FOREST REHABILITATION POLICY AND PRACTICE IN VIET NAM





Proceedings of a National Workshop

Hoa Binh - Viet Nam

4th - 5th November 1999











Publication

Published by: IUCN Viet Nam

June 2000

Available from: IUCN Viet Nam

13A Tran Hung Dao Street

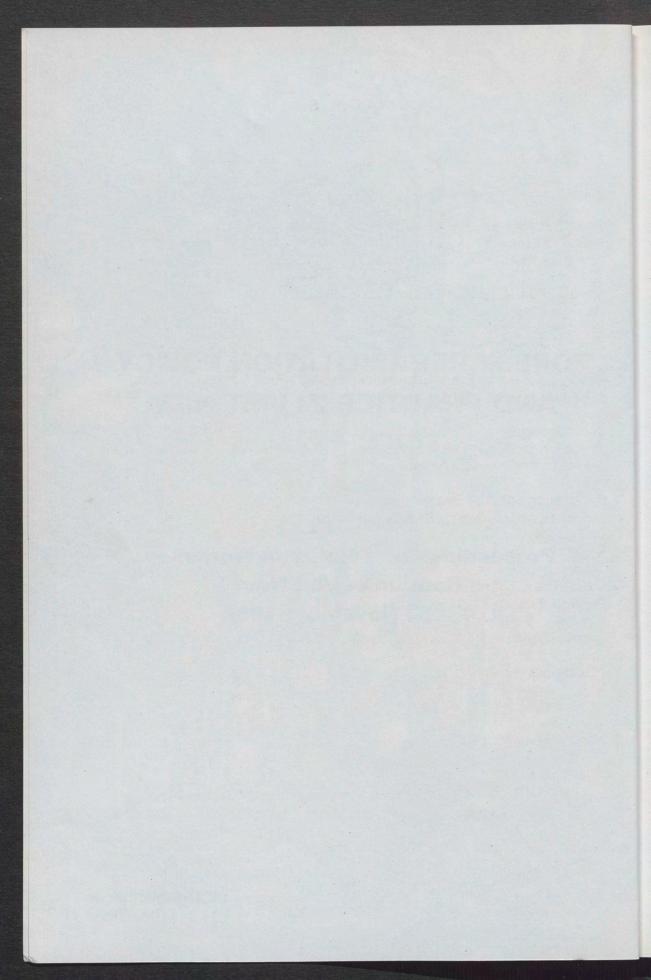
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JUCN 2000 048

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ACRONYMS

Committee for Ethnic Minorities and Mountainous Areas CEMMA DARD Department of Agriculture and Rural Development

DFD Department for Forestry Development

Food and Agriculture Organisation of the United Nations FAO

FIPI Forest Inventory and Planning Institute Forest Science Institute of Viet Nam **FSIV**

GDP Gross Domestic Product

Geographical Information System GIS

GoV Government of Viet Nam

German Development and Cooperation Organisation GTZ

International Cooperation Department ICD

IUCN World Conservation Union

Land Use Planning and Land Allocation LUPLA MARD Ministry of Agriculture and Rural Development

MOF Ministry of Forestry

Ministry of Planning and Investment MPI

Mekong River Commission MRC

National Tropical Forestry Action Plan NTFAP

Non -Timber Forest Product NTFP People's Democratic Republic PDR PRA Participatory Rural Appraisal State Forest Enterprise SFE

Sustainable Management of Resources in the Lower Mekong Basin Project SMRP

VINAFOR Viet Nam Forestry Corporation WFP World Food Programme World Wide Fund for Nature **WWF**



PREFACE

All governments in South-East Asia are concerned about the rapid and extensive deforestation and forest degradation that has occurred in recent years. In addition to halting degradation, there is a clear need for various forms of rehabilitation in order to restore the productive and protective functions provided by viable forest ecosystems. Together with IUCN's Programme in Asia, IUCN Viet Nam's Programme has expanded during the past few years to become involved in a wide range of conservation and development issues that are of interest to its members and partners.



During 1998 and early 1999, IUCN facilitated a regional overview of the policy and practical aspects associated with rehabilitating degraded forests in Cambodia, Lao PDR and Viet Nam. This regional project was developed by IUCN's Forest Programme in collaboration with the following projects, networks and organisations:

- "Sustainable Management of Resources in the Lower Mekong Basin" Project (MRC/GTZ)
- "Forest Innovations from theory to practice" Project (IUCN/ WWF/GTZ)
- Working Group on Community Involvement in Forest Management
- Commission on Ecosystem Management (IUCN)
- WWF International, Forest Programme

The study resulted in a regional workshop in Bangkok in March/April 1999, revealing that large scale forest loss and degradation had occurred during the past 50 years, and there was strong interest in all countries to reverse this on-going trend. Upon the recommendations of this regional workshop, national level assessments and consultative workshops in each of the four lower Mekong countries (Viet Nam, Lao PDR, Cambodia and Thailand) were conducted to engage a wider range of interested parties in detailed discussions. These national assessments and workshops together represented a second phase of the regional project "Rehabilitation of Degraded Forest Ecosystems in the Lower Mekong Basin".

Within the framework of this project, the national workshop on Forest Rehabilitation Policy and Practice was jointly organised by IUCN Viet Nam and the Department for Forestry Development, Ministry of Agriculture and Rural Development, Government of Viet Nam, from 4th - 5th November 1999, in Hoa Binh province, Viet Nam. This report represents the technical papers and results of working group discussions during this workshop.

The ultimate intention of this work and future IUCN initiatives is to assist stakeholders in the lower Mekong Basin countries to develop and implement ecologically and socio-economically sound forest rehabilitation policies and practices.

We wish to thank the workshop committee members and authors and many organisations and people who assisted with the organisation of, participated in, and contributed to the success of the workshop and the development and implementation of this project.

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FOREST REHABILITATION POLICY AND PRACTICE IN VIET NAM

Nguyen Van San and Don Gilmour Consultants, IUCN Viet Nam

GLOSSARY

Degradation: a loss of forest structure, productivity and native species diversity. A degraded site might still contain trees (i.e. a degraded site is not necessarily deforested) but it has lost at least some of its former ecological integrity.

Reclamation: to recover productivity at a degraded site using mostly exotic tree species. The original biodiversity is not recovered although the protective function and many of the original ecological services may be re-established.

Reforestation: the re-establishment of trees and under-storey plants at a site previously occupied by forest cover.

Rehabilitation: to re-establish the productivity and some, but not necessarily all, of the plant and animal species thought to be originally present at a site. For ecological or economic reasons the new forest might also include species not originally present at the site. The protective function and many of the ecological services of the original forest may be re-established.

Restoration: to re-establish the presumed structure, productivity and species diversity of the forest originally present at a site. The ecological processes and functions of the restored forest will closely match those of the original forest.

EXECUTIVE SUMMARY

Viet Nam has suffered deforestation and forest degradation during the past 40 years, and these processes are still issues of interest. Annual forest loss has been of the order of 100-140,000 hectares (ha). Rapidly expanding populations and migration into forest areas are among the major reasons why pressures remain to clear forests to provide additional agricultural land. Poverty is widespread in rural areas, and people are essentially forced to use forest resources for subsistence and market purposes. State forest enterprises have also contributed to forest degradation by engaging in unsustainable harvesting to meet production quotas set by central government. It is estimated that there are about 9.7 million ha of land that is potentially available for rehabilitation.

The Government has long recognised the need to rehabilitate the large areas of degraded forest land, and has established ambitious programmes to "re-green the barren hills" through the 327 Programme structure. The emerging vision for the country's forest lands is that deforestation should be halted, and that there should be an additional 5 million ha of forest established by the year 2010 (this should include 1 million ha of natural regeneration).

The experiences with reforestation have been mixed. The major emphasis has been on using fast growing exotic species (particularly eucalyptus and acacias) to obtain short-term economic benefits. The early plantings showed poor results due to the use of poor quality seed and seedlings, poor technique and poor species-site matching. Later planting improved considerably, but still requires substantial technical improvement. Further, due to certain disadvantages, exotic species have gradually replaced indigenous ones.

Interest is increasingly turning to obtaining environmental benefits (watershed protection and biodiversity conservation) as well as economic benefits from rehabilitation activities and the policy environment reflects this shift. There is also an increasing focus on decentralisation and devolution of authority and responsibility for resource management to lower levels of government and civil society. The 327 Programme (and its successor, the 5 Million Ha Programme) attempted to achieve these policy goals by establishing contracts with farmers to plant trees on degraded lands and to protect the forests. The benefit sharing arrangements are complex, and success has been limited, not least because the farmers feel that they are simply working for the government rather than investing in their own future.

Agricultural land has largely been allocated, and action is in hand to allocate large areas of forest land (particularly the bare and degraded parts). The hope is that private households, social organisations and other economic groups will be encouraged to play a greater role in rehabilitating the land to improve its productive and protective functions if they have a legal stake in the land and its products. A major stumbling block in this endeavour has been a failure to develop rapid, cheap and robust techniques to carry out participatory land use planning and land allocation. Another significant challenge is the need to change the culture of forestry agencies from one that emphasised control over forestland to one that emphasises facilitation and partnership with local communities.

1. Introduction

During the decade of the 1990s, Viet Nam has been reviewing its approach to the management of its natural resources. The agriculture sector has undergone massive reform, which has led to significant increases in productivity, particularly in the lowlands. The forestry sector has also come under scrutiny, and, while some reforms have been undertaken, fundamental changes have yet to take place. In the past the forestry sector has provided major income to the government from the sale of timber, and forest land has been used to absorb population from the heavily populated deltas to and from the northern mountain areas to Tay Nguyen (Do Dinh Sam, 1998). The overall results of these various pressures have been substantial reductions in the area of forest and severe degradation of the forests that have remained.

The Government has become aware of the problems with the country's forests and is keen to redress them by embarking on ambitious forest rehabilitation programmes. This report provides an overview of forest conditions and trends in the country, reviews the way in which forestland policy has evolved, documents some of the relevant experiences with rehabilitation, and identifies some of the key issues that need to be addressed in the future.

2. Terminological confusion: restoration, rehabilitation or reclamation

While some degraded ecosystems are able to recover naturally, many are not, because of some limitations. Even at sites where natural recovery is taking place, the process may be slow. This increases the chance of further disturbances re-occurring and degrading the site once more. Human intervention may be needed to either initiate the recovery process or to accelerate the rate at which it proceeds.

A variety of approaches might be used. These range from those where the objective is to restore the original ecosystem and recover the former biodiversity through to those where the aim is to simply

use the site for some productive purpose such as agriculture or forestry. The different approaches have fostered a confused terminology. In this report a particular distinction is made between rehabilitation and restoration. *Restoration* is used only for those situations where the intent is to recreate an ecosystem as close as possible to that which originally existed at the site. *Rehabilitation*, on the other hand, is used where, for ecological or commercial reasons, it has been necessary to include exotic species in the new succession. This might be because only exotic species such as Acacia can tolerate the soils now present at the degraded site and are necessary as nurse species to facilitate the entry of the original native species. Or it may be that commercial imperatives demand certain agricultural or timber species be included to justify the rehabilitation effort.

The term *reclamation* is used for those situations where no native species are used at all. In such cases there may be no direct benefits to regional biodiversity but there may be major social advantages or benefits such as improved watershed protection. The approaches differ in the extent to which they enable the original biodiversity to be regained. The approaches are similar, however, in that they all seek to establish a prescribed and stable new land use (excerpt from Lamb, 1999).

3. Forests in Viet Nam

3.1. General

Over 60% of Viet Nam's land area, some 19 million ha, is classified as forest land, and most of this is in the upland and mountainous areas located in the west and north of the country. According to official figures, forestry accounts for about 2% of the country's GDP. However, this figure grossly understates the importance of forestry and forest land in the rural economy, because most of the benefits that accrue from the use of forest land do not appear in the formal national accounts. Forest



lands meet much of the energy needs of the rural population, with some 15 million cubic meters of fuel wood harvested every year (MOF, 1995a). The forests, particularly natural forests, provide a wide range of non-wood products, ranging from bamboo to medicinal plants. About 24 million people live in or around forests and derive a substantial part of their food and income from the forest and forest land.

In the past, about one million cubic meters of commercial timber was extracted annually, but this has been reduced to 0.5 million cubic meters per annum since 1993. Most of this timber is used domestically for construction, furniture and mine props. The export of sawn and round wood was banned in 1992, although before that time there were significant timber exports, especially of higher value species. Forestry was an important source of foreign exchange and fiscal revenue for the Government. Commercial exploitation of the forest has also been associated with the building of roads and the provision of basic social services in remote areas.

In recent decades, forest lands have also acted as a safety valve for the heavily populated delta regions by providing new lands for agriculture and human settlement. During the past three decades about three million people from the delta areas have settled in the uplands.

In the past, most forests with commercial potential were allocated to state forest enterprises (SFEs), which were responsible for forest management and logging. The SFEs focused mainly on commercial timber production, paying little attention to long term sustainable management and regeneration. Ethnic minorities living in the forest areas as well as migrant farmers from the delta areas also contributed to deforestation. Out of a total of eight million minority people in Viet Nam, some three million live in forest areas and mostly practice shifting cultivation. This system was sustainable under low population densities when cultivated lands could be left fallow for 30-40 years to regenerate naturally. However, it is not sustainable in the present context where populations in the forest areas have increased rapidly due to natural growth and migration from the deltas. In some areas, fallow periods have shortened to less than 10 years. Migrant farmers from the delta areas are accustomed to farming flat lands suitable for paddy production. Due to the shortage of suitable flat land in the mountainous areas, paddy lands average less than 0.1 ha per person and this is not enough to provide sufficient food and cash for household needs. The migrant farmers resort to clearing and cultivating sloping lands around their paddy lands. However, being paddy farmers from the delta areas, they have little knowledge about upland agriculture. Crops grown and techniques used are often unsuitable and contribute to rapid soil degradation.

Because of the wide range of climatic and topographic conditions, Viet Nam has a very diverse forest flora. The main forest types are shown in Table 1.





Table 1. Classification of natural forests in Viet Nam

Forest type	Area (ha)
Closed broad-leaved tropical evergreen and semi-deciduous	5,648,600
Closed broad-leaved deciduous lowland and sub-alpine tropical	935,000
Closed tropical conifer, conifer and conifer-broad leaf mixture	155,100
Closed tropical bamboo and bamboo-broad leaf mixture	1,464,800
Mangrove	34,700
Melaleuca on sulphate soils	13,600
Total natural forest	8,251,800
Plantation	1,050,000
Total forest cover	9,301,800

Source: FIPI (1995); MARD (1997)

3.2. Status of forests

Deforestation has been widespread for several decades, and remains a serious problem. According to calculations based on satellite imagery, about 50% of the forest cover was lost during the 40 year period from 1943 to 1983 (Table 2).

It is clear that total forest area has declined rapidly. The Northwest and Northeast regions have experienced particularly severe forest loss. In these mountain areas the forest cover is only 13.5% and 16.8% respectively. Within these regions, some provinces have lost most of their forest cover. Son La has only 9.8% of its land under forest cover and Cao Bang has 11.2% (MOF, 1995a). At the present time deforestation is also proceeding at an alarming rate in the Central Highlands. In 1995, the total area of forest land was estimated to be 19.08 million ha (MARD, 1996c). Of this, only 8.25 million ha, or about 25% of the country's area, was covered by natural forest and 1.05 million ha by plantations. The remaining 9.78 million ha was bare land. Natural forests are mainly concentrated in the highlands (Tay Nguyen), in Central and South - Eastern Viet Nam.

Table 2. Loss of forest cover in Viet Nam (areas unit: 1,000 ha)

Region	Year	Total land area	Forest area	% forest cover
North	1943	11,575	5,500	47.6
	1975	11,000	2,200	1,862
	1983	11,575	1,862	16.1
Central	1943	14,760	6,000	40.6
	1975	15,860	6,215	39.2
	1983	15,232	5,244	34.4
South	1943	6,040	2,000	30.9
	1975	6,335	1,085	17.9
2	1983	6,470	704	11.1
Total	1943	32,840	14,325	43.7
	1975	32,900	9,500	29.1
	1983	32,169	7,815	23.6

Source: MOF (1995a); Landsat and Russian satellite imagery for 1975 and 1983.

Forest land in Viet Nam is divided into three categories for administrative purposes: production forests, protection forests, and special use forests. Production forests are earmarked for exploitation in compliance with approved management plans. Protection forests are designated to protect land and water resources in critical areas and their exploitation is more or less severely restricted. Special use forests are mostly nature reserves and national parks, kept for bio-diversity

and conservation, but they also include sites of cultural, historic and scenic importance. However, in each of these categories, tree cover occurs on only part of the forestland (Table 3).

Table 3. Forest cover on different administrative categories of forestland (1995)

(Unit: million hectares)

Forest class	With forest cover	Without forest cover	Total
Special use forest	0.7	0.2	0.9
Protection forest	2.4	3.3	5.7
Production forest	6.2	6.2	12.4
Total	9.3	9.7	19.0

The areas not covered by forest are generally referred to as "bare" but they are mostly shrub or grass covered. A recent attempt at further classification of these "bare" areas gave the following results:

Land covered with shrubs	3.5 million ha
Land covered with good grass	3.5 million ha
Land covered with poor grass	2.5 million ha
Rock	0.2 million ha
Total	9.7 million ha

A forest inventory carried out in 1993 (MOF, 1995b) estimated that treeless land covered about 11.4 million ha, and Table 4 shows its distribution throughout the country. It is evident that the Northwest is the most severely affected, although all regions have large areas of treeless land. It should be noted that these figures differ from those for "bare" land given above, no doubt due the use of different criteria for "bare" and treeless.

