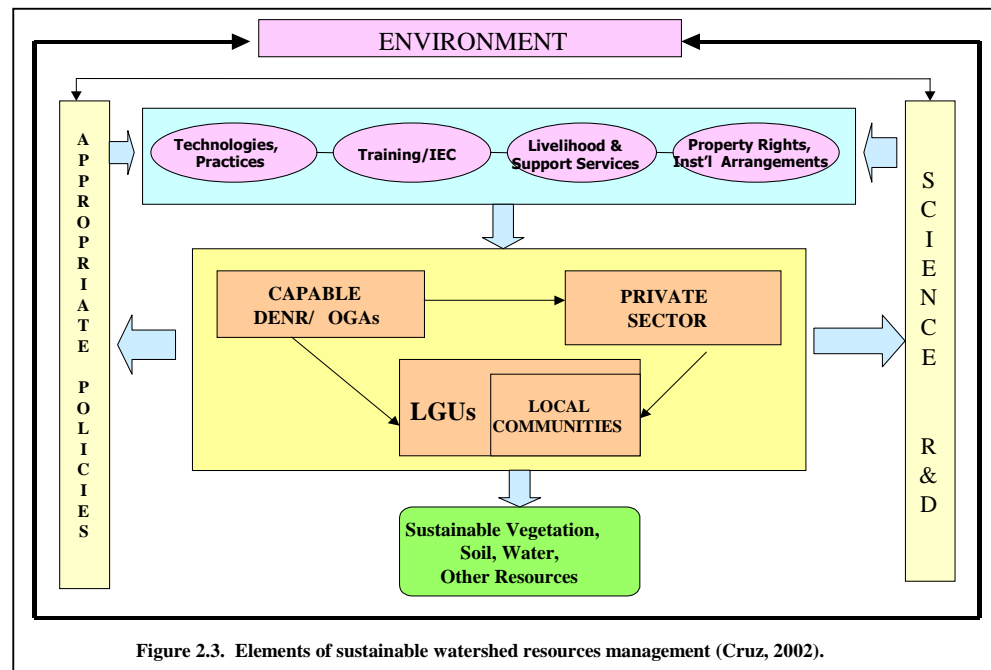


2.0 SUBSECTORAL ASSESSMENT

2.1 Watershed

2.1.1 Introduction

The report covers the assessment of the current state of watersheds and watershed management in the Philippines along with the current policies and programs related to watershed management. The detailed and accurate illustration of the procedures adopted for this task is shown in Figure 2.3.



The figure shows that the sustainability of watershed resources and, hence also the flow of goods and services from the watershed, is directly determined by the capability of various actors and players in watershed management. When the major actors and players (local communities, LGUs, DENR, others) in watershed management are fully capable and properly motivated to perform their roles, the watershed resources are going to be sustainable. Mechanisms that will equip and motivate the actors and players such as IEC, training, equitable and just property rights system, institutional arrangement, viable livelihood systems and sound technologies and practices should be in place. For all these to happen, appropriate policies and well developed science must be there as pillars upon which the enabling mechanisms and the various actors and players can rest in stability under varying environmental conditions. The following elements are therefore essential for the success of watershed management in the country:

- appropriate tenurial arrangements for land and resource use and mode of governance;
- adequate access to appropriate technology and technical assistance;
- adequate training and IEC;
- appropriate mechanisms for equitable sharing of costs and benefits;
- adequate opportunities and support systems for sustainable livelihood enterprises;
- appropriate policies; and
- growing science allied to watershed management

2.1.1.1 Current State of Watershed Management

2.1.1.1.1 The Philippine Watersheds

It is estimated that at least 70% of the total land area of the Philippines belong to watersheds of varying sizes (Table 2.4). Watersheds with area of at least 100,000 ha referred to as river basins comprise more than 10 M ha of the watershed areas. This includes areas inside and outside watersheds that are proclaimed as watershed reserves. Proclaimed watershed reserves refer to those watersheds that were specifically designated for various purposes such as domestic water supply, irrigation, hydroelectric power generation and multiple uses (Table 2.5). Watersheds are valuable not only because of its water resources but also because of forests and other natural resources found therein. Management of watersheds is hence critical in promoting the sustainability of all the natural resources in the watersheds.

2.1.1.1.2 Watershed Degradation

Many of our watersheds today are invariably degraded characterized by degraded forests, soil erosion, erratic streamflow, declining groundwater resource, loss of biodiversity, microclimate deterioration, and declining land productivity. Forest degradation is mainly due to the removal of natural vegetation from large area of land by converting forest into agricultural land, road construction and urban development. It also includes the reduction in the vegetation stock due to timber poaching, fuelwood gathering, and collection of rattan and other non-timber products. Forest degradation leads to loss of wildlife habitats, microclimate changes, and loss of production potential from a range of wood and non-wood renewable resources, and potentially to erosion and loss of nutrients. Latest estimates show that no more than 20% of the total area of the country is covered with forests. Almost 10 M ha of the country's forest were lost between 1935 and 1988 at a rate of more than 150,000 ha annually. This drastically dropped to about 100,000? ha per year from 1989 to 1996. Regionally, only Regions 2 and 4 have more than 30% of forest cover remaining. On the watershed level, the forest cover varies from almost none to more than 50% depending on major factors like population, remaining natural forest resource base, availability of sufficient non-forest based alternative livelihoods and presence of accountable managers.

Soil erosion is considered as one of the worst problems of most watersheds in the country, with estimates of between 74 and 81 million tons of soil being lost annually, and between 63% and 77% of the country's total land area affected. There are reports that 13 of the country's 73 provinces have over half of their land area affected by moderate to severe erosion. Sedimentation has reduced the storage capacity of the country's major reservoirs affecting water supplies for domestic, industrial, irrigation and power-generation purposes. Between 1973 and 1998, an estimated 20-30% reduction in area irrigated during the dry season by a number of irrigation systems (DENR 1999).

Table 2.4. River basins of the Philippines (NWRC, 1979).

Drainage Area (km ²)	Number of River Basins
40 – 100	51
101 – 200	117
201 – 500	151
501 – 1,000	59
1,001 – 2,000	26
2,001 – 5,000	8
5,001 – 1,0000	4
10,000 – 25,000	3
TOTAL	419

Region	Forestland (ha)	Forests (ha)	Proclaimed Watersheds		Priority Watersheds		% Forest Cover
			no.	ha	no.	ha	
CAR	1,479,269		6	113,009	12	1,573,700	
1	473,097	396,400	10	6,167	8	797,812	
2	1,717,793	1,501,443	5	119,261	16	1,637,887	33
3	771,174	194,500	8	221,385	10	3,004,161	11
NCR	15,368				3	63,600	
4	2,519,550	970,583	35	107,400	11	542,040	38
5	541,189	41,800	11	37,725	14	192,402	2
6	613,529	57,000	9	131,777	11	994,684	3
7	535,919	19,000	7	104,381	13	520,628	1
8	1,119,454	275,800	9	30,599	6	114,382	13
9	837,454	163,606	4	11,456	10	73,970	
10	746,193	793,039	4	114,970	11	693,522	
11	1,634,235	704,790	6	111,337	21	1,760,445	
12	890,446	273,756	2	169,272	3	184,074	
13	1,342,250		7	38,241	5	278,087	
ARMM	618,002		2	182,354			19
Philippines	14,375,653	5,391,717	125	1,499,334	154	12,431,394	18

Contrastingly, while many watersheds continue to deteriorate, the population that relies on the goods and services they provide steadily grows creating more pressure for the already overburdened natural resources in the watersheds. Watersheds continue to be the sole sources of water for domestic, agriculture, industrial and commercial uses in the country. The finite area of the watersheds however sets the limit to its capacity to meet the growing needs for water of an ever growing population. Around 975 MCM of water are estimated to be available daily to meet the demands from various sectors. It is shown that some areas are bound to experience water scarcity if the present pattern and rate of consumption do not change and that no increase in the present supply of available water takes place. According to projections, there will be more regions in the country that will experience water supply deficit by 2020. To guarantee the sustainability and availability of water, the mode of watershed management must improve focusing on strategies that will protect and or enhance the sustained ability of the watersheds to capture and store more rainwater and promote more conservation effective use of water resources.

2.1.1.2 Causes of Watershed Degradation

Watershed degradation in the Philippines is attributed to a wide range of physical and socio-economic factors that are often complex and to substantive degree localized in nature. These factors are described below.

Natural Predisposing Factors

- Monsoonal climate pattern that accounts for more than 60% of the total rainfall falling in the country and associated with high intensity rain events
- Extreme climate events such as the periodic El Niño and La Niña
- Frequent floods due to
- Rugged terrain coupled with geological instability associated with seismic and volcanic activity make the upper portion of many watersheds highly vulnerable
- Soils which are strongly acidic, with low natural fertility, strong leaching associated with high rainfall and rapid decomposition of organic matter

Direct Causes of Watershed Degradation

The direct causes of watershed degradation in the Philippines can be summed up as the absence of adequately skilled and properly motivated actors in watershed management that manifests in various ways as described below.

Erosive agricultural practices

These include absence or poor maintenance of erosion control measures in upland farms, improper crop rotations, shortening of the fallow period in *kaingin* cultivation, insufficient or excessive use of fertilizers, and overuse of irrigation water.

Inappropriate forestry practices

These forest management practices such as the use of destructive technologies for harvesting timber and non-timber products, badly constructed logging roads, and inappropriate plantation establishment (e.g., removal of ground cover by burning/clean weeding, planting in lines up and down the slope). The replacement of a mixed natural forest with plantations of a very limited range of exotic species is also considered as a common practice that is inappropriately applied in many watersheds.

Overgrazing

Overgrazing, excessive livestock population and burning of pasture lands lead to soil compaction and/or a decrease of plant cover, both of which may, in turn give rise to soil erosion and reduced infiltration of rainwater.

Poor water resource management

Over extraction of water (for irrigation, urban and industrial use) from rivers and other surface water sources has led to reduced downstream availability of water. Inefficient irrigation practices, wasteful urban/industrial water use and leakages from water delivery systems contribute to water shortage problems, as does over-pumping of the aquifers. In lower watershed areas, the intensive use of tube wells has led to abstraction of water in excess of natural recharge by rainfall and river seepage and a progressive lowering of the water table (DENR 1999). In coastal areas, over-extraction of groundwater has resulted in salt water intrusion into the freshwater aquifer (a growing problem in parts of Cebu).

Unregulated land conversion

Uncontrolled land development in many watersheds contribute to watershed degradation particularly deforestation. Mass conversion of agricultural lands to commercial, industrial, residential, and recreational (golf courses) purposes usually force affected families to seek lands which are easy to access such as the marginal upland areas. Hence, unregulated urban and industrial expansion within lowland agricultural areas is also contributory to watershed degradation elsewhere.

Industrial activities

Include all human activities of a bio-industrial nature: timber processing, factory farming (e.g., large-scale commercial poultry and piggery farms), power generation, mining, infrastructure and urbanization, waste handling, etc. It is most often linked to pollution of different kinds (either point source or non-point). In addition to possible chemical and organic pollutants, uncontrolled rainwater run-off from mine spoil heaps, unconsolidated roadside cuttings and embankments, urban and industrial sites can be the source of significant quantities of downstream sediment (DENR 1999).

Indirect Causes of Watershed Degradation

Indirect causes of watershed degradation are the underlying reasons why inappropriate types of land-use and management are practiced and usually relate to the socio-economic circumstances of the land-users and/or the social, cultural, economic and policy environment in which they operate. The following are of particular significance in the Philippines:

Population growth

The growth of population in the uplands as well as inward migration from the lowlands brings excessive pressure on watersheds. The problem is particularly serious where the population is growing rapidly while the natural resource base continues to shrink due to over utilization.

Poverty and absence of viable livelihoods

Poverty is the underlying cause of much watershed degradation in the Philippines. The upland and mountain areas of the country are generally the poorest and least developed. The on-site users of watershed resources are predominantly rural. In the absence of viable alternative livelihood activities, most of these users have no recourse but to depend on small-scale farming and/or forestry-based activities for their livelihood.

