



FORESTRY STRATEGY

TO THE YEAR 2020

OF THE LAO PDR

JULY 2005



Lao People's Democratic Republic

Peace Independence Democracy Unity Prosperity

Prime Minister's Office

No. 229/PM

Vientiane Capital, 9 Aug 2005

DECREE

on

**Endorsement and Declaration of the Forestry Strategy to the Year 2020
of the Lao PDR**

- Pursuant to the Law on the Government of Lao PDR, No. 02/NA, dated 6 May 2003
- Pursuant to the Forestry Law, No. 01-96, dated 11 Oct 1996
- With reference to the proposal of the Ministry of Agriculture and Forestry, No. 0163/MAF.05, dated 8 Jul 2005

The Prime Minister issues Decree:

- Article 1: To officially endorse and declare the Forestry Strategy to the year 2020 of Lao PDR as dated July 2005.
- Article 2: To authorize the Ministry of Agriculture and Forestry in collaboration with concerned authorities to effectively disseminate and implement the Forestry Strategy to the Year 2020.
- Article 3: To instruct concerned Ministries, Ministerial equivalent organizations, Provinces, Vientiane capital city, Special zone and other concerned organizations to strictly implement this Decree for achievement of good results.
- Article 4: This Decree shall enter into force from the date it is signed.

Prime Minister, Lao PDR

**Signed and seal
Bounyang VOLACHITH**

FOREWORD

The Government of Lao PDR has been always paying great attention to the sustainable management and use of the country's forest resources. At the National Forest Conference in 1989, the former President Mr. Kaysone PHOMVIHANE, who venerated the Lao people and nation in great deal, stated 'forest destruction in the country has reached an alarming rate. It is the time to change from uncontrolled logging and destruction of forests to focus mainly on tree planting and forest protection' (Page 38, Proceedings of the National Forest Conference, 1989). At the VIIth Party Congress held in 2001 in the report on the forestry sector, one conclusion was that "logging and forest destruction in the country increased in some localities which brought about the great loss of the nation forest resources, but the benefit generated from which are very little".

Because of the alarming situation in the forestry sector mentioned above, the Government instructed the agriculture and forestry sector to formulate a forestry strategy to the year 2020 which is among other important national strategies set by the Government to address the emerging problems in the forestry sector. The overall objective of the Forestry Strategy 2020 is to contribute to achieve the indicative targets of the national socio-economic plans, to provide goods and services to the economy and the society, to reduce dependence and increase concrete efforts to manage sustainably the country's natural resources and to contribute to the implementation of the National Growth and Poverty Eradication Strategy (NGPES). As we are already aware of, most Lao people in the rural areas or about over 80% of the population are heavily relying on forest resources, their daily life to a great extent is geared towards the collection of wood and non-wood forest products for their own use as well as for sale for income generation.

The formulation of FS 2020 was initiated in September 2000 when forestry management issues were considered as one key issue in the 7th Round Table Meeting process. The Ministry of Agriculture and Forestry was assigned as the leading agency for the formulation of FS 2020 under the guidance of an inter-ministerial Steering Committee established by the Deputy Prime Minister and President of the Committee for Planning and Cooperation in April 2001. Since then, a great number of studies were conducted for analysis of the general situation in the forestry sector and specific issues on forest management in the Lao PDR. Also, many consultations and workshops to present the multifaceted development and management issues and challenges and strategies for allowing for more sustainable resource use were organized in the past four years. A series of draft documents of the FS 2020 were produced following suggestions made by both concerned Lao agencies and the donors: the first draft of FS 2020 was discussed at a meeting in July 2003, the second draft was distributed to national agencies and international partners in November 2003 for further consideration and suggestions for improvements. MAF then organized a meeting of the MAF Science and Technology Council to deliberate and endorse on a third draft in May 2004. An improved and draft final version was submitted to the Committee for Planning and Investment for comments in August 2004 before it was proposed to the Government for endorsement in early 2005. Sida and JICA kindly provided the necessary financial and technical assistance to the formulation of FS 2020.

The FS 2020 is an official document to guide on the sustainable and management development of the forestry sector in line with national policies, strategies and priority programs for national socio-economic development and environmental conservation, including the NGPES. The FS 2020 is the base for follow-up formulation of concrete plans and projects in the forestry sector as

well as for requesting international cooperation programs and projects. The FS 2020 will be reviewed on a regular basis and revised according to changes in socio-economic and natural conditions and to policy and directions of the Government of Lao PDR in relation to sustainable use of the country's natural resources.

The FS 2020 presents a comprehensive review of the status of forestry sector including resources situation, use and management, past and on-going policy and programs. It also sets future challenges and development objectives for Sustainable Development and Management of the Forestry Sector, a range of policies, programs and actions (in total 146 actions), and clearly identifying the responsible agencies and main stakeholders to address each respective action. Although the actions proposed in the FS 2020 are of indicative nature, it is expected that they will be reflected in the annual and midterm work plans of the concerned ministries, agencies and other stakeholders both at central and local levels for implementation in their own responsible areas and will serve as an important reference document to harmonize external assistance, regional and international cooperation and collaboration in the Forestry Sector.

We are confident that the implementation of the FS 2020 will pave the way for the Lao PDR to realizing the long awaited goal to achieve real sustainable use of its forest resources which in turn would impact also on the sustainable use of the country's water and land resources across all watersheds in the uplands of the Lao PDR.

Vientiane Capital, Jul 7 2005

**Dr. Siene SAPHANGTHONG,
Minister,
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LIST OF ABBREVIATIONS

ABC	Afforestation Business Contract
ADB	Asian Development Bank
ASEAN	Association of South East Asian Nations
AFTA	ASEAN Free Trade Area
C&I	Criteria and Indicators
CBD	Convention on Biodiversity Conservation
CEPT	Common Effective Preferential Tariff Schemes
CFMC	Collective Forest Management Contract
CITES	Convention on International Trade of Endangered Species
CM	Council of Ministers
CDM	Clean Development Mechanism
CPC	Committee on Planning and Coordination
DAFO	District Agriculture and Forestry Office
DANIDA	Danish International Development Agency
DOF	Department of Forestry
FAO	Food and Agriculture Organization
FFMC	Family Forest Management Contract
FINNIDA	Finnish International Development Agency
FMC	Forest Management Contracts
FMU	Forest Management Unit
FOMACOP	Forest Management and Conservation Project
FORCAP	Forest Conservation and Afforestation Project
FRC	Forest Research Centre of NAFRI
FRCD	Forest Resource Conservation Division
FS 2020	Forestry Strategy to the Year 2020
FSC	Forest Stewardship Council
GDP	Gross Domestic Product
GOL	Government of the Lao People's Democratic Republic
GtZ	German International Development Agency
ICAD	Integrated Conservation and Development
IDA	International Development Association
ITPP	Industrial Tree Plantation Project
IUCN	The World Conservation Union
IWM	Integrated Watershed Management
JFM	Joint Forest Management
JICA	Japanese International Co-operation Agency
LSFP	Lao-Swedish Forestry Program
MAF	Ministry of Agriculture and Forestry

MAI	Mean Annual Increment
MCT	Ministry of Commerce and Tourism
MIH	Ministry of Industry and Handicrafts
MRC	Mekong River Commission
NAFES	National Agriculture and Forestry Extension Service
NAFRI	National Agriculture and Forestry Research Institute
NBCA	National Biodiversity Conservation Area (National Protected Area)
NEM	New Economic Mechanism
NGOs	Non-Governmental Organisations
NGPES	National Growth and Poverty Eradication Strategy
NTFP	Non-Timber Forest Product
PAFO	Provincial Agriculture and Forestry Office
PFA	Production Forest Area
PMD	Prime Minister's Decree
PMO	Prime Minister's Office
PFE	Provincial Forest Enterprises
PSS	Profit Sharing System
RWE	Round Wood Equivalent
SFE	State Forest Enterprises
Sida	Swedish International Development Agency
SOEs	State Owned Enterprises
STEA	Science Technology and Environment Agency
TFAP	Tropical Forest Action Plan
TLUC	Temporary Land Use Certificates
VFMA	Village Forest Management Agreement
VFO	Village Forestry Organisation
WCS	Wildlife Conservation Society
WB	World Bank
WWF	World Wide Fund for Nature

1 INTRODUCTION

1.1 Status and Objectives of the Forestry Strategy 2020

FS 2020, which is endorsed by the Lao Government, is the official document guiding development of the forestry sector in accordance with national socio-economic development plans and environmental conservation measures. It is the foundation for formulation of annual and medium-term forestry related work plans of both the Government and cooperation programs and projects. Owing to socio-economic development dynamics and environmental condition changes, FS 2020 will be regularly reviewed and updated accordingly.

The objectives of the Forestry Strategy 2020 (FS2020) are to define and agree on a set of policy and institutional arrangements and to allocate relevant roles and responsibilities among the main stakeholders to achieve sector objectives and targets (Section 4) through implementation of the chosen strategies, policies and actions (Sections 5 and 6).

More directly, the strategy provides guidelines to strengthen the management within the forestry sector so those sector objectives are efficiently achieved. In doing so, a further objective of FS2020 is to attract and focus donor support and to provide a framework for the coordination of donor activities.

1.2 Process of Formulation

Formulation of FS 2020 was initiated in September 2000 as one of policy dialogue activities in the 7th Round Table Meeting process. The Ministry of Agriculture and Forestry was assigned as the lead agency and the cross ministerial steering committee established to guide the strategy development by the Deputy Prime Minister and President of the Committee for Planning and Cooperation in April 2001. Since then, several consultations and workshops were organized for review of the status and issues of the sector and a land use and forest cover survey was conducted to understand resource situation and to analyze causes for changes in land use and forest cover.

A first draft of FS 2020 was discussed at a meeting in July, 2003 with participation of a wide range of stakeholders both national and international and many useful comments for improvement were made. A second draft was distributed to national and international stakeholders in November 2003 for further improvement. MAF organized a meeting of the MAF Science and Technology Council on a third draft in May 2004 for finalization. After receiving comments and directions on a fourth draft from the Committee for Planning and Investment in November 2004, MAF submitted a final draft to the Prime Minister's Office for endorsement in May 2005.

2 OVERVIEW OF FORESTS AND FORESTRY

2.1 Status of Lao Forests

The Lao Peoples Democratic Republic is particularly endowed with valuable, productive and ecologically unique forests which are not only a vital economic resource but provide essential contributions to the nutrition and income of the rural population and, in particular, the rural poor. They also provide a habitat for the nation's rich natural biodiversity and protect its soils, watersheds and water resources. Some eighty percent of the population are heavily reliant on the forest for timber, food, fuel, fibre, shelter, medicines, condiments and spiritual protection. In rural areas, forests provide one of the few available economic activities and non-timber forest products often provide more than half of a family's total income.

In 2001 forests contributed 3.2 % of GDP¹ by log production and its share would be higher if subsistent use and processing of wood and NTFP were counted. Wood products also provided some 25 percent of total export earnings in 2001². In terms of energy consumption, wood energy, including charcoal and fuelwood, is the dominant source of energy for cooking, even in the capital city of Vientiane, and in highland areas it also provides necessary heating.

According to the land use and forest cover study, of the country's total land area of 23,680 million hectares, current forest which has more than 20% of canopy density now cover some 41.5 percent. It is shown that forest has been declined at an alarming rate as compared to an estimated 70 percent in the mid-sixties. Forest change, which encompasses decreases in stocking, changes in species composition and size structure, loss of wildlife and plant habitats, and declines in wildlife and plant population, is as alarming as deforestation itself.

There is at present growing concern over the adverse social, economic, and environmental impacts of these trends. Moreover, deforestation and forest degradation affects most severely the poorest segments of Lao society, and particularly women and ethnic groups whose livelihoods are more closely dependent on the health of nation's forests.

2.2 Overview of Forestry Policy Development

Forest policy has seen several important developments over recent years that have led to the current legislative profile. This section gives a chronology of Government efforts to manage, protect and create forests and forest resources for the multiple objectives of economic development, livelihood improvement and environmental protection.

2.2.1 1975 to 1989

At the end of 1970s the forestry sector's main objectives were as follows:

- To utilize forest resources for the welfare and development of the population and to create capital;
- To ensure that harvesting of forest be followed by plantation, and
- To invest capital created in industries based on forest and agricultural products.

¹ Statistical Year Book 2003, National Statistical Center

² Economic and Monetary Statistics, September 2002, Bank of the Lao PDR

Under an initiative of planned and state-led economic management, a total of 9 State Forest Enterprises (SFEs) were established in the late 1970s to achieve these objectives. Each was allocated an average of 200,000-300,000 ha of production forests for general management including planning, harvesting, planting, protection and processing of forest products. With donor assistance and Government investment, many of SFEs were equipped with modern heavy logging machinery and large-scale wood processing factories. Their management and operation proved inefficient, however, and although tree planting was emphasised, actual plantation establishment was limited.

The first comprehensive forestry legislation after 1975 was the Council of Ministers (CM) Instruction N° 74 on Forest Protection, dated on July 17th, 1979. Provision was included for national resource ownership, permission of forest conversion and logging, prohibition of shifting cultivation in watershed areas, traditional use by local people and promotion of tree planting for restoration. However, due to a shortage of equipments and financial and human resources, implementation was limited.

The 4th Party Congress in 1986 adopted the New Economic Mechanism (NEM) in a shift towards a State led market-oriented economic management system. The 2nd Socio-economic development plan (1986-90) highlighted, as its second priority, a program to curb and eventually stabilize shifting cultivation after increasing food production; a major Government policy issue since 1975. The program stressed that 300,000 ha of forests are destroyed annually by shifting cultivation causing serious environmental problems. It was stressed that shifting cultivation should not be stabilized by order and force but rather by providing alternative crops or livelihoods to replace the practice of shifting cultivation.

2.2.2 From the National Forest Conference in 1989 to 1996

The National Forestry Conference was convened in May 1989 under growing concern over deforestation, and charted the overall direction of forest policy. Three main **policy directions** were defined:

- to preserve, improve and increase the biological capacity of the present forest, especially by improving existing systems of management and protection;
- to rationally use forests and its associated benefits, especially to improve economic benefits from forest resources; and
- to link rehabilitation, preservation and expansion of forests with requirements for food, commodities and creation of permanent economic activities for upland populations.

The Conference agreed on steps to be taken to reverse deforestation and resolved that forests cover should be returned to 70 percent by the year 2020.

The Government rapidly responded to the recommendations of the Conference and in October 1989 the Council of Ministers issued two decrees: N° 117 on Management and Use of Forest and Forest Land and N° 118 on Control and Management of Aquatic Animals, Wildlife, Hunting and Fishing. Decree No 117 contained 16 articles focusing on clear definition of MAF's roles and duties concerning forestry, allocation of forest and forestland and various restrictions on logging by enterprises and local people. Decree N° 118 defined wildlife as belonging to the national community and, as such, under Government control, then covered the roles and duties of MAF in wildlife management. Concerning wildlife protection, Article 3 defined prohibitions including the use of destructive hunting methods such as explosives, hunting of restricted species, hunting of species close to extinction and hunting during the breeding season. Later in 1993, MAF issued Instruction N° 298 on Control of Wildlife and Hunting, dated 24th March, for

field implementation of PM Decree N° 118. The Instruction included a list of protected wildlife species classified into restricted, controlled and general categories.

Stabilization of shifting cultivation remained high on agenda at the Conference and the allocation of forest and forestland to villagers and villages was mentioned in the resolution as a policy tool to rationalize forest use and introduce alternatives to shifting cultivation by local people. In PM Decree 117 this was elaborated in 3 articles stating the following arrangement:

- to allocate 2-5 ha of forest and forest land to each household and 100-500 ha to each village;
- to allow villagers to manage and use allocated forest as long as wood volume increases;
- to allow villagers to inherit or transfer allocated forest to others; and
- to recognize ownership of individuals and groups to degraded land which they plant trees, regenerate, grow crops or raise livestock by themselves.

The new policy was first tested in some of the northern provinces before being officially introduced in 1994 with some modifications.

After the SFEs were established, almost all Provinces created Provincial Forest Enterprises, involved in logging and processing, or issued private companies with logging permits to raise revenue for development projects. At the same time some of the SFEs were operating at a considerable loss to the government because of a lack of business management skills, which in turn led to poor returns on subsidies given. Soon after the Conference, most of the SFEs and PFEs were dissolved, privatized and/or long term rent to foreign companies while the government promotes the state owned enterprises (SOEs) only in strategically important areas such as finance and energy in pursuit of the policy of market oriented economic management.

The Conference Resolution called for a ban on indiscriminate logging and PM Decree N° 117 stipulated that logging should only take place in inventoried production forests with MAF approved economic-technical plans and that full payment of log royalties should be made and compensatory tree planting undertaken. With international assistance attempts were also made to strengthen planning and management capacity.

Directly after the 5th Party Congress in 1991, Prime Ministerial (PM) Decree N° 67 concerning a Logging Ban was issued in August and after abolishment of the SFEs a harvest/logging plan system was introduced. This was operated by government setting a national harvest/logging plan and providing the Provinces with sub-harvest/logging plans in performing log sales contracts with buyers. In many cases Provinces harvested above the allocated plan to create additional fund for development projects and there were many irregularities concerning log sales contracts as well as logging, grading and sales themselves. Decree N° 67 declared a nationwide logging ban and ordered MAF to prepare measures ensuring that forest management, logging, processing and trade followed and respected laws and regulations. It also made provision for forests to be surveyed and classified into protection, conservation, regeneration and economic/production categories. The logging ban was well implemented causing log production in 1992 to fall to half of that of the previous years with much of the remaining production coming from old logs or trees felled in the previous years. In 1993, however, log production increased dramatically to levels in excess of those recorded before the ban in 1991.

In 1993 two important decrees were formulated and promulgated: PM Decree N° 164 on Establishment of National Biodiversity Conservation Areas (NBCAs) and PM Decree N° 169 on Management and Use of Forest and Forest Land. PM Decree N° 164 was a legislative landmark for biodiversity conservation in Lao PDR. It established 18 national conservation forests

covering 2.8 million ha or 12% of total land area. These conservation forests, along with two more added in later years, remain a fundamental base for biodiversity conservation in Lao PDR.

PM Decree N° 169 constituted a response to the Logging Ban Decree and provided a new comprehensive forestry legislation to replace CM N° 117 of 1989 and also a base for the 1996 Forestry Law. The decree consists of 54 articles with provisions on forest definition, ownership, forest categorisation, contract management of forests and prohibition of development and forestry activities in protection and conservation forests. The five forest types defined in the Forestry Law (Protection, Conservation, Production, Regeneration and Degraded Forest) were originally developed for and included in this decree.

Although the PM Decree No 169 was repealed by the Forestry Law in 1996, it played an important role in the development of the land and forest allocation framework. Chapter IV on Forest Management Contracts (FMC) defined three types of FMC as follows: Collective Forest Management Contract (CFMC) for villages, Family Forest Management Contract (FFMC) and Afforestation Business Contract (ABC). CFMCs are held between Districts and villages and concern the use and management of forests, whereas FFMCs are between District and household and concern the use of degraded forestland for agriculture, tree planting and livestock raising. An incentive is also given in the latter that long-term use rights shall be granted after three years of successful implementation of the contract.

Concerning logging, PM Order N° 16 on Strengthening of the Tree Harvest Control System, dated Oct 7 1994, introduced a two-tier logging plan system. Logging plans were given for export of both logs and processed products to the three State Owned Enterprises also to the Provinces for domestic use. This logging plan system continued until 2000 when PM Order N° 11 was issued to return to the previous system in which all harvest/logging plans were given to Provinces.

In Oct 1994 the Government issued PM Decree N° 186 on Delineation and Allocation of Land and Forest for Tree Planting and Protection. This decree provides a basic legal framework for promotion of tree planting, including exemption of land tax on tree plantations containing more than 1,100 trees/ha, ownership of planted trees (use, harvest, sale, transfer and inheritance) and free from royalty payment amongst other things. The primary stimulus for this decree was to secure foreign and domestic investment in tree planting; it was also replaced by the Forestry Law.

Two other important legislative documents from this period are PM Order N° 3 on Continuation and Expansion of Land Management and Land and Forest Allocation and MAF Instruction N° 822, 1996, on Land and Forest Allocation for Management and Use. Together these documents provide a legal framework and guidelines for implementation of the land and forest allocation programme.

The land and forest allocation programme has two main components. Firstly the allocation of potential agricultural land and degraded land to households, on a three-year temporary land use certificate, for crop cultivation, tree planting or grazing; satisfactory performance permitted households to gain the land title. Secondly, the allocation of forests within the village boundary to village community for sustainable management, village forest is classified for use, protection, rehabilitation, etc. and agreements on rules managing each forest type are signed. A prototype of the present approach to land and forest allocation was formally introduced after several years of piloting by PM Decree N° 186 in 1994 and actual implementation was accelerated after the MAF Instruction of 1996. The main objectives of the land and forest allocation program are: (i) to promote crop production to replace shifting cultivation through allocation and titling of

production land, (ii) to protect forest through forest classification and, (iii) to utilize the allocated forests on sustainable basis.

Since 1995/96 to 2002/03, land and forest allocation was carried out in 6,830 villages (>50% of the national total) with the total allocated area of more than 9 million ha. More than 420 thousand households (>60% of the all agriculture households) received land for agriculture, livestock raising and tree planting. This is one of few forest related programs with clearly defined policy objectives, detailed instruction for field implementation and nationwide implementation.

2.2.3 The Forestry Law in 1996 and after

After 1996, several forest related laws were approved and promulgated by the National Assembly. They included the Forestry Law in 1996, the Land Law in 1997 and the Environment Protection Law in 1999 and Processing Industry Law in 1999. The Forestry Law is comprehensive and gives relatively clear directions in many aspects of forestry. Although the associated implementing PM Decree was only issued in late 1999, MAF has issued several sets of regulations for field implementation of the Law.

The Socio-economic Development Strategic Plan to the year 2020, 2010 and 5 year plan set development targets for 2005, 2010 and 2020 have been endorsed by the National Assembly in the year 2001. In accordance with these targets, shifting cultivation is to be basically stabilized by 2005 and completely stabilized (eradicated) by 2010. Secondly, tree plantation for commodity production is to be strongly promoted, with a target area of 134,000 ha for the 5-year period to 2005. The third priority action is to accelerate classification and delineation of forest for protection, conservation and production purposes.

Promotion of tree planting has been a priority policy for many years in Lao PDR. The MAF Regulation on Management and Promotion of Sustainable Tree Plantation gives a comprehensive legal framework concerning tree planting and management. The area planted increased to around 10,000 ha in 1996 and, after a drop in investment in 1998 and 1999 due to Asian economic crisis, reached a maximum of 20,000 ha in 2001. Much of the increase is attributable to commercial plantations of Eucalyptus spp. established by joint venture companies and individuals, often supported by the Lao-ADB industrial tree plantation loan program. In order to promote tree planting by small farmers the Government began charging a reforestation fee on top of log royalties in 2001, with revenues being used for promotional activities, establishment of nurseries and production of seedlings for distribution to farmers.

The MAF Regulation on Village Forest Management was issued in June 2001, mostly to consolidate existing provisions concerning village forests, e.g. classification of village forest, harvest of logs for housing and social welfare construction activities. However, collection of NTFPs for sale is also recognized, with the condition that management plans are formed and approved. NTFPs have been recognised as one of the few income sources available to rural villagers for a long time without legal recognition, which, for the first time, this regulation provides.

In May 2002 PM Decree N° 59 on Sustainable Management of Production Forest was issued. In addition to providing for delineation of production forest and management planning it acknowledges the participation of villages in all aspects of production forest management. Although implementation is at an early stage, it is expected that production forests will, one after another, be established on a solid legal basis and put under sustainable management. The share

of benefits from forestry operations would contribute to the development of participated villages.

PM Order N° 18/2002 on Forest Management Policy for 2002-2003 required MAF to reassess national forest cover, allocate and designate all forest categories according to present conditions, determine regions where logging bans should be placed on natural forests and develop strategies for forest conservation and re-forestation. Furthermore, export of logs and sawn timber from natural forest is banned to promote domestic secondary processing. The order also took steps to streamline the wood-processing sector by requiring operations to meet prescribed standards of technology and efficiency, to plant trees according to factory size and to regulate the use of wood as an energy source.

2.3 International Co-operation

International cooperation has played a key role in many aspects of forestry development in Lao PDR including human resource development, institutional strengthening, development of legal frameworks, development of forest management systems and investment in tree plantation development.

