the fact that agriculture and grazing are carried on in the considerable part of the watershed.

(3) **Unstable Program/Project Policies:** Permit with respect to tree harvest has been unstable, which discourages people to participate in forestry programs.

(4) **Permit to Harvest in ISF/CBFMA Areas and Private Lands:** Many CSC-holders of ISF projects have joined the CBFM Programs. Since the ISF projects started in 1980, many trees are reaching the maturity for harvest. However, CSC-holders are required to obtain a cutting permit from the CENRO, which is a time consuming process and expensive.

(5) **Cost Sharing Policy on Watershed Management:** Watershed management activity is carried out upstream of a river, which often involves some restrictions over conventional land use of upland dwellers. However, most of the benefit goes to stakeholders living in downstream reaches. Therefore, there should be a mechanism to share the cost of watershed management.

6.2 Institutional Constraints

(1) **Organizational Constraints:** Staffing with respect to CBFM is weak, and organizational constraints are related to:

1) Manpower competencies
2) Devolution of DENR Personnel

(2) **Financial constraints:** Financial shortage reduces mobility of the staff and regulates CBFM activities. The budget is not enough to secure vehicles or maintenance fees and travel expenses.

(3) **Weak Linkage in Technology Transfer:** Necessary technologies for POs and their members are identified through on observations by PMOs, and from actual requests by farmers. However, there is little linkage between the people with technologies and the people who need them.

(4) **Weak Monitoring and Evaluation System** DENR has a system of monitoring and evaluation (M&E)[1] of physical performance of projects. However, there is no regular feedback provided to the implementing units except when there are backlogs in targets.

6.3 Technical Constraints

It was found that there are technical constraints in forestry practice, and problems are mainly related to factors below.

(1) Inadequate fire control
(2) Insufficient site preparation
(3) Inappropriate planting and seedling treatment methods
(4) Inappropriate planting density and species

6.4 Constraints Pertaining to Natural Conditions

The Study area involves some difficulties in maintaining the natural conditions because of:

(1) Steep terrain, difficult access
(2) High potential of soil degradation
(3) Infestation by fire-prone grass species

6.5 Socio-Economic Constraints

Socio-Economic Constraints are mainly related to:

(1) Prevalent poverty and limited livelihood alternatives
(2) Political instability
(3) Lack of infrastructure
(4) Increasing population pressure on Protected Areas and Forestland
(5) Disorderly natural resource management mechanisms at the community level
(6) Gaps among socio-economic classes and gender groups
(7) Emergence of conflicts within a community or among communities
(8) Weak linkages between external society and community

6.6 Constraints Pertaining to POs and NGOs

Constraints of POs and NGOs are mainly related to:

(1) Lack of transparency and communication among leaders and members
(2) Inadequate educational background of PO members
(3) Low participation among PO members
(4) Lack of physical and financial input for PO development/activities

[1] DAO 99-38 Revision of the Standard Operating Procedure (SOP) for Performance Monitoring Prescribed Under DAO No. 33 Series of 1992

(5) Inadequate qualifications of community organizers at DENR and LGUs
(6) Possible discrepancy between village ordinances and national legislation

6.7 Lessons Learned from the Pilot Study

(1) **Time Frame of Capability Building and Institutional Strengthening:** It was found that the four components of capability building and institutional strengthening should be thoroughly and sequentially completed. The Pilot Study implies the required periods of 1.5 years for preparatory work, at least 2.5 years for community organizing and PO formation, and 2 years for participatory planning. With a little overlap of each stage, these three components would require at least 5 years.

(2) **Institutional Setup:** The expertise of DENR staff is generally limited to that of forestry. Linkage with the supporting agencies or use of external human resources should be sought for civil engineering, agriculture and agriculture extension service, horticulture, livestock industry relating to CBFM scheme.

(3) **Facilities and Equipment:** DENR's mobility to visit the communities for the monitoring of implementation of the CBFMP is crucial. Therefore, the DENR field offices need at least motorcycles and also adequate funds for the maintenance and travel expenses.

(4) **Necessary Information to Identify CBFM Areas:** Necessary data for the clear identification of CBFM areas include a base map, accurate and updated land classification maps, updated land use/vegetation maps, an administrative boundary map and soil map.

(5) **Technical Assistance in PO Formation:** Community needs technical assistance in the preparatory work such as the preparation of by-laws, policies, institutional structure, recruitment of members, collection of fees and others to develop POs.

(6) **Community Appraisal:** Prior to planning, data/information based on indigenous knowledge has to be well identified and sorted out properly. A participatory method such as PRA or similar method is useful in the collection of such data.