Table 4. Area of treeless land by region

Region	Area of treeless land (million ha)	% of total treeless land
Northwest	2.58	22.6
Northeast	1.78	15.6
North central	1.57	13.8
Red River Delta	0.09	0.8
North central coast	1.73	15.2
South central coast	1.63	14.3
Central Highlands	1.35	11.8
Southeast	0.35	3.1
Mekong Delta	0.32	2.8
Total	11.4	100

Loss of natural forest cover during the period 1976 to 1990 averaged about 190,000 ha per year across the whole country, but the indications for the current decade are that this rate could be declining (Table 5) (MOF, 1995b). This figure has been significantly reduced during the recent years (Nguyen Van Dang, 1998; Nguyen Cong Tan, 1999).

Table 5. Changes in forest cover between 1976 and 1995 (ha)

Forest cover	1976	1980	1985	1990	1995
Natural	11,076,700	10,186,000	9,308,300	8,430,700	8,252,500
Plantation	92,600	422,300	583,600	744,900	1,049,700
Total	11,169,300	10,608,000	9,891,900	9,175,600	9,302,200

Source: FIPI (1995)

While virtually all forest types have experienced significant decline in area, some of the less well-represented types have suffered particularly severe losses. For example, the Melaleuca forests on acid sulphate soils have lost 72% of their 1976 area (Table 6).

Table 6. Changes in forest cover of main forest types from 1976-1995 (Unit: 1,000 ha)

Type of forest	Year			Increase/decrease		
	1976	1990	1995	1976-90	1991-95	1976-95
Natural forests	11,108	8,431	8,252	-2,677	-178	-2,855
Evergreen broad-leaf and semi- deciduous forests	8,331	5,759	5,649	-2,573	-111	-2,682
Deciduous forests	796	847	935	+51	+88	+14
Conifer forests	181	135	155	-46	+20	-26
Mangrove forests	91	73	35	-18	-39	-57
Melaleuca on sulphate soils	48	34	14	-14	-20	-34
Bamboo forests	1,174	1.048	846	-126	-202	-328
Mixed woody & bamboo forests	429	499	619	+70	+120	+190
Orchard forests	27	35	1	+8	-34	-26
Planted forests	93	745	1,050	+652	+305	+957

Source: FIPI (1995); (-): decrease, (+): increase

4. Causes of forest loss and degradation

The government recognises that the economic, social and environmental costs of continued over-exploitation of the nation's forests are too high to bear. It is therefore seeking ways to halt this loss of resources and to manage its forests in a sustainable manner. In order to halt deforestation and ensure successful rehabilitation efforts, it is first necessary to understand what causes deforestation. Forests are seldom destroyed or degraded through accident or malice (although in Viet Nam's case, large areas of forest were destroyed by chemical spraying and napalm bombing during the war). Most analyses usually concentrate on immediate causes such as clearing trees to create farmland, rather than the underlying reasons behind such actions. It is useful to identify both the underlying and immediate causes leading to forest loss and degradation.



4.1. Underlying causes

The underlying causes of deforestation and forest degradation in Viet Namare:

- Rural poverty. Rural per capita incomes in some parts of Viet Nam are below US\$100/year.
 Factors related to rural poverty, leading to unsustainable use of forest products, include chronic fuel wood shortages, poor standards of nutrition and health, and high underemployment and unemployment. Poor people are forced to use forest resources to obtain both subsistence and market goods.
- Insufficient arable land. The overall population density in Viet Nam is 200 persons/km², with 500 persons/km² on arable land and more than 1,000 person/km² in the Red River Delta. Rural fertility rates remain relatively high, and the population could double from 70 million to 140 million within the next 35-40 years. The Government acknowledges that 24 million people live on forest lands. As a consequence of these population pressures, the amount of cultivated land available per person is only 0.10 ha in these areas.
- Limited and inappropriate institutional capacity. The capacity of the Ministry of Agriculture and Rural Development and provincial and district forest services to manage and protect public forests is limited. Legal, policy, and regulatory frameworks are complex, and most institutional structures are heavily top-down. Low numbers of trained field personnel and scarce funds and other resources are all serious constraints on improving forestland management.
- Land tenure. The absence of an appropriate system of land use planning and land allocation in forest areas has constrained the ability of local populations to exercise authority and responsibility for managing forest land. In many cases, forests are treated as open access resources (particularly by immigrant groups), and consequently they suffer degradation. There is also a lack of dialogue between government officials and ethnic minorities about "local" perceptions of land tenure.

4.2. Immediate causes

Largely as a result of the underlying causes discussed above, there are a number of immediate causes of forest loss and degradation.



- Population expansion in forest areas. Migration of people from the lowlands to the hills
 and the consequent massive expansion of agriculture has been a major direct cause of
 forest loss. Expansion of agriculture into forest areas has both direct and indirect
 environmental impacts. Its direct environmental impacts include erosion, loss of topsoil,
 watershed degradation, and loss of both plant and animal species. The indirect effects
 include the sedimentation of rivers, lakes, dams and harbours as well as the loss of carbon
 sequestration capabilities of the forest.
- Fuel wood collection. This activity primarily causes forest degradation rather than deforestation. It has been estimated that more than 90% of domestic energy consumption is derived from bio-mass (fuel wood, tree and agriculture residues) and charcoal, with 75% coming from wood-based sources. Some 21 million tons of fuel wood are consumed annually. Pig feed preparation is a very energy intensive operation with an estimated 350 kg of fuel wood equivalent being required for each pig. This results in a total amount of over four million tons of wood equivalent being required each year. The heavy demand for fuel wood not only degrades the forest but also often limits regeneration because regenerating vegetation is a prime target of fuel wood gatherers. If converted to area equivalents, fuel wood harvesting would account for six times as such forest harvesting as commercial logging (World Bank, 1995).
- Logging and harvesting of wood and non-wood forest products. Logging alone does not normally result in forest loss, particularly if it is followed by sound silvicultural practices. However, the cutting cycle in Viet Nam has generally been so short that major degradation has occurred. In addition, logging often opens the way for migrants to move into the forest and commence farming. A further complication is that employees of SFEs are often allowed to farm areas of productive land in the forest in order to supplement their livelihood. This practice has often been a precursor to steady encroachment into the forest and further conversion of forest to agriculture. Logging both by government timber units and also illegal cutting by various unofficial units, has (directly and indirectly) resulted in the loss of large areas of forest. From 1986 to 1991, SFEs officially harvested approximately 3.5 million m3 of wood annually (to which an additional 30% to 50% can be added for illegal logging). Conversion to area equivalents indicates that legal logging accounted for the loss of perhaps 80,000 ha of forest in 1991 (MOF, 1991). Besides, some 100,000 tonnes of bamboo is exploited annually for paper production. Officially, logging occurs in natural production forests, but unofficially it has also taken place in most forests including protected and special use forests. It has been recorded that between June 1997 and December 1998, forest protection guards caught and punished 77,025 cases of Forest Law trespass (Hanoi Newspaper, 25/12/1998). During three years (1997-1999), Forest protection departments and railway officials caught 858 illegal transport cases of forest products and confiscated: 1,435 m³ of timber of all kind, 1,998 chopping-board of Burretiodendron hsienmu, 5,870 kg of pine resin, and 4,912 kg of wild animals (Nhan Dan Newspaper, 30/8/1999). Other important non-timber products extracted from forests include honey, wildlife for food (especially snakes, geckos and turtles), and medicinal plants. About 2,300 plant species are harvested including fruits, flowers, bark, roots, stems and resins which are used for food, medicine, construction, textile production and water-proofing. An increasing volume of these products is now bartered and traded to neighbouring countries, especially China and Thailand (General Statistical Office, 1996). As with logging, sustainable harvesting of these products will not necessarily lead to degradation. However, in most cases the forests are treated as open access resources, and there are no official or local controls on harvesting.

- Fires. Forest fire causes forest degradation in many parts of the country. Some five million ha of forest land are recognised as being fire prone year round. Of the remaining nine million ha of forest, 56% is fire prone in the dry season. Between 20,000 and 30,000 ha of forest are burned each year, with up to 100,000 ha being burned in certain years (GoV, 1994). The greatest fire threat is the lower-montane evergreen forest of the Central Highlands and the Mekong Delta because of the distinct dry season. In the Central Highlands where the natural cover is dry dipterocarp forest, annual fires gradually degrade the quality of the forest by repeatedly eliminating the recruitment layer of saplings and occasionally removing large trees. During the dry season of 1997-1998, due to complicated weather patterns, there were 1,681 forest fires in the whole country causing a loss of 19,819 ha. Of this area, 6,293 ha were natural forest, 7,888 ha were plantation forests, 494 ha were bamboo forests, and 5,123 ha were grass and shrubs (New Hanoi Newspaper, 25/12/1998).
- Other Causes. Other causes of forest degradation have been related to infrastructure development such as the construction of dams and high voltage power lines. Construction of dams results in flooding of large areas of forests. It has been estimated that as much as 30,000 ha of forest are lost per year with the creation of reservoirs (World Bank, 1995). The construction of a 500 KW power line to carry electricity from Hoa Binh to South Viet Nam between 1992 and 1994 has resulted in a swathe of forest being lost. Destruction of forest cover was an important tactic during the second Indochina war of 1961 to 1975. Bombs, herbicides, and heavy machinery were responsible for major forest loss and other environmental damage. The major impacts were in upland and mangrove forests, as well as agricultural land. It has been estimated that some 13 million tons of ordinances were used during the war. Large areas of southern Viet Nam were affected by spraying 72 million litres of herbicide on forests. In total, about 4.5 million ha of forest were directly destroyed as a result of these operations (World Bank, 1995).

4.3. Summary of causes of forest loss

A recent attempt has been made by Ministry of Science, Technology and Environment (MOSTE) to analyse the causes of forest loss in different parts of the country. The results of this analysis are shown in Table 7.

Table 7. Causes of forest loss by zone in Viet Nam (%)

Zone	Over Exploitation	Shifting cultivation	Exploitation for agriculture	Free Migration	War	Exploitation for other purposes
Northern delta	12		17	41	9	21
North east	27	29	11	7	8	18
Central north	29	27	16	9	5	23
North west	11	36	12	11	3	27
North central	34	21	14	6	14	11
Central coast	28	17	11	9	29	6
Central Highlands	31	24	21	5	17	2
South east	29	15	13	9	24	10
Mekong delta	19	4	19	21	31	6

Source: MOSTE (1998)

Underlying causes of deforestation, such as rural poverty, are often confused with immediate causes, such as agricultural encroachment. Because immediate causes are often easier to address, reforestation efforts in Viet Nam have tended to focus on mitigating immediate causes and their direct effects, rather than seriously tackling the underlying, root causes. Viet Nam's forest policy, the framework for addressing the problem of deforestation, has been formed against a backdrop of profound changes affecting all areas of society during the past ten years. Since 1987, the Government has been implementing economic reform policies under the name of "doi moi", aimed at moving the country from a centrally planned to a market oriented economy. The old approach of setting detailed physical targets has largely been replaced by formulating development objectives which respond to market demands. So far, these policies have:

- Removed most price controls;
- Reduced trade restrictions;
- Moved exchange rates closer to market levels;
- Encouraged private and foreign investment; and
- · Abolished most subsidies to state enterprises.

At the microeconomic level, the reforms have:

- Recognised the legal status and rights of family economy;
- · Recognised the private sector;
- Enabled individual farmers to make production and marketing decisions; and
- Lifted prices for industrial and agricultural commodities closer to market levels.

These policies have had wide reaching impacts, including on forest policy formation.



5. Patterns of land use, land ownership and land allocation

All forest lands belong to the state, but the government has the right to allocate some of these lands to households and other entities for management purposes under long term lease agreements. Forest land which is not allocated is managed by local authorities. Between 1986 and 1992 some 5.23 million ha of forest land, including 1.75 million ha with forest cover, were allocated to various enterprises, co-operatives and households. Some 800,000 households have benefited from the programme and have received over one million ha of land (Nguyen Quang Ha, 1993; MOF, 1995b).

Up to the present time, 7.7 million ha of forest land, amounting to 43.8% of the total forest land, has been allocated to various groups (Nguyen Xuan Phuong, pers.com.) including:

- State forest organisations: 5.1 million ha (74.6% of total allocated land);
- Households: 1.4 million ha (17.5%); and
- Other users: 600,000 ha.

Unallocated land is under the management of the local administration and Forest Protection Units. Legal backing for the land allocation process is provided by the Law on Protection and Development of Forests (August 1991) and the Land Law (July 1993) which was amended in 1999.

In January 1994, the Prime Minister signed the Government Decree 02/CP concerning allocation of forest land to organisations, households and individuals for long term forestry purposes. The decree states that special use forests will not be allocated to households but will be managed by Management Boards set up by a special order of the Prime Minister. However, these Boards may enter into contracts with farmers living in the area to undertake protection or reforestation activities (Article 8).

Similarly, in the case of protection of watershed forests, Management Boards are set up to manage these forests according to approved plans. Areas which are classified as protection forest but are unforested may be allocated under long term leases to organisations, households and individuals and may be used for economic activities if they are in low priority watersheds, provide windbreaks and shelter belts in sandy areas, or protected sea or river dikes where soil has already been stabilised. Small areas of protection forest within one commune or village, which have not been allocated to any organisation or individual, may be managed by the commune in line with guidelines issued by the local forestry authorities (Article 7).

In the case of production forests, the state is leases all lands to organisations, households or individuals living in the area, subject to management in line with state plans. The state encourages reforestation and assists with organising production, processing, marketing and the provision of infrastructure (Article 9).

All leases for forestry land are for periods of 50 years but can be renewed and revoked if farmers do not adequately look after their land as required by the Land Law. In the case of state organisations, the lease period is decided by the state (Article 6). Two different types of land allocation are envisaged in the Decree:

- Land Tenure Certificates: Degraded lands and bare hills will be allocated under long term
 tenure certificates (50 year lease) which include a cadastral map or sketch, with the
 allocated area demarcated on the ground and on the map. The certificate gives the right to
 long term use as well as the right to access support services provided by the state.
- Management Contracts: In the case of watershed forests, special use forests or land which already has natural or planted forest, households or individuals can enter into

contracts with the appropriate state management unit for the protection and management of these areas. These contracts are to be registered with the local people's committees. According to these contracts, a fee for management and protection of forest will be paid to the forest owners for a period not exceeding 5 years.

Forests are the State's property and only after a planning process has been done will they be allocated to forest owners. There are two main types of forest land allocation taking place: existing forests maybe allocated to households or other economic entities for protection on payment of a fee; degraded lands maybe allocated for planting purposes, often with financial support provided under the 327 Programme (more detail of the 327 Programme is given in a later section). The process of forest land allocation to private households, which is a key aspect of the government strategy, has moved relatively slowly with only about one million ha distributed to households so far. Moreover, the land allocation process has failed to bring about a genuine sense of ownership among local households and communities. As a result the increase in investment and inputs that accompanied the allocation of agricultural lands has not been seen in forest land. There are two major reasons for this: limited government capacity to carry out the allocation process effectively, and the restrictive terms and conditions associated with the allocation process.

The Government has a very limited capacity to carry out the land allocation process in line with the requirements of Decree 02/CP. The Provincial General Departments of Land Administration have the responsibility for carrying out land surveying and for issuing land certification of agricultural land. In most provinces they are expected to continue work on the survey and certification of agricultural land for several more years. Only after work on agricultural land allocation is complete they plan to start work on forest lands. In the interim, allocation of forest lands is taking place either through preliminary land registration certificates (*So lam ba*) formally issued by district authorities but with most of the actual allocation work done by the Forest Protection Departments, or through management contracts between farmers and SFEs. The temporary certificates and management contracts have not created a genuine sense of ownership among households. In the past, many forest lands have not had any real owner and farmers have treated them as open access resources. They have felt free to cut down trees to meet their fuel wood needs or to clear land for cultivation. The temporary certificates/contracts do not overcome farmers' traditional view of forestlands as either open access resources or as belonging to SFEs.

The problems are compounded by the terms and conditions of land allocation which give detailed prescriptions about what species to plant and the spacing to be used. Farmers are generally expected not to cut trees in the protection forest areas and even in production forest areas there are severe restrictions on harvesting. Financial incentives are provided, but are not high enough to compel farmers to commit themselves to effective plantation establishment and management on behalf of the government. In the case of land allocated for protection of natural forests (which are often degraded), farmers are often unwilling at present rates of payment (about VND 50,000 per ha per year) to take responsibility for lands far from their villages. In the case of plantation areas, farmers are paid VND 1.5 million per ha for initial planting in the first year, VND 0.5 million for gap filling in the second year and VND 50,000 per year thereafter for protection. Amounts paid for initial planting and gap filling cover only about half of the actual costs. The current low investment rate into protection forest is not enough to plant good forest with high quality. For other forest types such as production forest, there are specific rates.

Land allocation has not been equitable. Bigger faming operations have obtained large tracts of land near villages for protection or planting, while there is little interest in taking lands located far from the village. This is especially true for small operations that have limited labour and risk bearing

capacity. There have been a number of attempts to make land allocation more participatory by reducing the role of the Forestry Protection Department and increasing the role of villages and districts. These efforts have been judged to be reasonably successful and have been accepted by the Government as a model for future land allocation.