In 1990, Government prepared a national Tropical Forest Action Plan (Lao TFAP), which was officially adopted in 1991. The Lao TFAP identified six major programs:

- 1) development process support (follow-up to TFAP, advisory support to MAF)
- 2) resource base strengthening (human resources development)
- 3) alternatives to shifting cultivation
- 4) water catchment area protection/conservation of forest
- 5) sustained use of forests
- 6) plantation forestry development

The Lao TFAP indicated a funding requirement of US\$ 230 million in investment for the period from 1990 to 2000, with US\$ 40 million in technical assistance. The Lao TFAP had a strong response from international organizations, bi-lateral aid agencies, development banks and NGOs. All six of the sub-programs have been addressed, to different extents, by the international community, the Government and the private sector. The main achievement can be summarized as follows:

- *Human resource development*: higher education overseas, establishment of a BSc. Course in Forestry and strengthening of vocational training,
- *Legal framework development*: development of several sets of MAF regulations implementing the Forestry Law, publication of forest related laws and regulations, and dissemination,
- *Institutional strengthening*: development of manuals and training of staff in land and forest allocation and protected area management,
- *Management model development*: land use planning, natural production forest management, village forest management, NTFP management, conservation forest management
- *Research and knowledge base*: tree seed conservation and production, development of alternative upland production systems, etc.
- *Tree plantation*; investment in commercial tree plantation, provision of incentives for smallholder plantation development.

2.4 The Roles and Contribution of Forests and Forestry in Lao PDR

2.4.1 Contribution to Socio-Economic Development

In the 1990s, the forestry sector grew faster than the rest of the economy, reflecting an increase in log extraction from 300,000 m³ in 1990 to 734,000 m³ in 1998. Since then, however, Government reduced the annual harvest, to some 260,000 m³ in 2000/01 and 2001/02, and further to some 150,00 m³ for 2004/05 and at the same time the GOL promotes downstream processing. Tree plantation development, although strongly promoted by the Government, is still in its early stage. Given favourable national conditions, including climate and land availability, and growing demand in the region, trees from plantation are expected to play a much larger role in the future.

In addition, Lao forests made a significant though unmeasured contribution through benefits provided to the rural population. Most rural households, especially the poorest, depend heavily on forests not only for timber for house construction and other purposes but also for food, fodder, fencing materials, medicines and condiments. Villagers also often derive cash income from sale of NTFPs and, in many areas, harvesting of forest resources is one of the few available economic activities. NTFP consumption and sales often equate to more than half of family income.

The forestry sector contributed 3.2% of GDP and 25 percent to the total national export value in 2001 and makes a substantial contribution to the national budget. In 2001/02, log royalties constituted 15 percent of total fiscal revenues. Log sales are also an important revenue source for many provinces.

Log royalty collection rates are low at present having fallen since the mid-nineties and it has been estimated that, in late 1990s, collection rates were as low as 50 percent. The Government has therefore responded, through the annual Prime Minister Orders, by tightening log royalty assessment and collection mechanisms.

The forestry sector is of great importance in employment generation, and although exact estimates are not available, the sector provides several thousand jobs in log extraction, transportation and processing, with the rural population and the poor amongst those benefiting most. In turn, secondary employment creation in the wood processing industry, including furniture manufacture, provides some 22,000 jobs constituting one-quarter of the national total of 93,400 in the manufacturing sector.

In some cases, timber harvesting has had a negative impact on the poor by destroying the very forests on which they depend. Therefore, Government efforts at controlling timber harvesting and fostering village participation in forest management aim directly at improving the livelihoods of the poor.

In terms of conserving Lao natural resources, forests in watersheds are essential for water and soil conservation, preventing, or diminishing the risk or intensity of floods, droughts and sedimentation, and improving the reliability and quality of water supplies for drinking, power generation, irrigation, navigation and fish production. Similarly, designated national biodiversity conservation areas and sustainable use of existing forests protect important, threatened or rare ecosystems and the plant and animal species they contain.

2.4.2 The Roles of the Forestry Sector in the Lao PDR

From the preceding description of the contribution of forests to Lao socio-economic development, the following roles can be derived:

- 1) The forest sector in general, including the wood processing industries, has been one of the fastest-growing sectors of the overall economy, and is an important source of materials, jobs, and financing for both the public and the private sectors. As mentioned above, it is also a major source of foreign exchange and fiscal revenue.
- 2) Forests play a role as a safety net in the livelihood of rural people by providing timber and non-timber forest products both for home consumption and sale.
- 3) Forests support or provide a basis for the development of other areas such as hydropower generation, navigation, irrigation, agriculture and fishing by keeping soil intact, water regulation and protecting villagers as well as urban dwellers from natural disasters.
- 4) Forests contain and protect environment and biodiversity of national, regional and international significance.

Roles that forests play change as economic, social, and international conditions change. As more market-orientated economies expand into rural areas or expansion of manufacturing absorbs rural labour, the dependency of villagers on forests declines. Technological developments in wood processing may also shift demands from a few species to a range of lower-value species, or from natural forest trees to plantation trees, etc. Furthermore, as economic grows, demand for biodiversity conservation and water supply increases.

Many of these roles can be threatened by over harvesting of existing forest resources. Severely depleted or degraded forests may no longer provide commercial timber, NTFPs or protect biodiversity, water/soil resources and environment. Experiences in neighbouring countries of increasing floods and droughts may result partly from such losses and it will take many years for these functions to recover if indeed they recover at all.

3 STATUS AND ISSUES

3.1 Land and Forest use

3.1.1 Land use system

3.1.1.1 Ownership of land and forest

The State ensures the right to use, transfer and inherit land owned by the national community in accordance with written law (The Constitution Art. 17). In urban and peri-urban areas, land titles, ensuring long-term use rights, including transfer and inheritance, have been issued to residential, agricultural and commercial landowners.

Natural forest and forest land is designated as property of the national community with the State acting as representative in the management and allocation of forest land for rational use by individuals and organizations. Individuals and organizations acquire tenure rights to trees, natural forest and forestland only when permission is received from the responsible agencies (the Forestry Law Art. 5). Degraded forestland has been allocated to farmers for crop production, grazing and tree planting through the land and forest allocation program. Temporary land use certificates are signed for a period of three years after which long-term use rights can be requested if the allocated land has been developed according to the agreed objectives.

Long term use right of natural forest can be allocated to individuals and organizations according to the Forestry Law (Art. 5). Natural forest can be also leased or granted to concessionaires for protection and harvesting (the Forestry Law Art. 56). However, the government has so far only allocated natural forest to villages through the land and forest allocation program.

Individuals and organizations to whom the State allocates protection, conservation and management of forest and forest land have rights to various compensatory benefits such as use of trees and NTFP collection rights in accordance with regulations issued by concerned agencies (The Forestry Law Art. 7).

With State recognition, trees or forests planted or regenerated by individuals or organizations using their own labour or capital become the property of the individual or organization concerned who then assumes rights of possession, use, transfer and inheritance in accordance with the written laws and regulations (The Forestry Law Art. 5).

3.1.1.2 Land classification system and land use planning

According to the Land Law (Art. 11) land is to be classified into eight categories according to use: agricultural land, forestland, water-area land, industrial land, communication land, cultural land, land for national and security defence, and construction land. MAF is responsible for further classification, management and development of agricultural land, forest land and water bodies.

The Land Law (Art. 12) stipulates that the Government holds national responsibility for zoning and demarcation of boundaries for each land category. However, owing to the lack of a coordinated system, land-use plans have yet to be developed at both the macro and micro levels.

3.1.2 Forest classification

Forests in the Lao PDR are classified into five categories, the first three relating to function and the last two to the current situation. (Forestry Law, Arts. 16 to 21):

- ❖ **Production Forests** are forests and forestlands used in regularly providing timber and other forest products on a sustainable basis for national economic and social development requirements and for people's livelihoods without significant negative environmental impacts.
- ❖ **Conservation Forests** are forests and forest lands classified for the purpose of protecting and conserving animal and plant species, natural habitats and various other entities of historical, cultural, tourism, environmental, educational or scientific value
- ❖ **Protection Forests** are forests and forestland classified for the protection of watershed areas and prevention of soil erosion. They also include areas of forestland with national security significance, areas for protecting against natural disaster and areas for protection of the environment.
- ❖ **Regeneration Forests** are young or fallow areas of forest classified for regeneration and maintenance of forest cover with a view reaching a natural equilibrium as trees increase in maturity.
- ❖ **Degraded Forests** are forests that have been heavily damaged, to the extent they are without forest or barren, that are classified for tree planting and/or allocation to individuals or organizations for tree planting, permanent agriculture and livestock production or other purposes in accordance with national economic development plans.

The uniqueness of the Lao forest classification system lies with the latter two categories. Given the vast areas of young fallow forest and degraded forest land in Lao PDR, these categories make explicit intentions to regenerate natural forest by stabilizing shifting cultivation and to productively utilize degraded forest land by encouraging investment through allocation to farmers and organizations.

3.1.2.1 Regulation and field classification of each category of forest

To date, MAF have issued regulations on management of NBCA No. 0360/MAF.2003, regulation on Establishment and Sustainable Management of Production Forest No. 0204/MAF.2003, and are preparing regulation for Regeneration Forests. However, actual classification has been progressing on the basis of PM Decree Nos. 169/1993 and 164/1993 and other legislation without detailed guidelines concerning criteria, processes, restrictions, incentives, etc. According to MAF statistics areas under the first three categories are as shown in the Table 1.

Table 1. Area of Production, Protection and Conservation forest in Lao PDR

Forest Category	Administrative Level	Number	Area (1,000 ha)
Production	National	106	3,207
Protection	Province	23	461
	District	52	56
	Total	75	517

Forest Category	Administrative Level	Number	Area (1,000 ha)
Conservation	National	20 and 2 corridors	3,391
	Province	57	932
	District	144	504
	Total	223	4,826
Total			8,550

Note: Regeneration and Degraded Forests have also been identified through the land and forest allocation process at the village level, however, no data are available.

3.1.2.2 Overlaps with other land-use types

Delineation of the first three forest categories, especially at national and provincial level, are made on large scale maps and contain other land use types in addition to forest. In a strict sense they are not forest as defined in the Forestry Law. Given the lack of detailed maps, the high rate of population increase and rapid changes in land use, it is not feasible at this stage to delineate forest, in the strict sense, and to manage it at this scale for the chosen purpose. As a result, coordination among concerned sectors within these forest areas is insufficient and lack of management units in some NBCAs especially at the field level, deforestation and forest degradation may go unnoticed. For example, the MAF Regulation on Management of NBCA and Wildlife N° 360/2003 prohibits expansion of rice field in the Conservation Forests, however, strict enforcement of this restriction is impossible and unfeasible given the levels of population movement and increase.

3.1.2.3 Overlaps with village areas

Through the land and forest allocation process village boundaries and village forest and agricultural areas are delineated and forest areas are classified into some or all of the five categories. Under the village forest classification, Production Forest is named Village Production Forest³ (Art. 2, MAF Regulation No. 0535/2001) and is used for NTFP collection and felling of trees for domestic use. Accordingly, there are village production and protection forests within NBCAs, Production and Protection Forests. This double-layered classification reflects the reality and will necessarily be maintained for the foreseeable future. However, there are no clear criteria for delineation of agriculture areas and classification of village forest.

3.1.3 Land use change and underlying causes

3.1.3.1 Land use and current forest area changes

A recent study on land use and forest area, which was carried out from end 2002 to early 2003, shows that forested area covers about 71.6% (17 million ha) of the total national land area. Its breakdown is given below⁴;

- 1) Current forest, which is relatively rich and has canopy density of 20% or more, covers 41.5% (9.8 million ha) of the total land area and has decreased from 47% (11.2 million ha) in 1992.
- 2) Bamboo forest covers 2.3% (0.5 million ha).

³ Village production forest is forest and forest land allocated for customary use of forest resources as described under Article 28 of the Forestry Law, which authorizes exploitation of non-restricted wood species and gathering of forestry produces for family consumption in view of improving multi-ethnic people's livelihood in a regular and sustainable manner. However, in practice this is now called Village Use Forest in order to avoid confusion with the national level Production Forest.

⁴ See Annex 3 for definitions of various forest types.

- 3) Temporary unstocked forest covers 25.6% (6.1 million ha).
- 4) Fallow forest or past shifting cultivation area covers 2.2% (0.5 million ha).

Temporary unstocked forest and fallow forest or past shifting cultivation area can naturally grow to become rich forest again in future with appropriate management and protection.

Besides the quantitative changes, forest quality has also deteriorated. Forest degradation, which encompasses decreases in stocking densities, changes in species composition and size structure and reductions in wildlife and plant populations, is in many areas as alarming as actual deforestation. Thus, forest fragmentation has increased with small forest compartments (less than 10 ha) having increased as a proportion of the total forest area from 0.9% in 1992 to 6.7% at present, while large forest compartments (larger than 1,000 ha) have decreased from 88% to 54%. Similarly, forest density has decreased dramatically with dense forest declining from 29% in 1992 to 8.2% at present and open forest increasing from 16% to 24.5% of the total. With respect to stand structure, the forest area dominated by large trees has decreased from 5% to 3% of the total, that dominated by small-size timber has decreased from 44% to 42% and pole-size forests have increased from 51% to 56% of the total.

3.1.3.2 Factors Behind Forest Decline

External factors

- High demand for wood and NTFPs in the markets of wood deficient neighbouring countries and countries in the region as well as the imposition of logging bans in some neighbouring countries brought about high pressure on forest resources in Lao PDR.

Internal Factors

- Shifting cultivation practices and forest fires are still the main causes of forest degradation particularly in the north.
- Unsustainable harvesting of production forest which occurs mainly in central and southern regions, and unsustainable management and use of allocated village used forests.
- The decline in current forest with more than 20% of canopy density over the last few decades has resulted partly from necessary conversion of forestland for agriculture and infrastructure development.

Underlying causes

The most basic factors are **widespread poverty and rapid population increase** amongst the rural population, who are, as a result, obliged to practice forms of cropping resulting in deterioration or destruction of forest. The situation has been compounded by decades of warfare and its after effects. Having achieved peace, the Government has been engaged in systematic campaigns to reduce and eventually eradicate shifting cultivation and opium cultivation through poverty eradication. Efforts over the last two decades have met with substantial success, leading to an important reduction in the area affected by these problems. Further concerted poverty eradication efforts in accordance with the National Poverty Eradication Program are, however, necessary to further reduce the adverse impacts of these practices on forest and forest resources. Furthermore, utilisation of forest and forest products and the promotion of NTFP domestication and processing require support to generate products and income necessary to eradicate rural poverty.

A second set of factors involved in forest cover decline relate to **economic incentives for over-harvesting of forest resources and governance**:

- Too many wood processing plants and excessive wood processing capacity has tended to put pressure on Government bodies to grant harvest/logging plans in sizes and locations often not matched with available resources; Government is currently trying to devise both long- and short-term solutions.
- Province and district authorities used to grant harvest/logging plans to businessmen in exchange for infrastructure or village development fees, a practice prohibited in 2002 for infrastructure not provided for in the National Socio-economic Development Plan endorsed by the National Assembly.
- Annual harvest/logging plans have usually been based on over optimistic estimates of annual allowable cut.
- The Government system establishing logging royalties and the lack of available information have led to rates significantly at variance with international prices. The methodology for setting royalty rates is currently under Government review.

A third set of factors relate to capacity:

- Public sector capacity to plan, supervise and control implementation of forestry development is seriously limited, both in terms of number and specialization of staff and availability of physical and budgetary resources. The support of various donors, including the World and Asian Development Banks, and the Swedish, Japanese, Finnish, Danish, German programs and others, has to some extent compensated for these constraints.
- The legislative and regulatory framework is still in its early stage and as yet incomplete. The Forestry Law, for example was passed in 1996 with its implementing decree issued late in 1999. Several sets of MAF regulations implementing the Forestry Law have been issued although there are some yet to be completed. Annual implementing PM Orders have been issued as gaps are noticed and efforts are being made with the support of the international organizations, donors, international financial institutions and others.
- Land and forest allocation policy, there is a lack of qualified staff, equipments and fund contributed to shortcomings in implementation. For example, village land and forest allocation exercises, which were carried out without sufficient training of local officers as well as without technical and financial support after planning, resulted in land and forest use plans that were unsustainable or do not stimulate villager's ownership, which brought about the efforts aimed at reducing shifting cultivation have sometimes not successfully.

3.1.4. Issues for Improvement of Land and Forest Use

3.1.4.1 Lack of land use planning and coordination among stakeholders

Forested area, including Current forest, tree plantations, bamboo forest, temporary unstocked forest and fallow land, occupy 71.6% (17 million ha) of the total land area. However, its multiple uses are often conflicting and it is often the only source of land for other activities. Despite designation as National Conservation or Production Forests, development activities including migration, expansion of agriculture land, road building, some of which are unplanned, continue.

Protection of forest cannot be achieved solely through forest related legislation or the efforts of local forest officers and the current Land Law lacks provisions on land-use planning and coordination among land related sectors at all levels. To remedy the situation, cross-sectoral coordination and cooperation mechanisms are necessary to guide processes from the preparation of land related legislation to implementation at the field level.

3.1.4.2 Incomplete sets of regulations for forest classification

Under the Forestry Law (Arts. 35 and 68) families and organizations engaging in regeneration, maintenance or protection of forest will receive incentives, such as credit privileges, tax exemptions, monetary reward, lease extensions or increases in leased area. However, grant of property rights on regenerated trees has not yet been addressed in an implementing regulation and there are no provisions relating to ownership of regenerated trees as there are for planted trees, where rights are secured by registration with DAFO. Similarly, there needs to be MAF regulation of Protection Forests.

3.1.4.3 Need to link forest classification at macro and village level

Based on various laws land and forest are being delineated not only as Conservation or Production Forests but also as mining areas or lease for tree plantations. In most cases these land and forests are used by local villagers and their cooperation is inevitable for establishment and management of these areas delineated on villages. Moreover, there might be opportunities of participation or benefit sharing for villagers or cases of compensation for them. In order to make sure the management of these areas contributes to livelihood improvement of local villagers, definition of village areas and their rights to and responsibilities for the land and forest within their villages need to be clearly provided in concerned laws including the Land Law and the Forestry Law.

3.1.4.4 Complex factors behind deforestation and forest degradation

As outlined above the causes of deforestation and forest degradation are complex and interlinked, and more importantly many of them are out the jurisdiction of the forestry sector or are general administrative or societal issues. Likewise, impacts of deforestation, be they economic or environmental, go beyond the boundaries of the agriculture and forestry sector.

If deforestation continues at the current rate, it is estimated that by 2020 only 7.4 million ha of current forest (with more than 20% of canopy density) will remain, marginally above 30% of the total land area. The exact impacts of this reduction in both quantity and quality are unpredictable but judging by experiences in other Asian countries, they could be considerable and at times catastrophic.

In parallel with national efforts to eradicate poverty, improve governance and promote economically efficient markets, land and forest use should be monitored, site specific causes for forest decline analysed and land and forest use policy formulated according on the latest data and analyses.

3.2 Production Forests

Currently, timber and other forest-related products come from several sources, including production forests, areas to be converted to other uses (like hydro-electrical dams, roads, and rural development projects), as well as from unauthorized logging in some NBCAs and protection forests.

As logging in conversion areas is approaching completion and control of unauthorised logging activities is strengthened, production forests will be increasingly becoming the main source of timber in Lao PDR⁵.

3.2.1 Current Status of Production Forests

There are some 106 unofficial establishment of production forest areas (PFAs) in Lao PDR with a total area of 3,207,000 ha. The principal provinces are Vientiane (8 PFAs, 503,000 ha); Savannakhet (8 PFAs, 429,000 ha); Bolikhamxay (11 PFAs, 359,000 ha), and Xayaboury (13 PFAs, 350,000 ha). Almost half of these (~1.55 million hectares) have been subject of some kind of management planning with the largest areas in Savannakhet (7 PFAs, 327,000 ha), Khammouane (6 PFAs, 309,000 ha), Oudomxay (5 PFAs, 148,000 ha) and Xayaboury (7 PFAs, 105,000 ha).

Without a clear legal basis for boundary location and management planning, these forests, with the exclusion of a few in Savannakhet and Khammouane, are not under systematic management and there is little specific information available. From what is known, the fragmentation has increased, density has decreased drastically and areas dominated by large trees and pole size trees have decreased, while areas containing only small trees have increased. In general, the rate of deforestation is high and seems to be accelerating.

3.2.2 PM Decree N° 59/2002 on Sustainable Management of Production Forest

To address the shortcomings in production forest legislation Government issued PM Decree 59/2002 on Sustainable Management of Production Forest in May 2002. The Decree sets the basic principles for establishment and management of production forest areas and the Ministry of Agriculture and Forestry issued regulation No. 0204/MAF in October 2003 for field implementation.

According to the Decree and Regulation, a production forest area is to be established by the Prime Minister's Office based on MAF recommendation. The Decree also mandates MAF to lead preparation of sustainable forest management plans in coordination with local authorities, to outline detailed implementation procedures and regulations and to determine principles for preparation and approval of detailed management plans. Each PFA is required to operate under a specific management plan based on real data, covering all forest categories and meeting all sustainable management criteria.

Within MAF, DOF has the overall responsibility for coordinating preparation of production forest management plans in association with relevant sectors and local authorities. PAFO, together with local authorities, are required to carry out the field surveys and data collection needed for plan formulation and to guide, monitor and control implementation. DAFOs are responsible for organizing the district Forest Management Units (FMU) who actually implement the plans. The role of Village Forestry Organizations (VFOs) is to organize villagers' participation in implementation of forest management activities under a Village Forest Management Agreement (VFMA) signed between the VFO and the respective FMU. The VFMA specifies the rights and responsibilities of signatories, the scope of village participation, and the revenue sharing arrangement. Further details are given in MAF Regulations N° 221/2000 and N° 0060/2003, which define principles and technical and legal prescriptions for logging and harvesting of forest products, principles/criteria for log measuring and grading and cutting limits for natural trees, etc.

⁵ Production forests and Production forest areas refer only to natural forests and do not include tree plantations.

To further improve forest harvesting standards and practices, MAF (DOF) will prepare code of harvesting practices. The implementation of the code will go some way to reducing in-forest and post-harvest losses and will also enhance sustainable forest management.

3.2.3 Issues for Sustainable Management of Production Forest

3.2.3.1 Production Forest Management

Implementing scientifically based management in the nation's production forest areas is a huge challenge calling for a major effort of the Government. The first area on which efforts should be focussed is **capacity**. DOF, PAFO and DAFO, have assumed responsibilities for producing forest management plans. They are not properly equipped, however, in terms of technical capacity, equipment and transport to produce all necessary plans within a reasonable period.

The second priority area is **quality**. In general, data currently available for forest management planning is scant and of poor quality. Key information such as growth rates for different species and forest types and ecological conditions are difficult to obtain and its accuracy difficult to assess. Therefore, management plans have tended to focus on a single parameter: timber volume of specific tree species which have high market demand.

The third area in which major efforts are required is **enforcement and compliance**. It has occasionally been reported that management plans are not implemented, or that logging has been undertaken immediately after completion of the management survey, without awaiting the pre-logging survey or tree marking. Similarly, it has been reported that, in spite of long-term logging plans, logging rotations and annual coupe areas specified in management plans, logging actually proceeds predominantly in accessible or well endowed areas or focuses on higher value trees.

The fourth area requiring urgent attention is **monitoring and control**. Agriculture and Forestry Sector has not yet been able to install a system monitoring the various factors contributing to sound sustainable forest management, e.g. the logging process, tree planting in logged over areas, the impact of logging on the remaining forest, road characteristics, water source and soil damage, biodiversity, the adequacy and appropriateness (size, width, weight, tracks) of logging equipment and of whether logging areas accord with plans.

3.2.3.2 Production Forest Certification

Since 1975, sustainable production of timber has been a major policy objective of the Government and MAF has taken a number of significant steps towards bringing the country's remaining natural forests under sustainable management. Recently Government has begun preparing for forest management certification by international or national certification agencies operating under internationally accepted criteria. Certification serves to guarantee that wood products are from sustainably managed forests and thereby allows higher sale prices. Moreover, in some markets, it will soon become the only way in which wood products will be accepted.

In Lao PDR, Criteria and Indicators (C&I) for sustainable forest management were developed in 1999-2000 and a one-year Pilot Forest Certification project under the Forest Stewardship Council (FSC), an international certification agency, is recently completed in Savannakhet and Khammouane provinces.

3.2.3.3 Village Participation in Production Forest Management

To strengthen the role of forestry in poverty eradication, Government has established policy that villagers in production forest areas, organized into village forestry organizations (VFOs), should participate in forestry planning and operations at the field level and should share in the derived proceeds.

The success of villagers' involvement in forest management has already been demonstrated in the Lao PDR in two major projects: the 1993 Joint Forest Management Project (JFM), supported by the Lao-Swedish Forestry Program (LSFP) and the 1996 FOMACOP Project, supported by IDA Credit and a grant from Finland. Villagers were involved in many aspects of forest management including boundary demarcation, land use mapping and planning, forest inventory, management planning, harvesting, and selling produce. Both projects trained personnel and produced a range of technical manuals and guidelines including forest survey and management manuals. However, the projects and concerned villagers paid most of their attention to harvesting logs and gaining revenues, and little to NTFP management and tree planting.