(7) **Assisting Organizations (AO):** Assisting organizations play critical roles in the implementation of CBFM. Therefore, they should be stable in respect of human, financial and other physical resources.

7. Basic Concept for the Watershed Management Plan

7.1 Objectives: The objectives of the watershed management plan are to:

- Mitigate soil erosion to retain/improve productivity and sustainability;
- Improve protection from floods;
- Provide quality water for on and off-site beneficiaries;
- Improve living standards of upland dwellers;
- Increase economic value of natural resources in the watershed; and
- Conserve and maintain biological diversity.

7.2 Goal of the Master Plan (M/P): The goal of the M/P is to turn the present watershed management into a sustainable one to realize the objectives of the watershed management. The M/P provides the framework for a) systematic and effective rehabilitation plan; b) plan for increasing economic opportunities for upland stakeholders; and c) improved management plan of the Study area.

7.3 Scope of the M/P: The scope of the M/P includes rehabilitation plan of Protected Areas and Forestland within the Study area with a target year of 2015. It is composed of technical, organizational, structural, institutional, and financial management and policy initiatives.

7.4 Basic Concept: Integration of conservation and development is the basic concept of the M/P. In the Forestland, development oriented approach is to be employed to support economically depressed upland dwellers while conservation oriented management should be applied to maximize expected multiple functions of the watersheds in the Protected Areas.

7.5 Approach of the M/P: The approach of the M/P includes:

a) Ecologically compatible land utilization;
b) Ecological restoration of degraded areas through vegetative measures;
c) Sustainable resource use for prevention of further degradation;
d) Enhancement of upland economic development for upland dwellers;
e) Establishment of improved management systems through encouraging participatory forest management; and
f) Policy initiative.

8. Watershed Management Plan

8.1 Criteria for Land Use Planning: Land use planning plays one of the most critical roles in this M/P, which generates a basis for a various plans (e.g. rehabilitation plan, forest management and others) of the M/P. Criteria that were used for the planning in the M/P are:

i) NIPAS policy for designation of protected areas: NIPAS Act of 1992

- Areas above 1,000 m elevation or
- Areas with slope above 50% or
- Areas covered with virgin forest (old growth and mossy forest)

ii) Slope category with potential erosion: Department of Agriculture, Bureau of Soils in the Philippines

- Below 18% : slight erosion
- 18 to 30% : moderate erosion
- 30 to 50% : severe erosion
- Above 50% : very severe erosion

iii) Main categories in the present land classification for vegetation and land use patterns

- Old growth (mossy forest)
- Sub-marginal Forest

- Residual Forest
- Reproduction Brush
- Grass Land
- Agricultural Land

iv) Agricultural land

- Secure sufficient size of land for the future agricultural use predicted by population growth by 2015 (approximately 120% of present agricultural land: 65,000 ha)

v) Grazing land

- Secure a minimum of 50,000 ha for the use of grazing (silvipasture) as indicated in the Regional Physical Framework Plan

8.2 Application of the NIPAS Policy

Current land classification has been reviewed according to the NIPAS policy, and the Protected Areas have been re-delineated for future land use in the Study area, applying the conditions stipulated in the NIPAS Act. The re-delineation resulted in enlargement of the Protected Areas from 89,067 ha to 349,010 ha.

8.3 Land Use Plan

The following table is a summary of the proposed land use plan.

Summary of the Proposed Land Use and Vegetation in the Study Area

Proposed Land Use &Vegetation	Size of Area (ha)			
	Proposed Protected Area	Proposed Forestland	TOTAL	(CADC Area)
1. Old Growth Forest	125,700	22,300	148,000	(68,600)
2. Mossy Forest	7,200	100	7,300	(3,900)
3. Residual Forest	128,700	88,200	216,900	(83,800)
4. Sub-marginal Forest	8,600	14,700	23,300	(9,700)
5. Pine Forest	500	100	600	(400)
6. Reproduction Brush	8,000	0	8,000	(2,300)
7. Other Plantation	1,000	8,800	9,800	(1,100)
8. Agricultural Land	10,300	56,000	66,300	(8,900)
9. Man Made Forest	46,400	31,200	77,600	(20,600)
10. Agroforestry	10,500	23,200	33,700	(8,900)
11. Silvipasture	0	57,100	57,100	(6,600)
TOTAL	346,900	301,700	648,600	(214,800)

*) Size of areas such as bare/rocky area and water body are excluded.
Source: JICA Study Team (size of area rounded to the nearest 100)

8.4 Forest Management Plan

The following tables summarize management activities in the proposed Protected Areas and Forestland with slope gradients.