Lack of markets and other livelihood support systems

Geographic isolation and the lack of a well-developed market infrastructure in most upland areas mean that the agriculture and forestry activities of upland communities have remained predominantly at subsistence levels. The opportunities for increasing cash income are largely restricted to a small number of commodities that keep well, have high value or are easily transported. Lack of good roads and markets limits the scope for promoting the growing of perennial tree crops, as an alternative to annual food crops on steep slopes, if the produce is perishable and bulky.

Land tenure

Sub-optimal use and management of watershed resources can largely be explained by the tenure regime under which the resource users operate. The more insecure the user feels with regard to his/her long term rights to use a particular resource, the more he is inclined to exploit the resource to the maximum over the short term.

Aggravating these problems are policies with inconsistent provisions on land classification, allocation and use. In particular, the provisions of PD 705, Mining Act of 1997, IPRA and NIPAS Law on jurisdiction and uses of watershed areas clash with one another leading to confusion in strategies and programs being undertaken. The multiplicity of land tenure instruments being issued such as IFMA, SIFMA, CCFS, CSC, CBFMA, CADT, CALT and CLOA under RA 7881 and 7950 also add to the confusion of land-use within many watersheds.

Misconceptions and inadequate knowledge about watershed management

It has long been thought that watershed management is only about water and that it is but a special use in forestry. The poor appreciation of the true concepts and principles underlying watershed management by the various watershed actors and players led to the evolution of policies and institutions that are insufficiently supportive of, if not completely opposed to the achievement of watershed management objectives. A number of provisions in PD 705, LOIs 845, 917 and 1002, PD 1515, EOs 223 and 224 of 1987, unduly confined watershed management to the protection and conservation of water resources precluding the management of many watersheds for their multiple uses.

- Inappropriate conservation technologies

Many current conservation recommendations (e.g., SALT, terracing, reforestation) have high initial investment costs when compared to current land-uses and the incremental development costs are beyond what most rural households can absorb. Technology development will need to consider the integration of the traditional technologies into the development of new but more effective ones to increase acceptability and adoptability to the end users.

- Lack of access to capital resources

Watershed users fail to adopt conservation effective technologies because they are costly and it is difficult to access financial and technical resources. Financing institutions are usually unwilling to open windows for lending money to the poor who do not have the ability to put up guarantees of their ability to pay like the watershed upland users.

- Absence of mechanisms to facilitate coordination of mandates of various agencies

Organizational problems related to the integrated management of watersheds stem from the restricted and often conflicting mandates of the different development agencies operating in upland areas. In particular, there is often a conflict of interests and legal responsibility over land-use within watershed areas between DENR, DA, DAR and the LGUs. The delineation and coordination of jurisdiction and scope of responsibilities among the various agencies as provided for in various legislations such as PDs 705, 1159, EOs 192, 223 and 224 of 1987, 258 of 1995, RAs 4850 amended by PD 813, RA 8371, LOIs 845 and 1002, and the Provincial Water Utilities Act of 1973, are not clear.

- Absence of appropriate scheme for valuation and pricing of watershed resources

The absence of valuation and pricing scheme for the natural resources of a watershed contributes to the inefficiency in its use. Under valuation and under pricing of watershed resources failed to promote the resource conservation or encourage improved natural forest management.

- Inadequate land use and management plans

Management of many watersheds in the country is saddled by the absence of good land use and management plans. Those with plans are mostly not better off than those without as plans, for land use and management plans are usually weakened by the lack of scheme with which integration and coordination with other relevant plans such as plans of a larger watershed where it belongs, or of LGUs that it encompass or of other adjacent watersheds or of the national government. Problems in proper plan integration is compounded by the lack of a comprehensive national land use policy.

- Absence of institutional mechanisms to encourage active, collective and sustained participation of stakeholders in watershed management

The task of translating participatory approach into workable strategy on the ground acceptable to the large group of stakeholders that are involved still remains as the primary challenge. Failure in this task is common and has led to the failure of many management efforts. Despite the large community of watershed stakeholders, the task of recruiting support for the protection and conservation of watershed resources has been very difficult.

- Inconsistent statutory and policy framework

The legal and policy environment in which watershed management takes place is characterized by overlapping and often conflicting policies on utilization and protection of watershed areas. Whereas,

there exist a range of legislative instruments for watershed management and forest protection, they have been used inconsistently and rarely with any real effect.

There are also policies which become inconsistent with the shifts in philosophy and management strategies. The remarkably slow process of instituting policy changes especially those that passed through legislation makes it so tedious to revise policies in order to make them consistent with the shift to new management strategies and philosophies. This is illustrated by the case of adopting CBFM as a strategy for managing certain portions of proclaimed watershed reserves and how its implementation is slowed down by the restriction to exploitation of any form as provided for in PD 705.

2.1.1.3 Current Initiatives Addressing Watershed Degradation

2.1.1.3.1 Policy

Several policies that directly address many of the causes of watershed degradation were passed since 1990. Some of the more significant policies are described below.

- ❑ *NIPAS Law* sets the framework for the protection of critical watersheds that are determined as areas essential for the conservation of biodiversity.
- ❑ *IPRA Law* emphasizes on the recognition of the rights of indigenous peoples to have jurisdiction over the management of the watershed resources within their ancestral domain. This law provides the security of tenure as well as the incentive for the indigenous peoples to invest in the long term protection and development of the watershed resources.
- ❑ *AFMA* provides the framework for the integrated management and development of the lowland and the upland portion of a watershed through the creation of the Strategic Agriculture and Fisheries Development Zones (SAFDZ). The limited scope of the SAFDZ that usually does not include the whole watershed leaves room for integration to include the whole watershed. Enhancing the participatory process in the delineation and management of the SAFDZ remain a challenge to the success of SAFDZ.
- ❑ *LGC* though not intended directly for watershed management purposes, provides the scope for the active frontline participation of the LGUs in watershed management particularly in relation to the devolved functions of the line agencies. The LGC gives power to the LGUs as comprehensive managers of all the natural resources found within its jurisdiction. However, the added responsibility poses the challenge of mobilizing additional financial, technical and human resources to the LGUs. There is also the challenge of maintaining a harmonious working relationship with the line agencies where its devolved functions originated to gain access to the pools of expertise they don't have.
- ❑ *EO 263* enshrined the community based forest management as the national strategy for the management and development of forest resources in the country. This order gives primacy to CBFM over other strategies as the management strategy for forests. It provides the legal basis for the participation of the local communities therefore in the management of watersheds. The major stumbling block however, is the restriction in proclaimed watersheds for any user to engage in any exploitative activities that is inconsistent with the intention of the CBFM to provide opportunities for sustainable livelihood to the local communities.
- ❑ *DAO 98-42* allows for the harvesting of government plantations in production zones of protection areas. This is expected to encourage the concerned beneficiaries to take part in the protection of the watersheds.
- ❑ *DAO 99-01* mandates the DENR field offices to use the watershed and ecosystem framework in the management of forests in the country. The use of the watershed as the unit for forest planning and management will facilitate the integration of the forestry sector development with the other sectors

particularly agriculture, the LGUs and the local communities. It should also provide the opportunities for operationalizing multiple use management and therefore optimize the use of watershed resources for the benefits of the greatest number of stakeholders for the longest time possible. Lack of adequate database and skilled technical personnel continue to slow down the implementation of this order.

- ❑ *Joint DENR-DILG MC 98-01* provides the legal basis for the co-management of certain watershed areas between the DENR and LGUs. This circular allows the DENR to let certain LGUs to administer and manage watersheds or portions thereof. The DENR provides the technical assistance to the LGUs who remain accountable to the DENR in complying with the legal standards.
- ❑ *Joint DENR-DILG MC 2003-01* reiterates and strengthens the provisions of the Joint DENR-DILG MC 98-01. As co-managers, the DENR and the LGUs will be jointly responsible for the identification and establishment of communal forests, community watersheds and reforestation areas among others. The DENR can devolve forest lands to the LGUs based on approved forest land use plans (FLUP) that were developed through transparent, accountable and participatory process.

2.1.1.3.2 Institutional

- ❑ *Multistakeholder watershed management councils* had been formed in several watersheds such as the Laguna Lake Basin Authority, Iloilo Watershed Management Council and the Bukidnon Watershed Management Council. From the limited experiences we have so far, it is evident that more can be accomplished when the different agencies representing various sectors and the civil society come together and work toward the common goal of promoting the sustainability of watershed resources.
- ❑ *Farmer-led initiative* in watershed management is illustrated by the Land Care Association in Claveria, Bukidnon. It is a model of how community based peoples' organizations can be effective in the dissemination of good soil and water conservation technologies in particular and in participatory watershed development in general.
- ❑ *Education and training* on agroforestry and soil and water conservation are available in several institutions such as the University of the Philippines at Los Baños, Mindanao Baptist Rural Life Center, and in a number of Centers for People Empowerment in the Uplands. While the academe continues to make their formal and non-formal training curricula relevant to meeting the expertise needed in managing watersheds in the country, several NGOs are becoming more active in the area of providing education and training to local communities and other players in watershed management.
- ❑ *GIS/MIS development* is an ongoing concern of several agencies and institutions after having been neglected for so many years. There is such an infectious enthusiasm on information systems that almost every government agency and units within each agency are committing to the development of GIS/MIS to beef up their respective capability to plan for and implement the best action plan attainable. However, it is needful of an integrative and coordinative direction so that the different initiatives can be unified to produce one integrated GIS/MIS in the most efficient manner.
- ❑ *Research and development* through the WMIC-WRDP an integrated research and development project was launched in 2002 in response to the need of generating empirical information base that can be used for improving the management of Kaliwa Watershed in particular and enhancing the management of other watersheds in general. Prior to this project, the Philippine Council for Agriculture, Forestry, Environment, Resources Research and Development (PCARRD) in collaboration with University of Georgia and Texas A & M embarked on an integrated watershed research and development project in Claveria and Lantapan, Bukidnon. Several other related research and development projects were also initiated during the 1990's and are documented by Cruz et al. (2001). The immediate challenge is how to sustain the initial gains of the various research projects in Kaliwa Watershed, in Bukidnon and elsewhere. Ultimately, there is a need to maintain a network of experimental watersheds across the country for the purpose of generating on a sustained basis.

2.1.1.3.3 Technology

- ❑ *Technology development and demonstration* on soil and water conservation are continuing concern of several CPEUs and of the Institute of Agroforestry in UP Los Baños. There is a need to enhance the development of technologies that capitalizes on traditional knowledge and practices to increase acceptability and adoptability of new technologies. As far as possible technology development and demonstration need to be integrated with the network of experimental watersheds.
- ❑ *Biodiversity conservation technology* especially for production forests are currently being tested in one of the remaining TLA concession areas. Reduced impact logging and improved land use planning procedures are some of the measures that are being pilot tested.
- ❑ *Watershed resource valuation and pricing schemes* are continuously being studied and developed in several watersheds by several institutions. The major challenge to the implementation of valuation and pricing scheme for watershed resources that capture more effectively the full cost of making the resources available to the users is how to make the scheme acceptable to policy makers and users at large who firmly believe that most watershed resources like water are free goods.
- ❑ *Guidelines for watershed management planning* exist and will need to be disseminated widely in order to be useful. Once the MPFD is revised, these planning guidelines will need to be reviewed and integrated with other materials to provide a more updated, comprehensive and straightforward references for watershed planning and implementation at various levels.

2.1.2 The Watershed Management Component of 1990 MPFD

2.1.2.1 Major Issues in Watershed Management Addressed

The major issues that were supposed to be addressed by the watershed management component of the MPFD are as follows:

- Land use conflicts in many watershed areas
- Absence of secure land tenure
- The need to rationalize the rehabilitation of vast denuded watershed areas
- The need to broaden the base of watershed management actors and players
- The need to protect the upland portion of the watershed from occupation of migrants from the lowlands
- The need to improve the scheme of devolving administration and management of watersheds or portions of watersheds to other government agencies

2.1.2.2 Goals and Objectives

The goal is to have environmentally sound and sustainable land use for both tangible and intangible benefits. The objectives include:

- Isolation of the effects of poor land use
- Elimination of environmentally destructive land use practices
- Enhanced productivity of upland watershed resources
- Improved security of the forest reserves

2.1.2.3 Strategies

Soil erosion control and stabilization measures are the strategies identified to isolate the effects of poor land use. The strategy to eliminate destructive land use practices include:

- Strengthening and enforcement of existing regulations
- Resettlement of upland occupants
- Improved incentive system
- Improved monitoring of land use and encroachment

For enhancing the productivity of watershed resources, the following strategies were proposed:

- Prioritizing the areas that require immediate rehabilitation and special management attention for the conservation of soil and water and other key resources
- Improved planning

The strategy for improving the security of the watershed forest reserves involves the expansion of the base of watershed beneficiaries from the local up to the national level as a way of mobilizing people who are strongly motivated to invest in the protection of the watershed resources.