DOF/PAFO will define different alternatives in order for target villages to be involved in every planning activity and actual operations, working together with DAFOs within the framework defined in the Prime Minister's Order on Decentralization 01/2000, with remuneration commensurate with their effort. In order to improve management and technical capacity available now, specific support resources will be allocated to strengthening the capacity of both DAFOs and the concerned village organizations.

3.2.3.4 Increasing Pressure on Conservation Forests and Other Forests

While sustainable forest management will be gradually implemented in the nation's production forests, the remaining forests will come under increasing pressure as a result of excess domestic capacity and demand originating in neighbouring countries. Indeed, harvesting of national conservation forests and other rich forests has already begun. Logs supplied from such unauthorized source tend to be cheaper than those from controlled areas and this has the effect of undermining the economic feasibility of sustainable management in production forests. Therefore, monitoring of logging outside authorized areas needs to be strengthened and measures discouraging unauthorized logging installed.

3.3 Non-Timber Forest Products

3.3.1 The importance of NTFPs for the rural economy

Non-timber forest products (NTFPs) play a central role in the rural economy of the Lao PDR by providing the following items, amongst others:

- Protein (wild meat, fish, frogs, shrimp, soft-shelled turtles, crabs and molluscs)
- Calories, vitamins and dietary fibre (mushrooms, bamboo shoots, fruits and vegetables, honey)
- Materials for house construction and handicraft production (bamboo, rattan, pandanus, broom grass, paper mulberry)
- Traditional medicines
- Cash income (from sale of NTFPs or product there from)

Proceeds from NTFP sales may account for more than a third of village cash income, rising as over a half in forest-rich areas. At the national level, it has been estimated that NTFPs are worth some US\$320 per household per year in rural areas and in aggregate, NTFPs may be worth Kip 1,837 billion per year (US\$183.7 million; consumption of firewood, fish and other aquatic resources excluded).

3.3.2 The importance of NTFP for the national economy

3.3.2.1 Production and Exports

Lao PDR produces many of NTFPs with commercial value, including cardamom, eaglewood, bamboo, rattan, yang oil, benzoin, dammar resin, sugar palm and malva nuts. Between 1994-1998, recorded exports of NTFPs were worth an average of \$31.8 million a year although with considerable annual variation (\$1.1 to \$73.2 million per year). In some years, export value of NTFPs reached half of that of total forest exports although sales have now declined substantially to US\$6-7 million a year.

Even though commercial NTFP processing is relatively undeveloped, there are a number of small and medium-scale processing industries. These include rattan and bamboo workshops, incense factories, resin distillation units, berberin processing plants, small-scale mulberry paper industries, and aromatic oil distillation factories.

3.3.2.2 Wildlife trade

Trade in wildlife is substantial, with an estimate in 2000 of US\$ 11.8 million. Trade has recently been increasing as a result of the opening of domestic and international markets, improved access to rural areas and increasing numbers of foreign visitors. Most wildlife trade is driven by foreign demand. The final destination of much of the trade in wildlife are mostly the neighbouring countries where wildlife products are high demand for trophy, meat in restaurant and pet as well as for medicinal. With respect to domestic trade and consumption, these exert a lesser threat but are still problematic despite Government seizures and the public destruction of unauthorisedly traded wildlife.

3.3.3 The importance of NTFP for forestry development and biodiversity conservation

NTFPs, in their great variety, play many important roles in the functioning of their natural ecosystems and their preservation is crucial in maintaining the integrity of these ecosystems so that the vital economic and environmental services they perform may continue. Accordingly, Government has limited the species that may be harvested, the seasons in which this may be done and modes and methods that may be used. For example, MAF Regulation No. 360/2003 prohibits harvest of NTFPs within NBCAs other than for customary use and PM Decree 164/1993 prohibits the use of other NTFP within NBCAs without an authorized plan. Specific regulations also protect excessive utilization of particular species, especially wildlife and fish.

3.3.4 Current Trends in NTFP Availability and Use

Some significant trends show increasing interest in the conservation and development of NTFPs:

- local innovators have begun domesticating a number of NTFP species in agroforestry system and home gardens,
- communities have shown capacity to establish and effectively run NTFP management systems,

- policies emphasizing sustainable forest management reinforce the NTFP sub-sector,
- the private sector is beginning to invest in small-scale NTFP processing industries.

At the same time, there are also a number of worrying trends that could adversely affect the overall status and management of NTFP resources:

- accelerated deforestation resulting from land-use conversions for agriculture and dams, unsustainable or unauthorised logging practices, fire and other disturbances
- increased market access and product demand in the absence of clear rules of resource allocation, tenure security and sustainable management regimes
- local technical knowledge about NTFPs is mostly vested in the older generations and is at risk of being lost due to out-migration and the changing lifestyles of younger generations.

3.3.5 Legislation Concerning NTFPs

3.3.5.1 Customary rights on NTFPs

Existing legislation secures villagers access to NTFPs and customary use rights are recognized in the Forestry Law and elaborated in MAF Decision 54/1996 and MAF Guideline 377/1996. PAFO and DAFO have the mandate to ensure compliance and also to ensure that uses in conflict with customary rights, such as slash and burn, forest fire and fish traps are limited.

Additionally, villagers are exempt from natural resource taxes and NTFP sale is permitted provided that villagers form groups or associations for commercial collection and that activities follow DAFO approved management plans. This is an important recognition, however, it has proved difficult to formulate management plans that are scientifically reliable.

3.3.5.2 Commercial harvesting

Commercial trading of NTFPs is subject to similar rules and conditions as timber products, including harvest/logging plans, the requirement for contracts and royalties and fee payment. Likewise, harvest of NTFP may only proceed in surveyed and inventoried production forest areas for which there is a forest management plan. Furthermore, harvesters of NTFPs must either directly plant a given number of trees per unit NTFP collected or pay fees for compensatory planting. PM Order 10/2000, MAF Order 1848/1999 and MOF Temporary Order 111/2000 regulate arrangements for tree planting and compensatory payment for harvest of certain NTFPs from natural forest; plantation based harvesting is exempt from these fees.

3.3.5.3 NTFP harvesting plans and trade

NTFP harvesting plans, specified by product, are set annually by PM Decree and allocated to the provinces by MAF, a process that includes resource assessment by provincial officers.

With respect to trade, at each point of sale and at various transportation and transfer locations, traders must pay taxes and service charges. These include royalties and export taxes, paid to the Provincial Finance Division, and/or some additional expenses for districts and villages. In common with timber export restrictions, export of certain classes of NTFP are also prohibited, for example, PM Orders 10/2000 and 15/2001 ban the export of Eagle wood and all species of unprocessed rattan.

3.3.6 Issues for NTFP Sector Development

3.3.6.1 Lack of Knowledge for NTFP Development

The major constraint on NTFP utilization and development is lack of knowledge. There are critical gaps concerning propagation, silviculture, enrichment, harvesting and sustainable management of wild populations of NTFPs as well as of their domestication. There is also a need to identify NTFP species with importance for food security, commerce and biodiversity conservation and to determine which of these are currently threatened so that appropriate interventions may be taken. Knowledge for developing of in-situ conservation efforts is also needed (*Annex 1*).

The extent and nature of domestic utilization, trade and markets of NTFP is unknown. Similarly, the market forces driving unsustainable as opposed to sustainable use of NTFPs are poorly known and there is little information on prices, quality standards and international market access requirements. This limited capacity to observe, identify, measure and control NTFP trade has a negative effect on sustainable use of NTFPs by providing conditions under which trade in prohibited products has flourishes.

3.3.6.2 Marketing Regulations for NTFP Development

Regulations for NTFP production and marketing must balance marketing knowledge with resource sustainability. Methods for harvesting level setting and marketing, which are scientific based on resource sustainability as well as competitive based on market mechanism, need to be developed in stead of the current system mostly depending on demand.

3.3.6.3 Capacity Constraints

Currently, there are few government officials responsible for NTFP development and these are split among a number of agencies with limited capacity, in terms of both human resources and equipment, to undertake the tasks required. Therefore, implementation of policy regulating marketing and development of NTFP resources will require substantial capacity building both within Government and with respect to other stakeholders, including villagers, traders and processors.

3.4 Tree Plantation Development⁶

3.4.1 Prospects and Potential for Tree Plantations in Lao PDR

Growing international and regional demand is projected for the kind of wood products derived from plantation grown wood (pulp, chips and furniture, etc). The high rates of economic development and expansion in Vietnam, Thailand, and to some extent, Southern China, plus significant Japanese imports, and a background of decreasing supply from natural forests in the region suggest that forest plantation in Lao PDR has potential and advantage compared to its neighbouring countries.

Potential plantation areas in Lao PDR are generally close to the Thai and Vietnamese markets and, if exported through Vietnamese ports, Japanese and coastal Chinese markets. Transport

⁶This section focuses on production-oriented tree plantations.

costs to such markets remain relatively high, although they may be reduced if major transport infrastructure is developed and equipment modernized.

3.4.2 Policy and Regulatory Framework

Tree planting has been a national priority since liberation and already in 1979, PM's Provision N° 74 promoted tree planting on bare land, and in 1980, June 1st was designated National Tree Planting Day. Under the current 5-Year National Socio-Economic Development Plan (2001-2006), tree planting for commodity production is strongly promoted, with a target of 134,000 ha. Annual planting area and seedling production targets are set in the National Socio-Economic Development Plans and distributed to Provinces for implementation.

With respect to legislation, besides the Forestry Law, MAF Regulations N° 196/2000 on Tree Plantation Development, and N° 1849/2000 on Tree Plantation Registration and the annual PM Orders regulating forestry activities (PMO 11/99; PMO 10/2000; PMO 15/01, and PMO 18/02) provide important support for tree planting.

To achieve targets, Government provides incentives, including allocation or lease of land for tree planting, property rights on planted trees, land tax exemption for registered plantations and free distribution of seedlings to farmers and organizations. A reforestation fee levied on logs and NTFPs harvested from natural forests is also used in nursery construction, seedling production and plantation development. In addition, plantation projects, such as the ADB-supported Industrial Tree Plantation Project (ITPP) have been implemented and Government is also cooperating with JICA, DANIDA, Switzerland, GTZ and other donor agencies over various aspects of tree plantation promotion.

3.4.3 Current Status of the Tree Plantation Sector

3.4.3.1 Plantation stocks

Some 146,600 ha of plantation have been established, predominantly in the Central region. It is estimated that out of these planted areas about 66% have survived (more than 70% of seedling survival rate) and constitute the current tree plantation stock.

According to Lao-ADB project, individual farmers and entrepreneurs contribute the largest area to the national total planted area (47.5%), with an average planted area of between 20 and 30 ha. Smallholders constitute the largest tree-owning group but on average have smaller plantations (~1.8 ha), altogether accounting for 30% of the total area planted under the project. At the other end of the scale, participating companies constitute 1% of clients but, with average plantation size of 200 ha, contribute almost 10% of the area, with households contributing the remaining 13%.

3.4.3.2 Plantation productivity and profitability

Productivity of existing plantations is lower than previously anticipated. In November 2002, a survey of *Eucalyptus camaldulensis* was carried out in Vientiane and Savannakhet provinces. Mean annual increment (MAI) was estimated at 6.2 m³/ha/year and the median slightly above 5 m³/ha/year. Among the different tree planters, commercial firms and self financing planters with their own funds performed better, with MAIs of over 14 m³/ha/year and 12 m³/ha/year respectively. Owners of larger sized stands, who tend to invest more per unit area in fertilizer application, mechanical site preparation and management also achieved higher MAIs. Thus, while owners of stands of 10 ha or more achieved almost 9 m³/ha/year, owners of smaller stands

achieved less. It can be concluded that presently productivity of tree plantations is in general lower than targets.

Such slow growth rates make tree plantation non-viable. Preliminary calculations indicate that at current forest gate prices (~US\$ 10/m³) an MAI of at least 20 m³/ha/year is needed to make tree planting financially viable; only one of the 108 sampled stands reached this figure. At such MAIs and prices, the internal rate of return for investment in tree planting was estimated at 17% if investment costs were US\$ 600/ha, and 9% if US\$ 900/ha. With a MAI of 10 m³/ha/year, the return on investment would be 3%, and -4%, respectively.

3.4.4 Plantation Financing

Financing for tree planting has come partly from firms' own equity or cash flow or from farmers' savings and own labour, and also from bank credit. Only one bank (the Agriculture Promotion Bank, APB) has participated in on-lending of the project's funding, since when Lao commercial banks ceased lending for this purpose.

APB is charging clients 7% interest and since its loan processing costs and the rate of inflation are much higher, the plantation on-lending operation results in an unsustainable net loss to APB.

3.4.5 Plantation Incentives

3.4.5.1 Tax Benefits

The Forestry and Tax Laws and PM Decree 150/2000 on Land Tax, exempt tree plantations from land taxes and fees where registered with DAFO, which issues a certificate of the respective right of land use. Individuals and organizations should also request that DAFO check and certify the site before planting.

3.4.5.2 The Profit Sharing System

Government invites farmers who lack capital or tree planting know-how to enter into a Profit Sharing System (PSS). The system, which has been in operation since 1997, is being piloted in two Districts of Vientiane Province under the assistance of the GOL/JICA Forest Conservation and Afforestation Project (FORCAP). Under PSS, plantations are jointly established by the Government and farmers; DAFO provides the initial funding in kind (seedlings, barbed wire, technical know-how, etc.) and participating farmers provide their own resources, mainly land and labour, for planting and maintenance. As the plantation reaches different stages of maturity, profits from thinning and final harvest are shared on a ratio of one fifth to DAFO and four fifths to participating farmers.

3.4.5.3 Native Species Plantations: Farmers' Teak Plantations in the North

Smallholders in northern provinces have been planting teak trees for the last two or three decades. They have done so in small plots of 0.1 to 1.0 ha at the sides of roads, rivers and streams, footpaths and fences and adjacent to paddy fields and homes. The total planted area is some 8,000 ha and harvesting and logging are practiced on a very small scale – almost on an individual tree basis – ensuring a continuous revenue stream over the years.

Most teakwood is processed into furniture, flooring and decorative products for the domestic market and farmers are easily able to sell their logs. As demand for teak is increasing (~10,000 m³ over the next few years), the outlook is good and international demand, particularly for

garden furniture, is high. Furthermore, trees grown sustainably are preferred in international, and especially European markets.

Teak plantation is, therefore, a promising option for subsistent farmers and Government is considering a number of promotional activities. These include, providing extension in tree improvement, plantation management and cutting methods, supporting farmer organizations, marketing and product development and providing additional land and financing for farmers involved in teak plantation. Formation of teak growers groups will help in negotiating better prices with buyers and in exchanging information on technical aspects of teak production.

3.4.6 Issues for Improvement of Tree Plantation Development

3.4.6.1 Low Tree Plantation Profitability

Inadequate tree-growing technology

Achieving satisfactory growth rates requires competent plantation establishment and management. Larger plantations established by companies using mechanical site and soil preparation, fertilizers, higher levels of investment per hectare and superior management have shown average MAIs of 10-15 m³/ha/year. On the other hand smallholders planting less than 2 ha each with minimal or no post-planting management barely attain 5 m³/ha/year.

Some efforts at improvement are already under way, such as the NAFRI/DANIDA Tree Seed project, which aims at developing technologically improved nurseries and identifying and protecting 'mother' trees from which higher-quality seed can be collected. Other such projects include the strengthening of the extension system project (NAFES/Swiss) and the promotion of forestry education (GTZ/National University) project.

Low prices

Current selling prices less current harvesting and freight costs lead to negative prices at the plantation gate. To make efforts to remedy the situation, it is necessary to carry out a market and marketing study to check conditions under which plantation products are sold, qualities are defined and checked and prices, premiums and discounts are set.

3.4.6.2 Legal and Regulatory Framework

Current legislation would seem adequate. Provisions exist which grant growers the right to own, use, receive benefits from, harvest, transfer, deliver and pass on trees they have planted and the forest land in which they sit as inheritance (Forestry Law, Articles 49, and 52-54). Furthermore, PM Decree 03, on Forest Land Allocation states that Government should allocate degraded forestland to individuals, families and organizations for tree planting.

There are, however, some areas for improvement. Firstly, there is a need for systematisation and placing all valid legal dispositions together and deleting others, which have been explicitly or implicitly repealed. Secondly, under current legislation a grower needs DAFO authorization to plant, thin or harvest trees and to sell or move logs. Government will study possibilities for simplifying these regulations and similarly any restrictions on saw mills to process logs from planted forests will be removed. Thirdly, Government will study ways to equilibrate the legal rights that different planters have with respect to land for plantation. Currently, foreign companies may lease land from the state for 30 years (Land Law, Art. 65), while villagers are granted temporary land-use certificates for three years and after satisfactory implementation within three years they are eligible to apply for permanent land title. Therefore, procedures to

transform these temporary land-use certificates into permanent land titles may need to be considered.

3.4.6.3 Funding and Incentives

APB is on-lending ITPP funds, but losing money in the process. Therefore, it may have to cease on lending in the near future or to increase interest rates sharply to protect APB's financial integrity and encourage other state and commercial banks to lend for the purpose. Government will consider ways and means for improving tree plantation funding mechanisms.

Plantations are currently exempted from land taxes or fees (except for lease payments) and Government will study whether other tax or non-tax incentives for tree plantation can be established and whether it is possible or convenient to establish special tax incentives for foreign investors interested in tree planting.

3.5 Harvest/logging plan and Royalties

To regulate forests harvesting, Government annually sets harvest/logging plans and log extraction royalties and determines rules for log sale through the release of Prime Minister's Orders⁷.

3.5.1 Harvest/Logging plans

Government sets nationwide logging plans, which are approved by the National Assembly, as part of the Socio-Economic Development Plan. Once approved, the national logging plan is divided amongst the Provinces and these, through the PAFOs, distribute the provincial logging plan amongst the Districts and, together with DAFO officers, among the individual production forests.

The national logging plan is determined on the basis of a proposal prepared by MAF/DOF, which itself is prepared on the basis of applications submitted by provincial authorities, municipalities, and special zones. Other factors such as development and budgetary needs and demands from processing mills are also considered.

In the future the Government will propose to allocate the cutting volume on the basis of forest management plans. Currently, however, these are not comprehensive enough and nationally cover less than half of the production forest area. At present, therefore, Provincial and District authorities use them as one of several criteria to divide the provincial logging plan amongst production forests.

DAFO organizes and monitors logging operations in the field, and reports to the PAFO. Logging operations up to second landing are implemented by state logging units where these exist, or are otherwise sub-contracted under supervision of Government staff. All logging must be within PFA boundaries and subject to management plans; activities not included in the management plan or otherwise in violation of Forestry Law and its implementing regulations are prohibited (PMD 59/2002, Arts. 9 and 10).

⁷ The latest are PMO N° 11 (1999); 10 (2000); 15 (2001), 18 (2002), 28 (2003) and 25 (2004), which regulate logging activities in 1999-2000; 2000/01; 2001/02, 2002/03, 2003/04 and 2004/05, respectively.

3.5.2 *Log royalties and Reforestation Fees*

Firms and individuals receiving harvest/logging plans required by Government to pay log royalties, or stumpage rates per cubic meter of timber removed from second landing⁸. As under a third of royalties due in the 1990s were actually collected, Government has taken recent steps to strengthen the link between the physical removal of logs and the actual payment of royalties to increase collection rates and reduce arrears.

Royalties are set and updated periodically by the Ministry of Commerce (MOC) according to species and grades. Amongst other considerations, rates are primarily based on international market data. The MOC is currently working closely with MAF and the World Bank to develop a support program to address the existing deficit of information relating to regional and international markets and trade in forest products.

The recent PM Decree 59/2002 encourages the use of market-based mechanisms to secure prices above those set by the MOC to maximize revenue for both the Government, forest management units and participated villagers. With the recent introduction of some degree of market-based bidding in the provinces, royalties act as a floor price ensuring a minimum level of revenue is collected at the provincial level.

To help sustain current forest cover, the government has also instigated collection of Reforestation Fees, charged for sale of both timber and non-timber forest products, to finance re-forestation activities. According to Point 2 of PM's Order N° 11/1999, trees cut must be replaced by a duty paid to Government for replanting under the management of the concerned government organizations, or for each tree felled 20 seedlings must be planted. The wood processing companies who have been allocated logs from the government have to pay the reforestation fee at the following rate:

- (i) Protected timber species, Category I, II: 3 US\$/m³,
- (ii) Controlled timber species, Category I, II: 2 US\$/m³,
- (iii) Controlled timber species, Category III: 1 US\$/m³.

Furthermore, PM's Order No. 18/2002 stated that the wood processing companies, apart from paying the above fees, have to invest their own plantations in order to secure their own supply of raw material.

According to MAF Instruction N° 1848/1999, the same applies to revenues from NTFP harvest. For example, each tonne of rattan harvested 10 trees must be planted or 6 US\$/tonne paid, and for one tonne of oleo-resin (black resin *Dipterocarpus* spp) harvested 50 must be planted or 10 US\$/ton paid.

3.5.3 *Sale of logs and non-timber forest products*

The standard system for sale of logs is through negotiation/bargaining although bidding at second landing has also been practiced in some cases. For the latter, concerned Ministries coordinate with relevant local authorities to arrange bidding procedures on the basis of survey data provided by the Provincial Forest Section. Bid winners negotiate and sign a sale contract with the Provincial, Municipal or Special Zone Commerce Division, make a down payment on the logs to the provincial finance divisions and also sign an afforestation contract with PAFO

⁸ In addition to nation-level royalties, wood processing industries and private logging companies may also be subject to payment of provincial, district and village development levies and fees.

and pay the re-forestation fee in totality. Piloting showed, however, that the bidding system was, inappropriate under the prevailing conditions and with the limited number of buyers. Therefore, the negotiation/bargaining system was reinstated⁹.

Government has now decreed, however, that logs and NTFPs be sold on annual basis to processing plants through competitive, market-oriented and transparent methods to secure better prices and maximize revenues accrued by Government and villagers. Log sale decisions will be made by the provincial log-sales working group under the guidance of the Provincial, Municipal or Special Zone Governor (PMD 59/2002, Art. 11). To ensure transparency, the working group will include participants from all concerned parties including the relevant village forest organizations. Gross revenues from log sale will be utilized for: (i) remittance to the national budget, (ii) contribution to the forest development fund, (iii) defraying forest operating costs, and (iv) funding local development including village development activities (PMD 59, Art. 12).

3.5.4 Issues for Improvement of Harvest/logging plan and Log Sales Systems

3.5.4.1 Transition to PFA based harvesting and sales

Once the national PFA system has been established and management plans are in place, the national harvest/logging plan and provincial allocation system will cease, as all harvesting will be on the basis of scientifically estimated annual allowable cut. Log harvesting and sales will be conducted for each PFA or sub-PFA by concerned local organisations. The transition between the two systems will be gradual and should therefore not place too great a burden on the forestry sector or the Government. However, challenging decisions may have to be made to ensure that the transition progresses smoothly and is not undermined.

3.5.4.2 Institutional strengthening for competitive log sales

Sales of logs from PFAs will be conducted transparently using competitive market-oriented mechanisms to yield prices above those currently set by Government (PMD N° 59/2002). To meet these requirements a sales method should be determined by Government and relevant guidelines prepared. In addition, strengthening of concerned agencies and staff, will be necessary before implementation.

3.6 Wood Processing Industry

3.6.1 Overview of the Wood Processing Industry

3.6.1.1 Economic and Employment Contributions

The wood-processing sector in Lao PDR makes an important contribution to both the economy and to regional employment through the following features:

- Wood processing constitutes approximately 6% of GDP and 32% of the manufacturing industry production value (estimate by MIH/UNIDO).
- In 2001, timber royalties provided 15% of national revenues.

⁹ PM's Decision N° 41/2002 cancelled Article 5 in the PM's Decision N° 60/2001, indicated the replacement of the bidding system by the negotiation/bargaining system.

- Wood products exports accounted for \$78 million or 25% (including log exports) of the official export value.
- The wood-processing sector employs approximately 22,000 people, more than 20% of the total employment in the manufacturing sector.

3.6.1.2 Industry Structure and Ownership

In 2001, there were 160 sawmills and two-ply mills in the country with an estimated annual capacity of approximately 1.0 million cubic meters of logs inputs. However, only 20% of the mentioned numbers have operated effectively. The larger factories are mainly located in the Central and Southern provinces and often have integrated operations including sawmilling, drying and remanufacture. Sawdust and slabs are used for fuel while in most of the smaller establishments (less than 5,000 m³ intake) by-products are burnt or used as fuel-wood by the community.