Management Options in the Proposed Protected Areas

Land Use & Vegetation	Slope < 18%	18% < Slope < 30%	30% < Slope < 50%	Slope > 50%
1. Old Growth Forest	- Nat. Regeneration - No harvesting - Patrolling			
2. Mossy Forest	- Nat. Regeneration - No harvesting - Patrolling			
3. Residual Forest	- Forest Stand Improvement (FSI) - Controlled NTFP with CBFM		- FSI - No harvesting	- Nat. Regeneration - No harvesting - Patrolling
4. Sub-marginal Forest	- Nat. Regeneration - No harvesting			
5. Reproduction Brush	- Agroforestry		- Reforestation - Controlled extraction with CBFM	- Reforestation - Assisted Natural Regeneration (ANR) - Controlled extraction with CBFM
6. Grass Land	- Agriculture		- Reforestation - Controlled extraction with CBFM	
7. Agricultural Land	- Maintain present activities		- Reforestation - Controlled extraction with CBFM	

Source: JICA Study Team

Management Options in the Proposed Forestland

Land Use & Vegetation	Slope < 18%	18% < Slope < 30%	30% < Slope < 50%	Slope > 50%
1. Old Growth Forest	- Nat. Regeneration - Controlled NTFP - Patrolling			- Nat. Regeneration - No harvesting - Patrolling
2. Mossy Forest	- Nat. Regeneration - Controlled NTFP - Patrolling			- Nat. Regeneration - No harvesting - Patrolling
3. Residual Forest	- Timber Stand Improvement (TSI) - Controlled extraction			- Nat. Regeneration - Controlled extraction - Patrolling
4. Sub-marginal Forest	- Nat. Regeneration - Controlled NTFP			
5. Reproduction Brush	- Silvipasture	- Agroforestry	- Reforestation - Controlled extraction	
6. Grass Land	- Agriculture	- Silvipasture		- Reforestation - Controlled extraction
7. Agricultural Land	- Maintain present activities		- Agroforestry	- Reforestation - Controlled extraction

Source: JICA Study Team

8.5 Rehabilitation Plan

The rehabilitation and restoration plan for forest management includes the following vegetative measures

- Silviculture: reforestation, FSI, TSI and ANR including enrichment planting, gap planting and supplementary planting
- Agroforestry: orchard, alley cropping, contour hedgerow planting
- Silvopastoral: ecologically compatible silvo-pasture, ecologically compatible pasture (live fencing and hedgerow fodder planting)
- Agriculture: ecologically compatible agriculture, contour farming, in-row tillage

The following table summarizes the proposed rehabilitation activities in the Study area.

Size of Area for Each Rehabilitation Activity in the Study Area

Rehabilitation Activity	Size of Area (ha)			
	Proposed Protected Areas	Proposed Forestland	TOTAL	(CADC Area)
1. ANR	8,000	0	8,000	(2,300)
2. FSI	2,100	0	2,100	(500)
3. TSI	0	2,500	2,500	(500)
2. Reforestation	46,400	31,200	77,600	(20,600)
3. Agroforestry	10,500	23,200	33,700	(10,100)
4. Silvipasture	0	57,100	57,100	(6,600)
Total	67,000	114,000	181,000	(40,600)

Source: JICA Study Team

8.6 Agroforestry and Silvopastoral Practice

It is proposed that total lands of 33,700 ha and 57,100 ha be secured for agroforestry and silvopastoral respectively.

Size of Area for Agroforestry and Silvopastoral in the Study Area

Development Activity	Present Land Use (slope)	Size of Area (ha)			
		Proposed Protected Areas	Proposed Forestland	TOTAL	(CADC Area)
1. Agroforestry	Repro. Brush (18 – 30)	6,700	13,600	20,300	(5,800)
	Repro. Brush (< 18)	3,800	0	3,800	(3,200)
	Agri. Land (30 – 50)	0	9,600	9,600	(1,100)
	Sub-Total	*10,500*	*23,200*	*33,700*	*(10,100)*
2. Silvipasture	Repro. Brush (< 18)	0	11,000	11,000	(1,500)
	Grass Land (30 - 50)	0	23,900	23,900	(2,600)
	Grass Land (18 - 30)	0	22,200	22,200	(2,500)
	Sub-Total	*0*	*57,100*	*57,100*	*(6,600)*

Source: JICA Study Team

8.7 Responsible Bodies

DENR is responsible for the management of natural resources in the Protected Area and Forestland by providing technical and administrative assistance. This management framework over the Study area should be maintained in the long run. The following table summarizes responsible bodies for different management activities.