2.1.2.4 Programs and Targets

The watershed components of the MPFD are classified into either primary or supportive development component. The primary development components contribute directly to the attainment of the objectives while the supportive development components are directed to the development of the human and institutional capability to implement the planned projects.

The primary development components are as follows:

- Watershed management
- Assisted natural regeneration
- Range management
- Soil conservation in forestry operations

Among the supportive development components are as follows:

- Policy strengthening
- Institutional and manpower development
- Interagency cooperation
- Research support component

2.1.3 Assessment of the Responsiveness of the MPFD to the Current Conditions

The watershed component of the MPFD contains several strategies and programs which are useful in watershed management. The effectiveness of the MPFD is however weakened by the inadequate integration of the key principles in watershed management in the primary and support programs identified in the master plan. This is aggravated by the absence of legal basis for the implementation of the MPFD that prevented the all out transformation of the MPFD programs into doable actions on the field level.

The focus of MPFD on the conservation of soil and water underscores its bias on the use of the watershed for supplying water for various uses. Such bias does not only bring about serious inefficiency in the use of watershed resources but also undermines the sustainability of water the very resource it seeks to

protect, by failing to protect other watershed resources like vegetation which are essential element in maintaining the stability of hydrologic processes.

The MPFD touches on the important roles that DPWH plays in soil and water conservation in watersheds. It also provides for the secure tenure for upland farmers in an effort to motivate them to adopt soil and water conservation technologies. It misses however to consider the vital need to engage the various watershed stakeholders aside from DPWH and the upland farmers in the whole range of key activities in watershed management. Specifically, the MPFD lacks adequate treatment on how it intends to instill among the stakeholders a lasting sense of belongingness in the community of actors and players who are mutually bound by common aspirations to realize the sustainability of watershed resources for the common good. Most importantly, the MPFD lacks articulation of the need for a mechanism by which the stakeholders will be encouraged to actively take part in watershed management.

2.2 Natural Forest Assessment

2.2.1 Introduction

The end of the previous millennium saw a number of significant efforts and attempts at rationalizing forest management and utilization in the country coupled with strong moves towards the conservation and even preservation of the remaining old growth forests in the Philippines. For instance, the DENR issued a number of regulations designed to enhance forest protection. In 1995, multi-sectoral forest protection committees were institutionalized in the DENR system by virtue of DAO 95-17 which was later amended by DAO 96-39. This move was further strengthened with the implementation of the Forest Protection Information System.

This period also saw the rise of quite a number of local government units, non-government organizations and other cause oriented individuals who became vigilant over the destruction of forest resources. Among the prominent programs initiated other than DENRs are as follows: a) Bantay Gubat of the City Government of Puerto Princesa, b) Kilusang Sagip Kalikasan (KSK) by the provincial government of Palawan, and, c). Bantay Bukid Brigade in Mt. Kanlaon, among others. With these efforts, administrative conflicts and problems exist on the coordination between and among them. For instance, there is no standard norm/protocol for making apprehensions of forest violators and the confiscation of illegally extracted forest resources as practiced by the different organizations and/or the various forest protection programs. While the DENR is represented in most of these programs, there is a felt need for it to take a more active leadership in such endeavors particularly in making its presence felt in the field.

2.2.2 Natural forest status

2.2.2.1 The Dipterocarp Forests

At the beginning of the Master Plan, the country's dipterocarp forests occupy an area of about 4.4 million hectares based on the consolidated RP-German and SPOT area statistics which were used by the MPFD. Of this total, 984,000 has were said to be virgin forests while the remaining 3.4 million hectares were residual in nature. Of this total, about 0.40 million ha are in national parks and other reserves which place the total of about 3.0 million hectares in production forests (MPFD, 1990). In 1997, the total area occupied by the dipterocarp forests was in the order of 3.5 million hectares of which 804,900 hectares are old growth and the remaining areas considered as residual forests (2.73 million hectares). Region 2 has the largest old growth (368,900 hectares) and residual dipterocarp forests (626,843 hectares) in the country. Among the issues

In the decade of implementation of the Master Plan, timber license agreements still remain to be the major instrument issued for the utilization of the dipterocarp forests of the land. In 1990, about 307,000 hectares of the virgin forests then were subject to TLAs while for the residual forests, it was estimated to be 1.18 million has. There were about 75 TLA holders responsible for such forest lands. In 1996, there were only 31 TLAs awarded covering 1.3 million hectares. Most of these TLAs were in Region 13 with a total forest area of 659,760 hectares.

The management of the country's dipterocarp forests continue to face challenges with the MPFD. One of these is the eventual phase out of the remaining TLAs as mandated by the 1987 constitution to be replaced by Timber Production Sharing Agreements (TPSAs) and small-scale utilization of forest resources. In 2002, there were only 7 or 8 TLAs remaining. As early as 1989, the DENR has started canceling TLAs who were found to be violating provisions of their agreements or whose performances were said to be wanting. The last of the TLAs will expire in 2011.

The silvicultural system for the Philippine dipterocarps underwent a number of innovations, all designed to increase the efficiency of logging operations and provide adequate protection to the forest resources. A number of policy issuances to this effect were made by the DENR to wit:

- Shift in logging from the old growth forests to the second growth forests (DAO 91-24)
- Annual Allowable Cut determination in the second growth forests (DAO 92-02)
- Ban on the use of high lead yarding systems in the dipterocarp forests (DAO 92-03)
- Annual allowable cut computation and the marking goal determination in the second growth dipterocarp forests (DAO 92-12)
- Regulations governing the establishment of buffer zones within forest lands (DAO-92-13)
- Conduct and submission of aerial photography by holders of TLA and the different programs and projects of DENR (DAO 92-17)
- Conduct of residual forest inventory in areas logged by active TLA holders within their operable second growth forests (DAO 93-28)
- Revised regulations governing the establishment and management of IFPs and management of residual natural forests for production purposes (DAO 93-60)
- Amending DAO 93-60 (DAO 93-68)
- Revised guidelines governing the issuance of certificate of origin of logs, timber, lumber and non-timber forest products (DAO 94-07)
- Guidelines governing the cutting, gathering and disposition of edible fruit-bearing trees (DAO 94-18)
- Revised general guidelines in the implementation of the sub-classification of forest lands and other alienable lands of the public domain (DAO 95-15)
- Adoption of the Log Control Monitoring System (DAO 96-04)
- Validity period of approved Integrated Annual Operations Plan (DAO 96-39)
- Conduct of TSI in residual forest areas covered by Community Forests Stewardship Agreements, Community Forest Lease Agreements, and Community Forest Management Agreements (MC 90-07)
- Prescribed DENR log marking procedures (MC 90-13)
- Clarifying the guidelines on TSI activities in dipterocarp forests (MC 90-16)
- Identification and demarcation of dipterocarp old growth forests (MC 91-14)
- Guidelines in the monitoring and evaluation of reforestation areas, enrichment planting and TSI by TLA holders (MC 92-01 and 02)
- Guidelines on the conduct and submission of aerial photography by holders of TLAs (MC 92-07)
- Submission of a medium term forest management plan for block I of the operable second growth forest and deferment of timber inventory in areas under blocks II and VI (MC 92-09)
- Prescribing guidelines in the verification of overlaps between the boundaries of forest lands and A&D lands (MC 92-14)
- Guidelines for the prosecution of illegal logging and related cases (MC 94-01)
- Implementing guidelines for the conversion of TLAs to IFMAs (DMC 94-21)
- Prescribed the no hauling of logs from virgin forests effective January 1, 1992 (MO 91-09)
- Prescribing guidelines for the re-evaluation of the result of the inventory and analysis of the timber resource data obtained within the second growth forest (block 1) of existing TLAs (MO 92-05)
- Adoption of revised procedures on the issuance of the Certificate of Origin forms (M 94-01)
- Creation and constitution of the National Federation of Multisectoral Forest Protection Committee (MO 95-04)
- Guidelines on the implementation of the Log Control and Monitoring System (MO 96-05)
- Guidelines on the protection and management of expired, cancelled and expiring TLAs (MO 97-05)

2.2.2.2 The Mangrove Forests

Estimate of total mangrove forests in the Philippines in 1988 stood at 139,725 hectares. Some ten years later (1997) this area was reduced to 112,400 hectares, down by 27,325 hectares (Table 2.7). In the latest estimate provided by the DENR, Region 09 which include ARMM has the largest block of mangrove forest (49,500 hectares), followed by Region 4 with 27,600 hectares. Regions 1 and 3 have the smallest mangrove forests at 100 hectares each.

Table 2.7. Mangrove areas of the Philippines in 1988 and 1997.

REGION	1988		1997	
	Area (ha)	%	Area (ha)	%
1	200	0.1	100	0.08
2	3,400	2.4	3,700	3.29
3	500	0.4	100	0.08
4	51,000	36.5	27,600	24.50
5	9,900	7.1	500	0.44
6	2,825	2.0	2,500	2.22
7	9,650	6.9	2,100	1.87
8	24,850	17.8	500	0.44
9	19,300	13.8	49,500	44.03
10	8,600	6.2	19,900	17.70
11	7,100	5.1	5,700	5.07
12	2,400	1.7	200	0.17
TOTAL	139,725	100.0	112,400	100.00

In 1992, Republic Act No. 7586 was passed by Congress of the Philippines which mandated the establishment and management of the National Integrated Protected Areas System (NIPAS). This promulgation provided teeth to the strategy of preserving the remaining mangrove forests in the country as embodied in the Master Plan of 1990. Consequently, a number of high biodiversity mangrove forests in the country were to become part of the protected areas system in the country as part of protected landscapes/seascapes, wildlife sanctuary, nature reserves, etc.

The enactment of RA No. 7586 also gave way to a number of Presidential Proclamations declaring certain parts of the Philippine archipelago as marine protected areas. For instance, there was Proclamation No. 431 dated 31 July 1994 which declared the coastal area and islands within Pujada Bay in the Municipality of Mati, Davao Oriental as a protected landscape/seascape. The destruction of the coastal and the marine ecosystems including the mangroves, seagrass, and coral reefs or the conduct of activities that could destroy or disturb those ecosystems and the resources in them were prohibited. Another was Proclamation No. 447, series of 1994 designating Palau Island and surrounding islets and marine waters in the Municipality of Sta. Ana, Cagayan as a marine protected area. The same prohibitions as contained in Proclamation No. 431 applies in this area. Very recently, there were Presidential Proclamation No. 271 (23 April 2000) for the Great and Little Sta. Cruz Islands Protected Landscape and Seascape in Zamboanga City; Presidential Proclamation No. 272 (23 April 2000) declaring the Chico Mangrove Wilderness in Cawayan, Masbate as the Chico Island Wildlife Sanctuary; the Agoo-Damortis Protected Landscape and Seascape by virtue of Presidential Proclamation No. 277 (23 April 2000); Murcielagos Island as a Protected Landscape and Seascape with Presidential Proclamation No. 281 (23 April 2000); and the Albuquerque-Loay-Loboc mangrove swamp into a Protected Landscape and Seascape. On May 31, 2000, several days after the issuance of the above proclamations, there were Presidential Proclamations No. 316, 317 and 319 establishing Mabini Protected Landscape and Seascape, the Naro Island Wildlife Sanctuary, and the Bongsalay Natural Park respectively.