Ownership of wood processing factories is dominated by the private sector although there are a few joint ventures with state companies. There are no large corporations that exercise significant control in the sector but some large factories in the centre and south of the country have substantial influence on forest resources.

The wood-processing sector has recently formed the Wood Producers Group to exchange information on trade issues and organize training courses. This Group could also organize marketing initiatives in an area dominated by the traders and buyers from neighbouring countries.

3.6.1.3 Competitiveness and Distribution

The Lao PDR wood processing industry has difficulty competing against established facilities in neighbouring countries when paying international parity prices for logs. Therefore, export of secondary or finished products is limited. Instead, these countries process logs and sawn wood from Lao PDR and export final products to lucrative markets in Japan, Europe and North America. Foreigners with direct market access do own some of the sawmills, however, a number of them use Thai timber traders to sell their products and do not therefore have much knowledge of prices or market dynamics.

More positively, large distributors such as Scancom, Home Depot and Ikea are actively sourcing product in SE Asia and providing assistance to plantation based industry and the road-upgrading program and second Mekong bridge will further improve market access and competitiveness. In addition, there is an opportunity for Government-to-Government initiatives to reduce costs, particularly through the corridor linking Lao PDR to the port in Thailand.

3.6.1.4 Production, Consumption and Export

Reported production of sawn timber has fluctuated over the past five years but has averaged 230,000 cubic meters per annum. At a 50% yield, this represents a log intake of approximately 460,000 cubic meters per annum or less than 50% utilisation of installed capacity. There are a number of reasons for the low capacity utilisation including:

- Unreliable log supply
- Unavailability of spare parts
- High level of downtime due to old machinery and equipment

Estimates of domestic wood product consumption are imprecise due to difficulties in assessing quantities of timber sawn by villagers. Despite these constraints, an indicative estimate of domestic consumption is put at 200,000 m³ per year, or 37 m³ per 1,000 people.

It is estimated that 90% of the reported sawn wood production is for export and the rest, just 23,000 m³, is for internal use. This suggests that most domestically used sawn wood is supplied by small pit sawing producers and processed into furniture, doors and indoor decorative products by furniture factories, of which there are more than 900. Combining these two types of sawing, the estimated total annual log supply for domestic processing is about 800,000 cubic meters.

3.6.1.5 Future Supply and Demand

By 2020, domestic consumption of timber and plywood will increase to approximately 300,000 cubic meters per annum assuming an equivalent per capita consumption. This equates to a round wood equivalent (RWE) of approximately 600,000 cubic meters at 50% conversion. If the current level of sawn timber exports is maintained, total log removals of more than 1 million cubic meters will be required. Given probable sustainable log removals of approximately 300,000 cubic meters per annum, it appears that plantation wood will have to supply a large proportion of logs for both domestic consumption and export.

3.6.2 Institutional Arrangement and Regulatory Framework

In Lao PDR, wood-processing factories are regulated primarily by MAF Regulation 261 (2000) and specific provisions in the Forestry Law, the Foreign Investment Law (1994), PM Decree 46 Implementing the Foreign Investment Law and the Processing Industry Law. Both MAF and MIH have authority to regulate wood-processing factories; MAF on the basis of Forestry Law and MIH on the basis of Article 44 of the Processing Industry Law, which gives the right to issue operating permits to various types of processing factory. That both ministries are empowered to set operating standards and register wood processing machinery causes confusion and dialogue between the two should be strengthened.

To establish a wood-processing factory in Lao PDR, a local investor must obtain an enterprise registration license from the Ministry of Trade, a tax license from the Tax Department of the Ministry of Finance and an operating license from MAF and/or MIH. In addition foreign investors must obtain a foreign investment license from the FIMC. MAF Regulation No. 0261 (2000) requires wood processing factories to obtain an operation permit annually. The factory must request a license extension by September of each year in order to qualify for wood processing and trading (PM Order 15, Art. 2).

Pursuant to the Forestry Law, Art. 22, and MAF Regulation 261, wood processing is a forest activity authorized by MAF. Specifically, MAF governs the registration and licensing of wood processing factories as well as any move, transfer or change in factory ownership. PAFOs are required to register all machinery and authorize and monitor the import and use of wood and NTFPs for factories. Lastly, DAFOs are mandated to monitor and inspect factories based on prohibitions in MAF Reg. 261, Art. 23, and other relevant legislation and to submit the resulting report to MAF.

3.6.3 Government Policy

Government policy has been to promote domestic wood processing by linking regulation of wood processing facilities to harvest/logging plans and timber harvest and promoting export of

processed wood only. Recent refinements have attempted to address overcapacity and to improve technology and standards to effect a transition from exporting logs and sawn timber from natural forest to gaining advantage in manufacturing finished and semi-finished wood products using, as far as possible, plantation grown timber.

3.6.3.1 Overcapacity

Government refines, both through downsizing and upgrading in the wood industry sector have been through selection of wood processing factories meeting certain criteria (PM Order N° 10/2000 and MAF Instruction N° 267/2000). The main conditions to be met are as follows:

- 1) Producing semi-finished or finished products.
- 2) Using high technology and high productivity machinery that is appropriate for production of semi-finished or finished products.
- 3) Demonstrating superior environmental protection, safety and welfare.
- 4) Operating with appropriate management.
- 5) Having a good record of law abidance.

According to the selection process, the Government has proposed closure of 26 out of 130 saw mills and 169 of 918 furniture factories. PM Order N° 18/2002 orders these factories to cease operation.

3.6.3.2 Promotion of Export of Semi-finished and Finished Products

In order to promote export of semi-finished and finished products the Government ordered a ban on export of logs and a reduction in sawn timber export by PM Orders N^{os} 11/1999, 10/2000 and 15/2001. In PM Order N° 18/2002 export of sawn timber is also banned to restrict export of roughly processed sawn timber or 'square logs'. Furthermore, PM Order No 25/2004 allows export of some semi-finished products only. These orders are being gradually implemented.

To protect domestic producers of semi-finished and finished products and to avoid pressure on natural resources, foreign investment in secondary processing based on natural forest, with the exception of furniture, is banned (PM Decree N° 46/2001).

To benefit from the Common Effective Preferential Tariff Schemes (CEPT) preferential tariff rates, many wood related items have been transferred from the Temporary Exclusion List into the Inclusion List, meaning that tariff rates for these products will be reduced to between zero and ten percent by 2008 from the current five to forty percent. This constitutes another step moving the Lao wood industry into a more competitive regional position.

3.6.3.3 Transition to Processing of Plantation Timber

In addition to the various schemes in Section 3.4 promoting tree plantations for future timber supply, a couple of wood industry specific measures have also been taken. One is to open foreign investment into all kinds of wood processing using plantation trees (PM Decree N° 46/2001). Another is to require wood processing factories to establish their own tree plantations in accordance with their size (PM Order N° 18/2002).

3.6.4 Issues for Strengthening of Wood Processing Industry

3.6.4.1 Complicated Factory Operation Processes

The regulatory framework should be adjusted to support sound operation and growth of the wood processing industry. However, the number of permits necessary to start businesses or to continue operation results in excessive time and monetary constraints. Furthermore, permission criteria lack transparency, which discourages investment in modern more efficient processing equipment.

3.6.4.2 Administrative Approach for Reduction of Processing Capacity

Allowing for weak institutional capacity with respect to logging regulation, the administrative measures currently taken to reduce excessive processing capacity are justified. The selection process must, however, be transparent and a comprehensive approach to capacity reduction is required to ensure efficiency in the remaining factories. Such an approach would entail instigation of competitive log sales and stout measures to control unauthorized logging and supply to factories. Moreover, it would be necessary to consider declaring closure of forests; temporary closure would be for areas where heavy logging beyond supply capacity of forests continued for a long time and shifting cultivation was practiced many years and permanent closure for riparian or watershed areas.

3.6.4.3 Inefficiency in Wood Processing

Many factories currently operate at less than half of installed capacity and log recovery rate is similarly around 50%, the factories are, however, still in business. As evidenced by the low royalty collection rates, actual royalties paid by these factories are far below the official or market rate due to incorrect grading of logs, an ample supply of cheap logs or simple non-payment. In parallel with providing a regulatory environment allowing only efficient factories to survive, regulations, rules and technical guidelines need to be strictly implemented.

3.6.4.4 Insufficient Export Promotion of Finished and Semi-finished Products

Government is committed to strict implementation of the log export ban and sawn wood export restrictions. However, this measure alone may be insufficient to foster a competitive, moderately sized secondary/final processing industry and export business. Given the unavailability of high technology processing equipment, skilled workers and design and marketing experience within the country alternative measures need to be considered and rapidly implemented.

3.7 Biodiversity Conservation

3.7.1 Biodiversity in the Lao PDR

3.7.1.1 Habitat Diversity

There are seven habitats in Lao PDR of high international conservation significance:

- Evergreen Forest of the Sai Phou Luang and foothills
- Central Indochina Limestone Karst
- Dry Dipterocarp Forests in the Mekong plain

- Boloven Plateau
- Northern Highlands
- Mekong River, and
- Other rivers and streams

3.7.1.2 *Species Diversity*

Lao PDR is rich in species with a high degree of endemism and biological distinctiveness. At least 8,100 plant species, 166 species of reptile and amphibian, 700 bird species, and 100 mammal species occur in Lao PDR. As an example, more than 430 bird species found in the Nakai-Nam Theun NBCA represent one twenty fifth of all bird species found world-wide and more than half of all bird species in the Lower Mekong system. Similarly, there are eighty-seven known families of fish in the Indochina region, whilst 74 families have been identified in the whole African continent, and 60 families in South America.

3.7.1.3 *Cultural diversity*

Ethnically, Lao PDR is highly diverse, both in terms of number of ethno-linguistic groups and in the breadth of their higher linguistic diversity. More than 230 spoken languages, belonging to four language superstocks, have been identified, making Lao one of the world's most diverse countries. With respect to location, the areas of highest diversity are often in the remotest upland areas, particularly within NBCAs.

3.7.2 *National Biodiversity Conservation System*

The program to establish a national biodiversity conservation system has been active since 1989. PM's Decree N° 164/1993 established 18 NBCAs, later increased to 20 plus two corridor areas. The current area totals 3.4 million hectares or 14.3% of the country's area. In addition, provinces and districts have designated their own conservation areas¹⁰ and protection forests¹¹ bringing the overall national total to 5,3 million hectares or 22.6% of the total land area.

3.7.3 *Legal Framework*

The three most important legal instruments are PM Decree N° 164/1993, the Forestry Law and the MAF' NBCA implementing regulation No. 0360/2003. A complete list of relevant legislation is presented in the report on the Legal Framework of the Forestry Sector (2003) prepared by DOF with Sida support. The following provides a brief summary of the main points in each of the main documents.

Prime Minister's Decree N° 164/1993 established the national biodiversity conservation area (NBCA) system¹². NBCAs are the only managed, national-level areas devoted to nature conservation with no other national parks, wildlife or bird sanctuaries, aquatic reserves or similar areas in Lao PDR.

¹⁰ 57 provincial biodiversity conservation areas totalling 932,000 ha and 144 district biodiversity conservation areas totalling 504,000 ha.

¹¹ 23 provincial protection forests totalling 461,000 ha, and 52 district protection forests totalling 56,000 ha.

¹² The Lao term 'Pa Sa-nguan Heng Sat' means 'national conservation forest'. To distinguish them from other types of conservation forest, the term 'National Biodiversity Conservation Areas', which more accurately reflects Government intent according to the wording of the Decree, has been adopted for English use (Berkmüller et al. 1995).

The Forestry Law N° 01/1996 defines the nature, functions, objectives, and legal status of conservation forests¹³ and requires Government to engage in participatory management of NBCAs with villagers. It also provides for zoning within the NBCAs into totally protected zones, controlled utilization zones and link or corridor zones.

MAF Regulation N° 0360/2003, on Management of National Biodiversity Conservation Areas, Aquatic Animals and Wildlife provides guidelines on NBCA establishment and zoning and also on restricted activities and development fund establishment and the rights and duties of state agencies in NBCA management.

3.7.4 Institutional Arrangements for NBCA Management

3.7.4.1 Institutional Responsibilities

MAF has overall responsibility for management of all categories of forest including those within NBCAs. Responsibility is delegated to DoF, with the Forest Resource Conservation Division (FRCD) in the role of technical unit. From DOF (FRCD) decentralized responsibilities are with the Provincial Agriculture and Forestry Offices (PAFO) and the District Agriculture and Forestry Offices (DAFO) who manage the conservation forests, aquatic animals and wildlife within their jurisdiction. The DAFOs themselves must in turn cooperate with people living inside and on the periphery of the relevant forests.

3.7.4.2 NBCA Management Strategies

Management approaches may be broadly grouped as integrated conservation and development (ICAD) and participatory management (PM). ICAD is generally more suitable for the Lao PDR since the livelihood systems of villagers put pressure on biodiversity, and poverty eradication through development intervention is necessary possible. PM is endorsed by the Government to involve villagers in NBCA management decisions and conservation activities, as they already often manage local forest resources in a sustainable way.

Both models are compatible and integrate well given the overall policy to decentralise NBCA management to the local level. Virtually all NBCA management projects have taken some sort of PM approach, however, since pressures on NBCAs is often from outside, fostering residents' participation may not be enough and PM should, therefore, be expanded to include all relevant local stakeholders.

3.7.4.3 International Cooperation

Cooperation is performed mainly to promote scientific research, technical development and to build human resource capacity. NBCA management has been supported individually or jointly by donors such as Sida, DANIDA, Canada, IUCN, WWF, WCS, TRAFFIC, GEF, World Bank and others.

In addition, there is cooperation with neighbouring countries and at border checkpoints unauthorised wildlife trade is regularly controlled. Such cooperation is useful to enhance the conservation potential of NBCAs adjacent to border. In addition, adjacent conservation areas in neighbouring countries can add to the overall significance of the individual areas by increasing

¹³ The Forestry Law also defines 'protection forests' as a distinct forest category (Art. 17) not intended for protection of biodiversity, environment or culture but for watershed protection, erosion control, national security and/or prevention of natural disasters.

gene pool sizes and increasing species population sizes giving greater buffering against disturbance.

3.7.5 Issues and Threats to Conservation Forests and Wildlife

Despite recent efforts by the Government to improve the legal framework, streamline the institutional set-up and control unauthorised activities, degradation of conservation forests and depletion of valuable wildlife continues. In some NBCAs such as Dong Phou Vieng and Phou Phanang, habitat degradation and forest conversion are so serious that some parts of the NBCAs are unlikely to warrant further conservation. Some other NBCAs are relatively well preserved but are also under pressure from unauthorised and development activities. The following are several threats to NBCAs and wildlife that need to be urgently addressed.

3.7.5.1 Habitat degradation

Agricultural practices. People settled within or around some NBCAs have encroached upon the protected area by expanded paddy fields, gardens or commercial cropping areas. Shifting cultivation is also practiced within some NBCAs and run away forest fires often cause great damage.

Livestock grazing. In the dry season, villagers often turn large livestock loose in the forest. To improve grazing, villagers may burn the forest under storey to promote grass growth and to drive away large predators, such as tigers, to avoid cattle loss. In addition to the direct damage this does, livestock also consume seedlings and may transmit disease to wild ungulates.

3.7.5.2 Resource harvesting activities and limited control capacity

Wildlife and trade. Wildlife is hunted mostly by rural people for home-consumption although meat and wildlife products are also sold at local markets. Commercial hunting and fishing, in contrast, can be much more damaging and as a result, some species such as rhino and some turtles have almost disappeared from Lao PDR. Since fish are concentrated in narrow habitat bands, i.e. rivers and streams, they can be killed more effectively than most other wildlife and thus suffer disproportionately.

At present laws and regulations to prevent unauthorised use of wildlife, although in existence, are not strongly enforced and knowledge and skills of staff, as well as the resource and facilities at their disposal, are limited. Attention to these matters through the concerted efforts of national and international bodies is urgently required.

Use of poison. Poisoning of terrestrial and aquatic habitats for wildlife 'hunting' in some areas is still practiced in Lao PDR. Government regulations prohibit this, but public awareness of the impacts of poisoning wildlife is still low and information campaigns are therefore required.

NTFP harvesting. NTFPs, as previously stated, provide a major source of food, fodder, fuel and other household materials and are essential for the livelihoods of many rural peoples. NTFPs are, however, harvested on a commercial scale, often in unsustainable manners and quantities.

Authorized and unauthorized Logging. Unsustainable logging activities presently convert large areas of healthy forest into degraded forest with fewer tree species of younger age and with a deficient fauna. Logging roads also create easy access for wildlife hunters, NTFP collectors, and local farmers placing further pressure on remaining habitats. In response to the situation,

efforts are being made to improve enforcement of regulations and policies requiring loggers to adhere strictly to the law.

Animal-human conflicts. Certain animals are hunted because they pose threats either to people, livestock or crops. Human activities, such as logging, collection of NTFPs and forest clearance, resulting in reduction of natural food sources for tigers, elephants and other wild animals have compounded matters by increasing pressure on crops and livestock and forcing animals into closer proximity with humans.

3.7.5.3 Development projects

Hydropower generation can be both a threat and a benefit to biodiversity. The flooding of large tracts of land following dam construction destroys habitats and plant populations and displaces wildlife. If power projects are, however, required to develop funding mechanisms aimed at biodiversity conservation, the overall impact may be mitigated. For example, 1% of revenues from electricity from Nam Luek hydropower project are currently used in the management of Phou Khao Khuay NBCA.

3.7.5.4 Socio-economic factors

Poverty is still widespread in Lao PDR, particularly in the more remote areas and many view the forest as a free source of food and saleable goods. Although the current population density in Lao PDR is still low in relative terms, population is estimated to increase to 6.7 million in 2010 to 8.3 million in 2020. Without the levels of poverty reduction aimed at over this period, pressure on forests is likely to become rapidly excessive leading to potentially disastrous effects for rural populations.

3.7.5.5 Public Awareness

Government is making continuous efforts to increase awareness of the importance of biodiversity and to improve education so that they may enjoy and protect plants and animals as part of the national heritage. These actions are performed in many forms, such as publication of important data, distribution of posters, production of newspaper articles, through radio transmissions and by celebrating July 13th as National Wildlife Conservation Day. More significantly, the Government recently took the decision to participate in the International Convention on International Trade of Endangered Species (CITES).

3.8 Protection Forests and Watershed Management

3.8.1 Status of watersheds and protection forests

It is estimated that provincial and district protection forests cover around 0.6 million hectares¹⁴. Within these areas, shifting cultivation, felling, burning or removal of trees, firewood collection, animal raising and construction of houses or other structures are prohibited, as are activities such as extraction of soil, stones or minerals and hunting or gathering of prohibited forest products (Forestry Law, Art. 41).

¹⁴ This figure includes other categories of forest under village management within these areas but excludes protection forest under village management in other areas.

Watershed classes 1, 2 and 3 represent 74 percent of the total land area of Laos. Much of this area is severely degraded and in 1993 only 11 percent was covered by dense forest and 44 percent lacked any forest cover at all.

3.8.2 Watershed Management Policy

MAF through the Department of Planning is promoting integrated watershed management (IWM), in accord with the national decentralization policy. In April 2002, the National Agriculture and Forestry Conference agreed that the IWM approach should be applied by all Districts to achieve sustainable natural resource management. As such, MAF is promoting the development of a number of IWM models resulting in IWM plans in, for example, the Nam Et Phou Loei NBCA and the Nam Tong and Nam Neun watersheds. Due to their importance in watershed management, Protection Forests need to be considered and used as a component of IWM. It has also been proposed that all hydropower and irrigation projects should include an IWM or river basin plan for the entire watershed in which they are situated.

3.8.3 Institutional Arrangements

The principal agency responsible for management of protection forests is the Forest Resource Conservation Division of DOF/MAF, which is charged with planning, coordination and any technical backstopping related to management of these forests. At the field level, implementation of projects and activities is the responsibility of the respective PAFO and DAFO. For IWM, many Governmental units share responsibility. These include the Science, Technology and Environment Agency responsible for overall coordination, MAF which acts as the leading agency, and the Ministries of Communications, Transport, Post and Construction, and Industry and Handicraft (Hydropower) together with their provincial branches.

3.8.4 Local Participation

As previously mentioned, the participatory approach to development and management is the official policy of the Government as supported by the Forestry Law, the Water and Water Resource Law and other legislation, decrees and instructions. As such, and because of the nature of the tasks involved, this approach is fully applicable to IWM and Protection Forest management.

3.8.5 Issues for Watershed Management

3.8.5.1 Funding Watershed Protection

Providing adequate funding for establishment, demarcation and management of forests of any kind is an obvious problem in Lao PDR as the Government's revenue base is limited. However, the problem may be alleviated when protection is required by, or associated with, valuable infrastructures projects. For example, the Government has decided to devote one percent of gross revenues generated by the Nam Ngeum hydropower plant to upstream watershed development and protection. This could represent funding worth some US\$ 125 million over 40 years.

3.8.5.2 Coordination among concerned agencies

Inadequate inter-agency and cross-sectoral coordination is a worldwide problem. Inter-agency rivalries and limited cooperation in fought over fields may lead to disruption of the efforts to reach commonly held objectives. Government will therefore encourage increased and more active inter-agency cooperation including non-binding cooperation agreements between line

agencies, mandated cooperation through provincial administrations and basin-specific management bodies. As an initial effort, Government is planning to revitalize the Water Coordination Committee of STEA and to implement coordinated watershed management, including dam management, agriculture/forestry development and, with ADB support, infrastructure development in the Nam Ngeum River basin.

3.8.5.3 Rehabilitation of degraded watersheds

Some of the most important watersheds in Lao PDR, such as the Nam Ngeum River basin, are heavily degraded and there are many areas where rehabilitation, mainly through combination of natural regeneration and enrichment planting, is the only way to recover suitable vegetation cover. In addition to the watershed management activities already mentioned, innovative methods, involving villager participation, need to be found and implemented to rehabilitate these areas. The “Water for Trees” method, i.e. tree planting in watersheds by villagers in exchange for construction of water supply systems, has been tested in Vientiane Province and provides a promising opportunity.

3.9 Village Land and Forest Management for Poverty Eradication

3.9.1 Poverty and Forestry

About one-third of the rural inhabitants of the Mekong Corridor (lowlands) and one-half of those living in mountainous and remote areas (uplands) live below the basic poverty line. The poverty situation of the former has improved significantly since the mid-eighties when half were below the poverty line, to one-third in the mid-nineties. For the upland group, however, the situation has not changed at all.

Both groups, but particularly upland people, are directly dependent on neighbouring forests for subsistence and for generation of meagre but vital income. The benefits derived from forests include wood for house construction, food and fuel for domestic needs, cash income from NTFP sale, wages for commercial forestry activities, land for cropping, shifting cultivation and tree planting or regeneration and inputs for cropping and livestock raising.

Threats to these contributions to rural livelihood and welfare take various forms. The main ones include: (i) forest loss and degradation leading to NTFPs scarcity, (ii) loss of access to forests through protection or conservation forest designation, relocation due to infrastructure development, village consolidation or warfare, use of defoliating agents or presence of UXO, etc. 3) natural disasters, e.g. droughts and floods forcing villagers to over exploit NTFP resources, and 4) indiscriminate or uncontrolled logging causing loss of valuable trees and environmental degradation.

Recognizing the dire need and acknowledging increasing deterioration of forests, forestlands and other lands inhabited by rural people, Government issued several legislative documents, culminating with the 1996 Forestry Law, and continues to prepare implementing regulations and additional laws and policies. Several measures aimed at improving rural peoples’ living standards have also been implemented including efforts to control and reverse deterioration and improve delivery of basic social and development services. In chronological order, the most important Government programs and projects are as follows:

- Protected/Biodiversity Conservation Area Program (active since 1988)
- Shifting Cultivation Reduction Program (active since 1989)

- Land and Forest Allocation Program (active since 1993)
- Community Forestry and NTFP Programs (active since 1993)
- Focal Site Strategy, and Village Relocation and Consolidation Program (initiated in 1994/95 and elaborated in 1998)

3.9.2 Legal Framework Governing Village Forests and Their Use

Through Government's past and on-going efforts the legal framework concerning village land use and forest management has been made comparatively clear. The most relevant legislation includes the Forestry Law, MAF Instruction 822/1996 and MAF Regulation 535/2001.

Village boundaries including forest boundaries are officially drawn with acknowledgement from neighbouring villages, through the land and forest allocation process. Village forest is classified into several types and rules on the use of each type are agreed upon with villagers' full participation. Villagers are allowed to collect and sell NTFPs and harvest timber for domestic use. They may be allocated land for tree planting and regeneration, and ownership of the resulting trees is guaranteed upon registration. Land tax may also be waived on tree plantations under certain conditions.