The issue most relevant to policy at the present time relates to the process of land allocation and the restrictions imposed by the current system of land classification and land use. There is a need to ensure that degraded lands allocated to farmers receive the investment and inputs necessary to yield high returns. At the same time, existing forests need to be protected and unsustainable logging stopped.

6. Evolution of forest policy

Forest rehabilitation policies and activities need to be understood in the context of the role of forestry and agriculture in the country's overall socio-economic development.

1954 to 1965

Along with the establishment of agricultural co-operatives, most forests were nationalised and put under the management of co-operatives and state units. Co-operative management for forest production concentrated on forest logging to sell wood and create land for cropping. Until 1961 the Department of Forestry of the Ministry of Agriculture was responsible for forest production. This mandate had to be carried out in a diversified manner. The improvement of forest production included the strengthening of the production organisation and its management, as well as the expansion of the number of and area covered by state lumber yards (later to be called State or Regional Forest Enterprises) (MOF, 1991; Nguyen Ngoc Lung, 1998a).

The function of forest policy was to "serve as a basis for the development of agriculture" and this was the rationale for combining agricultural production with forest production. The activities in the forestry sector were, among other things, to "suitably" guide the cultivation on burnt-out clearings (swidden agriculture) in order to stop "deforestation." It was perceived that swidden agriculture could be replaced by other modes of production, in particular by state and co-operative forest production. The administrative organisation responsible for the realisation of these aims and objectives was the General Department of Forestry which fell under the authority of the Government Council (MOF, 1991).

1965 to 1976

The administrative framework in the period 1965-1976 was characterised by a centrally planned system in the Democratic Republic of Viet Nam and an intensified war effort in southern region. The agricultural policy emphasised the cooperativisation of production in the uplands. Agricultural production was to be intensified, and both food and "industrial" crop production were to be increased with an emphasis on irrigated rice production.

Forestry policy concentrated, as in the previous period, on increasing production, and was oriented towards serving agricultural (watershed protection) and industrial production while increasing the production of timber and non-timber forest products.

Timber exploitation was restricted, however, by a lack of infrastructure and labour. Inadequate storage facilities for harvested logs resulted in large losses due to fungus and insects. In 1968 local authorities were given more authority over the management of forests (MOF, 1991), and the General Department of Forestry became more of an advisory body. Major wood industries were transferred to the General Department of Forestry at that time. A parallel organisation of "People's

Forestry Protection Units" was at the on provincial and district levels (MOF, 1991).

Forestry activities were carried out in the state sector and under the authority of people's committees at the local level. The national supervision over forestry production was strengthened by means of institution building, as well as the promulgation of the first law on forestry in 1975 (Act on Forest Protection 1975). This Act included forest management regulations regarding exploitation (including swidden agriculture), replanting and protection against diseases and forest fire. The strengthening of forest management was intended to play an important role in upland development (Nguyen Khac Vien, 1975). The General Department of Forestry was upgraded and became the Ministry of Forestry in 1976 (MOF, 1991).

1976 to 1986

After the end of the second Indochina War in 1975, policy and administration was based on the concept of "collective mastery". The administrative autonomy of Autonomous Zones was cancelled. Agricultural policy stressed the development of large scale production units as well as the development of surplus production of cash crops. Attempts were made to stimulate production in both the collective and state sectors. New approaches were tried, such as the allocation of land for agricultural and forestry "stabilised" production and agro-forestry.

In 1976, the Ministry of Forestry was established and directed forestry production in this period. The goal of forest policy was to increase production and support national defence. The greatest part of forestry production was under state control, and this resulted in over exploitation, because production quotas was set based on state needs rather than the productive capacity of the forests (MOF, 1991). The goal of achieving surplus production of cash crops was predominant during the first decade of the Socialist Republic and also in the forestry sector. However, by the mid-1980s Ministry of Forestry officials were changing their position. The natural environment had degraded to such an extent that it was officially observed that "growing of industrial crops in monoculture and rotational extensive cropping systems did not protect the forest vegetation" (MOF, 1985). Subsequently, forest management emphasised more protective activities. Since most designated forest land was situated in mountain regions where most of the ethnic minorities lived, forest policy planners also began to consider policies for ethnic minorities. In particular, solidarity between the ethnic groups was addressed in the forestry policy guideline No. 29-CT/TU/1984: on strengthening forest and land allocation, forest construction and the organisation of agro-forestry (MOF, 1984).

1986 to 1990

In 1989, the Government initiated a process to move from a centrally planned to a market driven economy—the policy commonly known as "doi moi." The main components of this policy are: a transition to a market economy; a reduction in the role of the government (particularly in production and trade); decentralisation of planning and decision making to provinces and districts; and a stable macro-economic environment. As a part of this process a number of key actions have been taken, including the liberalisation of prices and markets, unification of exchange rates and a devaluation of the currency, and control of fiscal imbalances. The results of the reform process have been good with the economy growing at around 8% per annum, reduced inflation, increased exports and imports, greater foreign investment, reform of public institutions and macro-economic stability.

The process of structural transformation has been extended to agriculture. The government has decollectivised agriculture and allocated most agricultural lands to the farmers with leases of 20-50 years. The co-operative system was reformed to become more of a service function. At the same time marketing has been liberalised. These steps have resulted in a rapid increase in agricultural production. In particular, rice production has risen rapidly and Viet Nam is now a major rice exporting country.

In this period the objectives of forest policy included, among other things, an expansion of forest plantations by SFEs, organisations and households (SPC/UNDP, 1990). The strategy towards the year 2000 outlined a continuation of several programmes. The main ones concerned reforestation and exploitation or what was often called "rational utilisation" of forest resources. The expansion of the processing industry was closely related to the programme concerning the promotion of forest product exports. The programme concerning the protection of forests in the upland region addressed mainly watershed management (MOF, 1991). This programme was a follow-up to the 1975 Forestry Act and was further elaborated by the 1986 regulations concerning forest protection (Circular No. 1171/QD 1987 see Section 12: Appendix). Another major forestry programme concerned training and education which was linked to the national forest research and extension programme (MOF, 1991).

Some officials maintained their position regarding centrally planned production (MOF, 1987). However, the changes in economic management following the Sixth Party Congress in 1986 stimulated further reorganisations in forestry production which had been the subject of discussion in the forestry branch during the 1980s (Bui Vu Minh *et al.*, 1986). Major changes occurred in the management of SFEs. The state sector was given more financial self-reliance, which meant that subsidies were cut. In general, attention shifted from forestry production by state and collective units to plantations carried out by Forestry Enterprise workers' households and other households under contract to the Forestry Enterprise.

In 1991, a functionary of the Ministry of Forestry called the new orientation "social forestry." Social forestry development in the administrative framework of that time meant the stimulation of forest production by means of land allocation to other branches, ministries (since 1983) and to cooperatives, schools, the military, and households (since 1986) (Pham Dinh Huan, 1991). Officially, it was perceived that implementation was hampered by "technical restrictions" (To Dinh Mai, 1987).

Agro-forestry was one of the most promoted cultivation models in this period (Nguyen Ngoc Binh, 1985; MOF, 1987; Fingleton, 1990). It was officially recognised that forests provided indispensable material for the daily life of the local people but forest resources also are an important source for the "development of socialism," to "serve the nation" and the national economy (Le Hong Tam and Nguyen Quoc Hung, 1991; To Dinh Mai 1991).

1991 to the present

In line with the overall reform programme, the Government has also been taking steps to restructure and transform the forestry sector. The National Forestry Action Plan was formulated in close collaboration with the international donor community. The process started in 1989 when Viet Nam applied for participation in the FAO sponsored Tropical Forestry Action Plan. The first step in this process was to undertake a forest sector review that was completed in 1991, in the form of a National Forestry Action Plan (NFAP). The review process was important in that it brought together Vietnamese and international experts, provided a series of reports about the state of forestry in Viet Nam, and put in place the guiding principles for forestry development. These principles included: decentralisation and public participation; restructuring of institutions dealing with forestry to make them supportive of local activities; environmental protection; and increasing output and incomes of people living in forest areas. The action plan also provided a list of projects for which finance was required.

The NFAP was complemented by a series of laws and decrees (passed by the National Assembly or the Government), directives (issued by the Prime Minister), and regulations, guidelines or circulars (issued by the concerned Ministries). Provinces sometimes also issue specific guidelines

to implement directives, regulations and guidelines from the central government, which aim to put in place a development programme for the forestry sector.

The decade of the 1990s has been significant for the recognition that has occurred of the degraded nature of the forests and of policy and practical attempts to address this. Along with the government emphasis on decentralisation, this is creating a significant shift in the power relations regarding forests.

From 1991 to the present time, a system of laws, policies and legal frameworks has been issued for forest development and forest protection as well as forest land allocation for sustainable forest management (Nguyen Ngoc Lung, 1998a; Pham Hoai Duc, 1998). For example, there is the law on forest protection and development (1991); Land law (1993); Decision No. 327/CT (1992) and others (see section 12: Appendix).

The 327 programme (which started in 1992) was the first large scale attempt to involve households and other organisations directly in forest establishment activities in terms of sharing in the costs and benefits. Most of the efforts were focused on conventional plantation establishment using exotic species (mainly eucalyptus and acacias) in order to increase the economic production from the land by "re-greening the barren hills." The Programme was not universally successful, and many of the funds were used to support inefficient state bureaucracies. However, valuable experiences were gained (MARD, 1998a; Nguyen Ngoc Lung, 1998b). The 327 Programme has now evolved into the 5 million ha Programme (Decision 661/ QD-TTg dated 29/7/1998 and Inter-circular No. 28/1999/TT-LT dated 3/2/1999) which is designed to establish five million ha of forest between 1998 and 2010. If successful, this will increase the forest cover in the country from the present 28% to 43%. The Programme has also targeted one million ha for rehabilitation by natural regeneration in order to protect the environment and maintain and develop biological diversity.

7. Vision for the future of forest lands

In the coming years it is envisaged that the forest cover will be stabilised and that forests will be distributed across the major administrative categories in the following manner (MOF, 1995a):

Special use forests: 3 million ha
Protection forests: 6 million ha
Production forests: 10 million ha

To achieve this general goal, the forestry sector has determined the short-term objectives as follows:

- Strictly protect 9.3 million ha of existing forests and completely halt deforestation.
- Rehabilitate 5 million ha of open lands through reforestation and natural regeneration of bare lands and denuded hills. A nation wide endeavour will be made to increase forest coverage to 43% by the year 2010.
- Properly utilise forest resources with the application of advanced logging and wood processing technology aimed at upgrading the woody biomass usage and value of forest products and satisfying domestic and export demands.
- Provide employment so that income generated from forestry can ensure livelihood for 1 million households with some 6 million people in the midlands and highlands.

To fulfil these short-term objectives, the Government plans to speed up forest land allocation (both

forested lands and open lands) to collectives, individuals and farmer households following the Land Law, the Law on Protection and Development of Forests and the Government's Circulation 64/CP (1993) and Decree 02/CP (1994).

To encourage forest land use to proceed after allocation, the Prime Minister's Decision 202/TTg (1994) has stipulated that state forest holders can make use of the state budget to conclude output contracts with farmers for forest maintenance and plantation establishment.

8. Major development programmes affecting forest rehabilitation

There have been three major development programmes that directly relate to forest rehabilitation activities. These are the 327 Programme for the re-greening of bare lands; its follow-on, the 5 Million Ha Programme, and the Fixed Cultivation and Sedentarisation Programme.

8.1. 327 Programme

The major programme for supporting forestry development was established under Decision 327/CT of the Council of Ministers issued in September 1992 concerning "policies on the use of bare land, denuded hills, forests, alluvial flats and water bodies." The original objectives of the programme were to encourage replanting, to protect forests, to improve utilisation of land and raise living standards, and to support the sedentarisation programme.

Under the 327 Programme, funds were provided for a series of projects to be formulated by provincial governments. These projects were to cover 5-10,000 ha corresponding to the area covered by a commune or village. The projects supported activities related to tree planting on bare lands, coastal sands and in different kinds of forests (special-use, protection and production), and protection and enrichment (artificial or natural) of existing forests. In order to reduce poverty and promote fixed cultivation and sedentarisation, support was also provided for production of livestock, food and cash crops, and fish. Each household in the project area was provided with a defined area of land for reforestation, protection, enrichment and regeneration. Where possible, some land was also provided for grazing and production of food crops or cash crops (kitchen gardens). The land given to each household depended on overall land and funds available, and on the household labour availability and its economic conditions. Wherever possible the project was implemented by existing state farms or forest enterprises, including those of the army. About 60% of the funds provided could be used for infrastructure, scientific and technical facilities, public welfare, afforestation of protection and special use forest land, national seed stands and support for the first six months to people who moved to a new area for reclamation of land. The funds were in the form of a grant and did not have to be repaid. The remaining 40% of project funds were for households to implement productive activities and had to be repaid, without interest, when the project activities started yielding revenues. Funding for the Programme was provided from the state budget and from funds raised through the natural resources taxes, bank loans and international agencies.

In order to guide the implementation of the 327 Programme and forestry development in general, government agencies such as the State Planning Committee (SPC), MOF (and later MARD), the General Department of Land Management, the Ministry of Finance and the State Bank have issued various directives and circulars. These define the administrative and technical procedures for getting project approval, and the responsibilities of different agencies that are eligible for grants as opposed to loans. The total amount provided under the 327 Programme was initially small (about USD 11.7 million in 1993) but was substantially increased to USD 56.4 million for 1995.

In September 1995 a prime-ministerial directive (No. 556/TTg, dated 12 September 1995) refocused the activities of the 327 Programme. Programme support was henceforth limited to protection and special use forests through plantations and agro-forestry, mainly relying on farmers for implementation. Support for plantations of industrial crops, fruit trees, scattered trees around houses and fields, and resettlement was discontinued except where these were in protection and special use forests (Article 1). The Programme set a plantation establishment and maintenance target of 250,000 ha per annum between 1996 and 2010 (Article 2). Acceptable agro-forestry approaches in the protection and special use forests include using a 40:60 mixture of indigenous and other species (including industrial and fruit trees), or using strips of forest, grass, industrial or fruit trees and food crops. All indigenous trees will remain the property of the state, but the farmers can retain two-thirds of the products from the other trees planted, all the products inter-cropped under the forest canopy, and any flowers and fruit (Article 3). The bulk of the money (60%) provided under the new Programme (budgeted at about USD 43.6 million for 1996) was to be spent in the form of grants for contracting farmers to carry out protection, maintenance and regeneration, tending and new plantation establishment. A further 12% was to be spent to provide interest free loans for industrial and fruit tree plantations, kitchen gardens and livestock (Article 4).

The decision to focus the 327 Programme on protection areas and increase farmers' involvement were major changes. These limit Government spending to areas where there are likely to be off-site benefits and try and mobilise complementary farmer investment. The decision to strengthen the role of the district in planning and implementation also marks a break with the past when SFEs were the main channels for finance.

From 1993 to 1998 over VND 2,987 billions were invested under the 327/556 Programme on the following activities (MARD, 1998a):

- Assigning forest for household protection: 1.6 million ha, excluding the area of forest protected using local funds, applying the same approach as that used for the 327 Programme.
- Planting forest: 1,386,618 ha, of which new plantations accounted for 638,500 ha, and 748,118 ha of on-going natural regeneration.
- Planting industrial crops, fruit trees and home gardens: 119,939 ha including 19,744 ha of rubber; 7,558 ha of tea; 28, 186 ha of other industrial crops; 26,733 ha of fruit trees and 31,223 ha of home gardens.
- Conducting livestock husbandry: 53,025 head.
- Moving people to project area: 92,420 households (of which 76,830 households have been re-distributed).
- Upgrading infrastructure (road construction: 5,000 km, school and clinic building: 86,405 m², ploughing virgin soil: 24,900 ha).

8.2. Five Million Hectare Programme

A Prime Ministerial Decision of July 29, 1998 (Decision No. 661/QD-TTg) and a subsequent Inter-Ministerial Circular set out the policies, objectives and guidelines for an ambitious set of activities to follow-on from the 327 Programme. This has become known as the 5 Million Ha Programme, named for its major long-term objective of establishing 5 million ha of new forest by a variety of means between 1998 and 2010. There are three basic objectives of the Programme:

- To establish 5 million ha of new forest in order to increase the forest cover to 43% of the land area (thus contributing to environmental security, reducing natural disasters, increasing water production, and preserving the source of genes and biological diversity).
- To use areas of bare land to create jobs, contributing to the eradication of famine and alleviation of poverty, sedentarisation of farming, increasing the income of people in rural parts of the mountainous regions, particularly ethnic people, ensuring political and social stability, national defence and security, especially in the border regions.
- To supply wood for industrial purposes, firewood and other forest products for domestic consumption and the production of export goods, to make forestry an important contributor to socio-economic development in the mountain regions.

The guidelines for implementation of the Programme give a good indication of some of the specifics being planned. It is proposed to apportion the new forest in the following ways:

- Protection and special use forest (2 million ha):
 - > 1 million ha of natural regeneration with enrichment planting in suitable areas.
 - ➤ 1 million ha of new forest for protection purposes in critical regions (such as water catchment areas, coastal eroded areas or areas needing urgent ecological restoration). Efforts will be concentrated on northern mountainous areas of low forest cover and central regions that are flood prone.
- Production forest (3 million ha):
 - > 2 million ha of industrial forest plantation with major species consisting of acacia, bamboo, pines and eucalyptus, with some special purpose and high value species.
 - >1 million ha of commercial cash crops such as rubber, tea, coffee, medicinal plants and fruits.