List of Proposed Responsible Bodies for the Management of Activities in the Protected Area and Forestland

Classification		Government			PAMB	NCIP	Comm. (PO)	Associ./ Firm	Indivi.
		DENR	LGU	Others					
Proposed Protected Area	Non-CBFM Area	○	-	-	◎	-	-	-	-
	CBFM Area	○	-	-	○	-	◎	-	-
	CADC/CALC	○	-	-	○	◎	○	-	-
Proposed Forestland	Area Under NIPAS Policy	○	◎	-	-	-	-	-	-
	CADC/CALC	○	-	-	-	◎	-	-	-
	CBFM Area	○	-	-	-	-	◎	-	-
	CSC	-	○	-	-	-	-	-	◎
	FLGMA	○	-	-	-	-	◎	◎	◎
	IFMA	○	-	-	-	-	-	◎	-
	SIFMA	○	-	-	-	-	-	◎	◎
	TFL	○	-	-	-	-	-	-	◎
	Agri. Land	○	-	◎[1)]	-	-	-	-	-
	Mining Land	◎	-	-	-	-	-	-	-
	Resettle. Area	◎	-	◎[2)]	-	-	-	-	-

Source: JICA Study Team

◎: Acting/main body for management/implementation

○: Supporting body for technical and/or administrative assistance

1): DAR and DA

2): DAR

8.8 Soil and Water Conservation Plan

(1) **Soil Erosion Control Measures:** In addition to the vegetative measures with reforestation, structural measures would also be effective from the view-points of both soil erosion control and of sediment damage prevention. Mechanical/structural measures are not formulated nor integrated into the M/P because of little data with limited field reconnaissance of the Study. However, small-scale physical work to reduce erosion is recommended to be studied during the implementation of the M/P.

(2) **Accessibility Improvement for Rural Area:** Easy transportation of the product from man-made forests or agroforestry to the lowlands is a prerequisite for making a contribution to stabilize livelihood of upland people mentioned as a principle of the M/P. Therefore, accessibility improvement such as a barangay road construction should be planned and implemented for rural/mountainous areas during the implementation of the M/P.

8.9 Community-Based Enterprise Development

(1) **DENR-LGU-PO as partner:** It should be a close collaborative partner of the POs in the establishment of the community-based enterprise. DENR can also assist in sourcing support to the POs from various sectors such as the LGUs, local industry organizations, local offices of national agencies such as the Department of Trading and Industries (DTI), Department of Science and Technology (DOST), the financial institutions and other sources of credit.

(2) **The PO as an Enterprise:** While the PO is organized to carry out the management functions needed in the sustainable management of the forest resources within the CBFM area it should be viewed as an enterprise.

8.10 Cost Sharing Mechanism in Watershed Management

There are instruments available for collecting domestic water charges, irrigation service fees, levies for power supply, and compensation for mining. However, they have different objectives but have had no coordination with each other. Therefore, it is not necessarily been utilized for watershed management purposes, except for part of the levy collected by NAPOCOR, and funds available are far below the required amount. It is utmost important to establish a total cost sharing mechanism to recover the required costs for implementing sustainable management of the Study area as a whole.

Starting with using the existing instruments of cost sharing in the Study area, a total cost sharing mechanism should be established in future to secure the necessary funds for the sustainable watershed management. To this end, a task force team should be formed by and among DENR, LGUs, and relevant other government agencies. Thorough discussion on the following mechanisms for cost sharing should be conducted:

- Scope of stakeholders;
- Role and responsibility of stakeholders;
- Fund management;
- Sharing ratio/amount of each stakeholder;
- Modality of cost sharing;
- Necessary organizational structure;

8.11 Establishment of Watershed Management Council

Watersheds covering areas beyond the jurisdiction of one administrative region or even one province need collaborative efforts between regions or between provinces. There are two large watersheds in the Study area, the Upper Magat River Watershed and the Upper Cagayan River Watershed. In the case of Magat River Watershed, two regions are involved, CAR and Region 2, and three provinces. For the Cagayan River Watershed there are three provinces involved. There is also the fact that several agencies and organizations such as DENR, LGUs, NAPOCOR, NIA, PAWB, NCIP, etc., are involved in the management of portions of the watershed. A coordinating body such as a watershed management council is necessary to bring all related entities into a single stream to share the same goal.