The start of the 1990s saw the issuance of new regulations defining access, limitations and conservation of mangrove forests in the country. DAO No. 15, Series of 1990 banned the cutting or use of mangrove resources in any form in the remaining mangrove forests that are not covered by existing Fishpond Lease Agreements (FLAs) and areas outside plantations. It also disallowed the granting and/or renewal of mangrove timber license and/or permit of any kind that authorizes the cutting including the debarking of the trees within the mangrove forests for commercial purposes in areas outside FLAs and mangrove plantations. Furthermore, this AO also banned the conversion of thickly vegetated mangrove areas into fishponds.

Plantation development, however, is encouraged in denuded or sparsely vegetated mangrove forests and A & D lands through an approved permit. The same order gives privilege to plantation developers to cut/harvest the planted trees within their jurisdiction, whether such is intended either for personal or commercial purposes as an incentive. DENR Memorandum Circular No. 5, Series of 1990 prescribed guidelines in the cutting of mangrove trees within approved FLA areas. With an approved permit issued by the DENR, trees to be cut are turned over to the DENR for disposition through public bidding. No cutting however is allowed if the area has 10% or more mangrove canopy cover and/or is capable of natural regeneration. FLA holder is also required to plant an area with mangrove species equivalent to the aggregate size where mangroves were clearcut in the FLA area.

These facilities which allow the harvesting and cutting of mangrove trees however, were nullified with the enactment by Congress of Republic Act No. 7161 which has as one of its significant provisions the banning of the cutting of all mangrove species. As the RA did not explicitly exempted planted mangroves from the ban, even the plantings covered in DAO No. 15 cannot be harvested. RA 7161, unless amended by Congress, is construed as a disincentive policy which may discourage coastal communities from engaging in worthy mangrove plantation development ventures.

Further efforts were also exerted towards rationalizing the development and utilization of mangrove forest resources in the country. DAO No. 2000-57 prescribed guidelines governing the implementation of mangrove subprojects under the Forestry Sector Project. A significant provision is the banning of the cutting of mangrove trees within the subproject and adjacent mangrove sites. The AO, however, allowed the gathering and/or harvesting of non-timber mangrove products on a sustainable basis with duly approved Resource Utilization Permit (RUP)

Among the issues on mangroves identified are as follows:

- Continued degradation and further threats of destruction

Despite the significant strides made in the protection of the remaining mangrove forests of the country, there still exist a number of problems that pose serious threat to the integrity of such forests. For instance, the boundary delineation of mangrove protection forests is found to be still wanting in most areas in the country. Forest protection measures, and the formulation and implementation of comprehensive plans for the management of the same cannot be initiated unless there is a definite boundary that is marked on the ground for these mangrove forests.

The continuing degradation of the mangrove forests in the country can also be attributed to the insufficient or complete lack of awareness on the importance of marine, coastal and mangrove ecosystems on the side of the public, most importantly, in the communities within or in the immediate periphery of mangrove forests in the country. In some areas, such an awareness may have been created already and is in fact observed to be increasing. But such areas are more of exceptions rather than the rule at the moment. A more vigorous IEC is therefore wanting.

- Overlapping functions and conflicting policies and legislation of different government agencies and LGUs

This is an issue that may have some bearing on the preceding one discussed. The problem maybe more pronounced between the DENR and local government units. The latter oftentimes allow more opening up of mangrove forests for development initiatives and other projects that will generate income for them. On the other hand, the former is expected to be more circumspect in allowing the conversion of mangrove forests into some other uses. For instance, since the recent implementation of the nautical highway system in the country by the government, the DENR has received applications and/or requests for permits to cut mangrove forests in order to expand port facilities in a number of locations in the Philippines.

- Appropriateness of the existing CBFMA Agreement for mangrove forests

The CBFMA is a generic agreement that has been applied across the country in all forest types. It is, however, first implemented in the uplands. The premises with which the instrument has been developed, and the underlying principles assumed in the operationalization of the Agreement as largely based on conditions in the upland regions of the country. Mangrove forests do have characteristics that are unique or otherwise different from those conditions observed in the uplands. The Community Based Resource Management Agreement for Protected Areas in mangrove forests has been patterned after the generic CBFMA. Thus, such instrument may have failed to recognize the unique conditions that are found in the mangroves which also defines the distinct relationship or interactions between families/communities and the forest/forest resources.

- Absence of policy to address existence of fully developed and productive illegal fishponds in mangrove timber lands and protected areas

In Region 7, there has been reports of fully developed and productive large fishpond areas converted from mangrove forests without permits or any form of authorization from the DENR. Apparently these fishponds have been in operation for quite sometime already and the DENR nor the LGU units concerned have not taken any move to demolish such or even issue orders for these establishments to cease from operating. It was also made evident during the consultation done in Cebu that the regional DENR units are in a quandary as to what to do in such cases as there are no firm policies in place to address such.

- Institutional constraints in the management and conservation of mangrove forests

Local government units entrusted with the management and conservation of certain mangrove and estuarine ecosystems in the country often have inadequate technical personnel to effectively and efficiently carry out the technical rigors of the job. This situation oftentimes results to the haphazard implementation of interventions which are usually stop gap measures only and are not meant to insure the long term sustainable management of the forests. There is clearly a need to beef up the manpower complement of the LGUs tasked with the management of mangrove forests or the need to provide training for such personnel.

It is also the perception that institutional collaboration in mangrove and coastal resources management is rather weak in the country. This problem is also aggravated by the differences in management priorities of agencies, organizations and LGUs with regards to the mangrove forests that fall under their jurisdiction. This concern provides evidence to the perception of relative unawareness of the 1990 MPFD or the utter disregard of the same in implementing development and/or conservation initiatives in the mangrove forests. The MPFD is supposed to provide direction to such endeavor. This means that the prioritization of activities should have been guided by the provisions of the MPFD.

2.2.2.3 Pine forests

In 1981, total pine forest coverage was estimated at 246,593 hectares. Of this area, some 243,616 hectares or 98.8% were found in public forest lands while the remaining area (2,977 hectares or 1.2%) were in A & D lands. The Master Plan also cited 1987 figures as 238,800 hectares total divided into 129,600 hectares of closed stands and 109,200 hectares of open forest. During the same year, about 2,100 hectares of the open pine forest were found in certified A & D lands. In 1997, the area covered by the pine forests was down to 227,900 hectares. Of these, 123,900 were close canopy forests while the remaining 104,000 were open canopy forests (Table 2.8). In a span of 16 years, pine forests were reduced by 18,693 hectares.

Table 2.8. Pine forests of the Philippines in 1981 and 1997.

Region/Forest	1981			1997		
	Closed	Open	Total	Closed	Open	Total
Region 1 *	129,203	101,231	230,434	90,300	84,700	175,000
Region 2	3,886	9,806	13,692	33,200	18,100	51,300
Region 3	686	882	1,568	400	500	900
Region 4	-	899	899	-	700	700
TOTAL	133,775	112,818	246,593	123,900	104,000	227,900

*Includes CAR

DAO No. 18, Series of 1995 sets the guidelines for the formulation of policies for the sustainable development and management of the pine forest areas and the conservation of biodiversity. The AO sought to operationalize the pertinent provisions on the management of the pine forests as embodied in the MPFD and as emphasized in the Regional Forestry Master Plans of CAR, Regions 1 and 2. The same also established guidelines for the conduct of research within the pine forests of the country. The guidelines allow for timber extraction within the research areas located in the residual pine forests but emphasized that such should be done appropriately following the prescriptions of the seed tree method.

Among the issues identified for pine forests are as follows:

- Forest Fires

Forest fire remains to be one of the destructive forces that constrain the natural regeneration and normal growth of the pine trees in the Cordilleras. This problem is even aggravated by the abnormally long dry spells that have seemingly been occurring frequently due to the El Niño Southern Oscillation phenomenon. Scientific studies have established the prolific nature of reproduction of Benguet pine and the excellent germination of seeds in natural stands. However, such successful natural regeneration of Benguet pine is often thwarted by frequent fires. There is clearly a felt need for a vigorous program on forest fire control and management in the Benguet pine forests in the Cordilleras.

Fire is also a potent silvicultural tool in the form of prescribed burning, particularly during site preparation activities in artificial pine regeneration undertakings. This approach however creates a lot of smoke which contravenes the provisions of the Clean Air Act. Thus, the utility of prescribed burning in the area is highly limited or curtailed totally.

- Pine forest utilization

The promulgation which bans the cutting of timber trees on areas higher than 1000 meters asl and on areas with more than 75% slope had serious ramifications in the Benguet pine production forests in the region. Other than heavily curtailing the economic utilization of the species, this policy initially hampered the conduct of studies that aimed to refine or improve the silvicultural system for the Benguet pine forests of the country. However, with the issuance of DAO 18, Series of 1995, reproduction cuttings were allowed if done within the purview of a research undertaking.

This cutting restriction also put a stop to the utilization of certain species which are part of the culture and tradition among the people in the Cordilleras. In the hinterlands in the Cordilleras, the people has by nature been using certain species in a regulated manner for domestic purposes only. Such utilization is by no means destructive. The ban on cutting has seriously curtailed such utilization practices which are very much part of the Cordilleran culture.

The same policy that banned the harvesting and/or cutting of timber also seriously impaired the provisions of DAO 09, Series of 1995 that regulates forest tree seed production, collection and disposition. This AO mandated the establishment and operation of Seed Production Areas all over the country to become sources of seeds for the various reforestation programs of the government. One critical component of the Seed Production Areas is the conduct of roguing operations to remove phenotypically inferior trees from the candidate site. In the Cordilleras, this operation is deemed not tenable because of the existing ban. Potential Seed Production Areas in the region are thus left to become, at best, seed sources where collection of seeds can be done from the elite trees within the area.

The establishment of the Seed Production Areas, however, can be viewed as a development undertaking as such requires rigorous observation of scientific methods in the selection of mother trees and the conduct of operations leading to the production of superior seeds for artificial forest regeneration purposes. It may thus be possible to look at SPA establishment as a research activity. If this is so, roguing operations maybe allowed as provided for in DAO 18, Series of 1995.

- Silvipastoral practices in the pine forests

In certain areas in the Cordilleras, silvipastoral systems are practiced. Cattles are allowed to freely graze under existing stands of Benguet pine. The virtues of such production systems have fairly been established over the years. Nonetheless, what is observed to be destructive in the system is the burning of the grasses to stimulate excellent grass regeneration which is actually a common practice in the area. Those who do this practice do not adhere to the tenets of prescribed or controlled burning. What results oftentimes is that the fire gets out of control and a raging forest fire ensues.

- Ancestral Domains

The enactment of Republic Act No. 8371 known as the Indigenous Peoples' Rights Act (IPRA Law) created profound implications on the development and management of pine and mossy forests in the country. Ancestral domain was aptly defined and their coverage enunciated in the law. The law provides bias towards the legitimate claims of the indigenous peoples (IPs) and their rightful claims to their ancestral domains. The law contains certain provisions that define the extent of development and utilization of natural resources within the ancestral domains. For instance, it states that the IPs shall have priority rights and not necessarily exclusive rights, in the harvesting, extraction, development or exploitation of any natural resources within the ancestral domains. Tenurial instruments made possible under the IPRA Law include the Certificate of Ancestral Domain Title (CADT), or the Certificate of Ancestral Land Title (CALT).

The same law created also the National Commission for Indigenous Peoples (NCIP). To date, conflicts between the DENR and the NCIP over jurisdiction and responsibilities have been noted on several occasions already. Noted also were conflicts and tensions between and among holders of land tenure and holders of natural resource utilization permits or agreements. The sustainable development and management of the country's pine forests are arguably threatened by these conflicts of interests and jurisdictions.

- Lack of concern on the genetic resources of pines

As a species that is native to the Philippines, Benguet pine invariably possesses a broad range of genetic variability represented by different provenances of the species. At the moment, there are no firm efforts aimed at preserving such genetic diversity. The continuous utilization of Benguet pine trees even with the ban in force invariably means that we are losing valuable germplasm of the species. The genetic resource conservation area established for mangroves in Pagbilao, Quezon can very well be replicated for the Benguet pine species.