A major guiding principle for the Programme is that it will be implemented through projects with the people's participation. It is stated that "Citizens are the main and driving force for the implementation of protection, regeneration and afforestation and they are also beneficiaries from forestry activities..." (Prime Ministerial Decision No. 661/QD-TTg, July 29, 1998).

Arrangements for funding the programme are similar to those that applied for the 327 Programme and "norms" have been set for paying for protection and reforestation activities. For example, up to 50,000 VND/ha/year is available for forest protection in Special Use and Protection Forests, with greater amounts available for the establishment of new forests, particularly in areas requiring ecological restoration.

Emphasis has also been made on the need to expedite the process of land allocation and the granting of land use certificates to "organisations, households and individuals." This work is targeted to be completed by the end of the year 2000 (Decree No. 24/1999/CT-TTg). It is the stated intention that these activities be carried out "...in public to ensure democracy at the grass roots level" (MARD, 1998b).

8.3. Fixed Cultivation and Sedentarisation Programme

Of the 24 million people living in or near forests (MOF, 1995a), some 3 million belong to minority ethnic groups for whom shifting cultivation is a way of life. The objective of the Programme, which has been in operation since 1968, is to reduce slash and burn agriculture and to increase incomes and living standards of minority people living in the mountainous areas. The main way to do this is to

provide the minority people with land for settled agriculture along with a range of infrastructure and support services. The Government instructions to guide the Programme include Resolution No. 22 of the Politburo issued in November 1989 and Resolution 72 of the Council of Ministers issued in March 1990. The Programme is represented in 200 districts of which 86 are "mountainous districts" and the rest are "upland districts."

In September 1993, the Government held a national seminar to review socio-economic development in the mountainous areas and revise Resolutions 22 and 72. New guidelines are contained in the Government directive No. 525/TTG dated November 1993 on "policies and methods for continuing economic and social development in mountainous areas." The directive recognises that food production alone cannot provide all development needs in the mountainous areas and that a key role has to be played by forests, cash crops, livestock, medicinal plants, agroprocessing and mining. A greater role has to be given to combining these activities with food production. Households which practice shifting cultivation, and periodically move their place of residence, are given land for production as well as plots of forest land.

At the national level, the Committee for Ethnic Minorities and Mountainous Areas (CEMMA), a ministerial level body formed in 1992, has overall responsibility to guide and co-ordinate the Programme. CEMMA also has offices in some provinces and districts, but the operational responsibility for formulating and implementing the Programme is vested in the local People's Committee.

The Programme has proceeded relatively well in some areas and, of the 3 million minority people practising slash and burn agriculture, some 800,000 have been settled by provisions of agricultural land. The Programme has, however, been more successful with some minorities than with others. In particular, some semi-nomadic people like the Ba Na tribes in the Ba River watershed have almost no tradition of settled agriculture and find it difficult to manage crops such as paddy. These people continue with slash and burn practices but are squeezed between dwindling forests and settlers from the delta areas, who are moving in to farm the land which has been cleared of forests. As a result their fallow periods are declining with serious implications for soil degradation.

9. Results of forest rehabilitation activities

9.1. Technical approaches

Viet Nam has over 40 years experience in carrying out forest rehabilitation. The major approaches that have been taken can be summarised as follows (taken from discussions with Nguyen Huu Dong, Pham Duc Lan, Nguyen Manh Cuong - FIPI; Do Dinh Sam, Tran Quang Viet-FSIV; Pham Hoai Duc-DFD; Tran Dinh Dan-FPD, Hoang Hoe-FA):

- Forest rehabilitation should concentrate on bare land, denuded hills or degraded land where forests previously existed.
- Forest rehabilitation should take place in poor forests after commercial exploitation or on land used for shifting cultivation by promoting natural regeneration.
- Rehabilitation of natural tropical forests should emphasise planting tree species which
 improve the land and also using natural regeneration. When the environment has been
 improved, valuable timber trees should be under planted.

There are two main approaches of forest rehabilitation (Nguyen Ngoc Lung 1998b): the first is natural regeneration, and the second is reafforestation. In between there two approaches is local vegetation treatment, whereby selected areas are also protected from exploitation so that they may

regenerate naturally and to assist the process they are also planted at a rate of 500 trees per ha. So the natural revegetation approach is divided into two methods: simple regeneration and impacted regeneration which happens when people want a faster regeneration process.

9.2. Physical achievements

Forest rehabilitation activities in Viet Nam started in 1955 and may be divided into three main periods:

- 1955-1975: A total of 219,290 ha was planted. During the early years of this period, only small areas were developed. From 1961, forest plantation establishment was promoted and about 50,000 ha of new forest were established each year in the later stages of this period.
- 1976-1985: 1,054,280 ha were established. The annual planting rate increased to around 160,00 ha in some years. Forest plantation work was planned and directed to certain regions and for specific economic purposes.
- 1986-present: 1,015,449 ha were established. Forest plantations were established with
 clearer objectives, but economic considerations were paramount. The species for planting
 in each region had been studied and plantations were more concentrated and intensified.
 Survival rate is claimed to be about 70%. The quality of established forests is much higher
 than for the earlier periods.

Most of the plantations developed in the earlier periods were exploited, and by the end of 1993 it was estimated that the total area of plantation forest remaining was 670,000 ha (MOF, 1995a). Invested capital for forest establishment comes from four major sources: the Government budget, loans, WFP and other foreign donors' support, and the private sector and individuals

A discussion about tree planting and forest rehabilitation in Viet Nam should include the people's tree planting. At the end of 1959, President Ho Chi Minh launched a movement called "Tet Tree Planting Festival." Since then, it has become a traditional custom for the nation and people in all walks of life, all economic sectors, offices, schools, and armed forces to participate in tree planting. During the period 1955-1985, 2.64 billion scattered trees were planted, of which about 660 millions were timber trees. From 1986 through 1990, 400-450 million trees were planted annually and since 1991, 350 million trees have been planted each year of which 70% are timber trees and fruit-bearing trees which can also produce timber.

Forest plantation areas and scattered trees supply some 12 million cubic metres of timber, poles and fuel wood. This reduces the pressure on natural forests, and reduces the use of agricultural residues for fuel, thus allowing for their use as fertiliser. Plantation forests and scattered trees also contribute to conserving biodiversity and providing environmental services. From 1955 to 1993 a total of 3.77 million ha was planted. However, it should be noted that these figures do not account for plantation areas that failed or have been harvested. Estimates given by MARD (1996) indicated that the actual area of plantations in 1995 was 1.05 million ha.

It should be noted that, although Table 8 indicates that more than 2 million ha of plantations have been planted, not all of these have survived. Some have been exploited and not replanted, some did not survive, and some have been lost to fire and other causes. Recent estimates made by MARD (1999) suggest that the total area of plantations across the country at the end of 1997 was about 1.37 million ha.

Table 8. Area of forest plantation established by year (ha)

Year	Area planted
1955-1975	219,290
1976-1980	563,120
1981	52,753
1982	66,018
1983	96,648
1984	125,113
1985	152,625
1986	168,763
1987	150,863
1988	131,609
1989	84,503
1990	93,830
1991	123,668
1992	129,000
1993	133,363
Total	2,291,166

Source: MOF (1995a)

With the increased emphasis on rehabilitation in forest policies in recent years, plantation forest has increased in all ecological zones including protection, special-use and production forests (Table 9).

Table 9. Forest plantation in different ecological zones from 1976-1995 (Unit: 1,000 ha)

Ecological Zone	1976	1980	1985	1990	1995	1997
North west		13.4	21.2	21.2	51.4	
Central north		103.7	99.8	82.7	139.5	
North east		88.6	114.6	104.3	139.9	
North central		133.4	145.2	161.4	227.8	
Central coast		18.0	32.2	75.2	157.6	
Central highlands		7.1	25.0	45.6	59.2	
South east		20.8	30.6	73.6	79.4	
Northern delta		13.8	15.1	19.0	30.7	
Mekong delta		23.5	99.6	161.1	163.7	
Total	92.6	422.3	583.6	744.9	1,049.7	1,050

Source: FIPI (1995)

9.3. Evaluation of performance

Despite the considerable progress in plantation forestry shown in Table 9, plantation establishment still lags behind the planned objectives due to several factors. These include limited investment capital, poor management and protection practices, and changing policies. The overall rate of reforestation is still low, and plantation growth is far from satisfactory (about 8 cubic metres per haper annum, MOF, 1995a).

As a proportion of the total forest resource, forest plantations constitute a comparatively small amount. They contribute little to total wood production, although their potential to meet future demands for industrial timber and fuel wood is substantial. The Government considers forest plantations to be important in reducing unsustainable harvesting from natural forests and in providing sources of wood close to dense populations.

While an overall evaluation of the performance of rehabilitation activities is difficult, some generalisations are possible. The following points are drawn from MARD, 1996, 1998; Phan Nguyen Hong, 1994; STRAP, 1995, 1996; and Tran Dinh Dan, 1995:

- The major species used in planted forests were fast growing exotics such as Eucalyptus, Caribaea pine and Acacia. These species had an ability to grow on denuded and degraded land, but their productivity was very low due to poor quality seed and seedlings and poor planting techniques.
- Plantations have been established mainly as pure stands. This is the reason why the soil under plantations tends to be infertile and degraded.
- Forest rehabilitation has been successful in re-greening bare land and improving the
 environment as well as providing a source of small-sized logs for raw material for industry
 and cash crops (such as cinnamon). However, forest rehabilitation for large sized timber
 trees using indigenous species (such as Erythrophorum ferrugianum, and Churkasia
 tabulari) has had little success.
- Rehabilitation of tropical forests has been successful in demonstration plots, but not on a large scale.
- Planting of species such as Hopea odorata, Dipterocarpus alatus, and Tectona grandis has been successful on the red-yellow ferralite and grey soils in the Central Highlands and Mekong Delta.
- Some success has been achieved in rehabilitating mangrove forests such as Rhizophora forests in the Mekong Delta, and the coastal forests in Can Gio and Ho Chi Minh City.

10. Discussion

Being aware of the importance of forests to social and economic development, the government has adopted a range of macro measures to preserve the remaining forest wealth and its biodiversity. Viet Nam's strategy for the conservation and use of biological resources was announced in the National Conservation Strategy (1984), and further elaborated in the Tropical Forestry Action Plan (1991), the Forest Protection and Development Law (1991), the National Plan for Environment and Sustainable Development (1991) and the Environment Protection Law (1993). This strategy focuses on the introduction of sustainable social forestry, strengthening reforestation to mitigate dependence on natural forest, in situ conservation of viable forest ecosystems in national parks and nature reserves, provision of well trained conservation staff, raising public awareness of the consequences of forest and biodiversity loss, active involvement of people in forest protection and conservation activities, and widening international co-operation in implementation of conservation projects.

Development of the forest sector and forest rehabilitation during recent years has been strongly influenced by the renovation of the economic system. In particular, the forestry sector has contributed to the development of strong links between agriculture, forestry and fisheries, especially in mountainous areas. The forestry sector has also participated in the construction of

roads and other infrastructure in mountainous areas. Over the past 30 years, more than 10,000 km of roads were constructed and another 3,500 km were upgraded, mainly in mountainous areas. Over the same period, almost 2 million people were assisted in changing their agricultural practices by the Programme for Fixed Cultivation and Sedentarisation, not least through the provision of about 180,000 ha of land for food production and planting of industrial crops.

It has become widely recognised that government management of forest lands (particularly through the SFEs) has resulted in widespread degradation of the forests and substantial deforestation. This continuing loss of forest has encouraged central government policy makers to consider ways of transferring responsibility for forest establishment, protection and management to household units and other groups in society. Initiatives such as the 327/556 Programme and its follow-on, the 5 million ha Programme have been the major vehicle to deliver this policy.

State forest enterprises (SFEs) have been encouraged to reform their management to improve their efficiency. Many SFEs have already changed their mandate from single purpose use of land (mainly timber exploitation) to multiple use (forestry, agriculture and fishery combined). At the same time, by contracting the use of forest land to families living in the area, the SFEs are gradually reducing their direct influence over the use of the land. The future, role and organisation and management of SFEs are clarified by the Decision 187/1999/QD-TTg dated 16/09/1999 by the Prime Minister. They will need to reinvent themselves to perform their newly emerging role as facilitators of community based forest management. This will require radically different roles for the staff compared with the traditional technical roles of the past.

In the earlier reforestation programs, planting techniques were mostly extensive with very low investment, poor species-site matching and poor quality seed. This usually resulted in poor establishment (less than 50% survival), low growth rates, and high occurrence of diseases. In recent years principles have been developed to improve the matching of species with sites, and, along with better attention to planting technique, this has resulted in an improvement in the survival rate to 70%. However, much more needs to be done to improve the technical aspects of forest rehabilitation.

While there have been considerable advances on the policy front and some improvement in the technical aspects of rehabilitation, there are still major social and institutional issues to be addressed.

Perhaps the most important of these issues relates to the question of access and use rights over forests. In the agriculture sector, the allocation of land to farmers since 1988 has resulted in rapidly increasing production. The government has developed policies to repeat this approach with forest land, but implementation of the policy is problematic. This is partly because of inherent conflicts between the government and communities over the use of forestland for different purposes, particularly in mountainous areas inhabited by ethnic minorities.

In the view of three million people living from shifting cultivation, forests are still mainly a source of fertile land for cultivation of essential food crops. While the Law on Forest Protection and Development forbids destruction of forest for shifting cultivation, no other way of meeting the everyday need for food is yet available for millions of people living in the mountains. For the shifting cultivator, the allocation of forest land as presently carried out is of little value. Under traditional systems of farming, farmers could clear forest for cultivation on a rotational basis (even if that was in contravention of the state law). By receiving relatively small parcels of land through formal land allocation and signing the corresponding land use certificate, farmers would lose their traditional freedom and would have to use the same land over and over again, thus degrading its fertility. They would then become absolutely worse off.

Mountain land not covered by high forest is normally classified as "unused land" by the forest authorities. This does not correspond at all to the view of the highland people. For them, such land is indeed used and is under the authority of a defined land user. There are normally locally known and accepted institutional arrangements that govern distribution of land for cultivation and use of forests for other purposes. That is, the forests are treated as common property resources rather than open access resources. However, the government approach to land allocation rarely acknowledges the existence of such local institutions. One of the big challenges is to bring together these two approaches (i.e. the community and the government) to resource allocation and use, to develop mutually beneficial outcomes.

A different scenario occurs in situations where people are not living on their traditional lands, but have moved to new lands, and particularly where the communities are of mixed ethnic backgrounds. In these cases it seems rare for indigenous systems of resource allocation and use to have survived the physical relocation and mixing of ethnic groups. In these cases, forests tend to be used as open access resources. This has led to heavy exploitation of the forest resource to satisfy short-term needs. As a result the forests are degrading rapidly.

Another important reason for the present problems is that, unlike the situation with agricultural land, the government has not yet developed the approaches and techniques necessary to carry out effective land use planning and allocation of forest land with the active participation of local communities. At the present time, allocation of forest land is generally carried out in a rather mechanistic way by the forestry agencies and with no, or only limited, input from the community. Because of the magnitude of the task, there is a need to develop rapid, robust tools and techniques for land use planning and land allocation that are reasonably inexpensive to apply.

11. References

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12. Appendix

Key government policies related to forest rehabilitation activities

- 1. Decree No. 246-TTg dated 17 May 1958 by the Prime Minister on hunting gun utilization.
- 2. Instruction No. 134-TTg dated 21 June 1960 by the Prime Minister on forbidding of elephant hunting.
- 3. Decision No. 72-TTg dated 7 July 1962 by the Prime Minister on the establishment of Cuc Phuong Forest Reserve with an area of 25.000 ha.
- 4. Decree No. 36-CP dated 5 April 1963 by the Prime Minister on forest wildlife hunting.
- 5. Decree on Protection of Forest (1972) with the Forest Protection Network of 10,000 staff.
- 6. Law on Forest Protection and Development (1991).
- 7. Decision No. 41-TTg dated 24 January 1977 on establishment of 10 forest reserves: Den Hung (Lam Thao, Vinh Phu Province)-285 ha; Pac Bo (Ha Quang District, Cao Lang Province)-3,000ha; Bac Son (Bac Son District, Cao Lang Province)-4,000 ha; Tan Trao (Son Duong District, Ha Tuyen Province)-1,081 ha; Dao Ba Mun (Cam Pha District, Quang Ninh Province)-1,800 ha; Ba Be (Cho Ra District, Bac Thai Province)-5,000 ha; Ba Vi (Ba Vi District, Ha Son Binh Province)-2,144 ha; Tam Dao Mountain (Tam Duong, Lap Thach-Vinh Phu, Son Duong-Tuyen Quang, Dai Tu-Bac Thai)-19,000 ha; Ban Dao Son Tra (Quang Nam-Da Nang Province)-4,000ha; Khu Rung Thong Da Lat (Lam Dong Province)-4,000 ha.
- 8. Decision No. 360-TTg dated 7 July 1978 on the establishment of Nam Cat Tien Nature Reserve with an area of 35,000 ha.
- 9. Decision No. 65-HDBT dated 7 April 1982 on the establishment of Mon Ray-Ngoc Vinh Nature Reserve with an area of 10,000 ha.