8.12 Institutional Strengthening Plan

(1) **Overall Plan:** The plan for the strengthening of watershed management in the Study area encompasses the following:

- Manpower complement where it is very necessary to do so;
- Provision of needed vehicles to improve ability to respond to the requirements of watershed management;
- Provision of needed equipment for implementation of field projects;

- Provision of needed equipment for database and information management necessary for planning, monitoring and evaluation and technology acquisition and transfer;
- Provision of supplemental budget for field units so that they can respond effectively to the needs of clients; and
- Establishment of a protocol for technology acquisition and transfer; and
- Establishment of Watershed Management Council(s) within the Study area.

(2) **Technology Acquisition and Transfer:** The target groups of the capability building within the framework of institutional strengthening will consist of the following:

- The program/project planners and managers: CENRO, PENRO and Regional staff who provide guidance in planning and direction for program implementation and also conduct monitoring and evaluation.
- The program/project implementers: The field units of CENROs (CBFM unit) composed field personnel who work directly with the beneficiaries or targets of the program/projects

(3) **Procedure for Technology Acquisition and Transfer:** The following procedure for technology acquisition and transfer are suggested:

- Technology Needs Assessment
- Search for Source of Technology
- Acquisition of the Technology
- Transfer of the Technology
- The Technology Acquisition and Transfer Chain at DENR

(4) **Training of Field Personnel:** Field personnel of the DENR such as staff of the Region 2, the PENRO, CENRO and Provincial ENRO staff should be trained. The general topics proposed for the training include:

- Watershed management
- Community-based forest management
- Forest protection
- Protected areas and wildlife management
- Community organizing and PO capability building

8.13 Capability Building of POs/IPOs

(1) **Target Communities:** A total of 408 POs/IPOs has to be organized during the M/P period from the year 2004 to 2015. To date 40 POs with CBFMA have been already established, and hence the remaining 368 CBFM POs/IPOs should be formed during the M/P period.

(2) **Strategies:** The strategies of capacity building of POs/IPOs include the technical assistance in the designing, planning, coaching, guiding, monitoring and evaluating of the main component of Master Plan implementation.

(3) **Accountability and Transparency of POs/IPOs:** The standard organizational structure of the PO/IPO should be established to ensure accountability and transparency regarding rules, regulations, decision-making process and others.

(4) **Human Resource Development:** Training on the intensification of farming to replace the extensive slash and burn farming is focused. In addition, the human resource development would be executed in the area of local policy and legislation.

(5) **Incentive Program:** Establishing the following services can provide incentives for PO/IPO members: development of micro credit services, purchase and sale of discounted farm supplies and commodity goods, provision of dividends, patronage refund, market information, training and education, promotion of livelihood activities and rental service of farm equipment/facilities.

(6) **Financial Management of POs/IPOs:** Financial Management of POs/IPOs

(7) **Linkages with External Societies:** The PO/IPO development initiatives will focus on the strengthening of linkage between POs/IPOs and external societies, as government agencies, donors, NGOs and market. The POs/IPOs are expected to develop their ability to proactively establish connections with external societies and enhance the inflow and outflow of resources and information to and from the community.

9. Implementation Plan

9.1 Priority of Sub-watersheds (SWS) Watershed Management Needs

In order to determine priority ranks on the 133 SWSs with the aspect of management needs, SWSs were first examined according to the two principal conditions, natural conditions and social conditions. Assessment of natural condition involved (i) mass reduction of soil erosion, (ii) erodible layer reduction and (iii) the ratio of rehabilitation area against entire SWS area. Management needs in respect of social conditions were examined based on dependency ratio of upland dwellers on agriculture and poverty level as the main indicators. Higher points (from 7 to 1) were given to the higher rank in the category (from 1 to 7). Finally, all results of this examination were synthesized into one composite priority ranking.