2.2.3 1990 MPFD Provisions

2.2.3.1 Dipterocarp Forests

Under 1990 MPFD the goal is to bring, in a practical and feasible manner, the dipterocarp forest toward a condition of sustainable yield with accompanying environmental stability for the benefit of a greater proportion of the population, in ways that are economically beneficial, environmentally sound, and politically, socially, and culturally acceptable. Among the specific objectives are as follows:

- Set aside a permanent forest estate
- Ensure the long term security of the forest estate
- Enhance forest productivity
- Improve regional, provincial, and local economic stability, and increase social equity and employment
- Enhance and maintain environmental stability
- Conserve biodiversity
- Protect and develop cultural communities

Among the strategies identified are as follows:

- Establishing a permanent forest estate
- Forest protection
- Enhancing forest productivity
- Improving regional, provincial, and local economic stability and increasing social equity and employment

2.2.3.2 Mangrove Forests

The main goal is for the mangrove resources of the country are developed and managed on sustainable basis for economic and environmental benefits of the people, Among the specific objectives are as follows:

- Preservation of the remaining mangrove forests, bringing them under effective management and enhancing their biological productivity
- Preservation of parts of the remaining mangrove areas for protection of the diversity of plant and animal life within the mangrove ecosystem
- Expansion of the mangrove forest area through reforestation and plantation development
- Effecting equitable access to mangrove areas on multiple-use – multiple user basis
- Provision of adequate supply of mangrove products and services to various end-users while at the same time conserving and expanding the resources
- Promotion of economic development in areas around mangrove resources, especially in ways that enhance mangrove protection and management
- Strengthening of institutional arrangements for ensuring sustained management of mangrove resources

Among the proposed strategies are as follows:

- Protection and management of remaining mangroves
- Expansion of the mangrove resources
- Equitable access to mangrove resources

- Promotion of additional/alternative sources of livelihood for mangrove users
- Institutionalization of mangrove resources development

2.2.3.3 Pine and Mossy Forests

The main goal is to bring the pine forests under sustainable management and development for the economic and environmental benefits of the people. Among the specific objectives are as follows:

- Preservation and conservation of the pine forests in the Cordilleras and the remaining Mindoro pine forests in Zambales and Occidental Mindoro
- Placing under sustainable management the remaining natural pine forests and to develop additional areas
- Effecting equitable access to the pine forest resources, especially to the communities within the pine forest areas
- Provision of adequate supply of goods and services from the pine forests to various end-users while at the same time conserving the resources
- Promotion of economic development in the pine forest areas
- Strengthening institutional arrangements for ensuring sustained management of pine forests

Among the strategies for pine forests are as follows:

- Preservation and conservation of pine forests
- Sustainable management of production forest and development of additional pine forests
- Equitable access to the management and use of pine forest resources
- Promotion of economic development in the rural communities
- Institutionalization of pine forest development

2.2.4 Assessment Of Performance/Effectiveness of the MPFD (1990-2002)

The prevailing sentiment indicates that the MPFD for the last ten years have failed in its implementation. However, its not that the various strategies called for in the attainment of the goals and objectives of the Master Plan have not been implemented. The past ten years saw policy issuances by the DENR and the conduct of certain development and conservation initiatives which are clearly parallel with the provisions of the Master Plan. These moves were made with little conscious awareness or none at all of the Master Plan and its various stipulations. To put it in another way, there was no systematic and directed implementation of the provisions of the Master Plan in the national office and the regional units of the DENR. The implementation of the Master Plan leaves much to be desired yet during the initial ten years.

There were significant efforts made in the past but it is difficult to surmise whether such were made with the purpose of attaining the goals and objectives set forth in the Master Plan. The Master Plan was made to establish and chart the direction with which development initiatives in the forestry sector will have to undertake in the future. It was able to paint a scenario of the future of forestry in the Philippines and the dire consequences that would result unless the stipulations raised by it are nurtured and implemented.

2.2.4.1 The MPFD and the Dipterocarp Forests

Events during the past ten years saw the government responding to the call for a more sustainable management of the Philippine forests in the coming years. To ensure the long term security of the dipterocarp forests in the country and to enhance its productivity, efforts were initiated to improve the implementation of the Philippine Selective Logging System and enhance the productivity and integrity of the dipterocarp production forests in the country. The conduct of TSI was enforced in residual forests covered by Community Forest Lease Agreements, Community Forest Stewardship Agreements, and Community Forest Management Agreements as far back as 1990. Log marking procedures were defined and prescribed. The shift in logging operations from old growth to secondary forests was enforced, a move

specifically designed to guarantee the integrity of the remaining old growth dipterocarp forests in the Philippines. Improvements were made in the computation of the marking goal and the annual allowable cut. Operational efficiency was the subject of several DENR promulgations and issuances which include the conduct of aerial photography by holders of TLAs, clarification of the validity period of the Integrated Annual Operations Plan and others as cited earlier in this report. The implementation of the Log Control Monitoring System which is now being perfected in the CARAGA region was definitely a move towards further protecting the forests and rationalizing the regulation of cutting and the movement of timber products from the cutting area to the sawmills or intended market of the logs. Efforts towards intensified and highly participatory forest programs have been discussed earlier in this report.

The past ten years also gave indications of the increasing emphasis on the practice of sustainable forest management system. A ban on harvesting has been made on areas higher than 1000 meters and in areas with slope of more than 50%. The NIPAS Act did that and also formed the basis for the designation of such areas in more than 1000 m and with more than 50% slope as protected areas.

Forest inventory continues to be a vital component of the Integrated Annual Operations Plan of TLAs. The high lead yarding system was discouraged in favor of methods which tend to cause less damage to the soil and the natural regenerations. The experience in SUDECOR opened a new approach to harvesting residual forests where the forest inventory prior to the cutting operations can incorporate concerns on biodiversity. The approach makes possible the generation of baseline information on the status of biodiversity in the area. Obviously, logging impacts on biodiversity can be assessed too.

The RP-German National Forest Inventory Project done in 1984 to 1988 provide the basis for the Master Plan. Currently, the ongoing Forest Resource Assessment Project will seek to provide the statistics which will serve as the backbone of a more detailed forest management planning for the different forest management units of the country. The move to transform the sampling plots into long term ecological research/monitoring plots augurs well for the sustainable management of the forest resources of the Philippines.

There is also now the Sustainable Forest Management Bill still awaiting passage in the Congress of the Philippines. The Bill seeks to provide clear direction to the management of our forests. The Bill has gone through so many congresses already and numerous deliberations on the floor.

On the dark side however, is the dismal failure in the setting aside of permanent natural forest estate which is one of the most significant strategy spelled out in the Master Plan. The DENR provided some funds which started the delineation of the boundary and its demarcation through monumenting of the Mt. Makiling Forest Reserve. It was indeed a pioneering effort but was not sustained because of lack of funds. The boundary was delineated but only a portion of the boundary was monumented.

Researches on the silviculture and management of the dipterocarp forests in the Philippines for the past ten years have not achieved much in terms of providing for the sustainable management of the same. A number of researches have been undertaken to solve the problem of propagule supply for the artificial regeneration of the dipterocarps. These researches focused on the macropropagation aspects to which certain species have favorably responded to rooting with the use of appropriate rooting hormones, rooting media and rooting environment particularly relative humidity, air temperature and moisture content of the medium. No research activities were done on natural silvicultural systems for the dipterocarps.

2.2.4.2 The MPFD and the Mangrove Forests

There were also significant strides made in the mangrove forest sector that have relevance to the Master Plan. Foremost was the expansion of the Community Based Forest Management Program to include the mangrove forests of the country in its coverage. This has been identified in the Master Plan as a viable means of establishing effective mangrove resource management in the country.

The Coastal Environment Program (CEP) of the DENR was established in April 1993 with the primary task of coordinating all programs, projects and activities pertinent to the management of coastal ecosystems in the country. The program is to be run by the Coastal Environment Program Coordinating Office (CEPCO). Five components comprise the program which include the following: (a) coastal habitats and biodiversity; (b) endangered species; (c) coastal industries and pollution; (d) resources inventory and assessment activities, and (e) research and special projects. The CEPCO is the forerunner of the present Coastal Marine Management Office of the DENR which has been described earlier in this report.

The establishment of mangrove permanent forest estates took the form of protected seascapes and mangrove wilderness areas which were created by virtue of Presidential Proclamations. Some of these have been mentioned earlier. The proclamations specifically contained the coordinates that define the boundaries of the said protected areas. However, the establishment of monuments to define the boundaries on the ground remain to be undertaken.

Mangrove reforestation projects were established in CBMFM areas and in a few reforestation projects by the DENR. To date there are no extensive plantations of Nipa whose establishment was identified as one of the key strategy of the development of mangrove forest resources in the country. There were also a few micro- and cottage-type industries established together with the CBMFM projects in various locations in the country.

2.2.4.3 The MPFD and the Pine Forests

As mentioned earlier in this report, DAO NO. 18, Series of 1995 was promulgated expressly to carry out the provisions of the Master Plan for pine forest development in the country. A Regional Master Plan for Forestry Development was also formulated taking of from the MPFD.

Community based pine forest management also became a distinct component of CBFM in the Philippines.

The ERDS-CAR also carried out researches vigorously. The research community at CAR lamented the provision of the NIPAS Act that banned the harvesting of trees in areas higher than 1000 meters. Accordingly, this provision effectively halted all researches dealing with regeneration of Benguet pine forests. The continuous assessment of the efficiency and effectiveness of the Seed Tree Method of reproducing Benguet pine was put to a compromise because of this prohibition. There were a number of researches that sought to find cost effective methods of revegetating and/or rehabilitating mine tailings pond as well as those ravaged by the open pit mining. Studies related to biodiversity in the pine forest and mossy forest ecosystems were also carried out.

2.3 Plantation Assessment

2.3.1 Introduction

Tree plantations may reduce the problem of deforestation. In addition, tree plantation restore degraded land, fight climate change, improve local livelihoods, return good profits, create employment and bolster national economies (ITTO, 2001). According to FAO data, there are more than 180 million hectares of tree plantations globally and about 4.5 million hectares of plantations are being established each year. In the Philippines, about 540,000 hectares of forest plantation were established from Industrial Forest Management Agreement/Industrial Tree Plantation Lease Agreement (FMB-DENR, 2000). Whether or not these plantations are in good shape, it remains to be seen. However, many are called “paper” plantations not because that is their eventual end-use but because it’s the only place they exist; in the field they have died of (a combination of) drought, sabotage, pest attacked, fire or some other form of neglect (ITTO, 2001).

The FMB believes that 12 million hectares or about 40 percent of total land area should be ideally being forest cover. If the existing 5.4 million hectares is subtracted from those 12 million hectares, some 6.6 million hectares still need to be reforested/planted. Of these 6.6 million hectares to be reforested/planted, the National Forestation Program (NFP) has targeted 1.4 million hectares by the end of the year 2000. Of the national target, 700,000 hectares are to be industrial tree plantations, of which 490,000 hectares (70 percent) are targeted for development by the private sector; 350,000 hectares by timber licensees (TLA) through IFMA and 140,000 hectares by ITP/IFMA and tree farm lessees.

2.3.2 Evolution and Brief History of Reforestation in the Philippines

Reforestation is the bringing in of crop cover, usually arborescent plants, in once vegetation-rich but now vegetation –bereft lands, include ecological reforestation and economic reforestation or their combination. Reforestation also includes new planting, assisted natural regeneration and enrichment planting. Reforestation in the Philippines started in 1910 with the opening of the Forest School at Los Banos, Laguna. Through Act No. 2649 in 1916, the first reforestation project was opened outside Laguna, in friar lands located in Talisay-Minglanilla in Cebu with a modest P10, 000 was released. Later, other reforestation projects were opened (e.g. Caniaw, Nasiping, Paraiso, etc.) To ensure a permanent source of fund for reforestation, the new Republic government in 1944, through RA 115, imposed a reforestation fee of 50 centavos and 40 centavos on every cubic meter cut in the public forest on the 1st and 2nd group and 3rd and 4th group of species, respectively. In 1960, the Reforestation Administration was created under RA No. 2706. It attained an average rate of 10,000 hectares planted annually and even reached 35,400 hectares in 1963. Reforestation projects increased in number from 57 in 1960 to 91 in 1972 with a total of 182,000 hectares planted. In 1972, the Reforestation Administration was integrated with the Bureau of Forestry, Parks and Wildlife Office and Southern Cebu Reforestation Project under PD No. 1 and LOI No. 3 into Bureau of Forest Development (BFD).