- 10. Decision No. 85-CT dated 1 March 1984 on the establishment of Con Dao National Park with an area of 6,000 ha.
- 11. Draft National Conservation Strategy (1985).
- 12. Decision No. 79-CT dated 31 March 1986 on the establishment of Cat Ba National Park with an area of 15,200 ha.
- 13. Decision No. 194-CT dated 9 August 1986 on the establishment of 73 Nature reserves with an area of 769,512 ha.
- 14. Decision No. 801-QD dated 26 September 1986 by the Ministry of Forestry on forest fire protection of Pine, Melaleuca and other susceptible tree species.
- 15. Resolution of the Politburo No. 22-NQ/TW dated 27/11/1989 on the general guidelines on the socio-economic development of the mountain regions (Central Committee, Hanoi, 1989).
- 16. Decisions No. 276 of Ministry of Forestry (1989) forbidding the hunting of 38 wildlife species.
- 17. Law on Forest Protection and Development (19 August 1991) including articles on protection and administration of wildlife.
- 18. National Plan on Environment and Sustainable Development 1991-2000 (1991) (This plan served as a basis leading to the drafting and later on the adoption of the Law on Environmental Protection in 1994, as well as to the establishment of the Ministry of Science, Technology and Environment, and Departments of Science, Technology and Environment in provinces).
- 19. Viet Nam Forestry Sector Review Tropical Forestry Action Programme (1991).
- 20. Decision 352-CT dated 29 October 1991 on establishment Yok Don National Park with an area of 58,200 ha.
- ·21. Regulation 17-HDBT dated 17 January 1992 by the Council of Ministers on the implementation of the Forest Protection and Development Law.
- 22. Regulation 18-HDBT dated 17 January 1992 by the Council of Ministers on the list of endemic forest plants and animals, and protection and management.
- 23. Circular 1171-QD by the Minister of Forestry Ministry (1992) on regulation of production, watershed and special-use forests.
- 24. Decision No. 327/CT dated 15 September 1992 on policies for the use of bare land, denuded hills, forests alluvial flats, and water bodies.
- 25. Decree No. 14-CT dated 5 December 1992 by the Prime Minister on administration punishment in forest protection and management.
- 26. Decision No. 18/HDBT dated 17 January 1992 by the Council of Ministers on a total ban on logging and hunting of 13 species of tree and 36 species of animals and a limited ban on logging/harvesting of 19 plant and animal species.
- 27. Decree No. 130-TTg dated 27 March 1993 by the Prime Minister on management and protection of endemic plant and animals.
- 28. Circular 1586 LN/KL dated 13 July 1993 by the Minister of Forestry Ministry on buffer zone of Nature Reserves and National Parks.
- 29. Land Law (1993).
- 30. Introduction 462-TTg dated 11 September 1993 by the Prime Minister on timber exploitation, transportation and export.
- 31. Introduction 525-TTg dated 2 November 1993 by the Prime Minister on policies and methods for continued economic and social development in mountainous areas.
- 32. Government Instruction No. 130-TTg dated 27 March 1993 on protection and administration of precious, rare floral and fauna species.
- 33. Law of Environmental Protection (1993).

- 34. Biodiversity Action Plan for Viet Nam (1995).
- 35. Decision No. 202-TTg dated 2 May 1994 by the Prime Minister on contracts for forest protection, maintenance, natural regeneration and planting.
- 36. Government Decision No. 39-CP dated 18 May 1994 by the Prime Minister on the organisation, duties, and authority of the Forest Inspectorate.
- 37. Regulation 4893/KGVX dated 5 September 1994 on the establishment of the Xuan Thuy Nature Reserve with an area of 7,100 ha.
- 38. Regulation 4991/KGVX dated 2 February 1994 on the establishment of Tram Chim Tam Nong Nature Reserve with an area of 7,500 ha.
- 39. Government Decree No. 02-CP dated 15 January 1994 on forestland allocation to organisations, households and individuals for long-term and stable use for forestry purposes.
- 40. Government Decree No. 01-CP dated 4 January 1995 on land allocation in agricultural production, forestry, and aquaculture of state enterprises.
- 41. Official correspondence 1259 LN/KL dated 18 May 1995 by the Ministry of Forestry on strengthening of special-use forest management and protection.
- 42. Decision No. 556/TTg dated 12 September 1995 by the Prime Minister on revising and supplementing Decision No. 327/CT.
- 43. Circular No. 04 NN/KL-TT dated 5 February 1995 by the Ministry of Agriculture and Rural Development on the implementation of the Decree No. 02-CP.
- 44. Regulation No. 359-TTg dated 29 May 1996 by the Prime Minister on urgent methods for wildlife protection and development.



46. Decree No. 77-CP dated 29 November 1996 by the Prime Minister on administration treatment in forest protection, management and forest product.

- 47. Decision No. 661/QD-TTg dated 29 July 1998 by the Government on Target, Objective, Policy and Organisation for the implementation of the national 5 Million Hectares Reforestation Programme.
- 48. Decree No. 145/QD-TTg by the Government on the policy in management and utilization of PAM plantation forest.
- 49. Decision No. 245/1998/QD-TTg dated 21/12/1998 by the Prime Minister on functioning the responsibility of State management at authority levels over the forest and forest land.
- 50. Inter-ministerial Circular No. 28/1999/TT-LT dated 3/2/1999 guiding the implementation of the Decision No. 661/QD-TTg dated 27/9/1998 by the Prime Minister on objectives, tasks, policies and organizing the implementation of the project on afforestation of 5 million hectares
- 51. Decision No. 187/1999/QD-TTg dated 16/9/1999 by the Prime Minister on renovation of organisation and management of State Forest Enterprises

International conventions on environment and biodiversity signed by Vietnam

- 1. UN Environmental Modification Convention (ENMOD) (1977), signed 26 August 1980.
- 2. Convention concerning the Protection of the World Cultural and Natural Heritage (1972), signed 19
 October 1987.
- 3. Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar) (1971), signed 20 September 1988.
- 4. Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973), signed 20 January 1994.
- 5. Convention on Biological Diversity (1992), signed 16 November 1994.

INCENTIVE POLICIES FOR FOREST REHABILITATION IN VIET NAM

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1. Introduction

The forest development process of a country as well as of a region has a direct impact on environmental protection and sustainable development of the country.

Forests in Viet Nam have a great impact on the living environment and play important roles in meeting the daily demands of human beings and thus also contribute significantly to the country's development. Forests have been important to the people of Viet Nam from historical times. Forestry is one of the main activities of rural people; it creates job opportunities for people living in mountainous and remote areas. Mountainous areas of Viet Nam, according to the latest survey, have about 19 million ha of forestland (the total geographic area of the whole country is 33 million ha).

Forests are spread all over Viet Nam but 80% are located in mountainous, remote and inaccessible areas with very rugget terrain. These areas were facing serious deforestation, especially in the period between 1970 and 1980. Forests were degraded not only in quality but also in quantity by both objective and subjective causes. Agricultural extension for growing crops for industrial use and fruit trees often is a reason for forest degradation. Uncontrolled migration into the forest areas also has a bad impact on forests. This caused such a bad impact on the environment, ecology and socio-economic development that the Government had to ring the "alarm to stop the forest degradation process."

A large quantity of timber and forest products for meeting domestic demand has been harvested mainly from natural forests. The demand for timber and forest products continually increases while the potential resources of timber material from natural forests have been reduced and the import of timber from overseas has been limited due to the financial shortage.

In the 1990s, Viet Nam approved the national programme on sustainable forest development and environment protection. As a result, the Law on Forest Protection and Development and the Law on Environment Protection were formulated by the National Assembly VIII and IX (in 1991 and in 1993). Due to these efforts forest degradation has been reduced, and in some areas the forests have been significantly rehabilitated.

Sources report a trend of increasing forest cover, whereby total forest area of the country increased by about 1 million ha during the period 1992 - 1997, specifically it increased from 27% in 1994 to 28% in 1995 and then further to 28.4% in 1996, finally reaching 28.8% in 1997.

A big challenge for forestry in Viet Nam is that society requires forests to be rehabilitated to serve as resources for developing the social economy and to increase the forest cover to 43%. These efforts will contribute to environmental security, prevent disaster, protect water sources, protect genetic resources and bio-diversity, and supply forest products to meet social demand which continues to increase.

To successfully set up new forests and develop sustainable ones there is a need for collaboration and support both nationally and internationally.

In doing so, it is important to pay proper attention to the sector management and planning mechanism. Before 1996, the Ministry of Forestry (today the Ministry of Agriculture and Rural Development) formulated 4 volumes of legal documents related directly and indirectly to forestry (all together these volumes represent at least 300 documents). In addition, every year, the Government and ministries also issue many legal documents on forest protection and development. The Department for Forestry Development will shortly formulate a list of existing legal documents to assist the management and implementation of forestry activities.

Some major issues are discussed below.

2. Land allocation and forest allocation

The Government has formulated a lot of policies related to land and forest allocation, of which important documents include Decision 184/HDBT, the Instruction 29/CT-TW (1993, the Resolution 10/BCT (1998), the Decree 02/CP (1994), the Decision 202/TTg (1994), the Decree 01/CP (1995), the Land Law (1993 and 1998), the Law for Domestic Investment Promotion (revised in1998), the Decree 51/1999/ND-CP (1999) and the two above mentioned laws.

By formulation of these policies, the State has created a legal environment for organizations, individuals and households to have fair and equitable access to land and forest for better management, protection and forestry business. The State has already decentralised forest establishment and forest development activities. Before 1980, only the state-owned organizations could take part in forest establishment and development, and the rights were given to the state-owned forestry enterprises and forestry services.

Up to now, only the most important national forests such as: special-used forests, protection forests, production forests with precious timber species, and forests in areas, that play important roles in national strategy, are under State management.

Most of the forest land areas are being allocated by the State to organizations, individuals and households based on the capacity of the future forest landowners and the land resources of localities. In 1999, the Government formulated 3 important decrees (Decree 50/1999/ND-CP - National support fund, Decree 51/1999/ND-CP - Guidelines on implementation of Law for Domestic Investment Promotion, and Decree 43/1999/ND-CP - Investment credit). These have created opportunities for people to take part in forest establishment and development activities in the future.



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3. Decentralization of forest management and forest land management

The Decree 17/CP (1992) - a guideline for implementation of the Law on Forest Protection and Forest Development, the Decree 39/CP (1994) and recently the Decision 245/1998/QD-TTg (1998) of the Government have already strengthened the management responsibility of the State and diffirent levels of authority on forests and forest land. Specifically, these decrees define the:

- scope of the state management on forest and forest land; and
- responsibility of different levels of state authority on forests and forest land.

Once again the Government emphasises the responsibility of different state-authority levels, because up to now the division of responsibility has not beeb clearly defined. In practice, however, all the forestry activities had been directly organized by provinces, and not by districts or villages.

The forest owners are responsible for protection of "their" forests and are responsible for all costs associated with rehabilitating their forests when they have been destroyed.

4. Policies on tenure and investment for forest sustainable development

It will be incomplete to address forest policies without referring to policies on tenure and investment for sustainable forest development. Details of the Government's policies have already been mentioned in the first section. Based on the key principle that forest owners can receive benefits from forest after investing capital and labor, with support from the Government and organizations, individuals and households in communities, the Government has concretized tenure policy for investors receiving foreign capital by issuing Decision 145 (1998) and Decision 162 (1999). As mentioned in the first section, the Government has promulgated three Decrees numbered 50, 51 and 43 which provide good opportunities for investment in forest development in future.



In 1963, the Government issued Decree 39/CP and later on, after promulgation of the Law on Forest Protection and Development, the Government released Decree 18/CP and a number of decisions in order to strengthen forest management, protection and development, and to limit wildlife exploitation and hunting in critical areas.

The Government has also issued many decisions to establish protected areas. To date,105 protected areas 11 of wich are national parks with a total area of 2.3 million hectares have been established. There have been many decisions to establish protected forests for hydro-electricity and watershed works, to protect forests in coastal areas, industrial zones and urban areas. Thanks to these efforts, many typical ecosystems and valuable genetic resources from tropical forests have been preserved for watershed and hydro-electricity values.

Limitations on exploitation of natural forests, especially of rare and valuable woods from vulnerable areas, are reflected clearly in two decrees numbered 286 and 287 (1997) issued by the Prime Minister

The Government's policies have also encouraged and created a favorable environment for various economic entities participating in industrial forest plantation that will provide materials for industries such as paper, artificial boards and domestic furniture.

6. Reorganization of State Forestry Enterprises System

State forest enterprises (SFEs) used to play a major role in the forestry sector of Viet Nam. During the 1970s and 1980s, SFEs faced a lot of difficulties and operated poorly due to many reasons, including elimination of budget subsidies, a decline in state budget, and a reduction in exploitation targets of natural forests. Resolution of the Central Party's Conference No. 4 (12/1998) has addressed renovation, development and effective management of state enterprises. Decree No. 20 (1998) by the Prime Minister emphasized a need to speed up re-organization and renovation of state enterprises. Following these instructions, the SFE system has been reorganized and now there are about 410 forest enterprises.

In September 1999, the Government issued Decision 187 on innovation of institutional and management mechanism in SFEs. This is a new opportunity for SFEs to affirm their business procedures. They are not just waiting for state budget but have to run their own businesses on forestland allocated by the Government. The Government only supports collective services and rural infrastructures. SFEs now have to run business on forest land with an aim to generating benefits and to exploiting natural forest in a sustainable way.

7. National Forestry Programmes

Recently, the Government has run two national programmes on forestry:

a) A programme to re-green barren land and hills (commonly refereed to as Programme 327) was promulgated with Decision 327/TTg on 12 September 1992. This 4-year programme has produced positive results. For instance, annually, 750,000 ha of forest have been brought under protection, 500,000 ha of new forest have been planted; 50,000 ha commercial fruit trees have been planted; about 20,000 families have been employed; and animal husbandry and construction of rural infrastructure have been undertaken. The Programme was adjusted and amended yearly to suit any changing condition. (MPI and MARD carried out an assessment of this Programme and finalized the report).

 b) The Five Million Hectares Reforestation Programme (commonly refereed to as Programme 661)

The Prime Minister issued Decision 661/QD-TTg on 29 July 1998 that contains objectives, tasks and policies to implement a project to plant 5 million ha of new forest. Among other, the Programme's objectives are: to plant 2 million ha of new protected and special-use forests; to plant 3 million ha of new production forest; to protect existing forests.

Apart from these two programmes, there are other national programmes with different objectives such as hunger eradication and poverty alleviation, rural infrastructure development, phasing out of opium, etc. These programmes have contributed a lot to forest protection and rehabilitation.

Six issues mentioned above have been addressed by Government policies, which indeed provide an open environment for attracting different economic components in forest development. As a result, common opinion says that the current policy facilitates a market-oriented environment. However, the forestry sector has not yet attracted investment and has not yet become a strength in the agriculture and rural development structure.

8. Constraints and Challenges

8.1. Policy inconsistency

There are still gaps between policies and practice.

- There are many procedures and fees in land allocation.
- Financial policy: Limited state budgets are not compatible with objectives and tasks. Loans
 are not attractive due to high interest rates and short lending terms, since doing forestry
 business takes a long time and involves high risk and uncertainties; areas for forest
 plantation usually face many social and economic difficulties; there are different opinions
 on investments for rural infrastructure development.
- Science and technology policy: there are few technological transfers in this regard, especially in seedling and plant varieties.
- Policy on labor attraction and human resource development: in rural areas, low income and socie-economic difficulties have made people pay more attention to ensuring daily needs.
- Benefit sharing policy has not been satisfactory enough to attract investment in forestry.
- Complicated procedures on many levels in trading relations have also posed challenges.

8.2. Limitations

Although the national programmes are expansive in scope, institutional arrangements for implementing these programmes, such as land allocation, tree pattern, capital, etc. have been limited. In addition, the programmes have been carried out in areas with low literacy levels and high levels of economic difficulty.

8.3. Appropriateness

Forestry objectives are interesting and reflect social needs, but implementing measures are not appropriate or suitable.

8.4. A system of forestry organization is too scattered and thin

These constraints and challenges have encouraged all people who are enthusiastic with forest to contribute more for better implementation of forestry development.

9. Recommendations

- Once a programme on sustainable forest development has been affirmed, the programme's objectives should remain in place for a certain period of time, at least 15 to 20 years.
- There should be clear land use planning based on legal foundation and participation of all stakeholders, especially those who will directly receive forest land.
- A careful study should be conducted on the forest market (particularly commercial forest) to provide necessary and reliable information for forest owners to develop feasible projects.
- Projects should have clear objectives and should be feasible.
- There needs to be an appropriate policy on capital for establishing stable and long-term forests during the implementation period of programmes.
- Regarding plant varieties, it is necessary to create new varieties and monitor, supply and transfer those new varieties to forest planters.
- Research should be carried out to assist forest planters in order to reduce outbreaks of pests and fire.
- The Government should have a reserve fund for forestry, especially for perennial trees that have high financial risks.
- The organizational structure supporting forestry, from the central to local levels, should be large and strong enough to fulfill all designated tasks.
- Last but not least, food security should be taken into account, because people only invest capital and labor in forest when they are able to meet their sustenance needs.