3.9.3 The Effects of Programs and Projects on Village Land and Forest and Poverty Eradication

3.9.3.1 Protected/Biodiversity Conservation Area Program

The objective of the National Protected Area/Biodiversity Conservation Area Program is to protect natural areas for conservation of flora and fauna, maintenance of ecological stability and watershed functions and to preserve historically, aesthetically, culturally or scientifically valuable sites. Program objectives should, wherever possible, be achieved through local, participatory management benefiting NBCA residents. Villages involved in NBCAs are classed into one of four types:

- enclave villages, whose production forests fall entirely within the NBCA boundary;
- straddle villages that may be outside the NBCA but some or most of its village production forest are within it;
- adjacent villages whose village production forest borders but does not impinge on the NBCA, and
- external villages whose activities have an impact on the NBCA.

The designation of an areas' inclusion in the program may also impact on villagers' access to forest and more generally on their livelihoods. A village may be constrained or even prohibited from customary use of the former village production forests or commercial forestry activities, which generated, or could have generated, income. Hence, participatory management involving the concerned villagers should be stressed to ensure they have access to some new sources of income that NBCA establishment may generate. Examples include: better utilization of 'management zones', employment as wardens or tour guides, establishment of conservation and monitoring agreements, sale of handicrafts, income from accommodating and providing food for tourists, etc. However, initial investments including the necessary training should be supported by beneficiaries of biodiversity conservation, be it the Government or international society.

3.9.3.2 *Shifting Cultivation Stabilization and Permanent Occupation Program*

Government has been concerned with the issues of shifting cultivation and permanent occupation since liberation and the program has been active since 1989 (PM's Decree 117/1989). Its objectives are to:

- stabilize shifting cultivation
- stop indiscriminate logging and regenerate forests, and
- improve the living standard of upland people through the adoption of permanent land use systems.

The strategy dealing with shifting cultivation stabilization, as spelled out in the 1999 Agricultural Sector Strategy, includes activities in the following areas:

- land use zoning based on slope and land capability
- sedentarization of agriculture in sloping lands through farming system diversification and agroforestry development
- enhanced access to markets through feeder road construction and delivery of market information
- rural savings mobilization and credit grants, and
- land allocation and land use occupancy entitlement

A major advance in policy definition has been the differentiation between 'shifting cultivation' (*'hay kheuan nhai'*¹⁵), in which clearing and farming advances continuously into the forest and 'rotational cultivation' (*'hay moun vien'*), which return to previously cropped areas after an appropriate fallow period, normally between seven and twelve years to allow recovery of soil fertility and eradication of weeds. In contrast to the shifting mode, the rotational cultivation does not impinge on new forest tracts.

Since 1990 significant reductions in the areas involved and the number of families practicing shifting cultivation have been reported. From 249,000 ha and 210,000 families in 1990, figures dropped to 93,900 ha and 134,000 families in 2001 and further to 29,400 ha and 43,039 families in 2005. The current targets are to eliminate 70% of the area under shifting cultivation by 2005 and to eradicate it completely by 2010. Five provinces in the North of the country (Luang Prabang, Oudomxay, Huaphanh, Phongsaly and Luang Namtha) are the focus for this program each being given an annual reduction target.

Rotational upland cultivation on allocated plots or within agreed areas, without encroachment upon new forest areas, is an accepted alternative, although sedentary cultivation on upland or sloping areas using improved, conservation-oriented farming methods is preferred. Promotion of non-rice crops, fruit and commercial trees, cattle, and fishponds potentially provide alternative sources of food and income for affected populations.

To replace shifting cultivation, Government recommends and supports establishment of alternative production systems through technical and, in some cases, financial assistance. No statistics exist, however, on the permanent occupations and livelihoods of farmers that abandoned shifting cultivation although many reported successes are promoted as models.

¹⁵ Shifting into locations further into the forest as reducing land fertility and weed infestation force farmers to abandon previously-cropped areas. It implies progressively cleaning and cropping new areas of heretofore forested land.

Amongst these are pineapple production in Luang Prabang and cultivation of cardamom and other NTFPs in Oudomxay.

Land and forest allocation (Section 3.9.3.3) and village relocation and consolidation have been used as the main stabilization mechanisms for shifting cultivation and the impacts of these programs are presented in the following sections.

3.9.3.3 Land and Forest Allocation Program

Land allocation activities began in the early 1990's and were consolidated into a national program under PM's Decree N° 3/1996. A specific Decree on Allocation of Land and Forest Land for Tree Plantation and Forest Protection (PM's Decree N° 186/1994) enabled allocation of land for these purposes. MAF Instruction N° 822/1996 set general principles, specific targets, implementation procedures, types of land to be allocated within villages and eligibility for land-forest allocation. The Land Law (N° 04/2003, Arts. 17 and 21) provides the framework for areas of land to be allocated. Accordingly, up to 25 ha¹⁶ can be allocated for agriculture and forestry for each labour unit available to an organization or individual.

The Land and Forest Allocation Program has been vigorously implemented under strong leadership of the Central Committee for Land and Forest Allocation, with MAF as the leading agency. Targets, in terms of numbers of villages, are set by province and a national meeting is held annually to review achievements and agree on the following year's targets. Table 2 below shows annual implementation of the program.

Table 2: Annual implementation of the Land and Forest Allocation Program

Year	N° of villages	N° of households	Total area (ha)
1995-1996	1,242	82,206	879,595
1996-1997	1,327	40,158	329,580
1997-1998	1,232	95,659	3,244,576
1998-1999	1,009	90,886	855,527
1999-2000	555	21,789	823,460
2000-2001	508	29,361	673,992
2001-2002	315	19,231	1,358,978
2002-2003	322	22,027	495,627
2003-2004	320	19,538	474,105
2004-2005	300	19,316	-
Total	7,130	440,171	9,135,440

Note: Total area of 9,135,440 ha consists of 314,197 ha for establishing new paddy fields, 419,701 ha of commercial crops, 62,772 ha of fruit tree and industrial tree plantations, 35,110 ha of pasture land, 8,210,803 ha of forestland and 92,857 ha with other uses including land for construction

Source: *Shifting Cultivation Stabilisation Centre, NAFES (2004)*

Until now some 6,830 villages, more than half of all villages including those in urban areas, took part in the allocation exercise, receiving on average about one thousand and three hundred

¹⁶ Up to 1 ha for rice and fish farming, up to 3 ha for commercial crops, up to 3 ha for orchards, up to 15 ha of deforested land or grassland for pasture and up to 3 ha of degraded or denuded forest land for afforestation. More land of any of these types can be requested on a lease-hold basis or land concession.

hectares of village land including one thousand and two hundred ha of village forest each. In addition, about 420 thousand households, more than 60% of agriculture households, have been allocated land. It is reported that shortages of funds, equipment and technical staff are the main causes of both delay in program implementation and its modest effectiveness.

Impact on forest resources. Forest allocation/classification and agreement on the use of each forest type should lead to both recovery of forest vegetation and increased quantities of forest resources available to villagers. However, much of the forest allocated has been classed within protected categories (conservation, protection, regeneration) and of slightly more than 100,000 ha of forests allocated in 2000-2001, 91% was under protected categories, and only 9% village production forest¹⁷.

Measures of program success, e.g. increase in forest cover, crown density and improved stand structure may be pre-empted by the 'five-year' rule due to the unintended effect of compelling villagers to slash areas within 3-4 years to prevent designation as regeneration forest. Therefore, the program may reduce the area of secondary forest over 5-year of age. It has therefore been recommended that the five-year rule be withdrawn¹⁸.

Impact on villagers' livelihoods and access to forest. It is important to note that the Land and Forest allocation program does not, in principle, affect or impinge upon the villages' arrangements for accessing and exploiting forest resources under village jurisdiction. Nor, in this regard, does it affect village rules and regulations, if implemented in a truly participatory manner. In many cases, however, over-zealous zoning of 'protected' categories at the expense of village used forests and farming areas has partly precluded collection of fuelwood and NTFPs.

Additionally, allotment of land for forest regeneration reduces land available for designation as cropland and could eventually encourage villagers to exploit other areas of forest for cropping. It could also restrict access to such forests for fuelwood or NTFP collection.

An impact evaluation conducted in Luang Prabang Province found that land allocation had reduced the area of cropland available to each family. Studies under Phase 4 of the Lao Swedish Forestry Program and the CPC/ADB Participatory Poverty Assessment reported similar findings. Besides the negative impact on income, such reductions in cropland may act in reverse to program aims by generating pressure to slash and burn nearby forest.

3.9.3.4 Community Forestry and NTFP Program

The Community Forestry and NTFP Program has been active since 1993 and focuses on village management and use of secondary forests, rehabilitation of degraded forest stands and cultivation or sustainable management of NTFPs.

It has been suggested that the program effects to support village authorities in drafting or improving their own rules and regulations for access to village used forests and harvest or collection of household timber and NTFPs. Such rules and regulations include incentives for sustainable use, criteria for allocating scarce or potentially scarce resources and for preventing improper or prohibited methods of collection. They may also include rules for recognizing tree property rights for those managing regenerating forests.

¹⁷ In addition, 6,006 ha, or 5% of the total 115,800 ha allocated in 2000-2001, was for crop and livestock production.

¹⁸ Discussion Paper on Village Land Use and Forest Management for Poverty Alleviation for FS 2020 (Main Report and Recommendations), page 37.

The Lao-JICA funded FORCAP project in Vientiane Province has been assisting villagers in formulation of a village forest management plan which is action oriented rather than restriction. Building on existing rules and regulations, villagers, with project technical assistance, discuss the present status and use of village forest and take actions related to watershed rehabilitation, NTFP collection/sales, establishment of school forest to maximize long term forest management benefits. With particular respect to NTFPs, collective management has been piloted in several locations, notably in Nampheng Village, Oudomxay Province where the Lao-IUCN NTFP Project introduced bamboo management and sale by the village group.

3.9.4 Issues concerning Management of Village Land and Forests for Poverty Eradication

3.9.4.1 Management and legal status of village land and forests

Through the Land Use Planning and Land Allocation program, boundaries of village forests have been identified and agreed upon with between villages and district authorities. The MAF Regulation (0535/MAF issued in June 2001) on Village Forestry Management gives guidelines for classification of forest land allocated to villages and clarifies the rights and responsibilities of villagers in protecting, conserving and using their forest. In spite of these regulations and practical delineation/classification of village forests, actual management of village forests is far from being satisfactory. Due to lack of village forest management plans formulated and implemented by villagers, almost all villagers make extensive use of nearby forests regardless of the classification and rules on uses.

As economy develops, more and more forest land is needed for other purposes including infrastructure development, commercial activities, large scale tree plantations, mining and so on and in most cases village land and forests are involved in these development activities. However, existing laws and regulations are lack of necessary provisions concerning conversion of village forest such as consultation processes between villages and development agencies and compensation to villagers for their loss of use right to allocated resources. Since the Lao economy is growing rapidly and land conversion involving village forest is envisaged to increase, these provisions need to be prepared in order to avoid unnecessary conflicts.

3.9.4.2 Shifting cultivation threats to forest and environment

It has been found that shifting cultivation has been one of the main causes of forest loss in the past, especially in the Northern provinces. It has also been noted, however, that forests have been regenerating following cessation of this method of cultivation despite the initial destruction caused. On the other hand, rotational shifting cultivation although acceptable from the forest protection point of view is most environmentally destructive when rotations are limited to only 3 or 4 years. Such reductions often lead to rapid loss of soil and vegetation and proliferation of the invasive and persistent *Cylindrica Imperata* grass. Thus, under certain circumstances, shifting cultivation may be less problematic than the rotational type, the key factors being the length of the recovery period and the amount of land available to facilitate this. More knowledge is therefore required on the actual threats to forests and the environment and methods through which they may be avoided whilst sustaining farmer's livelihoods.

3.9.4.3 Shifting cultivation stabilization through establishment of sedentary livelihood systems

As stated in several official documents, policy on shifting cultivation involves stabilization through arrangement of permanent occupation/sedentary agriculture. Target areas for shifting cultivation reduction are decided annually at the agriculture and forestry meeting. However, necessary staff and finances to establish sedentary livelihood systems for the target groups are

not available. This results in a tendency of Provinces and Districts to take short cuts and resort to simpler but improper means such as hurried land allocation or ill prepared resettlement. Compounding the problem is the general poverty of the northern Provinces, which, in itself, is a result of the lack of land suitable for high-yielding agriculture.

3.9.4.4 Flexibility in meeting specific conditions of villages

Natural and socio-economic conditions vary from village to village. Those close to main roads or with access to markets are most suitable for sedentary agriculture or crop production following land allocation. Villages with extensive flat areas of land are also appropriate for land and forest allocation. However, land allocation in remote mountainous areas where shifting cultivation is dominant will not achieve its objective because of lack of market access. Involuntary resettlement and/or consolidation of villages from/in these areas tends to fail unless well planned with people from both the recipient and relocated villages fully consulted.

4 FORESTRY SECTOR OBJECTIVES

4.1 The Policy Environment

Government's policy, objectives and strategy for the forestry sector are nested within and consistent with the overall National Socio-Economic Development Plan, the National Growth and Poverty Eradication Strategy (NGPES, 2004), the Rural Development Program, the Strategic Vision for Agriculture Development and the National Biodiversity Strategy and Action Plan. Accordingly, forestry policy must be defined in relation to the opportunities and boundaries set by domestic and international conditions.

4.1.1 Development Needs

In Lao PDR, opportunities for economic activity, revenue and foreign exchange generating activities and job creation are at present limited. Mineral resources, although largely untapped, are finite and areas suitable for agricultural production, which could generate jobs, tax revenues and export commodities, are limited.

The country does, however have extensive access to Mekong River and the fishing and navigation opportunities it offers. There are also sites with high potential for hydropower generation for electricity export and the country's central position in the region affords the chance to collect revenue from over flight and international transportation. The country also has an important potential for ecological and scientific tourism. All three activities, however, provide employment opportunities limited in quantity or duration. With the national population estimated to reach 8.3 million in 2020 new opportunities must be found.

The forestry sector offers one of the few possibilities for sustainable social and economic development and employment generation in the coming years and with the existing forest resource base and projected future demands for forest products in the region, the occasion should not be allowed to pass.

4.1.2 International Framework and Regional Dynamics

4.1.2.1 Overall Policy Framework

Lao PDR has pursued a gradual integration with both international and regional community through liberalization of external trade and investment as well as communication. This process has been accelerated by accession to ASEAN. In the forestry sector, Lao PDR is a signatory to some of major international conventions including the Convention on Biodiversity Conservation (CBD), the Framework Convention of Climate Change, the World Heritage Convention and the newest member country of the Convention on International Trade of Endangered Species. It is also an active member of the Mekong River Committee. Given its unique location and relatively rich forest resources, Lao PDR can contribute to supply of quality wood products, conservation of biodiversity and conservation of water/soil in international and regional context.

4.1.2.2 Regional Integration and Market Possibilities

Lao PDR is located at the centre of the Continental Southeast Asia region, bordering five other countries. Among them, Thailand, Vietnam and Southern China are the main markets for Lao timber and non-timber (raw and processed) products. Since these countries face scarcity in forest products and their economies are growing rapidly, demand for Lao products is likely to increase.

With improvement of roads within the country and interconnecting Lao PDR with surrounding countries, transportation costs are likely fall, improving the competitive advantage of Lao and promoting trade. Improvement of port facilities in Vietnam could also improve the Lao position in important overseas markets, including those of Japan and Oceania. Moreover, accession to AFTA (ASEAN Free Trade Area) will increase trade in Lao forest products if import tariffs on processed NTFPs are reduced or lifted by other countries. At the same time, the proximity of such strong demand and the presence of long borders create a threat to Lao resources.

Given this environment of opportunities and threats, the positive factors, which offer the potential of creating substantial markets for Lao forest products and revenues there from, should be accentuated and the negative factors controlled or eliminated. Both should be given full consideration in the national forestry strategy.

Conservation of the Lao forests has considerable and direct impacts on many aspects of the Mekong downstream areas including agriculture, fishery, industries, navigation and daily living of people. Lao PDR is committed to dialogue and cooperation for conservation of the Mekong watershed areas mainly through the Mekong River Committee.

4.1.2.3 International Agreements

The increasing links Lao PDR is establishing with the World Trade Organization (WTO) and the ASEAN Free Trade Area (AFTA) provide a considerable opportunity for the country to play a much stronger role in the regional and international forest products markets, given sufficient competitiveness.

Lao PDR has already applied for accession to the World Trade Organization (WTO). This move is fundamental to the future integration of Lao PDR into international trading networks and to achieve protection through rule-based WTO provisions. Lao PDR also acceded to ASEAN in 1997 and has consequently committed itself to tariff reductions according to conditions under the Common Effective Preferential Tariff (CEPT) scheme within the ASEAN Free Trade Area (AFTA). Tariff reductions under the CEPT scheme have not had significant negative impacts on Government revenues, nor has competition stiffened for industry, the wood processing industry included.

A particular challenge will surface when the removal of quantitative restrictions (QR – which include, among others, prohibition of log exports) and other non-tariff measures (NTMs) becomes mandatory. The Government is currently preparing an inventory of NTMs as agreed at the ASEAN meeting in April 2002.

The rich biodiversity in Lao PDR is unique and important at both regional and international levels. The Biodiversity Strategy and National Action Plan within the framework of CBD has been prepared hand in hand with FS 2020 and the both strategies will provide policy and actions in synergy. In addition, Lao PDR is collaborating with neighbouring countries for conservation of bordering protected areas and control of illegal trade of wildlife and prohibited plant species.

4.2 Challenges and Scenarios for Forestry Development

4.2.1 Challenges to the Forestry Sector

The impacts on Lao forests and forestry of social and economic development, both domestically and in neighbouring countries, and of efforts towards regional integration are difficult to forecast. Based in developments in neighbouring countries and other developing countries, however, the following changes may be expected:

Increasing conversion of forests to other land uses. As population increases, forests are commonly converted to cropland/paddy and pasture, roads and reservoirs are built and urban centres expand. The magnitude of forest loss to these factors may vary widely although conversion for agriculture is likely to be commensurate with population growth.

Increasing domestic and external demand for forest products. With population and income growth, timber demand for house construction, doors, flooring and furniture rises. Demand for bamboo and rattan products, medicines, condiments and food products similarly increase as does demand for wood pulp and paper with increases in literacy. External demand, as well as being dependent on these factors also hinges on relative competitiveness and barriers to trading and is thus potentially much more dynamic.

Increased requirements for soil and water conservation. Domestic demand for clean, reliable water supplies and for power/hydropower also increases with socio-economic development, the latter being more dependent on neighbouring countries in the case of Lao PDR. With greater populations settling in lowland areas, the requirement and economic necessity for improving flood protection/prevention measures is also heightened. Forests in water catchment areas therefore need to be reserved for protection and conservation.

Increasing demand for biodiversity protection. As already mentioned, Lao PDR is richly endowed with unique, rare and threatened plant and animal species. As development proceeds, roads bisecting forest areas are constructed, forests are converted for other land use and natural habitats are more thoroughly exploited. The Lao economy will also become more closely linked to global markets and international concerns. With these developments the need for protecting the country's rich biodiversity will increase both directly, in terms of tourism, and indirectly, in terms of funding and promotion for biodiversity protection. The demand will be intensified by reduction in the national forest cover and increasing awareness of the importance of conservation efforts.

In summary, pressure is on Lao forestry to perform in the face of many conflicting demands and a dwindling resource base. Effective and efficient, sustainable management of the resources, and of the sector at large, must, therefore, be the goal of the Government and its development partners.

4.2.2 Scenarios for Forestry Development

In terms of speed and intensity, only one scenario has been considered, namely, sector growth at as rapid pace as is practical within the ceiling imposed by sustainability. Given the pressing need for development, the Lao PDR, as one of the world's least developed, can ill afford to leave resources unexploited or under exploited. At the same time, however, national experience with over logging and forest cover reduction in the light of experiences in neighbouring countries foretell of the need to ensure that natural forest harvesting must be economically,

environmentally and socially sustainable. Government conviction of this concern has led to the current efforts to refine the forestry sector for the benefit of the entire country.

In terms of sources, it is already clear that conversion of forest for infrastructure development, a major source of timber in past years, is rapidly declining as the requirement for construction of major roads and dams comes to an end. At the same time, the Government no longer permits unauthorized logging within national protected areas (NBCAs and protection forests) or elsewhere. Therefore, all future production of timber and non-timber forest products will have to come from plantations and demarcated production forest areas, as defined in the recent PM Decree 59 on Sustainable Management of Production Forests.

TO expand these sources, instructions, incentives and extension efforts are also being made to foster regeneration of degraded natural forests. The Forestry Law and several implementing decrees, orders and instructions have set forth incentives for villagers to assist with and/or perform such efforts. Furthermore, as annual allowable harvesting levels in natural production forests are reached, efforts are increasingly being made, with the support of the Asian Development Bank, to establish a substantial national tree plantation area, expected to form the backbone of the forestry sector by 2020.

In terms of actors, Lao PDR has already experimented with systems owned and run by the state with results that were less than satisfactory, in terms of both revenue generation (revenue flows were negative) and social and economic development, particularly with respect to the poor. Subsequently, the Government moved to a more decentralized form of state led harvesting, allowing provinces and districts to set up logging teams. However, this modality failed to yield improved benefits.

As a result, Government has in principle decided on a system in which forest resources (both timber and non-timber) are harvested predominantly from production forests with scientifically based management and harvesting plans prepared by the relevant government agencies (DOF, PAFO, DAFO). Actual field management is to be implemented by forest management unit (FMU) with participation of villagers. Sale of products will be through profit maximising competitive methods undertaken by the Ministry of Commerce (MOC) who will support the system by setting royalty rates according to market prices that stimulate sector efficiency.

For the tree plantation, large commercial firms have played, and will continue to play, a major role, alongside small farmers, villagers, and ethnic groups upon who present efforts focus.

4.3 Objectives for the Forestry Sector

4.3.1 *The Vision*

By 2020, the Government of the Lao PDR envisage a sizeable, vigorous and robust forestry sector continuing in its role as one of the leading sectors advancing national socio-economic development. A sector in which scientifically-managed natural production forests generate timber and non-timber products at sustainable levels with village participation, under supervision and technical support from well staffed, well-trained local and national government units. Alongside the natural production forest system, large areas of commercial tree plantation in the hands of farmers, villagers and forestry companies will, through domestic wood and NTFP processors, provide products for both export and domestic use.

A sector with extensive and well managed forest benefiting the whole society and other economic sectors including agriculture, industries, eco-tourism, hydro-power generation and

transportation through provision of abundant water, clean air and places for recreation and nature observation as well as protecting soil and water in watershed areas.

A sector protecting a rich flora and fauna, especially within well-demarcated NBCAs managed with active participation of villages within or adjacent to the NBCA based on the integrated conservation and development approach., .

A sector benefiting the poor, be they villagers involved in forest management, rural labourers or families utilizing and selling processed NTFPs, and producing equitably collected tax revenues contributing to national development whilst generating needed foreign exchange earnings through substantial exports.

A sector with an installed processing capacity commensurate with sustainable levels of production from natural forests and tree plantations, with efficient high performance machinery and equipment and well-trained personnel producing high-quality, competitively priced products designed according to national and international tastes and well positioned in international markets.

A sector in which Government cultivates an enabling environment in terms of legislative framework, technical guidance, basic investment and support services such as research, extension and training; provincial and district authorities apply these according to local conditions; villagers undertake actual management of allocated resources in a participatory manner; and private investors engaged in commercial activities mainly in the fields of tree/NTFP growing and processing through market mechanism.

A sector with a well thought out, comprehensive legislative and regulatory framework that is effectively and efficiently implemented with the backing of adequate monitoring and enforcement capacity in order to contain irregular activities.

A sector able to generate and sustain its technological basis through sound, efficient research and development programs disseminating results through well managed training centres; with high calibre scientific and technical staff, adequate facilities and equipment; and which can train, technicians, staff members and professionals both domestically and through association with overseas institutions.

A sector which applies participatory planning for landscape level protection, management and restoration of forest resources and uses effective and appropriate monitoring systems for adaptive management.

A sector that receives international recognition both on technical grounds and on the quality of its production, which is internationally certified and works in cordial alliance with high-quality support from international communities.

4.3.2 Objectives and Targets

The Government has set two major national development goals to be achieved by 2020. The first is to graduate from least developed country status, the second to eradicate poverty. Development of the forestry sector and implementation of sustainable forest management are key elements supporting these objectives. The NGPES clearly recognizes the important roles of sustainable forest management for poverty alleviation through village forest management including NTFP processing and sales and water/soil conservation, small scale tree growing, participatory Production Forest management and so on.

The overarching objective supported by improved forest policy and management is **poverty eradication**. A significant proportion of the Lao population live within or around forested (or previously forested) areas. Such people make up the majority of the poorest sections of Lao society, including many impoverished ethnic groups. A major part, if not all of their livelihood and income-generating activities are related to utilization of forest products for self-consumption or sale. Forestry is therefore crucial for improving their livelihoods.