From 1966 onward reforestation became a joint undertaking by the government through its regular and foreign assisted funding; the industrial tree plantation (later the IFMA), tree farm and agro-forestry schemes and the upland people through socially-oriented programs in which reforestation is a component such as the Integrate Social Forestry (ISF), the Community Forest Stewardship Management Agreement (CFSMA), and the Community Forest Management Agreement (CFMA). Project under PD No. 1 and Letter of Instructions No. 3 into Bureau of Forest Development

As of 1987, there were 135 regular reforestation projects under the jurisdiction of the then Bureau of Forest Development (BFD) throughout the Philippines with an aggregate area of about 1,055,000 hectares. Of these, about 263,000 hectares were already planted as of March 1986 (BFD, 1989).

The Program for Forest Ecosystem Management (PROFEM) that was launched in 1976 required the private sector including timber licensees, industrial tree farm leases, tree farmers, and the citizenry to actively participate in past reforestation programs. The efforts of both government and private sector according to records increased reforestation areas to about 560,000 hectares. However, these areas were not monitored and evaluated, hence, detailed important information about these plantations are not known or recorded particularly on species composition, ages, growth and volume?

Also, past reforestation programs before 1960 and from 1960 to 1987 were beset by a number of problems such as low plantation accomplishment, low survival rate, acute lack of funds for administrative, technical and infrastructure support and unclear direction. Furthermore, many reforestation projects have been damaged due to forest fires, pest and diseases and other factors.

*The main objective of past reforestation programs/activities before 1987 was unclear and focused only on watershed rehabilitation and protection. Areas reforested were both for protection and production purposes. There was no distinction between **protection** and **production forest**. By and large, past reforestation efforts before 1990 were considered a "total failure".*

2.3.3 Assessment Performance of Reforestation

Alcala (1997) in his paper presented during the International Conference on Reforestation with Philippine Species for Biodiversity Protection and Economic Progress reported in chronological order the performance of the government in reforestation from 1930's to 1997, as follows:

Way back in the 1930's, about 545,000 hectares of critical forestlands as needing immediate reforestation. However, of the modest accomplishments of 28,000 hectares about 85% (23,800) were destroyed during the war.

In the 1940's there were about 5 million hectares of open, denuded, brushland and grasslands; 2 million hectares apportioned for reforestation and 2 million hectares for agriculture and pasture. It was computed that at the rate of 50,000 hectares a year, we may be able to reforest 2 million hectares in 40 years (then by 1980). Acknowledging the importance of reforestation, RA No. 115 was legislated as early as 1947 in order to have permanent source of fund for reforestation. Furthermore, in 1960 under RA 2760 a permanent agency in Reforestation Administration under the DENR to give direction to pursuance of vigorous reforestation.

An average of 10,000 hectares a year reforestation accomplishment by the Reforestation Administration was far from the target of 50,000 hectares a year. However, during its short life ending in 1972, accordingly the agency was able to reforest a total area of about 182,000 hectares (for 12 years).

From 1972 – 1986 (Martial Law Regime of Pres. F. E. Marcos), accordingly, the government has reforested a "better-than-before" rate at 27,000 hectares per year by the government and 24,000 hectares per year of reforestation by the non-government or private sector primarily the TLA-holders.

Arithmetically, by the end of 1985, the total area reforested should have been 780,000 hectares.

For the first three years (1986-1988), the Aquino Administration, the annual reforestation rate by the government was 28,000 and for the next three years (1989-1991), because of the ADB and OECF Japan loans, the annual rate increased to 105,000 hectares while the private sector achieved a yearly rate of 28,000 hectares.

Thereafter, up to 1995, the first three years of the Ramos government, annual reforestation rate by the government diminished to 17,500 hectares because of the exhaustion of the foreign funds, while the private sectors at 26,000 hectares.

Again, arithmetically it can be noted that by the end of 1995, about 1.5 million hectares were reforested, exclusive of the plantings done by the communities.

According to the MPFD (1990), up to 1987, the reforestation accomplishment totalled 847,000 hectares (587,000 hectares by the government and 260,000 hectares by the private sector). Indeed if we added the reforestation achieved in a short period of 8 years after 1987, which was close at 710,000 hectares to all the previous years of reforestation efforts, the same figures of about 1.5 million hectares of lands reforested would be achieved.

The area reforested by the government and private sector is presented in Table 1.2. Little wonder then that reforestation/tree planting is proving to be a popular pastime. If one looks closely the 2001 Statistics of the DENR/FMB about 1.5 million hectares have been established during the last 60 years. Whether these plantations are still there and in good shape or not remains to be proven. Many of these plantations are not in good shape. Some of these plantations are called "paper" plantations not because that is their eventual end-use but because it's the only place they exist; in the field they have died of (a combination of) drought, sabotage, pest attacked, fire or some other form of neglect.

2.3.4 Relevant Laws, Rules and Regulations

- Presidential Decree (PD) 705 dated May 19, 1975, (Revised Forestry Code of the Philippines, as amended by PD 1159).

Provision of PD 705, as amended by PD 1159 defines the basic policy of Government on the establishment, development, and maintenance of forest tree plantations. Guidelines governing the establishment and development of industrial tree plantation (ITP), tree farms, and agroforestry farms are provided in order to attain this purpose. In this context, ITP is defined "as any forestland extensively planted to tree crops primarily to supply raw material requirements of existing or proposed wood processing plants and related industries". Tree farms, "refers to any small tract of land purposely planted to tree crops", while agroforestry is defined "as the sustainable management of land which increases overall production, combines agricultural crops and forest trees and /or animals simultaneously or sequentially, and applies management practices which are compatible with the cultural patterns of the local population".

Section 33 of PD 705 defines lands to be reforested. The areas shall be reforested and covered with suitable and sufficient trees as follows:

- Bare or grass-covered tracts of forestlands;
 - Brushlands or tract of forestland generally covered with brush which need development;
 - Open tracts of forestlands interspersed with patches of forest;
 - Denuded or inadequately-timbered areas proclaimed by the President as forest reserves and reservations as critical watersheds, national parks, game refuge, bird sanctuaries, national shrine, national historic sites;
 - Inadequately stocked forestlands within forest concessions;
 - Portions of areas covered by pasture leases or permits needing immediate reforestation; and
 - Riverbanks, easements, road right-of-ways, deltas, swamps, former riverbeds and beaches.
- Executive Order No. 725 dated September 9, 1981.

Executive Order No. 725 was promulgated to facilitate the establishment of ITP to facilitate the country's reforestation efforts and promote ecological balance and adequate wood supply for the needs of the country. Section 10 of this EO provides that ITP Lease Agreement shall be for a period of 25 years renewable for another 25 years provided the lessee has complied with the terms and conditions of the lease agreements and with other existing laws, rules and regulations. The revised regulations and guidelines governing the establishment and development of ITP based PD 705, as amended by PD 1559 and Executive Order No. 725 are provided under DENR Administrative Order No. 1, Series of 1989. In addition, the revised regulations and guidelines on

ITP provides for: a) statement on areas not available for ITP, b) maximum area that may be granted for ITP; c) disposition of available area; d) application requirements and qualification of applicants; e) government incentives; and e) general provisions for monitoring and control including provisions for the cancellation of the lease.

- Administrative Issuance's
 - DENR A O 60, Series of 1993 – Revised Regulations and Guidelines Governing IFP and Management of Residual Natural Forests for Production Purposes.
 - DENR A O 97-04 dated March 04, 1997. Rules and Regulations governing IFMA.

To ensure adequate supply of timber and other forest products at the same time encourage private sector participation, the government designed the industrial/corporate scheme of forest plantation development as provided under DAO No. 60, Series of 1993 and DAO 97-04, Series of 1997.

Industrial Forest Management Agreement (IFMA) is an agreement entered into by the DENR and a qualified applicant which grants sole and exclusive privilege to the qualified applicant to develop a specific forestland into a forest tree plantation, harvest and utilize the planted tree crops pursuant to existing laws, rules and regulations. The agreement lasts for 25 years renewable for another 25 years. The IFMA covers a minimum area of 500 hectares and the maximum area is 40,000 hectares.

Socialized Industrial Forest Management Program (SIFMA) is another type of agreement entered into by the DENR and a qualified applicant the right to develop and manage a small tract of forest land and utilize the forest products planted therein. Primarily, IFMA is issued to have more equitable access to forest resources to small landowners and to generate additional sources of income and livelihood and help poverty alleviation in the uplands.

Under DAO No. 16 Series of 1992, the Private Forest Development Agreement can be issued by the DENR to a private landowner or his duly authorized representative for the establishment of tree plantation within his private property. The PFDA has duration of 25 years renewable for another 25 years.

- DENR Administrative Order No. 96-29 (Community-Based Forest Management Program)
- The Community-Based Forest Management Program (CBFMP) integrates all people-oriented forestry programs of the government including the Integrated Social Forestry Program (ISFP), Upland Development Project (UDP), Low-Income Upland Communities Project (LIUCP), Regional Resources Management Project (RRMP), Integrated Rainforest Management Project (IRFP), Forestry Sector Project (FSP), Coastal Environment Program (CEP), and the Recognition of Ancestral Domain/Claims.

- **Plantation Development vis a vis Other Laws**

Among the issues identified by Duenas, 2000 vis a vis IPRA are as follows:

- Implementation of certain provisions in RA 8371, that has something to do with the management of natural resources and ancestral domains/lands. The constraint affecting this issue is the existence of a case filed at the Supreme Court of the Philippines for the contentious provisions of RA 8371 that has something to do with the management, ownership and utilization of natural resources and ancestral lands/domains which is still pending.
- Contracting a reforestation project by a non-IP into their ancestral domain areas. This constraint is caused either the insincerity or non-adherence in the implementation of set guidelines on reforestation and permits issuances for rattan.
- Non-recognition of DENR officials, particularly the PENRO's and CENRO's on the ancestral domains/lands of IPs. The constraint identified is the non-enforcement of measures for violations of local personnel.

- Issuance of rattan permit by non-IP in CADC awarded areas. The constraint identified is the absence of a Memorandum of Agreement (MOA) between National Commission on Indigenous People (NCIP) and DENR to define roles and responsibilities in the implementation of pertinent provisions of RA 8371 relating to ancestral domains/lands and natural resources;
- Absence of formal areas of cooperation or partnership between DENR-NCIP as regards to the management of ancestral domains/lands and natural resources, transfer of technology and other related programs/projects for IPs that has to do with research, education, facilities, training and extension programs. The constraint identified is the absence of a mechanism/facility to institutionalize the participation of IPs in the barangay development affairs specifically for forest resources and related activities;
- Weak coordination between the LGU with its IP constituents particularly in the management and regulation of forest resources and extension work. The constraint identified is the weak or absence of a regular monitoring by DENR for PENRO/CENRO/Forester's activities in IP areas.

On the other hand, GAYO (2000), also identified several barriers to investments in tree farming, e.g. land tenure (unclear rules on public lands, uncertainty under CARP for private and commercial lands); problem on financing (lack of long-term financing; lack of bank's appreciation of the tree farming industry; transport/logistics (high informal taxes, too many checkpoints and "cash points"; poor infrastructure; high shipping cost); poor production particularly dissemination of technologies and inadequate technical and managerial skills; and others such as law and order situation in some areas (particularly in Mindanao); limited research, development and extension services

2.3.5 Accomplishments vs. Targets

Accordingly, the MPFD is an ambitious, gigantic Plan to solve the totality of the problems of the forestry sector in 25 years. Lacking in prioritization, it has many programs invariably uninterconnected, which makes it very difficult to make an honest and factual assessment (Bernas. 2000).

Assessments on accomplishment under Forest Plantation Development cannot be done properly because Forest Plantations and Tree Farms (FPTF) are integrated with other major sub-sector programs. FPTF is one of the five- (5) component programs under Forest Management and Products Development Programs (FMPDP). Also, it was noted that most the People Oriented Forestry Programs (POFP) has included other program components such as *plantation development, watershed management and biodiversity conservation*.