OVERCOMING TROPICAL FOREST DEGRADATION: WHETHER TO PLANT MANY SPECIES OR JUST MANY SEEDLINGS

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ABSTRACT

Large areas of tropical forest are being degraded but satisfactory methods of restoring biodiversity to these areas have not been developed. Managers are usually forced to choose between restoring biological diversity to a small area by planting a large number of species or, alternatively, restoring just productivity over a large area by planting a large numbers of individuals of a single species. There is, in fact, a wider range of choices and this paper reviews some of the options that might be used to foster forest restoration on a large-scale as well as some of the trade-offs that must be made. Promising results have been obtained using dense, species-rich plantings. However these are usually difficult to implement over large areas because of the difficulty of obtaining sufficient seed of many species and because of the costs involved. An alternative is to plant at a similar density but use a much smaller number of species. This avoids the first of these problems and costs can often be reduced further if species are introduced by directly sowing seed. Biodiversity may then be regained once the succession is initiated if intact forest is nearby and species from this area are able to be colonise the planted areas. Commercial plantation monocultures represent a third option. Traditional silvicultural practices usually preclude the development of much biodiversity in these areas but species mosaics, mixed-species plantings or understorey management offer a means by which commercial plantations might yield productivity benefits as well as some degree of landscape biodiversity. Finally, large degraded areas might be reforested using low density plantings that simulate the "perch tree" effect widely observed in many abandoned pastures. Seedling colonisation around these by bird-dispersed species can take place provided intact forest remains in the region. Each of these approaches has advantages and disadvantages depending on the ecological conditions prevailing, the social circumstances and the resources available for restoration



1. Introduction

The extent of degradation and biological simplification in the world's tropical forests is attracting widespread attention (Brown and Lugo, 1994; Elliott *et al.*, 1995; Grainger 1988; Lugo, 1988; Parrotta *et al.*, 1997a; Uhl, 1988). In some places the original forests have been totally cleared and replaced by grasslands. In others most of the original tree species may still remain in the area but the structure and biomass of the forest is substantially altered. There is common agreement that some form of rehabilitation should be carried out on these degraded lands. However, there is much less agreement over how this should be done.

In some situations communities have undertaken activities to assist natural regeneration processes such as eradicating weeds, establishing soil conservation measures and building cattle-proof walls or trenches (Bhattacharya, 1998; Cohen *et al.*, 1995; Gilmour, 1990; Gilmour *et al.*, 1990). Where degradation has been more extensive, various forms of reforestation have been proposed with the aim of re-establishing the biological diversity and functional processes of the original ecosystem (Goosem and Tucker, 1995; Kooyman, 1996; Miyawaki, 1993; Tucker and Murphy, 1997). Some of these reforestation approaches show considerable promise but in practice have been too expensive to apply over large areas. More commonly, rehabilitation has been carried out using plantation monocultures to restore just productivity and achieve some financial benefits although these may also provide some watershed protection benefits (Bruinjzeel, 1997; Appanah and Weinland, 1993).

There is, however, also a third option representing a compromise between these two extremes. This involves re-establishing some, but not all, of the original biodiversity as well as improving the commercial productivity of degraded lands. This alternative offers the possibility of regaining at least some of the lost biodiversity over much larger areas (Lamb, 1998).

These three alternatives can be represented as a choice between various combinations of two factors. The two factors are the numbers of species used in replanting and the density of individuals planted. The advantage of planting a large number of species (i.e. a high proportion of the original biodiversity) at a degraded site is that species diversity is rapidly enhanced and there is a strong likelihood that structural complexity will also be fostered. This can enhance the likelihood of regaining the former wildlife diversity. The disadvantages of using a large number of species is that it can be difficult to get the seed of many tropical forest species and raise large numbers of seedlings. Further, a high plantation diversity may reduce the commercial yield or financial outcome because it reduces the productivity per hectare of the most commercially preferred species. The advantage of planting at a high tree density is that it helps to quickly eradicate weeds and also leads to a higher initial productivity. The most obvious disadvantage of a high planting density is that the planting cost is also higher.

In all cases, a necessary precondition for restoration is that it is acceptable to landowners or land users and that disturbing influences (recurrent fires, grazing animals, timber harvesting etc.) are removed or cease. The site can then be left to recover through normal successional processes or the rate of recovery can be accelerated by replanting. This review outlines some of the reforestation alternatives that have been used to accelerate the recovery process at degraded sites in the tropics. These vary in terms of the numbers of species planted and the density at which they have been planted. It considers the circumstances under which they have been used and some of the unresolved problems remaining with each option. The various alternatives are summarised in Table 1 and the relationships between the numbers of species used and the planting densities in each alternative are shown in Figure 1.

2. Ecological restoration using dense plantings of many species

2.1. Method

Dense plantings using many species have been used to restore biodiversity to severely degraded tropical sites in high rainfall areas where few original species remain present (Group A of Figure 1). The implicit goal has been to restore the site to something approaching its original condition (i.e. to move from the degraded state at point B to point A in Figure 2).

A common approach has been to remove all weeds by intensive tending or weedicide applications and then plant seedlings of a variety of species (Goosem and Tucker, 1995; Kooyman, 1996; Miyawaki, 1993; Tucker and Murphy, 1997). All species are planted at the same time at densities up to 3000 trees per hectare (ha) and weed control is maintained until canopy closure is achieved. Necessary mycorrhiza can be inoculated on seedlings in the nursery. Since it is rarely possible to replant all the species that might have been originally present, plantings usually concentrate on fast growing species able to quickly occupy the site but may include poorly dispersed species unlikely to easily colonise from any intact forest remnants still present in the landscape. Other species might include those with contrasting life forms (to foster structural complexity), nitrogen fixers (to improve soil fertility), or bird attracting species such as figs (Lamb *et al.*, 1997). Up to 80 tree species per site have been replanted in some studies (Parrotta *et al.*, 1997b; Tucker and Murphy, 1997).

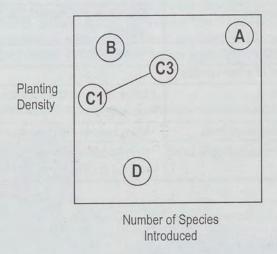
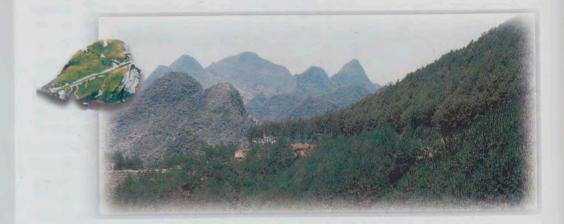


Figure 1: Reforestation schemes can be represented by various combinations of planting density and species richness. Group A has many species planted at high densities; Group B has fewer species at high densities; The commercial plantations schemes of Group C contain a range of combinations while the sparse plantings of Group D commonly contain limited numbers of species.

Method	When to use	
A. High densities of many species		
Plant many seedlings of many species	Need rapid site capture and recovery of diversity	
Direct sowing and supplementary plantings of many species	Mineral soil is exposed or weeds can be eradicated and large seed volumes of man species are available	
B. High density plantings of fewer species		
Plant seedlings of a small number of early pioneers	Seed-dispersing birds and bats can transfer seed from nearby forest remnants	
2. Direct sowing of a few early pioneer species	Mineral soil is exposed or weeds can be eradicated and seed can be dispersed from nearby forest remnants	
C. High density plantings of a few commercia	I timber or agroforestry species	
1. Nitrogen fixing trees	Degraded sites have infertile soils	
Patchwork mosaic of monocultures	There is considerable spatial site heterogeneity and species-site relationships are well known	
3. Mixtures of plantation species	Silviculture of complementary species is known	
4. Enhanced plantation understorey	Forest remnants remain nearby	
D. Low density plantings of a few species		
Isolated trees or clumps	Large areas need rehabilitation and funds are limited	
2. Line plantings of wind dispersed trees	Many species are dispersed by wind	
3. Enrichment plantings in heavily logged forest	Populations of commercial or otherwise desired species are small	



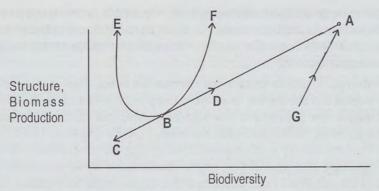


Figure 2: Pathways of degradation and ecosystem recovery. The original ecosystem is at A and degradation takes it to B where it has a reduced biodiversity and structural attributes. Continued disturbances can cause further degradation to C or, in the absence of such disturbances, it can begin to recover through normal successional processes to D. The degraded site can be replaced by plantation monocultures E, or by communities represented by a subset of the original ecosystem F. Although structural recovery may be complete these new communities have still not attained the original biodiversity. Heavy logging of tropical forests can cause a significant decline in forest structure though not necessarily in biodiversity G. Natural recovery may take place over time or it can be accelerated by enrichment planting.

At sites where degradation has been caused by mining a similar approach has been used except that more site preparation is often necessary at such sites (Brooks and Bell, 1984; Foster, 1985; Parrotta *et al.*, 1997b). Success is more likely where topsoil has been removed before mining and stockpiled. This can then be replaced over the old mine tailings. It is also often necessary to rip the new soil material to reduce soil compaction before replanting. Fertilisers are commonly needed



since infertile subsoil material may have been brought to the surface by mining and now be part of the rooting zone for the new plant community. Plants can be re-introduced to these mine sites as seedlings although direct seeding is also possible in many situations since mineral soil is exposed and weeds are temporarily absent.

The results of attempts to restore species-rich communities in both high rainfall zones and in seasonally dry tropical and sub-tropical forest areas using techniques such as these have been promising and diverse new forests have now been established in a variety of landscapes (e.g. Clusener Godt and Hadley, 1993; Foster, 1985; Kooyman, 1996; Parrotta *et al.*, 1997b; Tucker and Murphy, 1997). Most restoration projects are still relatively young and most of these new forests are still lacking a significant proportion of their original biodiversity. Further biodiversity gains will therefore depend on recruitment from remnants of the original forest communities still present elsewhere in the landscape.

2.2. Problems and Issues

2.2.1. Restoring all species and trophic groups?

It is usually impossible to deliberately restore all the original plant species that might have been present at a tropical forest site, even in the unlikely event that the identity of all of these was known. For example, the numbers of tree species that can be re-introduced is usually much less than 50 percent of the original tree flora which may total several hundred species in many tropical areas. The task of collecting the seed of such a large number of species is simply too great, especially since most are often represented by only a few individuals per hectare in natural communities. Similarly, in most tropical situations it is usually impossible to directly assist the recolonisation of other plant life forms such as vascular epiphytes or wildlife species. This means that a more likely short-term outcome is to point F of Figure 2; at this point, structural recovery is virtually complete but the forest has not yet regained its initial biodiversity. This may still happen over time with further colonisation from nearby remnants.

The rate at which any subsequent recolonisation actually occurs depends on the distance to these forest remnants elsewhere in the landscape and on the extent to which they still contain the original plant and animal species. In the particular case of plants, it also depends on the effectiveness of the various dispersal vectors. The more distant these source areas are the slower the decolonisation process is likely to be, meaning that restoration in highly degraded landscapes is unlikely to ever be completely successful (Wunderle, 1997). In less degraded areas where dispersal distances are not so great some species may recolonise relatively quickly while others, especially wildlife, may require the development of particular habitat conditions (e.g. a certain degree of structural complexity) before recolonisation can take place (Parrotta et al., 1997b). Deliberate efforts can be made to overcome such impediments where the objective of restoration is to re-introduce particular species such as rare or endangered plants or animals.

2.2.2. The proportion of each species to plant

The species used in any reforestation program are often chosen on the basis of certain criteria (e.g. nitrogen fixing species, poorly dispersed species with large fruit, rare or endangered species, etc.) and pragmatic considerations such as the availability of seed. However, there are usually few

guidelines to suggest what the relative planting densities of these species should be. Many restoration projects use mainly long-lived, secondary species or primary forest species representative of late successional stages. The densities at which these are planted often means that many individuals are eventually excluded by competition. Since the seed of these species is commonly difficult to collect it might be preferable to use more easily obtained seed of short-lived pioneers to act as "fillers" between these desired species. Even though this risks the possibility that some may be temporarily overtopped by the faster growing pioneers, the shade tolerant primary species can normally persist until such time as the fast growing pioneers die. There are presently few guidelines on which to base the proportions of primary forest species or the proportions of primary species versus pioneer species, and care will need to be taken to monitor the outcome of the present establishment methods.

The task is more difficult when shade intolerant species are being used. Rehabilitation of sclerophyllous forest in sub tropical Queensland following mining for heavy minerals (rutile, zircon, etc.) was originally carried out using 700 grams (gm) per ha of Acacia seed to rapidly enhance the nitrogen content of the replaced soil (Table 2).

Table 2. Sequence of operations used to rehabilitate land after "sand mining" for rutile at Stradbroke Island, Queensland (based on Brooks and Bell 1984).

Process	Benefit	
Spread soil material after extracting minerals to re-establish original site contours	Helps restores hydrological character and habitat conditions of site	
Spread stockpiled topsoil (from original 0 - 30 cm depth)	Restores mycorrhiza and soil seedbank	
Directly sow seed mix (up to 25 species including Acacia and other understorey species)	Composition of mix depends on original species present before mining	
Sow hybrid sorghum seed	Reduces wind erosion; dies after one year	
Add NPK fertiliser	Improves topsoil fertility	
Spray bitumous coating to stabilise soil (or use brush matting)	Reduces wind erosion; brush matting may also contain some seed	
Plant seedling of species having very small seed (ie. unsuitable for direct sowing)	May not be possible to collect enough seed to allow direct sowing of all species	

In initial trials the early community growth was promising and a high plant diversity was established. But after 10 years the *Acacia* had overtopped all other species and began to shade them out and plant biodiversity plummeted. The site was subsequently burned by wildfire when many Acacia trees began to senesce. This caused massive regeneration of soil-stored Acacia seed and a perpetuation of the monoculture. Trial and error has since reduced the application rate of Acacia seed to only 30 gm per ha. Where species are shade tolerant the problem may not be as significant. In the absence of other guidelines it might be most appropriate to broadly replicate the relative populations of the species in the original forest.

2.2.3. Assembly rules

Studies of successional sequences in a variety of situations have shown the importance of initial conditions in determining community outcomes (Janzen, 1988) but there are few guidelines for determining whether species can all be planted at the same time or whether some planting sequence should be followed. Epiphytes obviously need trees before they can enter a community but do certain tree species require particular "facilitator" species to enable their establishment? Some evidence suggest they might. For example, some primary rainforest species from mature successional stages appear able to tolerate being established in open conditions but others, such as many South East Asian dipterocarps, require some degree of shading for best growth (S. Appanah. pers. com.). Likewise, certain members of the *Meliaceae* appear to suffer less insect attack and have higher rates of survival when established under some shade than when planted in the open (Keenan *et al.*, 1995). Current approaches to solving this problem rely primarily on trial and error testing.

3. Ecological restoration by planting high densities of fewer species

3.1. Method

An alternative approach is to re-introduce large numbers of only a small range of short lived secondary species (Group B of Figure 1). These might be established as planted seedlings or be directly sown as seed following weedicide applications to remove weed competition (Goosem and Tucker, 1995; Tucker and Murphy, 1997; Sun et al., 1995). Early trials suggest the growth of directly seeded plants is slightly slower than directly planted seedlings (Snell and Brooks, 1998) although this may simply reflect differences in seedling age. The high seedling density (up to 3000 trees per ha) can quickly exclude grasses and other weeds and provides a suitable microenvironment for other plant species to colonise from nearby forest remnants. These shade tolerant primary forest species can colonise under the canopy or when gaps are created as the short-lived plants begin to senesce after a few years. Or additional species might be deliberately introduced by direct sowing in the weed free environment once the new canopy is established (Tucker, pers. com.).

Care must be taken in the initial choice of species to plant as seedlings or to sow as seed. Species must be capable of rapid growth under a variety of conditions and must also provide a rapid and deep shade cover to exclude weeds. Ideally, species should also be attractive to seed-dispersing birds. Many early rainforest pioneers are potentially suitable. In the particular case of direct sowing, the species chosen should be those for which large numbers of easily germinated seed are readily available since seed application rates need to be high to compensate for a low seedling establishment rate.

This approach does not yield the rapid increase in species diversity that the first approach provides. It assumes this diversity will eventually develop through normal successional approaches after colonisation from remnants elsewhere in the landscape. Hence it is less suited to extensively degraded situations where such remnants might be relatively distant. On the other hand, the approach is much simpler than the first because it requires the handling of many fewer species and this may be a considerable advantage in a number of situations. The opportunity to directly sow seed rather than plant seedlings also offers the opportunity to rehabilitate large areas more inexpensively.

3.2. Problems and Issues

3.2.1. Poorly dispersed species

Early trials using densely planted seedlings suggest the technique can be quite useful in excluding grasses and weeds and initiating successional processes. The weakness of the approach is its high reliance on further seed dispersal to re-establish significant levels of biodiversity. Certain species, particularly large-fruited species, may have no vectors able to disperse them across the landscape and into a site being rehabilitated in this way. Such species may never recolonise unless they are deliberately planted (Hardwick *et al.*, 1997; Wunderle, 1997).

3.2.2. Weed species

The method depends primarily on seed-dispersing birds being attracted to the site. But birds can disperse seed of weed species as well as natives, and weed colonisation may be a particular problem in landscapes containing many woody weeds. Weeds that are light-demanding shrubs and understorey species may eventually be shaded out but exotic canopy trees and vines may become permanent members of the restored community unless there are resources to eradicate them over the several years necessary for canopy closure to occur.

3.2.3. Direct sowing

Direct seeding is an attractive option because of the cost advantages it offers but may be difficult to apply at many places other than mine sites. The broadcast seed must first be able to survive predation by ants or rats, although seed survival is likely to be greater in grasslands than under forest canopies (Hau, 1997; Osunkoya, 1994). The seed must also reach the mineral soil for seedlings to become established, so all competing weeds must be removed beforehand by herbicides (mowing is less effective because weed roots remain intact). This means it may not be possible to adopt direct seeding at sites with very heavy weed cover. Even if all weeds have been killed by weedicide, the amount of dead plant material present may make seedling establishment and survival difficult. It might also be possible to directly sow only a limited number of rainforest species. Depending on the season, only a small percentage of any broadcast seed may survive and germinate so large volumes of seed are needed. Further trials are needed in a variety of ecological situations with a wider variety of species to refine the approach further (Hardwick et al., 1997).