The major objectives of forestry sector development are;

- 1) To build capacity of government organizations and concerned parties for implementation of FS 2020.
- 2) To control and correct various actions which lead to deterioration of forest resources in terms of both quantity and quality and at the same time for livelihood improvement of poor farmers in rural areas and for protection of forest cover.
- 3) To develop and enforce laws and regulations related to forest.
- 4) To ensure sustainable management of Production Forests with participation of local people and to promote commercial tree planting by individuals, groups, organizations, small and medium scale companies and foreign and national investors with government providing policies,
- 5) To take a balance between wood processing industries and wood volume approved annually for harvest based on scientific calculation and to strongly promote domestic processing of finished products.
- 6) To contribute to conservation of forest ecosystems, habitat and all plant and animal species in danger of extinction.
- 7) To protect soil, watersheds and environment and to secure durability of important infrastructure by forest conservation.
- 8) To use revenue from forests in most effective ways for development of economy and other sectors according to government's priority development plans to contribute to poverty eradication.
- 9) To ensure sustainable management of NTFP and their contribution to livelihood improvement of rural villagers

The major sector targets, which must be achieved to contribute to poverty eradication, are:

- 1) To improve quality of existing forested area, which are about 70% of the total land area, by naturally regenerating up to 6 million ha and planting trees up to 500,000 ha in unstocked forest area as an integral part of a rural livelihood support system encompassing stable water supplies and prevention of natural disasters.
- 2) To provide a sustainable flow of forest products for domestic consumption and to generate household income through sale and export, thus contributing to livelihood improvement, fiscal revenue and foreign exchange earnings whilst increasing direct and indirect employment.
- 3) To preserve the many species and unique habitats, which are, for different reasons, threatened both within the country and elsewhere.
- 4) To conserve environment including protection of soil, conservation of watershed and climate.

In order to achieve the targets, which are to improve richness of existing forests, to conserve environment and to supply forest products from natural forests in a sustainable way, it is necessary to implement clear measures for management, protection and regeneration of forests as well as for quality improvement of existing forests through natural regeneration and tree

planting. Natural regeneration of 6 million ha in unstocked forests mentioned above is one of important and urgent tasks. However, it should be clearly understood that a large part of unstocked and fallow forests is used in rotational shifting cultivation systems by local villagers. Therefore, natural regeneration in these areas can be achieved through comprehensive rural development including promotion of sedentary agriculture or crop production at household level, integrated agro-forestry development, development of rural finance system, development of and access to market, information dissemination and basic infrastructure development.

5 PRIORITY POLICY, PROGRAMS AND ACTIONS

5.1 Policy Directions and Implementation Principles

Government recognizes that realisation of the preceding goals and objectives will require tackling important challenges in several policy areas. Among those requiring continued effort are:

- 1) To formulate national land policy and introduce land use planning both at macro and field level.
- 2) To enhance village based natural resource management for poverty eradication.
- 3) To introduce reliable systems for harvest determination.
- 4) To control unsustainable harvest and export of NTFPs and promote sustainable participatory management and processing of NTFPs.
- 5) To improve performance of the wood industry including bringing processing capacity into closer accord with the sustainable timber supply and processing of more finished products.
- 6) To promote tree planting and management by setting clear purposes with relevant target owners and markets, and investment schemes to strengthen wood supply base and farmers' income base.
- 7) To prevent encroachment, unauthorized activities and biodiversity degradation through solid law enforcement, capacity building and assisted participation of villagers in forest management.
- 8) To determine target areas for forest closure of both permanent and temporary nature. Permanent closure is for forest areas of national security and forest on river banks or watershed. Temporary closure is for heavily degraded areas due to shifting cultivation for a long time, forest areas without sustainable management system and areas heavily logged beyond their sustainable supply capacity.

In implementing the preceding policies and programs, the following principles are central to sector management:

- 1) Completing and improving the forestry related legal framework, clearly defining different stakeholders' responsibilities and providing sound criteria for, and transparency in, decision making.
- 2) Improving sector efficiency and strengthening international competitiveness through greater market-orientation.
- 3) Completing decentralization process or bottom-up planning and implementation system and capacity building, especially at local level.
- 4) Maximising benefit generation through innovative mechanisms and equitable allocation.
- 5) Mobilizing effective international cooperation.

5.2 Programs and Actions

5.2.1 Land and Forest Use

5.2.1.1 Introduction of Land Use Planning

- Formulate a national land use policy,
- Introduce a land use planning system at national and local levels (provincial, district and village level)
- Conduct national land use zoning based on land use policy and system eg: forest land, agricultural land, industrial land, cultural land and land for other purposes in order to avoid confusion over land use
- Prepare detailed national, provincial, district and village forest land use zoning
- Establish a land use coordination mechanism at national and local levels.
- Conduct a survey of target areas for forest closure of both permanent and temporary nature.

5.2.1.2 Completion of the Forestry Law Implementing Regulations

- Prepare and issue MAF regulations on Protection and Regeneration Forests

5.2.1.3 Clarification of Definition and Status of Village Forest

- Clarify definition and status of village forest in the Forestry Law

5.2.1.4 Monitoring of Land Use Changes and Analysis of Causes for Forest Decline

- Review current land-use classification system used in the land use and forest cover survey
- Continue monitoring of land-use and forest cover change, including impacts of such changes on biodiversity and poverty levels
- Establish permanent sample plots and introduce more sophisticated methods for regular monitoring
- Continue analysis of underlying causes of land-use and forest cover changes
- Establish linkage between land-use monitoring and land and forest use policy formulation

5.2.2 Production Forest

5.2.2.1 Production Forest Management

Legal Framework

- Prepare technical instructions and guidelines to implement PMD 59/2002 and MAF regulation No. 0204/2003 and other regulations concerned
- Disseminate of related legislation to all stakeholders through publication and workshops

Capacity Building

- Enhance training for DOF, PAFO and DAFO technical staff
- Provide adequate training to participating villages in sustainable land use and forest resource management in addition to PF management

Enforcement and compliance

- Reinforce DAFO's mandate with fresh instructions and, if possible, additional personnel, equipment and field trips funded from the shared benefits of log sales.

5.2.2.2 *Production Forest Certification*

- Analyze results of the pilot certification project, especially its costs and benefits under existing policy and conditions of Lao PDR
- Consider application for certification of Production Forests, which have long term management plans

5.2.2.3 *Village Participation in Production Forest Management*

- Ensure active participation of villages in Production Forest management through explanation of management schemes and tours to existing management sites
- Increase involvement of villagers in sustainable management and use of village forestland and agricultural land through village land use planning and land allocation

5.2.2.4 *Control of Logging Outside of Production Forests*

- Publicise location of approved logging sites and annual harvest volumes
- Establish regular monitoring of logging outside Production Forests, and especially within NBCAs and patches of rich forests, with villagers' cooperation

5.2.2.5 *Integrated Production Forest Management*

- Establish production forest areas in the entire country;
- Establish appropriate institutional arrangement to effectively manage the production forest in provinces based on PM's decree 59/2002, and MAF regulation No. 0204/2003 and others;
- Identify and make available sound technical practices for managing the production forest. These may include: national code of harvesting practices, forest planning, enrichment or replanting techniques, thinning, pest and insect control, downstream processing, selling, and marketing development;
- Allocate adequate financial resources for managing the production forests.

5.2.3 *Non-Timber Forest Products (NTFPs)*

5.2.3.1 *Improving Basic Conditions for NTFP Development*

- Conduct surveys and studies to add knowledge necessary for sound policy and programs for NTFP development (*Annex 1*)

5.2.3.2 *Improving Harvesting and Marketing for NTFP Development*

- Link harvesting plans with forest management plans developed by villages through the Village Land Use planning process
- Enhance the transparency and consistency of the harvesting plan setting system and procedures and their year to year stability
- Establish NTFP harvesting plans increasingly based on resource assessments rather than only on markets' demands. Harvesting levels need to be sustainable and scientific, and do not threaten the resource base.

- Set higher royalties on products more susceptible to over-harvesting or that are known or thought to have threatened populations.
- Promote NTFP processing and export through appropriate trade regulation and technical and financial support.

5.2.3.3 Capacity Building

Institutional strengthening

- Strengthen village capacity to develop sustainable forest resource management especially NTFPs.
- Address the need for better coordination within the NTFP sub-sector and consider creation of a task force to guide formulation of an NTFP sub-sector strategy and better involve stakeholders.

Reinforcing research and extension work

- Develop mechanism of exchange of information and provision of technical, social, credit and other services for stronger linkage between research and extension at field implementation level.
- Establish a coordination mechanism between the Forest Research Centre (FRC) under NAFRI and other organizations including the Institute of Medicinal Plants, Ministry of Industry and Handicrafts, Science and Forestry Faculties (National University), STEA and the Lao Women's Union.

5.2.4 Tree Plantation Development

5.2.4.1 Formulation of National Tree Plantation Development Plan

- Formulate a national tree plantation development plan with comprehensive coverage from tree breeding to plantation management, processing with clear target groups and incentives

5.2.4.2 Improving Tree Plantation Profitability

Improving Tree Growing Technology

- Conduct applied, adaptive research on species (including seed and nursery requirements and the use of indigenous species), species/site matching, harvesting, thinning and coppicing methods, site and soil preparation, fertilization programs and post-plantation management
- Make research results available to PAFO and DAFO and then to potential growers. This would entail assisting DAFO in developing adequate capacity for the task
- Provide tree plantation owners, especially teak plantation owners in the north, with skills to select seed, plant at the correct density, thin and prune stands for quality improvement and increased sale price.

Securing Better Prices

- Carry out market research to study conditions under which plantation products are sold, how qualities are defined and checked and how prices, premiums and discounts are set.
- Develop and promote processing technology of small diameter plantation trees.

5.2.4.3 Improving Legal and Regulatory Framework

- Establish procedures respecting customary land and forest use by local people or compensating for losses upon development of commercial tree plantations
- Simplify regulations concerning all aspects of tree plantation management from planting to harvesting, transporting and exporting
- Establish procedures to convert temporary land use certificates to long term rights (land titles) without undue burden on small holders
- Prepare for large scale plantation investment both national and international partly boosted by Clean Development Mechanism (CDM) in terms of environmental safeguard and harmonization with local use

5.2.4.4 Improving Funding and Incentives

- Promote agro-forestry at household level to generate continuous income flow.
- Review existing loan schemes for tree plantation, especially those for smallholders, in terms of financial feasibility, sustainability, justification for subsidy, etc
- Explore ways and means to support smallholder tree plantations by reviewing trials in progress including the Profit Sharing System (PSS)

5.2.4.5 Marketing Development

- Provide information sharing regarding the wood prices in domestic and international markets.

5.2.5 Harvest/logging plans and Royalties

5.2.5.1 Shift from National Harvest/logging plan Setting to Management Plan-based Harvesting

- Shift from the national harvest/logging plan setting and allocation to bottom-up setting of harvest levels based on management plans in accordance with Production Forest establishment.
- Publicise PFA management and operation plans so that wood processing factories can prepare long term investment plans

5.2.5.2 Improvement of Royalty Setting

- Improve royalty setting formula to reflect international market prices
- Establish an equitable benefit sharing and cost covering scheme to complement efficient royalty setting

5.2.5.3 Improvement of Royalty Collection

- Review current royalty collection systems and systems for collection of other taxes and fees payable to the central treasury, e.g. in terms of local and central responsibilities, to improve collection rates

5.2.5.4 Improvement of Log Sales System

- Resume piloting of bidding whilst strengthening institutional and staff capacity for implementation.

5.2.6 Wood Processing Industry (WPI)

5.2.6.1 Simplifying Processes for Factory Operation

- Instigate dialogue between MAF, MOIH, MOF and FIMC to simplify administrative processes for establishment and operation of wood processing factories
- Increase transparency by providing criteria and responsibilities for decision making with respect to business permits, operational issues and so on.
- Rationalize existing sawmills and wood based factories so that operation are more efficient and match sustainable wood harvesting regimes

5.2.6.2 Comprehensive Approach for Reduction of Processing Capacity

- Publicise criteria for selection of factories to continue operation
- Pilot competitive log sales and undertake institutional strengthening for nation-wide introduction
- Improve law enforcement and governance regarding logging and log supply to factories, including cancellation of operation permits for factories that process unauthorized logs.

5.2.6.3 Improving Efficiency in Wood Processing

- Strictly implement regulations, rules and technical guidelines for tree marking, felling, logging, grading and log sales contracts
- Introduce tax incentives for installation of secondary or tertiary processing machinery and provision of appropriate training
- Consider development of a network on forest and wood export to promote forest management certification and optimize the market benefits available to certified forest products

5.2.6.4 Further Promotion of Export of Finished and Semi-finished Products

- Strictly implement the export ban on log and sawn timber
- Transfer remaining wood products from the Temporary Exclusion List to the Inclusion List and reduce tariff rates under the AFTA/CEPT scheme to stimulate exports
- Temporarily and restrictively relax the ban on foreign investment in secondary wood processing using natural wood
- Introduce tax incentives for installation of timber drying kilns
- Improve skills of wood processing workers by provision of vocational training
- Promote small scale wood processing skills for woody handicraft or basket weaving at household, household group or village level for income generation.

5.2.7 Bio-diversity Conservation

5.2.7.1 Improving the legal and regulatory framework

- Consider participation in other international conventions (besides the Convention on Biodiversity (CBD) and CITES))
- Consider preparation of a law on biodiversity conservation based review of existing NBCA and other related regulations
- Improve wildlife regulations concerning use of wetlands for fish raising and ecotourism
- Develop controls and regulations for protection of forest genetic resources and intellectual property rights to ensure that benefits from development of pharmaceuticals

or other products, which may have been derived from genetic resources collected in Lao PDR or developed based on traditional knowledge of forest products, accrue to the nation and rural communities.

5.2.7.2 Improving NBCA development and management

- Review the existing NBCA system to include important wildlife and aquatic habitats and exclude more developed areas
- Prepare long-term NBCA development and management plans with participation of stakeholders including local villagers
- Improve NBCA financing through government funding and income generating activities and fines
- Develop eco-tourism in investment programs and projects
- Provide NBCA managers with the required materials and facilities (transport, computers, uniforms, etc.)
- Increase NBCA staff numbers and skill levels through short and long-term programs and establish an NBCA staff management and reward system to compensate for duties performed under difficult living and working conditions
- Consider the development of codes of practice or guideline for tourism operators to provide a basis for development of responsible ecotourism that benefits rural communities and the environment while generating revenue for the nation
- Identify sites for conservation of tree genetic resources in the whole country and establish legal framework for conservation of the sites and the use of genetic resources

5.2.7.3 Controlling wildlife trade

- Using information collected from recent studies on wildlife trade in Lao PDR, identify and implement priority actions to strengthen domestic and international wildlife trade controls
- Intensify border patrols to control unauthorised export of wildlife to neighbouring countries and to enhance monitoring of trade/transport routes out of NBCAs
- Take advantage of participation in CITES to strongly cooperate with others countries on border control of trade on wildlife and plants

5.2.7.4 Enhancing education and public awareness

- Educate and train central, provincial and district level staff (including Ministry of Finance tax and customs staff) on biodiversity conservation and trade in wildlife and plant species
- Establish extension programs on the sustainable use of wildlife and plants and other conservation in general
- Educate villagers to streamline forest resource use methods that threaten resource base or negatively impact biodiversity
- Introduce or include biodiversity conservation into primary and secondary school curriculum.

5.2.7.5 Strengthening research

- Prepare research into dynamics of important plants, wildlife and habitats inside and outside NBCAs

- Cooperate with foreign universities and institutes to develop scientific knowledge and provide high level training for officials and students
- Develop plant and wildlife databases for research, decision-making and management

5.2.8 Protection Forest and Watershed Management

- Set up an inter-sectoral coordination mechanism for effective watershed management
- Support implement of Integrated Watershed Management in the field
- Develop innovative funding schemes to finance watershed management activities
- Prioritize crucial and vital watershed in the whole country that need to be protected and managed to secure soil and water conservation through sustainable natural resources use.
- Formulate plans and projects for rehabilitation of degraded watershed areas mainly with natural regeneration supplemented by tree planting with villagers' participation

5.2.9 Village Land and Forest Management

5.2.9.1 Legal framework

- Clarify the definition and status of village forest in the Forestry Law and prepare provisions for conversion of villages forest including consultation process and compensation

5.2.9.2 Land and Forest Allocation

- Review and improve the land and forest allocation program in terms of impacts on villagers' livelihoods including agriculture production, NTFP collection and other available resources for flexible implementation according to village socio-economic conditions
- Clarify the legal status of Temporary Land Use Certificates (TLUC), which were issued more than three years ago.
- Consider establishment of participatory land use planning based on the legal status of village land and forest.

5.2.9.3 Shifting Cultivation Stabilization

- Define target areas, according to NGPEP, re-undertake land and forest allocation and support villagers to draw-up long term land use plan according to the existing potential resources
- Study impacts of shifting cultivation on environment and forests
- Consider setting a target number of households to be assisted in adopting improved livelihood system

5.2.9.4 Enhancement of Village Based Forest Management as an Integral Part of Rural Livelihoods

- Establish a clear legal framework covering village land and forest resources that enables effective community based natural resource management including participatory land-use planning at village level reflecting actual land and forest use
- Assist villagers in formulating village land and forest management plans on the basis of overall land use plans and focussing on sustainable and equitable use of common land and forest resources, maintenance/rehabilitation of village watershed areas, income generation, etc.

- Establish a demand-driven, household-based extension and information dissemination system supported by DAFO as well as model farmers and others
- Assist villagers in forming groups or association for collective management of NTFPs including domestication, sales and processing
- Establish micro-finance systems to support villagers investing in cropping, NTFP domestication and processing, livestock production and so on
- Develop domestic and international marketing mechanism for promoting sale of forestry and agricultural products

5.3 Cross Cutting Areas

5.3.1. Legal Framework and Implementation

Important legislation for particular kinds of forests and forestry activities was mentioned in various sections in Chapter 2 and 3. Several proposals for amendment and improvement of legislation specific to sub-sectors are made in the previous sections of this chapter. To have an increasingly complete and coherent legislative framework for the sector at large, and enhance chances of proper implementation, the following actions need to be taken:

- Issue extension materials on key forestry legislation in cooperation with Ministry of Justice in formats suitable for local authorities and villages to improve implementation and awareness
- Improve the access to, and dissemination of, forestry legislation by publishing together all legislation currently in effect, and issuing periodic updates
- Clarify which forestry legal documents have been repealed and which are still in effect
- Continue to issue implementing regulation mandated by the Forestry Law
- Conduct training on legal drafting and implementation focused on the Permanent Secretary Office (MAF), Technical Division (DOF), and members of PAFO/DAFO with such duties
- Institute committees or working groups for different forestry sub-sectors to be involved in consultation or for multi-institutional drafting teams for key legislation

5.3.2. Law Enforcement and Governance

Problems of law enforcement and governance are mostly related to harvesting and utilization of timber and non-timber forest products. In spite of the government efforts to regulate forest resource uses there have been cases of unauthorized harvesting, utilization and trade of forest products at various levels.

Weak enforcement of laws and regulations has led, in many cases, to logging in production forests not in accordance with the targets set in the respective management plans; or to excessive cutting by those who have been allocated a logging plan; or to them cutting outside the boundaries to which their logging plan was bound, or to excessive or inappropriate extraction of NTFPs. Similarly, weak enforcement of law and regulations has permitted, or not detected, cases of individuals or firms which go into conservation and protection forests and log or extract NTFPs.

In addition to the proposals for action related to this issue in the previous sections a couple of actions are proposed as follows in order to improve law enforcement and governance in the forestry sector.

- Clarify bordering or overlapping responsibilities, making it explicit and public who has the right or authority to authorize what, and who does not have it.
- Consider to set up a cross sectoral program consisting of forestry, police, customs and others for detection and suppression of unauthorized harvesting and trade of logs and NTFPs.

5.3.3. Institutional Strengthening and Human Resource Development

Substantial strengthening of concerned institutions and human resources is one of prerequisites for successful implementation of the agenda developed in this strategy. There are two main areas for strengthening. One is the capacity of sector analysis, policy formulation and sector monitoring at the central level. The other is implementation including extension at the field level. In addition to specific proposals made in the previous sections some general actions are proposed as follows.

Policy formulation

- Improve collection, storage and retrieval system of information and statistics at both departmental and ministerial levels.
- Institute a periodic review of the sector with use of the collected data and information.
- Improve staff capacity of sector analysis and policy formulation through participation in training courses and higher education.

Policy/program implementation

- Based on MAF's human resource development strategy, develop and implement a human resource development plan taking into consideration the training needs suggested in the proposals in the previous sections.
- Provide equipment, facilities and transportation with local offices necessary to carry out duties identified in the previous sections through new and additional funding.
- Incorporate explicit human resource development components in all international cooperation projects.

5.3.4. Research and Extension

Various research needs are identified in the previous sections. Refocusing of the research activities and coordination between research institutions with the Forestry Research Center playing a pivotal role and involving other institutions such as NOUL, private companies and cooperation projects are the key to efficient and effective research activities.

The National Agriculture and Forestry Extension Service (NAFES) was established in late 2001 and has been quickly expanding its organization and activities. However, actual extension to serve needs of farmers and tree planters is still at an initial stage. Its human resources as well as its system need more improvement.

Research

- Formulate Forestry Research Strategy to 2010 and 2020
- Establish a coordination mechanism between research institutions
- Upgrade researchers capacity through participation in training courses and long term academic studies

Extension

- Give a clear mandate to extension service at local levels.
- Provide training with local extensionists on their mandate, farmer oriented extension methods, technical knowledge and marketing.
- Establish an efficient extension delivery system involving all possible sources including research institutions, private sector and individuals.

5.3.5. Gender

Access to forests and trees has a critical effect on the well-being, and even survival of various ethnic peoples in marginal areas and fragile environment such as mountainous sloping lands, upland valleys and arid lowlands. The forest also helps to protect land and water resources by preventing erosion, replenishing freshwater supplies and reducing the threat of floods and drought.

Both men and women have different access to and control over and use of trees and land. Therefore, all forestry development actions should take into account the gender differentiated knowledge of sustainable forest management, which includes improved practices in forest and the multipurpose management of woodlands and trees. As the Lao forest service is imbalance regarding roles and responsibilities between male and female same as other countries, increasing emphasis needs to be made on the participation of female staff and women foresters.

Through their many uses of forest, men and women have also accumulated special and different knowledge domains about forest plants. Women's roles as caretakers and users of forests is often crucial as they do most of the gathering of fuel, fodder, fruits and other wild foods that provide important nutrients for the daily diets. Men's roles as users of forest include tasks, such as logging, tree cutting, hunting, collecting forest products for soil replenishment, and cutting raw materials for local industries and handcrafts.

- Promote gender-sensitive approaches in all activities related to management and utilization of forests and forest land
- Develop gender sensitive methodologies, technical guides and best practices regarding the management of trees and forests in fragile areas
- Carry out more socio-economic research and analysis of the impacts of forestry projects on gender
- Ensure a more equitable share of responsibilities in natural resource management, equitable access to resources (education, extension, training and production inputs such as credit and financial services)
- Enhance gender responsive training curriculum in the education system
- Increase opportunities on representation and participation of women in decision making at all levels, including the availability of appropriate technical knowledge and skills
- Support income generating activities for improving women livelihoods through forest related projects

5.3.6. Funding and Allocation

The forestry sector has several sources of funding including government budget, private investment, international grant and loan projects. As for the government budget funding to the sector is made through two types of budget, e.g. general budget and special budget. There is only one special budget at this moment, which is the reforestation budget paid out of the surcharge on logs from natural forest. Production Forest management will be partly financed through the benefit sharing of the profits from log sales based on the PM Decree No. 59.

Concerning allocation of budget between central and local levels, general activities are budgeted and financed at each level separately. This means there is no subsidy and financial support from MAF or its line departments to Provincial or District forestry sections. As for the special budget including sharing of log sales profit, Provinces with large harvest volumes generate most of the fund and there is tendency that these Provinces use most of the fund. Allocation of these special funds needs to be reviewed from the point of actual needs for tree planting, forest inventory and Production Forest management.

Another issue is that conservation activities totally rely on the scarce general budget or international assistance. Funding to NBCA management and wildlife protection needs urgent consideration in order to implement the proposed actions identified in the previous section. Several actions for more funding and equitable allocation are made as follows;

- Review the general funding to the forestry sector from the point of view of taking balance between the revenue generated by the sector and the costs necessary to maintain appropriate management, especially conservation work.
- Review the uses of the reforestation fund and consider possible allocation to conservation activities.
- Establish a fund to support forestry development in harmonization with other related Funds.
- Review the allocation of special budgets in order to reflect actual needs by Province.