Plantation forests include all those plantations developed for economic (production) and ecological (protection) purposes. *Reforestation and plantation areas according to the MPFD are taken here to mean the same thing*. The areas identified as "plantation areas", therefore include those areas reforested by the government (DENR & OGA) including regular reforestation and special projects and non-government sector (i.e. timber licensees, IFMA, SIFMA, CBFMA, TFLA, PLA, ITPLA, and TF). Tree farms (TF) are those developed by small landholder in private lands.

Plantation development implemented by the government through *foreign-funded or assisted projects* is included along with other activities. As such it is very difficult to segregate/classify the funds utilized solely for plantation development. By comparing the MPFD physical targets for forest plantations and tree farms from 1991 to 2000 from the plantations developed by various sub-sectors (e.g. FLMA (contract reforestation), IFP/TLA/TPSA, CBFM and Agroforestry/Tree Farm, it appears that the accomplishments are less than 50% (0.4 million hectares against the target 1.3 million hectares). This confirms also the result reported by Tesoro (2000) and Quintana (2000). The plantation development implemented by the government was funded by ADB, which provided a loan of US\$ 25 million.

The MPFD also envisioned that the private sector would be developing from 1991 to 2015 over 500 thousand hectares of tree plantation or about 20,000 hectares yearly that will be the future source of its raw materials. However, records showed that there was no significant industrial tree plantation development during the present Administration.

2.3.6 Program Impacts

From 1991-2000, the program was able to manage about 5.5 million hectares benefiting about 355,000 families. In addition, the management of about 5.5 million hectares of forestlands by families and communities saves the government in forest protection costing about P127 million annually. One important influence of Community-Based Forest Management program is the development of Alienable and Disposable (A & D) lands into forest plantations and tree farms.

2.3.7 Issues, Problems and Constraints

Several relevant issues, problems and constraints (crosscutting policy and legislation), including technical and information/research and development were identified confronting and affecting the successful and efficient implementation of forest plantation development in the country. These issues/problems were initially identified during the initial workshop in October 2002 and meetings with concerned officials of the DENR, forest industry and stakeholders concerning the implementation of the MPFD. There's a general consensus that there is *lack of interest by the private sector/other stakeholders to participate in plantation development* mainly on the following concern/problems:

- Not enough provisions for economic incentives particularly on the security of land tenure and exemption from forest charges; and some obstacles particularly on accessing forestlands (because of high application fees, cost of surveys and mapping, and cost of protection against encroachers) in plantation development.
- Some technical problems identified include the following:
 - Poor species selection procedure e.g. disregards for wood quality/end use and little attention to species site compatibility. Also, there is overemphasis on exotic species.
 - Absence of a scientific yet practical and systematic national Site Classification Scheme.
 - Poor nursery management practices
 - Lack of integrated approach to deal with forest plantation pests and diseases (it should start in the early stage of plantation design).
 - Poor plantation development practices (from site preparation to pre-harvesting) and neglect of basic silviculture practices.
- Over-enthusiasm on high technology e.g. biotechnology; tissue culture, clonal forestry yet the basic program on forest tree improvement (production of improved/quality seeds and source of selected clones for mass propagation) has been neglected.
- Research and development in nursery and plantation development are still fragmented and not prioritize.
- Lack of inventory of existing forest plantation and reliable growth data.
- Difficulties in harvesting and transporting plantation products;
 - Forest products cannot be harvested without prior forest inventory. The present requirement of the DENR requires a 100 percent inventory of the area prior to issuance of permit to harvest the trees.
 - Harvested logs cannot be sold without Certificate of Origin (COO) from the DENR.
 - Intervention of the local government units in imposition of taxation, documentation of forest products.
- On wood processing, the present policy of the government makes it very difficult to buy and install processing mills. Installed mills are hard to operate owing to restrictions on sourcing raw materials and transport of processed lumber products

- Similar problems are encountered in marketing of forest plantation products. The government has no guidelines for prices and grading rules of “chain sawn lumber” or regular sawn lumber to compete with international markets. Additional problems include:
 - Lack of database on production technology and market price,
 - Lack of market linkages for some timber and forest products, unfavorable mode of payment,
 - Price manipulation by middlemen,
 - Poor conditions of “farm to market” roads,
 - No market outlets for some plantation species,
 - Unstable market, policy and raw material price.

- There are several institutional obstacles that were identified affecting forest plantation development. Some institutional concerns are presented as follows:
 - There is need for a common definition of some forestry terms, e.g. forests, forest plantation/tree plantation, watershed, reforestation/forestation, protection forests, and production forests.
 - Conflict and overlap of jurisdiction on forestland use; whether or not to exclude/include the second growth forests as protection forests and refine process of prioritizing site to be declared as priority conservation areas.

- Weak enforcement of forestry laws in the field.
- Absence of an institution that will oversee the effective implementation of forest plantation development and continue the implementation of forest tree improvement program in the country.
- Forest plantation development not properly funded or funds appropriated for the purpose are not properly used. For private plantations, very expensive capitalization.
- Lack of financial support from private and government financial institutions.

2.4 Protected Area System

2.4.1 Introduction

A complex of mix ecosystems and habitat types characterizes the Philippine landscape. Many of the islands are believed to have a very high degree of plant and animal endemism. Philippines is one of the most important countries in the world for conserving diversity of life on earth. It is one of the 17 mega diversity countries with more than 52,170 described species, of which half are found no where else in the world. However, less than 6% of the country's original forest cover remains, while 418 species are listed in the 2000 IUCN red list of threatened species, making Philippines to the top of the 25 global bio-diversity (and coral reef) hotspots (Manila Bulletin, Sept.13,2002 p 9).

The most important policy instituted on IPAS and biodiversity conservation is RA 7586 (NIPAS Act of 1992) and its implementing rules and regulations, DAO 25 of 1992. This Act establishes a comprehensive system of integrated protected areas within the classification of national parks.

As of 2001, the DENR had recognized 244 protected areas under NIPAS (Including 137 key conservation sites), with a total area of about 3.2 million ha. Most remaining virgin forests have been given protected status, but many of these areas are in critical condition and remain threatened due to inadequate protection resulting from lack of funds and lack of political will.

The PAs, at the moment are the responsibility of DENR's regional offices. The Protected Areas and Wildlife Bureau (PAWB) provides staff support to the field offices.

Any sort of utilization activity is prohibited in parks and reserves, but most if not all these areas are in a sad state of degradation owing primarily to illegal cutting and kaingin making. This has been the result of inadequate physical protection of the areas. There are local communities and indigenous people living in and around protected areas. There is need to enhance and strengthen the PA system. Work in this regard are being undertaken by four foreign-assisted projects, which together cover 18 PAs having a total area of 1,308,766 ha.

Details/scope of activities and period covered in respect of the foreign-assisted projects and the quality of work undertaken need to be verified to get a clear indication of accomplishments. In the mean while, Conservation International, the Washington-based International NGO, along with relevant agencies in Philippines has come out, in September 2002, with a new set of Philippines Biodiversity Conservation Priorities(CI, 2002).

There are several legal instruments relating to PAs and wildlife management: (i) Wildlife Local Transport Permit, (ii) Wildlife Collectors Permit, (iii) Wildlife Farm Permit, (iv) CITES/ Non-CITES export/import/re-export permits, (v) Scientific Researches, and (vi) Certificate of Wildlife Registration. There are many rules and procedures under each of these main instruments. Non-compliance, however, is a serious issue. Not much has been done to address the people-PA conflicts; it is necessary to involve local communities in PA management, as is done in some countries.

2.4.2 Issues

Among the issues identified under the protected area subsector are as follows:

- Inadequate skills and knowledge, i.e. species identification and inventory
- Lack of ground demarcation of forest lands, e.g., production areas, protection areas, restoration areas
- Lack of protection of residual forest which biodiversity rich areas

- NIPAS Act and IPRA Inconsistencies
- Biological pollution
- Need for habitat rehabilitation
- Extinction of species and genetic resources
- Severe disturbance in ecological and evolutionary process
- Erosion of Indigenous Knowledge
- Management constraints
- Local Interest, rights concerns
- Development Potential
- Access and Benefit sharing from FBD
- Management of biodiversity zones/areas outside PAs

2.5 Grazing and Pasture Land Management

2.5.1. Introduction

Grazing and pastureland management (or range management) is one of the 4 components under the “Soil conservation and Watershed Management Program” of the Master Plan for Forestry Development (MPFD 1990). As per PD 705, grazing lands refer to “that portion of the public domain which has been set aside, in view of the suitability of its topography and vegetation, for raising livestock”. Legally, these areas are under the administration, management and disposition by the Forest Management Bureau, although the authority is now decentralized to the DENR regional offices. The terms grazing land, pastureland and rangeland are synonymous and used interchangeably in the literature. For this report, grazing land will be the term to be used.

Grazing lands are commonly located within classified public forest zones which evolved from the gradual depletion of previous climax forest vegetation due to destructive logging, kaingin and other land use conversion activities. In the Philippines, grazing lands are dominated by different grass communities such as cogon (*Imperata cylindrica*), bagokbok or samsamon (*Themeda triandra*), Misamis grass (*Capillepedium parviflorum*), amorseco (*Chrysopogon aciculatus*) and talahib (*Saccharum spontaneum*) depending on site quality or degree of site degradation and grazing management history (Aguilar 1995). More than 50% of grasslands are severely eroded, consequently degrading the soil to become acidic, shallow, and deficient in N, P and other nutrients (Concepcion and Samar 1995). As a result, the carrying capacity of the native grasslands is considered very low at 0.5 animal unit (au) per hectare. The introduction of high yielding grasses and nutritious legumes is believed capable of increasing the carrying capacity to 3 au/ha (Castillo 1991; PCARRD 1993, 2001).

The statistics on area covered by grasslands in the Philippines vary. The DENR estimated grassland cover at 1.5 M ha (Malvas 1995), DA at 6.5 M ha (Concepcion and Samar 1995), and PCARRD with 5.1 M ha estimate (PCARRD 1982). The variation maybe attributed to differences in their basis of estimation. It is likely that DENR’s estimate is based on public lands which it has jurisdiction, while DA and PCARRD included both public and A&D lands.

Since the enactment of the 1939 Pasture Land Act, vast tracts of grazing lands were awarded by the government to private ranchers for livestock production (mainly cattle) through pasture lease agreement (now called forest land grazing management agreement or FLGMA) or pasture permit. The total number and area of lease agreements and permits have steadily declined through the years due to abandonment, cancellation and/or non-renewal of the leased areas (Table 2.8). The latest data (2001) shows that there were only 407 leases/permits covering 119,000 ha, down from 1,077 leases/permits covering 414,000 ha in 1990 (Forestry Statistics 2001). This is equivalent to an average “rate of loss” of about 61 leases/permits per year or about 26,800 ha/year during this 10-year period.

The decreasing trend in the number and area covered by FLGMA and pasture permit result to decreasing contribution of these cattle ranches to total cattle population and beef production in the country. As shown in Table 2.9, cattle ranches contained about 210,000 heads of cattle in 1997 (or 9% of total cattle

population), decreasing to about 178,000 heads in 2002 which is 7% of total cattle population (Bureau of Agricultural Statistics or BAS 2002). Conversely, the main bulk of cattle population are raised in the backyards, contributing about 91% and 93% of total in 1997 and 2002, respectively.

Filipinos are not really beef-eaters if compared to such countries like Argentina and Australia. The Philippines' per capita beef consumption is only 2.6 kg/year (BAS 2002). At this rate, it is estimated that ranches contributed about 8.19 million kg of beef in 2002 satisfying the beef requirement of 3.2 million Filipinos (about 4% of total Filipino population). At P100/kg, the 8.19 million kg of beef translates to about P819 million annual contribution to the economy which is still substantial.

Table 2.8. Number and area of forest land grazing management agreement (FLGMA) and permit, CY 1990-2001. (Source: Forestry Statistics 2001)

Year	Lease		Permit		Total	
	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)
1990	1,014	405,000	63	9,000	1,077	414,000
1991	941	360,000	12	2,000	953	362,000
1992	956	365,000	6	0	962	365,000
1993	880	325,000	3	0	883	325,000
1994	769	278,000	23	4,000	792	282,000
1995	714	252,000	8	5,000	722	257,000
1996	678	222,000	21	5,000	699	227,000
1997	569	179,000	19	8,000	588	187,000
1998	492	151,000	49	19,000	541	170,000
1999	462	145,000	34	8,000	496	153,000
2000	419	122,000	0	0	419	122,000
2001	407	119,000	0	0	407	119,000

Table 2.9. Cattle population in the Philippines, CY 1997-2002.