3.3. Commercial timber plantations and agroforestry systems providing some biodiversity benefits

Another form of rehabilitation that also uses relatively high density planting of a small number of species is commercial timber plantations (Group C of Figure 1). Trees in sawlog plantations are commonly planted at densities around 1100 trees per ha but thinned out substantially over the rotation to ensure that between-tree competition is reduced and growth rates of individual trees are optimised. At the end of the rotation (30 - 60 years) the final stocking may be 200 tree per ha. In pulpwood plantations the rotation is usually much shorter and commonly around 10 years. These plantations are almost invariably designed to provide improvements in forest productivity but not biodiversity. In fact, most such commercial plantations are monocultures of fast-growing exotic species

Such plantations are not normally seen as contributing significantly to the restoration of landscape biodiversity but there are certain situations where they might. For example, exotic species can play a valuable role in many degraded landscapes when natives are unable to tolerate the lower levels of soil fertility or other changed conditions. In such situations a monoculture of Acacia or some other nitrogen fixing species may be a necessary precursor to restore soil fertility and permit the reintroduction of higher-value native species (Ang, 1994; Awang, 1994; Cooper *et al.*, 1996; Liyanage *et al.*, 1997; Nyberg and Hogberg, 1995; Otsama, 1998; Rhoades *et al.*, 1998). Plantations of fire-tolerant exotic species such as eucalypts might also be useful in buffer areas to protect stands of more fire sensitive native species.

Not-withstanding these advantages, some situations may allow more complex plantation designs to be used that offer rather more direct assistance in helping restore regional biodiversity. In fact the ownership or land tenurial patterns in much of the tropics may mean that simple monocultures of exotic species are an unappealing form of reforestation in many areas. This has been the case in north Queensland following the cessation of logging in natural rainforests where attempts are being made to establish a viable farm forestry program. Few landowners have been interested in planting exotic tree species but many have expressed interest in growing high value native rainforest species for sawlogs. The reduction in timber supplies from the natural forests caused the market price of these timbers to decrease rather than increase since the market could not be sustained by the small volumes of timber still available. This unexpected decline in prices meant landowners have been reluctant to participate in tree planting. The long rotations and the delayed financial return from plantation forestry are added disincentives. One way of breaking this impasse has been to design plantations that provide landowners with an alternative short term benefit. This benefit is the aesthetic and conservation gain from mixed-species plantations on their farms in the place of monocultures, and many farmers have been interested in this option.

Mixed species plantations can take a variety of forms including random mixes of trees, alternate rows or patchworks of monocultures. These can be established with or without an overstorey nurse crop (Ball *et al.*, 1995; Lamb and Tomlinson, 1994; Wormald, 1992). Some of the possible approaches are outlined in Table 3. These alternatives all increase the contribution plantations might make to regional biodiversity and they may also offer some functional advantages as well (Kelty, 1992; Lamb, 1998). For example, there may be nutritional or watershed protection advantages from these more complex designs over those provided by exotic monocultures, and there is now renewed interest in these forms of silviculture in some tropical areas for these reasons alone. Similar benefits can be derived from some forms of agroforestry, especially those involving native forest trees (Cooper *et al.*, 1996; de Foresta and Michon, 1997; Wickramasinghe, 1995).

The extent to which biodiversity is restored to degraded lands by these types of approaches can range from rather modest improvements that might come from using two or three species in a plantation mixture to rather more significant gains when plantations and agroforestry systems act to catalyse natural recolonisation and successional development (Parrotta, 1993; Parrotta *et al.*, 1997a). However, they offer the possibility of financing the restoration of some degree of biodiversity to potentially quite large areas of degraded lands that might not be restored otherwise.

Table 3. Methods of enhancing the regional biodiversity in commercial forest plantations areas.

Method	Technical Limitation Reduces overall commercial productivity of site	
Buffer strips around plantation monocultures		
Patchwork mosaics of monocultures	Requires good knowledge of species-site relations	
Mixed species plantations	Requires knowledge of compatible specie and appropriate silvicultural techniques Needs intact forest nearby as seed source	
Encourage understorey development		

3.3.1. Problems and issues

Mixed species plantations are not appropriate in all situations. For example they might not be suitable in large scale industrial operations or in pulpwood plantations where the short rotation lengths commonly used mean any biodiversity gain would be short-lived and the cost to production too high. In such cases regional biodiversity might be best enhanced by buffer strips of natural or restored forest around the more traditional plantation.

But even in other circumstances foresters have been reluctant to embrace mixtures. There are several impediments. Perhaps the most important is that the general perception that they are too difficult to manage and that they have a lower productivity. The former is almost certainly true but the latter may not be. In fact there is evidence from a number of trials that productivity can be enhanced in some situations (e.g. Montagnini et al., 1995; Lamb, 1998; Wormald, 1992). The problem is that there is rarely a good understanding of the overall contribution the plantation makes to the broder regional economy. What are the true overall costs and benefits? Has productivity really been lost? And if it has, is there an accompanying gain because of biodiversity or watershed benefits? Since it is difficult to assess some of these non-market values (e.g. the benefits of biodiversity) such comparisons of the real economic or social advantages and disadvantages of various alternative plantation designs are usually not made.

A second problem is that there is usually insufficient knowledge about indigenous rainforest tree species-site relationships to allow well designed mosaics to be developed and implemented at a landscape scale. Similarly, there are rarely well developed forms of silviculture for mixed species plantations; little is usually known about what species combinations might form stable mixtures or how to manage the mixtures as they age (Wormald, 1992). There is no doubt that these are more complex forms of silviculture and management than those of traditional monocultures but there is also no doubt that the ecological and social benefits they provide can be significantly greater than monocultures. Many of these issues are discussed further in Lamb (1998).

4. Ecological restoration using low density plantings of a small number of species

4.1. Planting isolated trees, clumps or lines in grasslands

All of the approaches outlined above involve establishing trees at densities of at least 1000 trees per ha. This means it can be expensive to cover large areas of degraded land such as those left when agriculture has been abandoned. A significantly cheaper alternative might be to accelerate

the natural colonisation process that occurs on many abandoned agricultural lands by providing the initial trigger for colonisation. In many such lands isolated remnant trees act as perch trees and focal points for seed-dispersing birds (Guevara and Laborde, 1993; Guevara et al., 1986; Kellman and Myanishi, 1982; McClanahan and Wolfe, 1993; McDonnell and Styles, 1983; Robinson and Handel, 1993). Significant populations of tree seedlings can become established around these remnant trees and can develop into tree groves. Toh et al. (1999) noted there was some evidence that clumps of trees could be marginally more effective than single trees in fostering the initial development of seedling populations. This suggested that planting isolated trees or clumps of trees at wide spacings (perhaps 100-200 m apart) across a degraded landscape could have a similar role in attracting seed dispersing birds. Interestingly, they found that fleshy fruited trees were not more attractive to seed-dispersing birds than trees bearing wind dispersed fruit. This means the trees to be planted could be those that are poorly dispersed such as large fruited species or species with no particular dispersal mechanism. A minimal degree of tending of some of the seedlings regenerating under these trees could enhance their survival. Janzen (1986, 1988) has also noted that some limited grazing in such grasslands might improve the rate at which wind dispersed tree species are able to colonise grassland sites away from the residual trees.

4.2. Enrichment planting in degraded forests

In some rainforests heavy logging causes a significant change in structure and stand biomass but has a rather smaller effect on plant biodiversity (Point G in Figure 2). Even though species richness may be reduced on a particular hectare, the landscape as a whole still contains most of the original plant biodiversity. A common solution is to leave such forests to recover unaided or to provide a limited amount of tending of existing seedlings and the growth of residual trees will restore the original structure and productivity over time. But heavy logging can sometimes remove a high proportion of the population of certain commercially favoured tree species leaving the naturally regenerating forest with a lower representation of these species as seedlings or saplings. As a consequence the forest is likely to have a much lower future commercial value. One way of overcoming this form of degradation is to carry out "enrichment planting" in which seedlings of commercially attractive species are planted in widely spaced rows within the forest (Adjers et al., 1995; Appanah and Weinland, 1993; Montagnini et al., 1997). The density of these plantings can reach several hundred trees per ha. If properly tended these seedlings can grow up in the canopy gaps left by logging and eventually join the canopy layer. A similar approach could be used to increase the populations of endangered, vulnerable or rare species. Unlike the cases of restoration described previously, enrichment planting promotes movement of the system along the structure and productivity axis of Figure 2 rather than the biodiversity axis.

4.3. Problems and Issues

4.3.1. Poor survival of planted seedlings

Grassland areas are prone to recurrent fire and great care is necessary to exclude fire for sufficient time for the seedlings to become established, even when the species being used may be fire tolerant as adults. This means a system of fire-breaks is usually needed (Janzen, 1986). Seedling survival in grasslands can also be low because of the competition offered by grasses and the fact that regular weeding is difficult when widely dispersed plantings are used. There are usually no

opportunities to replant in these widely dispersed plantings as can be done, for example, in closely spaced commercial tree plantations. However, there are some conflicting reports. Hardwick *et al.* (1997), working in the seasonal forests of northern Thailand, found higher survival rates at the end of the hot season for some tree seedlings in sites that were not tended than in sites that had grasses removed by slashing. Likewise, Tolkamp and Aldrianto (1998) noted some species were able to tolerate being planted in grasslands and given minimal tending and survived better than being planted in canopy gaps in secondary forest. These differences may be due to differences in shade and drought tolerance of these particular species.

The survival of underplantings into areas with many residual canopy trees can also be low because seedlings are swamped in a mass of undergrowth or vines responding to the more open light conditions at the forest floor after heavy logging. Although the technique can work well in experimental situations it is often more difficult to apply as a routine treatment to large areas and planted seedlings can be "lost" in a mass of pioneer tree regrowth (Tang and Wadley, 1976). But survival standards for these low-density plantings may be much lower than those considered "acceptable" in a commercial plantation. Even rates as low as 50 percent may still be useful in achieving the purpose of accelerating recovery.

4.3.2. Further seedling colonisation

The rate at which seeds are brought into the site by birds or bats and the rate at which these germinate and establish can be slow (Wunderle, 1997). Many birds will not fly across open grasslands, especially when the perch trees are short. In addition, the above and below-ground competition offered to newly germinated tree seedlings by grasses and other weeds can be very high (Nepstad *et al.*, 1991). Toh *et al* (1999) found only a small proportion of young seedlings actually survived to reach more than one meter and that most of these were secondary species rather than primary forest species.

5. Choosing between options

The most appropriate method to use in any particular situation will be governed by both ecological and socio-economic factors. In any case the degree of restoration finally achieved will depend on the extent of recolonisation from plant and animal populations in intact remnant patches of forest elsewhere in the landscape. If the remnants are large and the distance to these patches of forest is short then approaches relying primarily on seed dispersal from remnants may be appropriate. But if the dispersal distances are large or the remnants are small and have lost many of their original species, then methods involving the deliberate introduction of more species will be necessary. Where severe degradation has occurred it may not be possible to reintroduce some plant species until site conditions change. In such situations an exotic nitrogen fixer may be a necessary precursor to the re-establishment of native species.

The choice will also depend on land ownership patterns and on social factors such as the land-use preferences of the land owners or users. Not all land owners may see the need to undertake rehabilitation, especially if the benefits flow to the wider community rather than to themselves. And even if landowners are willing to undertake some form of rehabilitation their choice may be determined primarily by the financial or other resources they have available. In the particular case of mine site rehabilitation the choice may be affected by legal requirements to rehabilitate a site to a particular standard.

Despite such imperatives, any choice represents a series of trade-offs. One of these is the trade-off between the likely rate of biodiversity accretion and the area that can be treated (Figure 3). The Group A methods (many species and high planting densities) rapidly reintroduce large numbers of plant species but the resources needed and costs of doing this are high. Consequently it is usually only possible to treat comparatively small areas using these techniques. Group B methods (few species but high densities) generate slower rates of recovery although these can still be quite significant if large areas of intact forest remain nearby. Since fewer species are involved it may be feasible to treat larger areas, especially if direct seeding is possible. Group C methods involving commercial forest plantations or agroforestry systems offer the possibility of covering very extensive areas of degraded land. The rate at which these contribute to the return of biodiversity varies with the plantation or system design but may be significant if understorey development can be fostered. Group D methods involving low density plantings of a small number of species may also enable large areas to be treated but the rate at which biodiversity is likely to increase is slow. Overall, there is a trade-off between being able to foster rapid plant biodiversity recovery and being able to cover large areas.

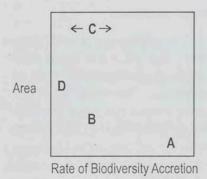


Figure 3: The rate at which biodiversity is restored to degraded lands differs between the several Groups with Group A methods (many species, high densities) having the highest impact. The costs of the different methods mean there is also a difference in the areas that are likely to be treated by each Group. The commercial forestry methods of Group C may cover the largest area because of the likelihood of a financial return.

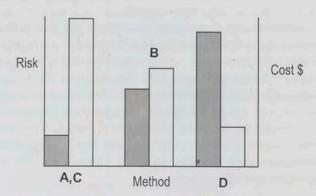


Figure 4: There is usually a trade-off between the treatment costs and the risk that a particular treatment will fail. Groups A (many species, high densities) and C (commercial plantations) are expensive treatments but are more likely to succeed than Group D (few species, low planting densities) which is more prone to losses from weeds or further disturbances.

There is also trade-off between the likely cost of treatment and risk (Figure 4). Intensive operations such as dense, multi-species plantings and commercial forest plantations (Groups A and C) are costly but the rapid site occupancy means that the risk of failure is low. By contrast, low density plantings of a few species (Group D) are much cheaper to carry out but carry a higher risk of failure. The rate of forest recovery is lower and sites may appear abandoned wastelands rather than being actively rehabilitated. Both factors increase the risk of further disturbances such as wildfires reversing the rehabilitation effort.

6. Conclusions

The massive extent of forest degradation that has occurred in the tropical forest regions, especially this century, needs to be halted and the process reversed. Ecological restoration that restores most of the original biodiversity is usually difficult for ecological, social and financial reasons. It may be possible in some small priority areas in or around national parks or perhaps in some wildlife corridors. But it is likely to be difficult to accomplish over large areas. However, there are a number of other approaches likely to achieve more modest goals in places such as the large areas of tropical grasslands created in recent years, riparian strips, steep hill slopes and even agricultural areas with significant human populations. In any particular landscape it may be necessary to use more than one of these approaches depending on the situation at each site. The results of using these approaches can range from minor improvements in regional biodiversity to quite large improvements although the most successful outcomes are likely to be in areas where extensive fragments of forest still remain. All these approaches also offer the prospect of improvements in various ecological goods and services other than just biodiversity.

Perhaps the most difficult challenge is to incorporate biodiversity enhancement into other traditional land uses such as plantation forestry and agriculture. The advantages of doing this are that it offers the possibility of restoring biological complexity to much larger landscape units. But a number of ecological and silvicultural problems remain to be resolved before standard methods can be offered to managers. And many industrial managers and some landowners may question why they should risk limiting productivity for the sake of a small improvement in regional biodiversity, particularly if some nature reserves or national parks already exist in the region. But added biological complexity may not necessarily come at the expense of productivity or real economic returns to land users and more work is needed to establish the actual overall costs and benefits.

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PARTICIPATORY LAND USE PLANNING AND LAND ALLOCATION: PRACTICAL EXPERIENCES IN THE SONG DA WATERSHED

Nguyen Tuong Van Social Forestry Development Project

1. Song Da Watershed

The Song Da Watershed lies in 5 provinces: Lai Chau, Son La, Hoa Binh, Lao Cai, and Yen Bai. It includes 24 districts and 329 communes, with a total area of 2,606,500 Hectares (ha). The starting point of the watershed is Hoa Binh dam, one of the most important projects in Viet Nam and the largest hydroelectric power souce in Southeast Asia. The power plant is also the country's principal source of electricity, with a maximum generating power capacity of 1920 Megawatts (MW). The normal maximum water level creates a reservoir extending 230 Kilometes (km) upstream from the dam, in a long and narrow area reflecting the steep topography of the Song Da. In the original plan, the projected life of the dam was estimated at more than 100 years, which has since been reduced to an estimate of about 50 years as result of higher than expected sediment loads carried into the reservoir (Hirsch, 1992). At present, feasibility studies are being done for establishment of a new dam, called the Ta Bu dam, for the new Son La hydroelectric power plant located some 230 km upstream from Hoa Binh dam.

Some important information related to the Song Da watershed

- Hydro power (40% of electricity of Viet Nam)
- 2.6 million ha (mountainous, isolated, heterogeneous)
- 3.2 million people (more than 20 ethnic groups)
- Poor infrastructure, poverty and food scarcity
- Scarce agricultural land
- Forest land 80%, forest cover 20%
- Weak government institutions (communication problem)

2. The Social Forestry Development Project - SFDP

The Social Forestry Development Project is supported by the German Development and Cooperation Organization (GTZ) and is being implemented by the Department for Forestry Development in the Ministry of Agriculture and Rural Development (MARD). It is the first German technical cooperation project in the forestry sector in Viet Nam since the unification of Germany. The project focuses its activities in Son La and Lai Chau provinces. At the provincial level the project works closely with Department of Agriculture and Rural Development (DARD), Forestry Protection Department and the Cadastral Department.