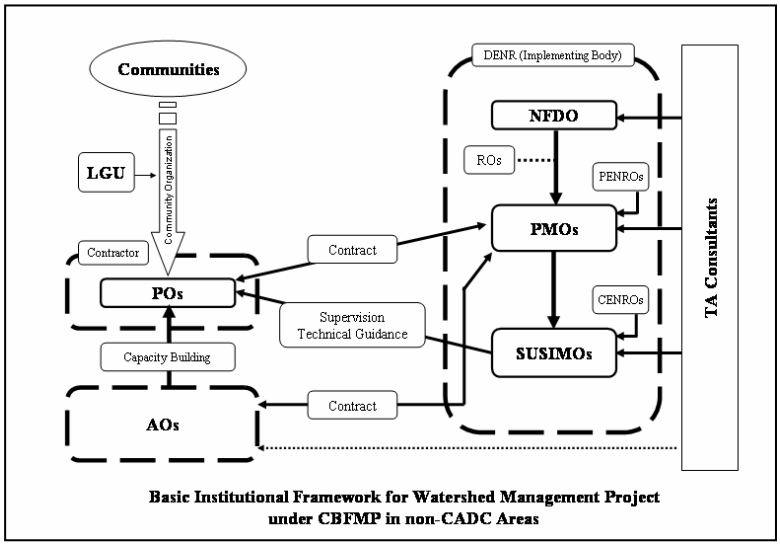
9.2 Institutional Framework of Implementation

(1) **Grouping SWSs According to Rehabilitation Area:** Rating the SWSs was made with the size of possible reforestation and agroforestry areas. Then the ranked SWSs were grouped into two categories, i.e., the SWS with the possible reforestation and agroforestry area of more than 100 ha and the ones with the areas less than 100 ha. It is assumed that the former group would be implemented under foreign assisted/special projects, while the latter one would be implemented as regular projects.

(2) **Grouping SWSs According to the Land Tenure:** CADC area is subject to the management by NCIP not matter the area is located within the Forestland or not. Therefore it should have a different implementation framework of non-CADC areas, which is under jurisdiction of DENR. It is, therefore proposed that SWS with CADC area more than 80% of the basin area be implemented mainly by NCIP, that of the

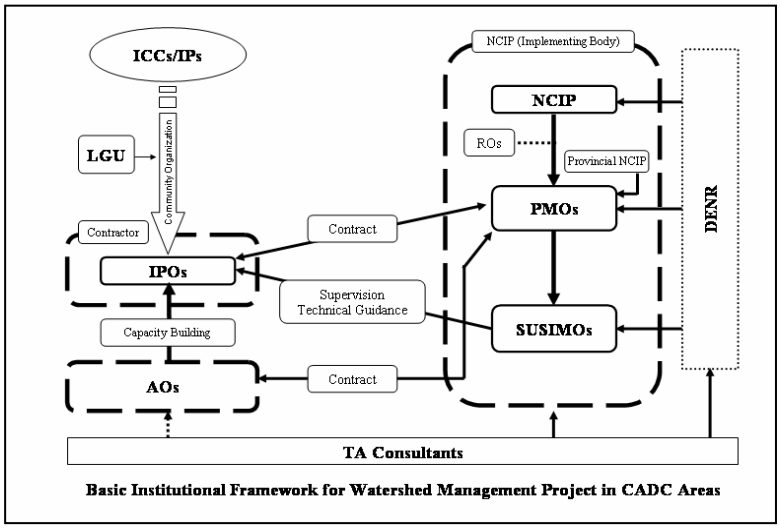
SWS with CADC area between 79-21% of the basin area be implemented by both the NCIP and the DENR, and that the rest be implemented by DENR as a rule.

(3) **Implementation Framework for Non-CADC Areas:** The DENR through the National Forestation Development Office (NFDO) will be responsible for the implementation of the watershed management project. At the provincial level, Project Manger Offices (PMOs) would be established based at the PENRO. At the sub-watershed level, Sub-project Site Management Offices (SUSIMOs) would be established. Each PMO will enter into contract with CBFM POs for the implementation. The SUSIMO will be responsible for supervising and monitoring of the implementation by the POs and provide them with technical assistance on the matter relevant to the implementation.



Basic Institutional Framework for Watershed Management Project under CBFMP in non-CADC Areas

(4) **Implementation Framework for CADC Areas:** A National Ancestral Domain Sustainable Development and Protection Plans (ADSDPP) project office would be established, as the sole executing agency, in the NCIP for the implementation of the watershed management project in CADC areas. Field offices including PMOs and SUSIMOs are similar to those for the framework of the Non-CADC areas.



Basic Institutional Framework for Watershed Management Project in CADC Areas

9.3 Proposed Work

(1) Component of the Proposed Work: Proposed project work included in this M/P are: i) preparatory work, ii) community organizing and PO/IPO formation, iii) participatory planning, iv) rehabilitation of degraded Protected Areas and Forestland, v) community-based enterprise development, vi) establishment of watershed management council for watershed management in the Study area; vii) establishment of cost sharing mechanism for watershed management in the Study area; and viii) institutional strengthening, and ix) PO/IPO capacity building.