Year	Commercial (Ranches)	Backyard	Total
1997	209,857	2,056,427	2,266,284
1998	208,953	2,168,149	2,377,102
1999	197,224	2,228,705	2,425,929
2000	193,799	2,285,054	2,478,853
2001	188,230	2,307,371	2,495,601
2002	178,016	2,369,065	2,547,081

(Source: Bureau of Agricultural Statistics 2002)

The beautiful landscape and the presence of various microhabitat patches within the rangelands make these areas ideal sites for outdoor recreation and habitats for distinct flora and fauna.

As one of the components of several watersheds, the grazing lands' ecological and hydrologic importance to downstream ecosystems is enormous. If not properly managed, they can contribute a lot of soil erosion and surface run-off. For instance, it was estimated that overgrazed and regularly burned grassland contributes about 440 t/ha/yr of soil erosion as compared to only 10 t/ha/yr in undisturbed grassland. In fact, natural range grazing was estimated to be no longer profitable beyond 18% slopes if the rangeland is regularly burned and overgrazed due to the estimated increasing cost of erosion (both on-site and off-site) (MPFD 1990).

In spite of the tremendous economic and environmental importance of rangelands, there has been no significant study or policy change regarding their true resource value so that fair assessment for charging user's fee can be made. In fact, the annual user's fee was pegged at P1.00 or lower per hectare since the

1939 Pasture Land Act. It was only recently when findings of an ERDB study on pricing of grassland resources resulted to formulation of a policy to increase the user's fee or economic rent (Francisco et al 2000).

2.5.2 Goal and Objectives of the 1990 MPFD for the Grazing Land Management Component

Unlike in the other program components, the MPFD did not specifically state its goal, objectives and strategies and the issues and concerns it wants to address for this sub-sector. Nevertheless, it briefly mentioned the problem of low productivity of rangelands (i.e. cattle densities not exceeding 0.3 to 0.5 au/ha) due to overgrazing and regular burning and the concomitant considerable soil erosion and site degradation. Obviously, the master plan's intent is to put this sub-sector back to productive condition through proper management such as improved forage production and cut-and-carry feeding system to increase carrying capacity and to avoid or minimize overgrazing and regular burning practices.

2.5.3 Policies and Physical Accomplishments Vis-a-Vis MPFD Targets

2.5.3.1 Policies Related to Grazing Land Administration and Management

There are eight major policies related to grazing land administration and management (Table 2.10). The 1939 Pasture Land Act was followed by the issuance of MAO No. 50 Series 1982 after a lull of more than 4 decades. The latest major policy issuance was in 1999 when DAO 99-36, as amended by DAO 2000-23, was issued, incorporating the controversial provision that substantially increased the user's fee as recommended based on an ERDB research findings mentioned earlier. Currently, a proposed DAO (DAO 2003) regarding the revised rules and regulations governing the administration, management, development and disposition of forestlands used for grazing purposes is under review by the DENR. This draft DAO actually tries to harmonize the sentiments of ranchers who are opposing the new user's fee being imposed with the scientific findings and the recent policy pronouncement by President Arroyo in Masbate.

Table 2.10. Chronological listing of major policies related to the administration and management of grazing lands.

<i>Name of Policy</i>	Year Issued
1. Commonwealth Act No. 452 (Pasture Land Act).	1939
2. MAO No. 50 Series 1982 (Regulations governing the administration, management and disposition of grazing lands, communal grazing lands and forest lands for grazing purposes).	1982
3. BFD Circular No. 12 Series 1983 (Revised guidelines in the processing of grazing lease/permit application).	1983
4. BFD Memo. Circular No.5 Series 1995 (Amending BFD Circular No. 12 Series 1983).	1995
5. DAO No. 95-13 (Amending Section 16 of MAO No. 50 Series 1982).	1995
6. DAO No. 99-36 (Revised rules and regulations governing the administration, management and disposition of forest lands used for grazing purposes).	1999
7. DAO No. 2000-23 (Amending certain sections of DAO No. 99-36).	2000
8. Proposed DAO (Revised rules and regulations governing the administration, management, development and disposition of forest lands used for grazing purposes).	2003

The following summarizes the major provisions of these 8 major policies:

- 1) Grazing land area to be leased or given permit = 50 – 20,000 ha per applicant.
- 2) Tenure = 25 years, renewable for another 25 years.
- 3) Application fee = P1.00/ha (1983) to P10.00/ha (1999).
- 4) Grazing land capability survey to determine suitability and availability of grazing land being applied for:
 - a) Nine criteria to be used in the assessment (biophysical and socio-economic factors).
 - b) Assessment (including perimeter survey and mapping) to be done by Land Capability Survey Team to be created by the DENR regional offices.
 - c) Assessment/survey fee = P2.50/ha (1983) to P300.00/ha (1999).
- 5) Preparation of 25-year Forest Land Grazing Management Plan and 5-year Operations Plan.
- 6) Area for forage improvement -- Each lessee is required to establish forage improvement in at least 10% of the total leased area.
- 7) Rental fee/user's fee:
 - a) P1.00/ha (1939-1998).
 - b) DAO 99-36:
 - o 5-year transition period, i.e. Y1 = P200/ha; Y2 = P275/ha; Y3 = P350/ha; Y4 = P425/ha; Y5 = P500/ha.
 - o Starting Y6, user's fee to be computed using economic rent formula.
 - o 80% user's fee reduction incentive.
 - c) Proposed DAO – imposes P40/ha user's fee (to comply with President Arroyo's pronouncement) but it has provision stating that DENR reserves the right to set/revise the user's fee or government share based on economic rent formula.
- 8) Annual Grazing Report --- required to be submitted by the lessees to DENR.
- 9) Performance evaluation of leaseholder's compliance of the management plan – to be conducted by DENR every year during the first three years and every two years thereafter.
- 10) Grounds for cancellation of lease agreement:
 - a) Violation of any of the provisions of the agreement;
 - b) Non-compliance to the approved management and operations plans;
 - c) Failure to submit the mandatory annual grazing report; and
 - d) Failure to pay the user's fee.

Analysis of these policies indicate two things:

There are enough provisions to enhance or safeguard sustainable grazing land management such as: a) conduct of land capability assessment to ascertain suitability and availability of the area being applied for grazing purposes; b) preparation and implementation of management and operations plans; c) issuance of the Environmental Compliance Certificate (ECC) as condition precedent to the approval of the management and operations plans; and d) regular monitoring and evaluation of lessee's performance through the annual grazing reports and the conduct of annual/bi-annual performance evaluation.

Realization of the above safeguards depends on the capability of the lessee to implement such provisions or requirements and the capability of DENR to provide technical assistance to lessees

from planning to implementation and monitoring and evaluation of the formulated management and operations plans.

2.5.3.2 Physical Accomplishments of Grazing Land Management Component vis-à-vis MPFD Targets

The MPFD projected a gradual decrease in area of grasslands that will be left for livestock production due to land use change – i.e. from 1.5 M ha in 1990 and 0.9 M ha in 2000 to 0.7 M ha in 2015. Based on this scenario, the MPFD envisaged that increasing areas of grazing lands have to be managed productively, perhaps to reverse the trend (Table 2.11). However, it appears now that this increasing physical target cannot be met in the coming years if the decreasing trend in the number and area of leased areas continues. In fact, by year 2005, it is projected that there will only be about 165 lessees left to manage an estimated 48,000 ha remaining grazing lands. This is 2.4 times lesser than the 115,000 ha targeted by MPFD for that particular year. And if the current rate of decrease still proceeds, there will be no more lessees to speak of by year 2010.

Table 2.11. Area of grazing lands targeted by MPFD for productive management versus the actual and projected number and area under FLGMA management.

Year	MPFD Targets (ha)	Actual & Projected Areas Under FLGMA	
		Number	Area (ha)
1990	0	1,077	414,000
1995	15,000	722	257,000
2000	65,000	419	122,000
2001	75,000	407	119,000
2004	105,000	225*	65,700**
2005	115,000	165*	48,000**
2010	165,000	0*	0**
2015	215,000	-	-

In general, forage improvement was not undertaken or fully complied with by the FLGMA holders in spite the fact that it is their obligation under DAO 99-36 to establish forage improvement in at least 10% of their total leased area. In fact, the 482.65 ha total area with forage improvement as reported by 126 lessees (Table 2.12) means that on the average, each lessee established only 3.83 ha of his/her total leased area. If the average area per lessee is 292 ha (based on the 119,000 ha covered by 407 lessees it implies that only 1.3% of the total leased area per lessee was with forage improvement established.

Table 2.12. Total hectarage of FLGMA lease areas with forage improvements. (Source: Annual Grazing Reports Submitted to FMB – 2002)

Region	No. of Lessees	Forage Improvement (ha)
CAR	27	22.54
1	6	1.91
2	42	111.00
3	6	7.50
4	13	84.00
5	11	66.50
10	11	162.50
12	10	26.70
Total	126	482.65

The main reason provided by ranchers for not being able to fully implement the required forage improvement in their lease areas is due to the absence of sources of seeds or germplasm of forage crops. The forage seed production areas established by DENR in 7 different project sites are accordingly no longer operating since 1997 due to lack of funds. This is exacerbated by the lack of formal trainings of DENR range management officers in the field on range management. They do not have enough technical capability to provide the necessary assistance to lessees such as improved forage production technologies, herd management and the like.

2.5.4 Issues and Concerns on Grazing Land Management

Numerous issues and concerns were raised by Austria (1993) in his pioneering policy research (MS thesis) on the administration of public rangelands in the Philippines which are still valid today. Several issues were also presented during the series of National Grassland Congress of the Philippines (e.g. Florido et al 1998; Moog and Castillo 1995; Montemayor 1999). This consolidation of issues and concerns (including the recommendations presented in section 6) have been reiterated and validated during the interview of key informants from DENR and a leaseholder and during the regional consultation seminar-workshop held in Baguio City.

- **Institutional and Technical Issues and Concerns**

- Low priority concern on rangeland management as compared to the traditional forest land uses like timber production, CBFM, etc. The DENR's present organizational structure does not include range improvement as one of its functions.
- Lack of DENR manpower (both in number and capabilities) and funds to provide necessary technical assistance to lessees and to regularly perform its regulatory and monitoring functions.
- Lack of coordination between or among DENR, DA and ranchers.
- Lack of technical and material assistance for range improvement (e.g. sources of seeds/planting materials for forage improvement).
- Lack of good breeder base population. The high yielding cattle breeds used to upgrade native strains are usually imported.

- **Policy Issues and Concerns**

- No policy change regarding user's fee since 1939 until only recently when appropriate pricing of grassland resources was recommended resulting to non-intensive and inefficient operations.
- Implementation of DAO 99-36 (as amended by DAO 200-23) is being opposed by many ranchers and lease applicants because of perceived very high rates imposed for several fees (application fee, user's fee, site assessment fee, etc.) and too many requirements.
- No land use policy allocating certain grassland and other potential areas as permanent grazing lands.

- **Biophysical/Social/Financial Issues and Concerns**

- Biophysical constraints in grazing lands:
 - Marginal soil (acidic, low N and P)
 - Weed infestation especially by *Chromolaena odorata* and *Lantana camara*.
 - Low herbage yield of native pastures (can hardly support 0.5 au/ha)
 - Long dry season/El Niño phenomenon (cause seasonal shortage of forage)
- Social and financial constraints:
 - Squatting, rebel problem, ancestral land claim, cattle rustling, incendiarism, vandalism, and illegal cutting of trees/charcoal making.
 - Unfavorable peace and order condition is accordingly the main reason why grazing leaseholders are forced to abandon their ranches.

- High cost/lack of high quality cattle breeders.
- High cost of fencing materials, feed supplements and other ranch structures required (high initial investment cost required).