5.3.7. International Cooperation

Many multilateral, international, regional, bilateral agencies and NGOs have been involved in supporting the Lao forestry sector in the past decade. As mentioned throughout this paper, external support has made a major contribution to enhancing capacity and covering for it when it has been found lacking, as well as in producing studies and data and financing programs and projects.

Future assistance needs to support the proposals put forth in this Forestry Strategy paper with the purpose to agree with them on their supporting specific aspects of it on the basis of their internal policies, and their comparative advantage in providing funding, technical staff or training, and in which particular sub-sectors. The purpose is to maximize the impact such valuable contribution makes to the Lao forestry sector, and to take advantage of all possible synergies that can arise from their concerted efforts.

In addition global and regional dialogue on forests have been increasingly active in various forum and forest-related conventions. They are among others UN Forum on Forest, ASEAN Senior Officials on Forest Meeting, Framework Convention on Climate Change, Convention on Biodiversity, CITES and so on. Lao PDR with relatively rich forest resources and biodiversity and unique experience in their management can make useful contribution to these processes through active participation. The following is proposed to make them happen.

- Strengthen the cooperation sections of MAF and concerned departments for better coordination of international support and active participation in international dialogue on forest.
- Enhance the existing government mechanism where the government and international community can exchange views and information concerning support to the forestry sector.

6. IMPLEMENTATION, MONITORING AND EVALUATION MECHANISM FOR FS 2020

The Forestry Strategy 2020, a comprehensive framework for forestry development/reform until 2020, is the highest official document to guide the forestry sector and one of the pillars for implementation of the National Growth and Poverty Eradication Strategy. FS 2020 consists of analysis of status and issues, objectives of the sector development, policy directions and proposals for actions. Actions proposed, 146 in total, range from policy formulation/review to field actions, and from research to international cooperation. In principle, the Actions need to be implemented by the responsible agencies identified in the Implementation Framework in the Strategy. However, many of them are interrelated and complex, and need quick concerted actions. A specific mechanism for FS 2020 implementation at the government level is needed for smooth and well coordinated implementation of those proposals as well as for overall monitoring of the strategy implementation.

6.1. Implementation framework for the proposed actions

Implementation framework for each of the proposed actions consisting of responsible agency, main stakeholders, priority, timeframe and resource availability is presented in Annex 2. Although the framework is indicative, it is expected that the framework will be reflected in annual and midterm work plans of the concerned ministries, agencies and other stakeholders including both central and local levels for implementation in their own responsible areas.

6.2. Institutional arrangement for Implementation, Monitoring and Evaluation

MAF will be assigned as the lead agency for overall coordination, implementation, monitoring and evaluation of FS 2020 with the Forestry Department functioning as the secretariat. It will be authorized to coordinate with concerned Ministries, local administrative authorities and other stakeholders for implementation of relevant proposed actions and to convene meetings of concerned Ministries and other stakeholders for facilitation of implementation, monitoring and evaluation of FS 2020.

MAF will report status of FS 2020 implementation and results of monitoring to the government on a periodic basis and recommend necessary actions to be taken by the government for effective and efficient implementation, monitoring and evaluation of FS 2020.

6.3. Source of fund for implementation

The Forestry Strategy to the Year 2020 is the official document that guides development of the forestry sector and the base for formulation of medium term and annual work plans of the government related to forestry as well as of international cooperation programs and projects. It needs to be reviewed and revised according to changes in socio-economic and natural conditions and to support policy and directions of the Government. The amount of fund necessary for FS 2020 implementation is estimated at some US\$ 180 million and the potential sources of this fund are listed below:

1. Government budget.
2. Forest Development Fund.
3. Environment Conservation Fund.
4. International agencies including bi-lateral and finance agencies, and NGOs.
5. Contribution or investment by various organizations in the society and domestic and international investors.

6.4. International Dialogue

In order to facilitate smooth implementation of the FS 2020 through efficient mobilization and implementation of international assistance in the forestry sector, a dialogue between the Government and the international donor community will be maintained on a periodic basis.

6.5. Promotion of domestic and international investment in the forestry sector

Domestic and international investment in the forestry sector will be promoted in the following sub-sectors; tree planting, processing of plantation trees including furniture, moldings or household use, planting and processing of NTFP, conservation of forest resources and eco-tourism. Concerning specific areas for investment the Law on Promotion of Domestic Investment, No 10/NA, dated 22nd Oct 2004 and the Law on Promotion of International Investment, No 11/NA, dated 22nd Oct 2004 should be referred to.

ANNEXES

ANNEX 1: The Most Critical Studies Proposed on NTFPs

ANNEX 2: Implementation Framework

ANNEX 3: Definition of Land and Forest Types

THE MOST CRITICAL STUDIES PROPOSED ON NTFPs

Some of the most obvious topics for specific studies which would be required to fill critical gaps in NTFP knowledge are:

Rural development

- Identification of promising NTFPs for subsistence and income generation for villagers. The DOF/IUCN NTFP project recently produced a booklet with descriptions of the 24 most important NTFPs for subsistence and export
- Nutritional value of NTFPs and their role in food security
- Inventory of medicinal plants. Identify health care and business opportunities
- Nature and level of traditional usage of NTFPs. Development of a monitoring system thereof
- Methods for domesticating/cultivating NTFPs, prioritizing those NTFPs facing depletion or extinction
- Methods for processing NTFPs before sale to minimize waste and maximize benefits
- Locally recognized access and use rights for different NTFPs, as a basis for developing agreed protection and use rules with appropriate groups of people
- Indigenous silvicultural knowledge as a basis for developing agreed management plans for specific NTFP resources
- More testing to develop a variety of multi-cropping agro-forestry systems
- Ethno-linguistic study into indigenous conservation values, results of which can be used in promoting conservation and sustainability in management of NTFP collection, production and marketing

Biodiversity and resource base

- Detailed vegetation mapping based on ground truthing and specimen collections (for NBCA planning and zoning, and to inform NTFP inventory and monitoring work)
- Conventional plant surveys and specimen collection to support the reliable identification of NTFP species
- Test and develop methods for reliable first-hand assessment of NTFP resources
- Sustainability and ecological effect of extraction of NTFPs, prioritizing those NTFPs for which there is a significant market
- Creation of a Herbarium and Botanical Garden institution, to collect, record and store ethno-botanical resources and information (including seed stocks, where appropriate)

National development & product development

- Develop and test methods for monitoring trade in NTFPs (including covert trade)
- More work on product development for enhancing NTFP exports, and for developing new markets and commercial products. For example, there is a strong interest in domesticating the production of Eaglewood (*Sterculia spp*) and for selecting and growing improved varieties of cardamom (*Amomum spp*)
- Promotion of NTFP-based industries (maybe through a new program within the Forest Research Division), focusing on those products which may be domesticated successfully

- Study tours to China and Vietnam to identify products, markets and customers, approaches, and species related to commercial/industrial-scale NTFP development

Information and databases

- On the resource base, including:
 - Species and their use
 - Species distribution
 - Population biology and maximum sustainable collection/harvest levels
 - Trends in species availability and distribution
- On trade, processing and exports, including:
 - Trade and export volumes and values
 - Markets and international prices
 - Traders, processors and final customers
 - Trends and projections on volumes, destinations, and prices

ANNEX 2: IMPLEMENTATION FRAMEWORK

1. Land Use and Forest

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority & Timeframe	Resource Availability
A: Introduction of Land-Use Planning				
A-1: Formulate a national land use policy	PM Office (Department of Land Use Planning and Development) (PM/DLUPD)	Committee on Review and Amendment of Land Policy and Land Law (Land Committee)	H; by 2007	Internal; Available Assistance; Preferable
A-2: Introduce a land-use planning system at national and local levels (1-A-4 and 5)	PM (DLUPD)	Land Committee	H; by 2007	Internal; Available Assistance; Preferable
A-3: Conduct national land use zoning based on land use policy and system eg: forestland, agricultural land, industrial land, cultural land and land for other purposes in order to avoid confusion over land use	PM (DLUPD)	Land Committee	H; by 2007	Internal; Available Assistance; Preferable
A-4: Prepare detailed national, provincial, district and village forest land use zoning (1-A-2 and 5, 1-D-5)	PM (DLUPD), MAF (DOF)	Land Committee	H; by 2010	Internal; Available Assistance; Preferable
A-5: Establish a land use coordination mechanism at national and local levels (1-A-2 and 4)	PM (DLUPD)	Land Committee	H; by 2007	Internal; Available Assistance; Preferable
A-6: Conduct a survey of target areas for forest closure of both permanent and temporary nature.	MAF (DOF)	Provinces, Districts, Villages	H; by 2010	Internal; Limited Assistance; Necessary
B: Completion of the Forestry Law Implementing Regulations				
B-1: Prepare and issue MAF regulations on Protection and Regeneration Forests	MAF (DOF)	MOJ, PAFO, DAFO, Villages	H; by 2005	Internal; Available Assistance; Preferable
C: Clarification of Definition and Status of Village Forest				
C-1: Clarify definition and status of village forest in the Forest Law (9-A-1)	MAF (DOF)	MOJ, PAFO, DAFO, Villages	H; by 2007	Internal; Available Assistance; Preferable
D: Monitoring of Land Use Changes and Analysis of Causes for Forest Decline				
D-1: Review current land-use classification system used in the land use and forest cover	MAF (DOF)	PM Office (Department of	H; by 2007	Internal; Available

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority & Timeframe	Resource Availability
survey D-2: Continue monitoring of land-use and forest cover change, including impacts of such changes on biodiversity and poverty levels D-3: Establish permanent sample plots and introduce more sophisticated methods for regular monitoring D-4: Continue analysis of underlying causes of land-use and forest cover changes D-5: Establish linkage between land-use monitoring and land and forest use policy formulation (1-A-4)	MAF (DOF) MAF (DOF) MAF (DOF) PM (DLUPD)	Geography) (DOG) PM (DOG) PM (DOG) PM (DLUPD, DOG) Land Committee members	Every 5 year M; by 2010 Every 5 year H; by 2010	Internal: Limited Assistance: Necessary Internal: Limited Assistance: Necessary Internal: Available Internal: Available

2. Production Forest

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
<u>A: Production Forest Management</u> 1) Legal Framework A-1: Prepare technical instructions and guidelines to implement PMD 59/2002 and MAF regulation No. 0204/2003 A-2: Disseminate related legislation to all stakeholders through publication and workshops 2) Capacity Building A-3: Enhance training for DOF, PAFO and DAFO technical staff on PF management A-4: Provide adequate training to participating villages in sustainable land use and forest resource management in addition to PF management 3) Enforcement and compliance A-5: Reinforce DAFO's mandate with fresh instructions and, if possible, additional	MAF (DOF) MAF (DOF) MAF (DOF) MAF (DOF) MAF (DOF)	PAFO, DAFO, VFO PAFO, DAFO, VFO, Wood Processing Industry (WPI) PAFO, DAFO, FMU PAFO, DAFO, FMU, VFO PAFO, DAFO, FMU, VFO	H; by 2005 H; by 2005 H; by 2010 H; by 2010 H; by 2005	Internal: Available Assistance: Preferable Internal: Limited Assistance: Necessary Internal: Limited Assistance: Necessary Internal: Limited Assistance: Necessary Internal: Limited

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
personnel, equipment and field trips funded from the shared benefits of log sales. (2-A-1)				Assistance: Necessary
<u>B: Production Forest Certification</u>				
B-1: Analyze results of the pilot certification project, especially its costs and benefits under existing policy and conditions in Lao PDR	MAF (DOF), MOIH	PAFO, DAFO, FMU, VFO	M; by 2010	Internal: Limited Assistance: Necessary
B-2: Consider application for certification of Production Forests, which have long term management plans	MAF (DOF), MOIH	PAFO, DAFO, FMU, VFO	M;	Internal: Available Assistance: Preferable
<u>C: Village Participation in Production Forest Management</u>				
C-1: Ensure active participation of villages in Production Forest management through explanation of management schemes and tours to existing management sites	MAF (DOF)	PAFO, DAFO, FMU, VFO	H; by 2010	Internal: Limited Assistance: Necessary
C-2: Increase involvement of villagers in sustainable management and use of village forestland and agricultural land through land use planning and land allocation	MAF (DOF)	PAFO, DAFO, FMU, VFO	H; by 2010	Internal: Limited Assistance: Necessary
<u>D: Control of Logging Outside of Production Forests</u>				
D-1: Publicize location of approved logging sites and annual harvest volumes (5-2)	MAF (DOF)	PAFO, DAFO, WPI, VFO	H; by 2007	Internal: Available Assistance: Preferable
D-2: Establish regular monitoring of logging outside Production Forests, and especially within NBCAs and patches of rich forests with villagers' cooperation	MAF (DOF)	PAFO, DAFO, WPI, VFO	H; by 2007	Internal: Available Assistance: Preferable

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
<u>E: Integrated Production Forest Management</u> E-1. Establish production forest areas in the entire country;	MAF (DOF)	PAFO, DAFO	H; by 2010	Internal: Limited Assistance: Necessary
E-2. Establish appropriate institutional arrangement to effectively manage the production forest in provinces based on PM's decree 59/2002, and MAF regulation No. 0204/2003 and others;	MAF (DOF), PAFO	DAFO, Villages	H: by 2010	Internal: Available Assistance: Preferable
<i>E-3. Identify and make available sound technical practices for managing the production forest. These may include: national code of harvesting practices, forest planning, enrichment or replanting techniques, thinning, pest and insect control, downstream processing, selling, and marketing development;</i>	MAF (DOF)	PAFO, DAFO, Villages	H: by 2007	Internal: Limited Assistance: Necessary
E-4. Allocate adequate financial resources for managing the production forests.	MOF	MAF (DOF), PAFO, DAFO	H: by 2020	Internal: Limited Assistance: Necessary

3. Non-Timber Forest Product (NTFP) Management

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
<u>A: Improving Basic Conditions for NTFP Development</u> A-1: Conduct surveys and studies to add to knowledge necessary for sound policy and programs for NTFP development (3-C-5)	MAF (NAFRI)	MOIH, Health, Commerce, etc. NUOL, STEA, Women's Union, NTFP trade and processing companies, local villagers, etc.	H: by 2010	Internal: Limited Assistance: Necessary
<u>B: Improving Harvesting and Marketing for NTFP Development</u> B-1: Link harvesting plans with forest management plans developed by villages through the Village Land Use planning process (7-B-3)	MAF (DOF)	PAFO, DAFO, Villages	H; by 2010	Internal: Limited Assistance: Necessary
B-2: Enhance the transparency and consistency of the harvesting plan setting system and	MAF (DOF)	PAFO, DAFO, NTFP	H; by 2007	Internal: Available

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
<p>procedures and their year to year stability</p> <p>B-3: Establish NTFP harvesting plans increasingly based on resource assessments rather than only on markets' demands. Harvesting levels need to be sustainable and scientific, and do not threaten the resource base. (7-B-1)</p> <p>B-4: Set higher royalties on products more susceptible to over-harvesting or that are known or thought to have threatened populations.</p> <p>B-5: Promote NTFP processing and export through appropriate trade regulation and technical and financial support</p>	<p>MAF (DOF)</p> <p>MAF (DOF), Ministry of Commerce (MOC)</p> <p>MAF(DOF, NAFES), MOC</p>	<p>traders</p> <p>PAFO, DAFO, NTFP traders</p> <p>Provincial and District Agriculture and Commerce Divisions, NTFP traders</p>	<p>H; by 2007</p> <p>H; by 2007</p> <p>H;</p>	<p>Internal: Available</p> <p>Internal: Available</p> <p>Internal: Limited Assistance: Necessary</p>
<p><u>C: Capacity Building</u></p> <p>1) <u>Institutional strengthening</u></p> <p>C-1: Strengthen villagers' capacity to develop sustainable forest resource management especially NTFPs. (2-C-2, 9-D-2)</p> <p>C-2: Address the need for better coordination within the NTFP sub-sector and consider creation of a task force to guide formulation of an NTFP sub-sector strategy and better involve stakeholders.</p> <p>2) <u>Reinforcing research and extension work</u></p> <p>C-4: Develop mechanism of exchange of information and provision of technical, social, credit and other services for stronger linkage between research and extension at field implementation level. (7-D-2, 9-D-3)</p> <p>C-5: Establish a coordination mechanism between the Forest Research Centre (FRC) under NAFRI and organizations including the Institute of Medicinal Plants, Ministry of Industry and Handicrafts, Science and Forestry Faculties (NUOL), STEA and the Lao Women's Union. (LWU)</p>	<p>MAF (NAFES)</p> <p>MAF (NAFRI)</p> <p>MAF (NAFRI, NAFES)</p> <p>MAF (NAFRI)</p>	<p>PAFES, DAFO, Villages</p> <p>Same as 3-A-1</p> <p>Same as 3-A-1</p> <p>Same as 3-A-1</p>	<p>H; by 2010</p> <p>H; by 2010</p> <p>M; by 2010</p> <p>H; by 2010</p>	<p>Internal: Limited Assistance: Necessary</p> <p>Internal: Limited Assistance: Necessary</p> <p>Internal; Limited Assistance; Necessary</p> <p>Internal; Limited Assistance; Necessary</p>

4. Tree Plantation Development

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
<p><u>A: Formulation of National Tree Plantation Development Plan</u></p> <p>A-1: Formulate a national tree plantation development plan with comprehensive coverage from tree breeding to plantation management, processing with clear target groups and incentives</p> <p><u>B: Improving Tree Plantation Profitability</u></p> <p>1) <u>Improving Tree Growing Technology</u></p> <p>B-1: Conduct applied, adaptive research on species (including seed and nursery requirements and the use of indigenous species), species/site matching, harvesting, thinning and coppicing methods, site and soil preparation, fertilization programs and post-plantation management</p> <p>B-2: Make research results available to PAFO and DAFO and then to potential growers. This would entail assisting DAFO in developing adequate capacity for the task</p> <p>B-3: Provide tree plantation owners, especially teak plantation owners in the north with skills to select seed, plant at the correct density, thin and prune stands for quality improvement and increased sale price. (9-D-3)</p> <p>2) <u>Securing Better Prices</u></p> <p>B-4: Carry out market research to study conditions under which plantation products are sold, how qualities are defined and checked and how prices, premiums and discounts are set</p> <p>B-5: Develop and promote processing technology of small diameter plantation trees</p>	<p>MAF (NAFES)</p> <p>MAF (NAFRI), NOUL</p> <p>MAF (NAFES, NAFRI)</p> <p>MAF (NAFES, NAFRI)</p> <p>MAF (NAFES, DOF)</p> <p>MAF(DOF), MOIH</p>	<p>DOF, PAFO, DAFO</p> <p>MAF (DOF), PAFO, DAFO, Commercial companies, Farmers</p> <p>PAFO, DAFO</p> <p>PAFO, DAFO, Farmers</p> <p>PAFO, DAFO, Farmers, Commercial companies, WPI</p> <p>WPI</p>	<p>H; by 2005</p> <p>H; by 2010</p> <p>H; by 2010</p> <p>H; by 2007</p> <p>H; by 2010</p> <p>M;</p>	<p>Internal: Limited Assistance: Necessary</p> <p>Internal: Limited Assistance: Necessary</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Limited Assistance: Necessary</p> <p>Internal: Limited Assistance: Necessary</p> <p>Internal: Limited Assistance: Necessary</p>
<p><u>C: Improving Legal and Regulatory Framework</u></p> <p>C-1: Establish procedures respecting customary land and forest use by local people or compensating for losses upon development of commercial tree plantations (1-C-1, 9-A-1)</p> <p>C-2: Simplify regulations concerning all aspects of tree plantation management from</p>	<p>MAF (DOF, NAFES)</p> <p>MAF (DOF, NAFES)</p>	<p>PAFO, DAFO, Villages, Commercial companies</p> <p>PAFO, DAFO, Villages, Commercial companies</p>	<p>H; by 2007</p> <p>H; by 2007</p>	<p>Internal: Available Assistance: Preferable</p> <p>Internal: Available</p>

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
planting to harvesting and export C-3: Establish procedures to convert temporary land use certificates to long term rights (land titles) without undue burden on small holders C-4: Prepare for large scale plantation investments both national and international partly boosted by CDM in terms of environmental safeguard and harmonization with local use	MAF (DOF), MOF MAF (NAFES), FIMC, STEA,	PM/DLUPD, PAFO, DAFO PAFO, DAFO, Villages	H: by 2007 H: by 2007	Assistance: Preferable Internal: Available Assistance: Preferable Internal: Limited Assistance: Necessary
<u>D: Improving Funding and Incentives</u> D-1: Promote agro-forestry at household level to generate continuous income flow through tree plantation related projects D-2: Review existing loan schemes for tree plantation, especially those for smallholders, in terms of financial feasibility, sustainability, justification for subsidy, etc D-2: Explore ways and means to support smallholder tree plantations by reviewing trials in progress including the Profit Sharing System (PSS)	MAF(NAFES) MAF (NAFES), APB MAF (NAFES, DOF), MOF	PAFO, DAFO, Farmers PAFO, DAFO, Farmers, Commercial companies PAFO, DAFO, Farmers	H: H: by 2007 H: by 2007	Internal: Limited Assistance: Necessary Internal: Available Assistance: Preferable Internal: Available Assistance: Preferable
<u>E: Marketing Development</u> E-1: Provide information sharing regarding the wood prices in domestic and international markets.	MOC	WPI, MOIH, MAF, MOF	H: by 2010	Internal: Limited Assistance: Necessary

5. Harvest/Logging Plans and Royalties

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
1. Shift from the national harvest/logging plan setting and allocation to bottom-up	MAF (DOF)	PAFO, DAFO, WPI	H; by 2010	Internal: Available

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
setting of harvest levels based on management plans in accordance with Production Forest establishment				Assistance: Preferable
2. Publicize PFA management and operation plans so that wood processing factories can prepare long term investment plans (2-D-1)	MAF (DOF)	PAFO, DAFO, WPI	H; by 2010	Internal: Available
3. Improve royalty setting formula to reflect international market prices	Ministry of Commerce (MOC)	MAF (DOF), WPI, VFO	H; by 2007	Internal: Available Assistance: Preferable
4. Establish an equitable benefit sharing and cost covering scheme to complement efficient royalty setting	Ministry of Finance (MOF)	MAF, PAFO, DAFO, VFO	H; by 2007	Internal: Available Assistance: Preferable
5. Review current royalty collection systems and systems for collection of other taxes and fees payable to the central treasury, e.g. in terms of local and central responsibilities, to improve collection rates	MOF	MAF, Provincial Financial Section, PAFO, WPI, VFO	H; by 2007	Internal: Available Assistance: Preferable
6. Resume piloting of bidding whilst strengthening institutional and staff capacity for national implementation. (6-B-2)	MOC, MAF	PAFO, Provincial Commerce Section, VFO, WPI	H; by 2005	Internal: Available Assistance: Preferable

6. Wood Processing Industry (WPI)

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
A: <u>Simplifying Processes for Factory Operation</u>				
A-1: Instigate dialogue between MAF, MOIH, MOF and FIMC to simplify administrative processes for establishment and operation of wood processing factories	MAF, MOIH, FIMC, MOF, MOC	WPI	H; by 2007	Internal: Available
A-2: Increase transparency by providing criteria and responsibilities for decision making with respect to business permits, operational issues and so on.	MAF, MOIH, MOC	WPI	H; by 2007	Internal: Available

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
3: Rationalize existing sawmills and wood based factories so that operation are more efficient and match sustainable wood harvesting regimes	MAF, MOIH, MOC	WPI	H; by 2007	Internal: Available
<u>B: Comprehensive Approach for Reduction of Processing Capacity</u>				
B-1: Publicise criteria for selection of factories to continue operation	MAF (DOF)	WPI, MOIH	H; by 2007	Internal: Available
B-2: Pilot competitive log sales and undertake institutional strengthening for nation-wide introduction (5-6)	MAF (DOF), MOC	PAFO, DAFO, Provincial finance & commerce, VFO	H; by 2005	Internal: Limited Assistance: Necessary
B-3: Improve law enforcement and governance regarding logging and log supply to factories, including cancellation of operation permits for factories that process unauthorized logs.	MAF (DOF), MOIH	PAFO, DAFO, WPI	H: by 2010	Internal: Available Assistance: Preferable
<u>C: Improving Efficiency in Wood Processing</u>				
C-1: Strictly implement regulations, rules and technical guidelines for tree marking, felling, logging, grading and log sales contracts	MAF (DOF)	PAFO, DAFO, VFO	H:	Internal: Available
C-2: Introduce tax incentives for installation of secondary or final processing machinery and provision of appropriate training (6-D-4)	MOF	MAF (DOF), MOIH	H: by 2010	Internal: Available
C-3: Consider development of a network on forest and wood export to promote forest management certification and optimize the market benefits available to certified forest products	MAF, MOC	PAFO, DAFO, Provincial finance and commerce, VFO	H: by 2010	Internal: Limited Assistance: Necessary
<u>D: Promotion of Export of Finished Products</u>				
D-1: Strictly implement the log export ban and restrictions on sawn timber export	MOC, MOIH	MAF (DOF), Provincial Commerce and Forestry, WPI	H;	Internal: Available
D-2: Transfer remaining wood products from the Temporary Exclusion List to the Inclusion List and reduce tariff rates under the AFTA/CEPT scheme to stimulate exports	MOC, MOIH	MAF (DOF), Provincial Commerce and Forestry,	H: by 2008	Internal: Available