(2) **Preparatory Work:** Preparatory works will include: i) survey and mapping; and ii) establishment of institutional organizations.

(3) **Community Organizing and PO/IPO Formation:** Community organizing and PO/IPO formation will be executed for 408 *barangays*/ICCs. All the activities with respect to the community organizing and PO/IPO formation would be assisted by assisting organizations (AOs).

(4) **Participatory Planning:** Participatory planning is a main strategy to attain the goal of the M/P. It is largely classified into the following types:

- Participatory planning under CBFMP: A community resource management framework (CRMF) and annual work plan (AWP) will be formulated for each of the CBFMA areas by the PO concerned with assistance from DENR and AOs.
- Participatory formulation for Ancestral Domain Development and Protection (ADSDPP): In order for ICCs/POs to freely pursue their economic, social, political and cultural development of the CADC areas.

(5) **Rehabilitation of Degraded Area and Forestland:** The rehabilitation of degraded Protected Area and Forestland will be restored for 181,100 ha in total, and breakdown of which is shown below.

Proposed Rehabilitation Activity to be Implemented

(Unit: ha)

Rehabilitation Activity	Total Area for Rehabilitation
1. Assisted Natural Regeneration	8,000
2. Forest Stand Improvement	2,100
3. Timber Stand Improvement	2,500
2. Reforestation	77,600
3. Agroforestry	33,700
4. Silvipasture	57,100
Total	181,000

(6) **Community-Based Enterprise Development:** This component is to provide financial and technical assistance to all POs/IPOs. Technical assistance will be i) searching for projects with a high potential for implementation, ii) pre-feasibility study and feasibility study for a project including market search, iii) inquiries to the banks of finance that are possibly used for the enterprise development, iv) requesting local governments for assistance in the improvement of infrastructures (road construction, water supply and power supply) and v) acquisition of technical skills and knowledge.

(7) **Watershed Management Council:** A series of activities to create a watershed management council for the Study area will be undertaken during the implementation of the M/P. The activities will include: i) creation of a task force consisting of staff from FMB, and Regional offices; ii) dissemination to and consensus building among stakeholders within the Study area; iii) formulation of tasks, rules and regulations of the council; iv) authorization of the establishment of the council; and v) conducting general assemble meetings to discuss and ratify the organization setup for the council, implementing rules and regulations.

It is also proposed that a technical committee under the Council be formulated to discuss technical and local issues on watershed management. Technical meeting will be commenced a year after the establishment of the Councils and be held for about 10 times annually to implement watershed management effectively.

(8) **Cost Sharing Mechanism:** In order to establish a cost sharing mechanism for the implementation of the sustainable watershed management after the M/P implementation, the following activities are planed to: i) create a task force; ii) conduct dissemination and consensus building; iii) formulate/ develop concept, rules and regulations; iv) legitimate the mechanism. The task force for creating the watershed management council could combine the tasks for the cost sharing mechanism for through discussions.

(9) **Institutional Strengthening:** Institutional strengthening program will include: i) creation of M/P implementation offices; ii) improvement in mobility of field personnel with acquisition of appropriate vehicles; iii) provision of the equipment required for improving the capability of PMOs and SUSIMOs to respond to PO needs, better project management, provision of required technology, development of database and information system; and iv) human resource development and technology transfer.

(10) **Capability Building for POs/IPOs:** Capability building will be provided to all target POs/IPOs during the implementation. The key components of this component will consist of i) community organizing, ii) PO/IPO formation, iii) participatory planning, iv) project management.

9.4 Indicative Cost Estimate for the M/P

Based on the proposed work and unit costs set up in the Study, overall project cost was estimated at **₱ 9,256.7 million (US$ 169.5 million**[2]).

[2] US $ = ₱ 54. 6

Cost Estimate for Overall Project

(Unit: Million Pesos)

Work Items	Cost
1. Project Direct Cost	7,388.8
1) Preparatory Work	215.1
2) PO formation & CBFMA Acquisition/ IPO formation	73.4
3) Participatory Planning	0.5
4) Rehabilitation (Degraded PA & FL)	5,791.9
5) Community-based Enterprise Development	40.8
6) Institutional Strengthening	690.7
7) PO Capability Building	573.3
8) Initiative for Watershed Management Council Establishment	1.8
9) Initiative for Cost Sharing Mechanism Establishment	1.3
2. TA Consultant	591.1
3. Contingencies	798.0
4. Administrative cost	478.8
Total	9,256.7

9.5 Implementation Schedule of the M/P

(1) **Overall Implementation Schedule:** The proposed work of the M/P for the overall watershed management in the Study area would be implemented during the period from 2004 to 2015.

(2) **Implementation Schedule for the Forestry Sector Project Phase 2 (FSP-2):** Japan Bank for International Cooperation (JBIC) reviewed the on-going Forestry Sector Project (FSP) and formulated an implementation program (I/P) for upcoming second phase of the FSP. The I/P includes 19 priority SWSs of the M/P, which covers 130,900 ha.

10. Conclusions and Recommendations

10.1 Conclusions

(1) **Pressing Need of the Implementation of the M/P:** Considering on-going degradation in the Protected Areas and Forestland, the implementation of the Master Plan is the urgent need for restoring inherent functions of watersheds in the Study area.

In particular, the implementation of the following activities is extremely important to facilitate the appropriate watershed management:

i) Re-delineation of Protected Areas and Forestland;

ii) Imminent implementation of the FSP-2, which includes 19 priority SWSs; and

iii) Implementation of the watershed management plan in CADC areas in the priority SWSs because 77.8 % of the present CADC areas are situated in the proposed Protected Areas, where play vital role as critical watershed of the Upper Magat and Cagayan Rivers.

(2) **Funding Source to Maintain the Watershed Management Activities:** Watershed management requires continuous and considerable financial input. In order to acquire enough funding, there are conceivable options such as budgets allocated from the national budget, financial aid from donor counties, current trust fund legalized with DOE Energy Regulation 1-94, and contributions from the relevant stakeholders.

Out of the options, cost sharing by the relevant stakeholders including the already legitimated trust fund is most likely to meet the requirement for funding. In this context, establishing the cost sharing mechanism is essential to maintain the restored watershed after the implementation of the M/P.

10.2 Recommendations

(1) **Overall Recommendations:** Overall recommendations of the M/P include:

i) DENR should promote the implementation of the FSP-2 with financial assistance from JBIC;

ii) NCIP should seek financial sources for the implementation of the watershed management plan in the CADC areas; and

iii) Re-delineation of the proposed Protected Areas and Forestland be legitimized and that its boundaries should be established with appropriate surveys on the ground accordingly.

(3) **Political Arrangements in the Implementation of the M/P:** Several political and administrative issues have been identified for the purpose of the implementation of the M/P. These issues should be discussed intensively and make agreements among related parties. Main issues include:

i) Conflict in land use: Jurisdictional overlaps between the NIPAS Act (RA 7586), the Mining Act (RA 7942) and the IPRA (RA 8371).

ii) The establishment of sub-classification of grazing lands or pasturelands under the Forestland (production forestlands) should be included in the proposed national land use act or in the sustainable forest management act and that the definition of the critical watershed should be reviewed so that guidelines on land classification in the NIPAS Act could be fully reflected in the definition.

iii) Policies on harvesting fallen and damaged trees from the Forestland: Sporadic and inappropriate suspension of RUP should be revised.

iv) Permit to harvest and transport plantation-grown timber: PO members expect to harvest the trees that they plant. Current procedures to issue cutting permit should be streamlined based on the concept of sustainable use of natural resources.

v) Pricing policy on water from watersheds: A system for pricing water should be developed during the implementation phase so that a mechanism for compensating LGUs for the water coming from watersheds within their jurisdiction can be developed.

(4) **Improvement of Institutional Arrangement for M/P Implementation:** Similar to the political arrangements, it is inevitable to make some institutional arrangements because watershed management involves diverse sectors.

i) Devolution of Management of Small Watersheds to LGUs: LGUs should carry more responsibility for local development and resources management so that small watersheds could be well-managed based on the local needs.

ii) Co-management of Watershed Resources: Collaboration between DENR and LGUs to establish a co-management scheme particularly for the Forestland is encouraged.

iii) Tree for Legacy Program: Private citizens including school children can participate in conservation activity. This program is encouraged particularly in the management of watersheds close to urban and settlement areas.

iv) Ancestral Woodlots or *Muyong* and Communal Forests or *Ala-a*: Traditional forest management practices such as *Muyong* and *Ala-a* should be fully recognized and legitimized.

(4) **CBFM Initiatives:**

i) Size of CBFM Area: There is risk of land exploitation if the size of CBFM covers an extensive area. Therefore, it should be properly evaluated and controlled by DENR.

ii) Formulation of Quantitative CRMF: Existing CRMFs indicate only conceptual resource management framework so that it is difficult to define the management goal. CRMF, therefore, should also indicate quantitative frame.