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
D-3: Temporarily and restrictively relax the ban on foreign investment in secondary wood processing using natural wood	FIMC, MOC, MOIH, MOF, AFTA Commit	WPI	H: by 2010	Internal: Available
D-4: Introduce tax incentives for installation of timber drying kilns (6-C-2)	MOF	MAF (DOF), Provincial Commerce and Forestry, WPI	H: by 2010	Internal: Available
D-5: Improve skills of wood processing workers by provision of vocational training	MAF, MOIH, MOE	MAF (DOF), MOIH	H: by 2010	Internal: Limited Assistance: Necessary
D-6 Promote small scale wood processing skills for woody handicraft or basket weaving at household, household group or village level for income generation.	MOIH	Ministry of Labor & Social Welfare (MOLASW) MAF, Min. of Labor, MOC, Banks, Villages	H: by 2010	Internal: Limited Assistance: Necessary

7. Bio-diversity Conservation

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
<u>A: Improving the legal and regulatory framework</u>				
A- 1: Consider participation in other international conventions (besides the Convention on Biodiversity (CBD) and CITES)	STEA	MAF	H; by 2010	Internal: Limited Assistance: Necessary
A-2: Consider preparation of a law on biodiversity conservation based on review of existing NBCA and other related regulations	STEA, MAF (DOF), MOJ	PAFO, DAFO, Villages	H; by 2010	Internal: Available Assistance: Preferable
A-3: Improve wildlife regulations concerning use of wetlands for fish raising and eco-tourism	MAF(DOF)	MAF(Dept. of Livestock), MOC	H; by 2007	Internal: Available
A-4: Develop controls and regulations for protection of forest genetic resources and	MAF(DOF), MOJ, STEA	Villagers,	H; by 2010	Internal: limited

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
intellectual property rights to ensure that benefits from development of pharmaceuticals or other products, which may have been derived from genetic resources collected in Lao PDR or developed based on traditional knowledge of forest products, accrue to the nation and rural communities.				Assistance: Necessary
<p>B: Improving NBCA development and management</p> <p>B-1: Review the existing NBCA system to include important wildlife and aquatic habitats and exclude more developed areas (7-A-2)</p> <p>B-2: Prepare long-term NBCA development and management plans with participation of stakeholders including local villagers (7-A-2, 7-B-1)</p> <p>B-3: Improve NBCA financing through government funding and income generating activities and fines</p> <p>B-4: Develop ecotourism in investment programs and projects</p> <p>B-5: Provide NBCA management with the required materials and facilities (transport, computers, uniforms, etc.) (7-B-3)</p> <p>B-6: Increase NBCA staff numbers and skill levels through short and long-term programs and establish an NBCA staff management and reward system to compensate for duties performed under difficult living and working conditions (7-B-3)</p> <p>B-7: Consider the development of codes of practice or guideline for tourism operators to provide a basis for development of responsible ecotourism that benefits rural communities and environment while generating revenue for the nation</p> <p>B-8: Identify sites for conservation of tree genetic resources in the whole country and establish legal framework for conservation of the sites and use of genetic resources</p>	<p>MAF (DOF)</p> <p>MAF (DOF)</p> <p>MAF (DOF), MOF</p> <p>PM Office/National Tourism Authority MAF (DOF)</p> <p>MAF (DOF)</p> <p>MAF (DOF)</p> <p>MAF (DOF, NAFRI)</p>	<p>STEA, PAFO, DAFO</p> <p>PAFO, DAFO, Villages</p> <p>PAFO, DAFO, Villages</p> <p>PAFO, DAFO, Villages</p> <p>PAFO, DAFO</p> <p>PAFO, DAFO</p> <p>National Tourism Authority, PAFO, DAFO, Villages</p> <p>NAFES, STEA, NUOL, PAFO, DAFO</p>	<p>H; by 2007</p> <p>H; by 2010</p> <p>H; by 2010</p> <p>M;</p> <p>H; by 2010</p> <p>H;</p> <p>H; by 2010</p> <p>H; by 2010</p>	<p>Internal: Limited Assistance: Necessary</p> <p>Internal: Limited Assistance: Necessary</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Limited Assistance: Necessary</p> <p>Internal: Available</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Limited Assistance: Necessary</p>

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
<u>C: Controlling wildlife trade</u>				
C-1: Using information collected from recent studies on wildlife trade in Lao PDR, identify and implement priority actions to strengthen domestic and international wildlife trade controls	MAF (DOF)	MOC, Police, PAFO, MOF, DAFO, Local police, Villages	H; by 2007	Internal: Available Assistance: Preferable
C-3: Intensify border patrols to control unauthorized export of wildlife to neighboring countries and to enhance monitoring of trade/transport routes out of NBCAs	MAF (DOF), Police, MOF	PAFO, DAFO, Local Police, Villages	H; by 2010	Internal: Limited Assistance: Necessary
C-4: Take advantage of participation in CITES to strongly cooperate with others countries on border control of trade on wildlife and plants	MAF, STEA, Ministry of Foreign Affairs	PAFO, DAFO, Villages	H; by 2010	Internal: Available Assistance: Preferable
<u>D: Enhancing education and public awareness</u>				
D-1: Educate and train central, provincial and district level staff (including Ministry of Finance tax and customs staff) on biodiversity conservation and trade in wildlife and plant species	MAF (DOF)	Provincial and District Forestry and Financial Officers	H; by 2010	Internal: Limited Assistance: Necessary
D-2: Establish extension programs on the sustainable use of wildlife and plants and other conservation in general (3-C-1, 9-D-3)	MAF (DOF, .NAFES)	PAFO, DAFO, Villages	H; by 2010	Internal: Limited Assistance: Necessary
D-3: Educate villagers to streamline forest resource use methods that threaten resource base or negatively impact biodiversity (2-C-2, 3-C-1, 9-D-2)	MAF (DOF., NAFES)	PAFO, DAFO, Villages	H; by 2010	Internal: Limited Assistance: Necessary
D-4: Introduce or include biodiversity conservation into primary and secondary school curriculum	MAF, Ministry of Education (MOE)	DOF, PAFO, DAFO, Provincial and District Education Division	H;	Internal: Available Assistance: Preferable
<u>E: Strengthening research</u>				
E-1: Prepare research into the dynamics of important plants, wildlife and habitats inside and outside NBCAs	MAF (NAFRI), STEA,	NOUL	H; by 2010	Internal: Limited Assistance: Necessary
E-2: Cooperate with foreign universities and institutes to develop scientific knowledge and provide high level training for officials and students	MAF (NAFRI), STEA, NOUL	Foreign Universities/ Research Institutes	H;	Internal: Limited Assistance: Necessary

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
E-3: Develop plant and wildlife database for research, decision-making and management	MAF (NAFRI, DOF), STEAM, NOUL	PAFO, DAFO	M; by 2020	Internal: Limited Assistance: Necessary

8. Protection Forest and Watershed Management

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
1. Set up an inter-sectoral coordination mechanism for effective watershed management	STEAM, MAF (Department of Planning (DOP))	MOIH, MTCP, etc.	M; by 2010	Internal: Available
2. Support implementation of Integrated Watershed Management in the field	MAF (DOP)	PAFO, DAFO,	H:	Internal: Limited Assistance: Necessary
3. Develop innovative funding schemes to finance watershed management activities	MAF (DOP, DOF, NAFES)	PAFO, DAFO	H: by 2010	Internal: Limited Assistance: Necessary
4. Prioritize crucial and vital watershed in the whole country that need to be protected and managed to secure soil and water conservation through sustainable natural resources use	MAF (DOP, DOF, NAFES)	STEAM, PAFO, DAFO	H: by 2010	Internal: Limited Assistance: Necessary
5. Formulate plans and projects for rehabilitation of degraded watershed areas mainly with natural regeneration mixed with tree planting with villagers' participation	MAF(DOF, NAFES)	PAFO, DAFO, Villages	H; by 2010	Internal: Limited Assistance: Necessary

9. Village Land Use and Forest Management

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
<u>A: Legal framework</u> A-1: Clarify the definition the status of village forest in the Forestry Law and prepare	MAF (DOF)	MOJ, PAFO, DAFO,	H; by 2007	Internal: Available

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
provisions for conversion of villages forest including consultation process and compensation (1-C-1, 4-C-1)		Villages		Assistance: Preferable
<u>B: Land and Forest Allocation</u>				
B-1: Review and improve the land and forest allocation program in terms of impacts on villagers' livelihoods according to agriculture production, NTFP collection and other available resources for flexible implementation according to village socio-economic conditions	MAF (NAFES)	PM (DLUPD), MOF (DOL), PAFO, DAFO, Villages	H: by 2007	Internal: Limited Assistance: Necessary
B-2: Clarify the legal status of Temporary Land Use Certificates (TLUC), which were issued more than three years ago.	MAF (NAFES)	PM (DLUPD), MOJ, MOF (DOL), Villages	H: by 2007	Internal: Available
B-4: Consider establishment of participatory land use planning based on the legal status of village land and forest (1-A-1 and 3, 1-C-1, 9-A-1)	MAF (NAFES)	PM (DLUPD), MOJ, MOF (DOL), PAFO, DAFO, Villages	H: by 2010	Internal: Available Assistance: Preferable
<u>C: Shifting Cultivation Stabilization</u>				
C-1: Define target areas, re-undertaken land and forest allocation and support villagers to draw-up long term land use plan according to the existing potential resources (2-C-2, 3-C-1, 9-B-4, 9-D-2)	MAF (NAFES)	PAFO, DAFO, Villages	H: by 2010	Internal: Available Assistance: Preferable
C-2: Study impacts of shifting cultivation on environment and forests	MAF (NAFRI, NAFES)	PAFO, DAFO, Villages, STEA	M: by 2010	Internal: Limited Assistance: Necessary
C-3: Consider setting a target number of households to be assisted in adopting improved livelihood system	MAF (NAFES)	PAFO, DAFO, Upland farmers	H; by 2005	Internal: Available
<u>D: Enhancement of Village Based Forest Management as an Integral Part of Rural Livelihoods</u>				
D-1: Establish a clear legal framework covering village land and forest resources that enables effective community based natural resource management including participatory land-use planning at village level reflecting actual land and forest use (1-A-1 and 3, 1-C-1, 9-A-1, 9-B-4)	MAF (DOF., NAFES)	PM (DLUPD), MOF, MOJ, PAFO, DAFO, Villages	H: by 2007	Internal: Available Assistance: Preferable
	MAF (NAFES)	PAFO, DAFO, Villages	H: by 2010	Internal: Limited

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
D-2: Assist villagers in formulating village land and forest management plans on the basis of overall land use plans and focusing on sustainable and equitable use of common land and forest resources, maintenance/rehabilitation of village watershed areas, income generation, etc. (2-C-2, 3-C-1, 9-C-1)				Assistance: Necessary
D-3: Establish a demand-driven, household-based extension and information dissemination system supported by DAFO as well as model farmers and others (3-C-1, 4-B-3, 7-D-2)	MAF (NAFES)	PAFO, DAFO, Villagers	H: by 2010	Internal: Limited Assistance: Necessary
D-4: Assist villagers in forming groups or association for collective management of NTFPs including domestication, sales and processing	MAF (NAFES)	PAFO, DAFO, Villagers	H: by 2010	Internal: Limited Assistance: Necessary
D-5: Establish micro-finance systems to support villagers investing in cropping, NTFP domestication and processing, livestock production and so on	APB, MAF	PAFO, DAFO, Villagers	H: by 2010	Internal: Limited Assistance: Necessary
D-6: Develop domestic and international marketing mechanism for promoting sale of forestry and agricultural products	MAF (NAFES)	PAFO, DAFO, Villagers	H; by 2010	Internal: Available Assistance: Preferable

10. Cross-cutting areas

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
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Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
<p>A: Legal Framework and Implementation</p> <ol style="list-style-type: none"> 1. Issue extension materials on key forestry legislation in cooperation with MOJ in formats suitable for local authorities and villages to improve implementation and awareness 2. Improve the access to, and dissemination of, forestry legislation by publishing together all legislation currently in effect, and issuing periodic updates 3. Clarify which forestry legal documents have been repealed and which are still in effect 4. Continue to issue implementing regulation mandated by the Forestry Law 5. Conduct training on legal drafting and implementation focused on the PSO (MAF) Technical Division (DOF), and members of PAFO/DAFO with such duties 6. Institute committees or working groups for different forestry sub-sectors to be involved in consultation or for multi-institutional drafting teams for key legislation <p>B: Law enforcement and Governance</p> <ol style="list-style-type: none"> 1. Clarify bordering or overlapping responsibilities, making it explicit and public who has the right or authority to authorize what, and who does not have it. 2. Consider to set up a cross sectoral program consisting of forestry, police, customs and others for detection and suppression of unauthorized harvesting and trade of logs and NTFP. 	<p>MAF (DOF)</p> <p>MAF (DOF)</p> <p>MAF (DOF)</p> <p>MAF (DOF)</p> <p>MAF</p> <p>MAF (DOF)</p> <p>PMO, MAF, MOC</p> <p>MAF, Ministry of Interior, MOF and others</p>	<p>MOJ, PAFO, DAFO, Industries, Villages</p> <p>PAFO, DAFO, Industries, Villages</p> <p>PAFO, DAFO, Industries, Villages</p> <p>PAFO, DAFO, Industries, Villages</p> <p>MAF, DOF, PAFO, DAFO</p> <p>Other Ministries, MAF other departments, Industries, PAFO, DAFO, Villages</p> <p>PAFO, DAFO, Industries, Villages</p> <p>Provincial divisions, Industries, Villages</p>	<p>H: by 2007</p> <p>H: by 2010</p> <p>H: by 2007</p> <p>H: by 2005</p> <p>H: by 2007</p> <p>H: by 2007</p> <p>H: by 2007</p> <p>H: by 2007</p> <p>H: by 2007</p>	<p>Internal: Available Assistance: Preferable</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Available</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Available Assistance: Preferable</p>
<p>C: Institutional strengthening and Human resource development</p> <p>1) <u>Policy formulation</u></p> <p>1. Improve the collection, storage and retrieval system of information and statistics at both</p>	<p>MAF (Departments)</p>	<p>PAFO, DAFO</p>	<p>H: by 2007</p>	<p>Internal: Limited</p>

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
<p>departmental and ministerial levels.</p> <p>2. Institute a periodic review of the sector with use of the collected data and information.</p> <p>3. Improve staff capacity of sector analysis and policy formulation through participation in training courses and higher education.</p> <p>2) <u>Policy/program implementation</u></p> <p>1. Based on MAF's Human Resource Development Strategy, develop and implement a human resource development plan taking into consideration the training needs suggested in the proposals in the previous sections.</p> <p>2. Provide equipment, facilities and transportation with local offices necessary to carry out duties identified in the previous sections through new and additional funding.</p> <p>3. Incorporate explicit human resource development components in all international cooperation projects.</p>	<p>MAF (DOF)</p> <p>MAF (DOF)</p> <p>MAF (Departments)</p> <p>MAF</p> <p>MAF (Departments)</p>	<p>MAF departments, Ministries, PAFO, DAFO, Industries, villages</p> <p>NUOL, Inter national University/Research Institute</p> <p>PAFO, DAFO</p> <p>PAFO, DAFO</p> <p>PAFO, DAFO</p>	<p>H: by 2010</p> <p>H: by 2007</p> <p>H: by 2010</p> <p>H:</p> <p>H:</p>	<p>Assistance: Necessary Internal: Limited Assistance: Necessary</p> <p>Internal: Limited Assistance: Necessary</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Limited Assistance: Necessary</p> <p>Internal: Limited Assistance: Necessary</p>
<p>D: Research and Extension</p> <p><u>1) Research</u></p> <p>1. Formulate Forestry Research Strategy to 2010 and 2020</p> <p>2. Establish a coordination mechanism between research institutions</p> <p>3. Upgrade researchers capacity through participation in training courses and high education abroad</p> <p><u>2) Extension</u></p>	<p>MAF (NAFRI)</p> <p>MAF (NAFRI)</p> <p>MAF (NAFRI)</p> <p>MAF (NAFES)</p>	<p>NUOL, PAFO, DAFO, Private Sector, Villages</p> <p>NUOL, Ministries and others</p> <p>NUOL, Inter national University/Research Institute</p> <p>PAFES, DAFO, Villages</p>	<p>H:</p> <p>H: by 2010</p> <p>H:</p> <p>H: by 2005</p>	<p>Internal: Available Assistance: Preferable</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Limited Assistance: Necessary</p> <p>Internal: Available</p>

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
<p>1) Give a clear mandate to extension service at local level.</p> <p>2) Provide training with local extensionists on their mandate, farmer oriented extension methods, technical knowledge and marketing.</p> <p>3) Establish an efficient extension delivery system involving all possible sources including research institutions, private sector and individuals.</p>	<p>MAF (NAFES)</p> <p>MAF (NAFES)</p>	<p>PAFES, DAFO, Villages</p> <p>PAFES, DAFO, NAFRI, NUOL, Private sector and others</p>	<p>H: by 2010</p> <p>H: by 2010</p>	<p>Internal: Limited Assistance: Necessary</p> <p>Internal: Limited Assistance: Necessary</p>
<p>E: Gender</p> <p>1. Promote gender-sensitive approaches in all activities related to management and utilization of forests and forest land</p> <p>2. Develop gender sensitive methodologies, technical guides and best practices regarding the management of trees and forests in fragile areas</p> <p>3. Carry out more socio-economic research and analysis of the impacts of forestry projects on gender</p> <p>4. Ensure a more equitable share of responsibilities in natural resource management, equitable access to resources (education, extension, training and production inputs such as credit and financial services)</p> <p>5. Enhance gender responsive training curriculum in the education system</p> <p>6. Increase opportunities on representation and participation of women in decision making at all levels, including the availability of appropriate technical knowledge and skills</p> <p>7. Support income generating activities through forest related projects for improving</p>	<p>MAF(DoF, NAFES)</p> <p>MAF(DoF, NAFRI, NAFES)</p> <p>MAF(NAFRI, DOF)</p> <p>MAF(DoF)</p> <p>MAF(NAFES), MOE</p> <p>MAF (DOF,)</p> <p>MAF (NAFES)</p>	<p>LWU, NAFRI, PAFO, DAFO, Villages</p> <p>LWU, PAFO, DAFO, Villages</p> <p>LWU, NAFRI, PAFO, DAFO, Villages</p> <p>LWU, NAFRI, NAFES, PAFO, DAFO, Villages</p> <p>LWU, NAFRI, PAFO, DAFO</p> <p>LWU, NAFRI, NAFES, PAFO, DAFO, Villages</p> <p>LWU, DOF, NAFRI, PAFO, DAFO, Villages</p>	<p>H; by 2010</p> <p>H; by 2010</p> <p>H; by 2010</p> <p>H;</p> <p>H; by 2010</p> <p>H;</p> <p>H;</p>	<p>Internal: Available Assistance: Preferable</p> <p>Internal: Limited Assistance: Necessary</p> <p>Internal: Limited Assistance: Necessary</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Available Assistance: Necessary</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Limited</p>

Proposed Actions (related actions)	Responsible Agency	Main Stakeholders	Priority and Timeframe	Resource Availability
women livelihoods				Assistance: Necessary
<p>F: Funding and Allocation</p> <p>1. Review the general funding to the forestry sector from the point of view of taking balance between the revenue generated by the sector and the costs necessary to maintain appropriate management, especially conservation work.</p> <p>2. Review the uses of the reforestation fund and consider possible allocation to conservation activities.</p> <p>3. Establish a fund to support forestry development in harmonization with other related Funds.</p> <p>4. Review the allocation of special budgets including reforestation fund in order to reflect actual needs of Provinces.</p>	<p>MOF, MAF</p> <p>MOF, MAF</p> <p>MAF, MOF</p> <p>MAF</p>	<p>PAFO, DAFO</p> <p>PAFO, DAFO, Donors, Villages</p> <p>PAFO, DAFO, Villages</p> <p>MOF</p>	<p>H: by 2007</p> <p>H: by 2007</p> <p>H: by 2007</p> <p>H: by 2007</p>	<p>Internal: Available</p> <p>Internal: Available</p> <p>Internal: Available Assistance: Preferable</p> <p>Internal: Available</p>
<p>G: International Cooperation</p> <p>1. Strengthen the cooperation sections of MAF and concerned departments for better coordination of international support and active participation in international dialogue on forestry.</p> <p>2. Enhance existing government mechanism where government and international community can exchange views and information concerning support to the forestry sector.</p>	<p>MAF</p> <p>MAF</p>	<p>MAF' Departments, NAFRI, NAFES</p> <p>Ministries, PAFO, DAFO, Industries, Villages, Donors</p>	<p>H: by 2007</p> <p>H: by 2005</p>	<p>Internal: Limited Assistance: Necessary</p> <p>Internal: Available Assistance: Preferable</p>

Note: 1) - H: High Priority - M: Medium Priority
2) Timeframe is not indicated for actions of continuous nature

***ANNEX 3:* Definition of forest and Land types**

Current Forest (CF)

Current Forest includes natural forests and plantation forests. It is used to refer to land with a tree canopy cover of more than 20% and area of more than 0.5 ha. The trees should be able to reach a minimum height of 5 m. The basis for the distinction between forest and other land use groups is the crown density. In this study the natural forests are classified into forest types which compose Upper and Lower Dry Evergreen Forests, Upper and Lower Mixed Deciduous Forests, Gallery Forest, Coniferous Forest, Mixed Broadleaved and Coniferous Forest, and Dry Dipterocarp.

Potential Forest (PF)

Previous forest areas where the crown cover has been reduced below 20% for some reason (logging or shifting cultivation) are classified as Potential Forest. The potential forest includes Bamboo, Old shifting cultivation areas (young secondary forests) and Temporary Unstocked areas.

Unstocked Forest Areas (T)

Unstocked Forest Areas are previously forested areas in which the crown density has been reduced to less than 20 % because of logging, shifting cultivation or other heavy disturbance. If the area is left to grow undisturbed it becomes forest again.

Abandoned ray and disturbed stands with a crown density less than 20% should be classified as Unstocked Forest Areas. Old ray in which seedlings, sapling and trees cover more than 20% of the area should be classified as some type of Current Forest.

Bamboo (B)

If an area is covered with bamboo and the over storey has a crown cover less than 5% it should be classified as Bamboo.

Abandoned ray is often recovered by bamboo. Some species of bamboo may last for many years. Bamboo brakes may vary in height from 2 m to 25 m depending on their species. If the Bamboo represents less than 80% of the total vegetation cover of the under storey I the vegetation type should not be classified as Bamboo.

Plantation Forest (P)

In Plantation Forests the planted trees could still be identified (i.e. by even height, even spacing or by species typical for plantations) although they may be mixed up with other non-cultivated plants. All sustainable plantations (including young ones with a crown density less than 20 %) should be classified as Forest Plantations.

Rubber plantations are also classified as Plantation Forest. However, coffee, tea and shade providing trees for coffee and tea as well as fruit trees are not classified as Plantation Forest.

5.4 Other Wooded Areas

Areas with tree where the site conditions are so poor that the crown cover can never be expected to exceed 20% are classified as Other Wooded Areas. This includes Savannah Forest, Heath, Stunted and Scrub forests.

Ray (RA)

Ray is an area where the forest has been cut and burnt for temporary cultivation of rice and other crops. The area should be classified as Ray from the time of clear-cut until one year after it has been abandoned. Areas being prepared for clear-cut but not yet clear-cut and areas that have been abandoned for more than 1 year should not be classified as Ray.

Rice Paddy (RP)

Areas permanently being used for rice cultivation. Old paddy that has been abandoned and not been in use for more than one year should not be classified as Rice Paddy.

Agricultural Plantation (AP)

Areas of agricultural land being used for production of other crops than rice, i.e. various kinds of vegetables, for fruit tree cultivation etc. Plantations with cash crops, such as coffee, tea, cocoa and cotton are also referred to this land use class.

Other Agriculture Land (OA)

Agricultural land being used for other agricultural purposes than agricultural crop cultivation, i.e. grazing of cattle, should be classified as Other Agriculture Land, unless the tree cover exceeds 20%. In that case it should be classified as some type of Current Forest depending on the tree species composition.

Barren land and Rock (R)

Unfertile or seriously degraded land on shallow soil and rocky areas on which neither trees nor grasses can grow.