Project objective: Local communities in Son La and Lai Chau provinces manage their natural resources in an ecologically, economically and socially sustainable way.

The project is scheduled to last 12 years and is divided into 4 phases:

- Phase 1 Orientation phase: baseline studies and project concept (1993-1994)
- Phase 2 Pilot approach: develop methodologies and technologies (1995-1998)

Phase 3 Institutional capacity building (1999-2001)

Phase 4 Handing-over and large-scale application

The main project fields are:

- 1. Land use planning and land allocation: secure tenure and conflict resolution
- 2. Increased agriculture production (by development of an extension service)
- 3. Community forest management
- 4. Decentralisation of planning mechanisms (village development plan)
- 5. Capacity building and training

3. SFDP Song Da Methodology For Participatory Land Use Planning and Land Allocation (LUPLA)

Since the promulgation of the new legal framework on land management, responsible agencies have been pushing to complete land allocation for the whole country by the year 2000. In 1994 the former Ministry of Forestry issued the "Guideline on the method of land allocation at communal level." This guideline was subsequently considered as the basis for the implementation of forest land allocation in all provinces. The SFDP has been studying it carefully and using the LUPLA methodology for the Song Da watershed. In addition, the Song Da SFDP has learnt valuable and fruitful lessons and experiences from other international projects such as the Viet Nam - Sweden Forestry Cooperation Program, FAO/Italy, The Renovation of Forestry Strategies Project (Tu Ne methodology), etc.

The Song Da SFDP has been actively involved in participatory LUPLA since 1995 and is distinguished by two concepts:

3.1. Land use planning

Land use planning is a process for determining the most appropriate (productive and sustainable) land use by a certain land user for a certain land unit. It can be done from national level down to the watershed, commune, village and plot level. Land use is continuously changing due to socioeconomic and policy developments, as well as impacts of the land itself. For example huge development of coffee plantations in the Central Highland of Viet Nam has led to serious forest destruction.

3.2. Land allocation

Land allocation is a procedure that essentially defines the owner of the land, as well as its resources (forest, water, etc.). The aim of this activity is to clarify land use rights to settle and avoid land conflicts, ensure appropriate land use, stimulate private investment in land use improvements and higher production, as well as to establish the foundation for a land tax system. The rights and obligations of the owner are defined and documented in a land use certificate called a Red Book.

Over the past 4 years the Song Da SFDP has been developing a methodology for participatory land use planning and land allocation at the commune and village levels that is suitable for a highly diverse mountainous area like the Song Da watershed. The methodology has been tested and adapted to the conditions in two districts that are representative of the major ethnic groups of the watershed: the Thais and the Hmongs.

The SFDP methodology follows to a large extent the ministerial guidelines and can be summarised as follows:

- a) Preparation: this includes the establishment of a steering committee at the District level and an implementation-working group at the commune level. In addition, basic information and secondary data are compiled.
- b) Village meetings are held for discussion and explanation of the land allocation process. Field survey of present land use and village/commune boundaries is necessary.
- c) Preparation of the land use plan during village meetings.
- d) Allocation of land in the field.
- e) Completing administrative procedures for approval of LUPLA results
- f) Issuing Land Use Certificates.

According to the SFDP's strategy, a Participatory Rural Appraisal (PRA) exercise is the starting point for participatory LUPLA; this element aims to develop a better understanding of the local conditions, problems and potentials. PRA exercises carried out include the preparation of a simple present land use map, village transects and a 3-D village model made from available materials, which are used, for LUP purposes.

It is necessary to mention that the SFDP uses the LUPLA process as an entry point for the identification of measures for encouraging sustainable land use practices and for improving the living conditions in the targeted villages. For this purpose, the result of PRA and LUPLA are analysed and transformed into programs of activities to be carried out in the villages, ranging from forestry protection and management activities to agricultural demonstration trials and training courses for farmers. These activities are listed in an annual village plan, then aggregated at commune and district level, serving as a basis for development of the SFDP's annual plans of operations.

Based on assessment of methodology applied and practical implementation experiences in Yen Chau and Tua Chua districts, the following strengths and weaknesses have been identified:

Strengths

- The methodology consists of inherited experiences with previously applied methodologies, flexible and appropriate to the local capacity and resources.
- 2. Land use planning is implemented and approved prior to land allocation.
- 3. Land use planning and land allocation are implemented for both upland agricultural and forest land for individual villages before being aggregated for the whole commune and then for the district.
- Local people are directly involved in the process with the application of PRA (3-D model, transect and land allocation in the field).
- 5. Administrative proceduress and Cadastral documents and table have been simplified.

Weaknesses

- 1. The progress of land use planning and land allocation is slower than required. There are still mistakes, and in hand made maps, accuracy is low in drawing and editing.
- 2. The Cadastral Department's requirements for Cadastral documents and procedures to obtain Land Use Certificates are still time and resource consuming.
- 3. Institutions in charge of LUPLA are weak, lack qualified staff, receive insufficient funding, and coordinate and cooperate poorly.
- 4. There is no application of the Geographical Information System (GIS) system in land allocation to improve maping or to qualify and accelerate the process of obtaining Land Use Certificates.
- 5. Costs are estimated at 20.000 Vietnamese dong per ha

In 1999, the methodology was submitted for approval to the provinces of Lai Chau and Son La for large-scale application. The project will continue to support both provinces with training of staff in charge of implementation, and will continue to monitor the implementation and impact of the methodology in order to make suggestions for its improvement.

4. Practical Lessons and Constraints Related To Land Use Planning and Land Allocation

4.1. Practical lessons

Over past 4 years of LUPLA implementation in Yen Chau and Tua Chua districts, the following practical lessons and experiences have emerged:

- The LUPLA process is carried out primarily at the village level, since villagers have a manageable size and a clear social hierarchy; village level plans can then be aggregated to represent commune plans.
- LUPLA is carried out in unison for all kinds of land and not separately for agricultural and forestland.
- Local languages are used to explain the intentions, procedures and implications of the process, and local names are used during discussion to identify land areas.
- The local Cadastral agent is actively involved during the entire process.
- The villagers themselves, with the presence of Government officers, carry out identification of land plots.
- Land and forest management issues are addressed during the planning and land allocation process and forest land allocation to forest protection groups is encouraged.
- Training and capacity strengthening of local government agents with regard to all tasks involved is considered an integral part of the process.

4.2. Constraint Issues Related To Land Use Planning and Land Allocation

Security of long-term land use rights can be considered a prerequisite for promotion of investment in land use. Therefore, although there were almost no guidelines on agricultural land allocation, except decision No 64/CP, the pace of the allocation of agricultural land and issuance of land tenure rights in the form of the "Red Book" has been reasonably rapid, while allocation of forest land has been hampered by a variety of factors. The main problems and issues can be summarised as follows:

- Current land classification is not based on present land use but on the purpose for which
 the land should be used in the opinion of the government administration. This creates a
 conflict with current land use practices of rural populations in mountainous areas who
 have long been using upland areas on sloping land for agricultural purposes.
- Classification of forests as special-use, protection and production forests and subsequent subdivision of protection forest into very critical, critical and less critical zones does not relate well to the management requirements for each forest class. And so far no clear criteria or standards exist for the application of the classification system during the land use planning process.

- Land use planning has traditionally been a top-down approach in Viet Nam, with national
 targets being set for land allocation, forest protection, etc. and consequently being
 translated into targets at lower level. Since national targets are based on small scale
 national surveys and national strategies and priorities rather than on implementation
 capacities, they risk being overly ambitious with resulting pressures falling on the local
 level to implement more than can be managed. This results in rushed preparation and poor
 quality of implemented activities.
- Lack of coordination and cooperation among corcerned organizations resulted in insufficient information exchange and distribution of available geographic data that could speed up the LUPLA process and increase the quality of the associated documents.
- Current practice on forest land under protection contract for an annual fee of VND 50.000
 per ha has not encouraged farmer households because they do not obtain full land use
 rights and do not get permission to use forest products for fuel wood and construction
 purposes. This management scheme is neither economically interesting to farmers nor
 financially sustainable for the State.

5. Conclusion

Land Use Planning and Land Allocation are important steps to improve land management, however they are not enough to guarantee more productive and sustainable land use. LUPLA has to be followed by activities: (a) to improve practical land management; (b) to provide farmers with information and alternative land use options suitable to the local condition; (c) to improve extension, protection, land administration and legal services; and (d) to improve farmer's access to capital, input and markets.

Viet Nam has a unique opportunity to improve land management through the combination of land use planning and land allocation. After land allocation has been completed this opportunity will be gone and changes in land use and ownership will be much more difficult to implement. At present, Viet Nam has expressed a strong interest in completing a national LUPLA exercise. There should be an equally strong interest in achieving good quality results because of timing and funding investments.

Finally, it is important to understand that LUPLA is a long process. It needs a strong commitment to ensure that land use and land allocation records are kept up-to-date and comport with to acceptable quality standards. If they are not, the initial investments made in the process will be wasted within a short time and the potential for sustainable efforts to improve land management will be lost.

INITIAL EXPERIENCE IN FOREST ALLOCATION IN DAK LAK

Tran Ngoc Thanh Sustainable Management of Resources in the Lower Mekong Basin Project

1. Introduction

Participatory land use planning and forest land allocation are important programmes of Dak Lak province to contribute to adequate management and use of its natural resources. The first part of this report touches upon Dak Lak's forest resource situation in recert decadeds, its degradation and causes. The second part introduces Dak Lak's major forestry policies to improve the situation and to put forward orientation for future development. The third part highlights initial experience on trial forest allocation in Ea Sol commune, Ea Hleo district.

2. Dak Lak's forest resources and its current situation

Dak Lak is one of the four plateau provinces that have the largest forest area in the country (1,243,882 Hectares (ha))¹. Forests are one of the most important provincial and national natural resources. Forests in Dak Lak are valuable not only in terms of economic values and national defence, but are also of environmental significance.

Due to a number of reasons, the area of forests has decreased at a rapid rate in recert years. On average, annually Dak Lak loses 5000 ha in area and 1.32 million cubicmeter (m³) in volume (according to average statistics from 1991 through the present). The following reasons for this loss are worth mentioning:

- Population increase (natural and mechanical) led to increased demand for land for cultivation and other purposes (in 1975, the population of Dak Lak was 350,000; now it is around 1.7 million)
- Recent establishment of coffee plantations due to higher profitability has reduced forest area (as planned, coffee plantations woulld cover 70,000 ha, but already they cover 170,000 ha).
- Unsustainable exploitation (practiced by of forestry organisations, such as state-owned afforestation yards and forest product companies) does not decrease the forest area, but reduces the forest quality considerably (in 1991, rich forest covered 72,667 ha but now has been reduced to 36,260 ha. Similarly, in 1991, medium forest covered 396,385 ha but now has been reduced to 185,543 ha)².

In addition to the above mentioned causes, or visible phenomena, the following are also underlying reasons for forest loss:

¹ According to the 1991 report on natural forest inventory, and the report on forest protection and development programme to 2010.

² Exception from the draft report on forest protection for 1999 - 2010

- Forests do not have real owners (so far, forest management and protection are the responsibility of government agencies, without participation of local communities, and noone is certified to have the forest land use right)
- There is a lack of planning for adequate, scientifically valid and sustainable forest use.

3. Dak Lak current solutions for improvement of the situation

Adequate forest management, protection and use cannot be achieved by applying a single solution, but instead require co-operation from different programmes. Currently, the following programmes are being implemented in Dak Lak:

- Natural resource review for adequate management and use. In resert years, Dak Lak has been reviewing the status of its natural forest in accordance with Directive 286/TTg, dated 2 May 1997 by the Prime Minister. Aerial photography is being used, and after deciphering the photographs, data will be digitised to set up a data bank on forest resources.
- Forest development strategy for 2000-2010. This strategy includes orientation, solutions, and an action plan for the forestry sector as well as sustainable forest development.
- Renovation of organisation and managerial mechanism of state-owned afforestation yards in accordance with Decision 187/1999/QD-TTg, dated 16 September 1999 by the Prime Minister. The objective of this programme is to increase production and trade capabilities of the state-owned afforestation yards, to enable them to act as a key force in forestry production, technical service provision and forest protection.
- Carrying out Decision 245/1998/QD-TTg, dated 21 December 1998 on implementation of responsibility for state management at all levels on forests and forestry land, in order to decentralise management.
- Programme to establish forest on 5 million ha
- Implementation of forest allocation to local people as owners for 3 types of forests, and involvement of those people in forest development, protection and management.

This report focuses on initial results with forest allocation in Ea Hleo Afforestation Yard, Ea Sol commune, Ea Hleo district, Dak Lak province.

4. Initial experience with forest allocation in Ea Sol commune, Ea Hleo district, Dak Lak province

4.1. Introduction to Ea Sol commune, Ea Hleo district

Along Ea Sol commune, Ea Hleo district, is located 30 km northeast of the provincial centre the provincial highway 7 from Dak Lak to A Yun Ba district of Gia Lai province. This commune is classified as remote, belonging to the region III³. It is a poor commune with extremely difficult socioeconomic conditions.

³ According to Decision 42 UB-QD dated 23 May 1997 by the Committee of Ethnic Minorities and Mountainous Area, the classification into three mountainous regions is based on development levels.
Communes of the region III are the ones that in extremely difficult conditions.

Additional information about Ea Sol is as follows:

Natural area:	23,406 ha
Agricultural area:	4,033 ha
Forestry area:	14,520 ha
Number of households:	1,370
Population:	7,168
Population density:	30.6 people/km2

4.2. Plan on trial forest allocation in 1999

Throughout Dak Lak province, 7000 ha of forests were allocated on a trial basis to the local people in 1999. Of this areas 2000 ha belonging to sub-regions 1066 and 1068 were allocated from Ea Hleo Afforestation yard to local people of Ea Sol commune. Details about these two sub-regions are as follows:

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•	Natural area:	2,036 na
•	Area of natural forests:	1,668.6 ha, of which
	> Area of dipterocarp forests:	1,502.8 ha
	> Area of semi-evergreen forests:	121.5 ha
	> Area of evergreen forests:	42.8 ha
	Non-forest area:	369.2 ha

4.3. Organisation of implementation

In order to carry out the trial forest allocation, Ea Hleo Afforestation Yard is responsible for project development under direct supervision of the Dak Lak Department of Agriculture and Rural Development, specifically the Forestry Development Unit. In addition, the Forestry Advisory Group on forest allocation is assigned to assist and co-operate with the Afforestation Yard during implementation. Other involved institutions/individuals that give comments from time to time include:

At the provincial level:

- Department of Land Administration
- Department of Planning and Investment
- Department of Science, Technology and Environment
- Department of Justice
- Economic Section of the Provincial People's Committee

At the district level:

- District People's Committee
- Land Administration Unit

At the communal level:

- Communal People's Committee
- Land Administration officers
- Communal Forestry Committee
- Heads of villages and elderly people

4.4. Selection of target groups for implementation

Criteria for selection include:

- Community status: targeted groups include local ethnic people (who are in difficult
 conditions and practice slash-and-burn cultivation) and communal officers (who are given
 priority in order to create confidence for local people and take the lead for the people to
 follow later);
- Willingness of households to participate and ability to protect the forests;
- · Close proximily to forests
- . Easy access to the forests; and
- Consistency with planning of the Afforestation Yard and the localities.

Taking these criteria into consideration, 4 out of 13 villages and their communal officers were selected for the trial (Diet, Cham, Ta Ly and Kri villages), with 150 out of 351 households (41%) participating. Both bare land and natural forests were allocated to the households and they were given land use right certificates. Table 1 provides the status of forest lad allocation in the project area.

Table 1: Status of forest land allocation in the project area

Name of village	Total number of households	Number of households receiving forests	Percentage (%)
Kri	97	60	62
Diet	28	15	50
Cham	86	40	46
Ta Ly	127	22	17
Communal officers	13	13	100

4.5. Initial lessons learned

4.5.1. Co-operation between the Department of Agriculture and Rural Development (Forestry Development Unit) other sectors and local authorities (Department of Planning and Investment and Department of Land Administration)

Forests and forestry land are State assets but belong to different authorities administratively. Therefore, co-operation between different local authorities is very important.

In Dak lak province, three technical departments (Agriculture and Rural Development, Land Administration, and Planning and Investment) play important roles in the process. Clear allocation of responsibility and smooth co-operation between these departments are necessary to speed up the process, as are regular discussions to come up with consensus between different sectors. Officers involved should monitor the process from time to time, perform specialised functions and remain engaged until the end.

At the same time, it is important to obtain instructive comments from provincial authorities the District People's Committee, and particularly the Communal People's Committee and heads of villages .

4.5.2. Role of the Forestry Advisory Group on forest allocation

Forest land allocation is a complicated issue. The allocation of natural forests to individual households is new in Viet Nam and no province has yet done so. Since forest allocation in Dak Lak is being tested as a trial, the formation of a Forestry Advisory Group on forest allocation was necessary. The advantages of the group are as follows:

- Acts as direct advisor to the Forestry Development Unit on matters related to forest allocation
- Is able to bring together different sectors and local people to participate
- Is able to study in-depth aspects related to forest allocation
- Facilitates dialogues between different sectors and local authorities for consensus
- Supervises the process to draw lessons learned and document these lessons
- Provides information, applies experiences from other places, and facilitates information exchange
- Involves support from SMRP in the programme

4.5.3. Involvement of local people and their expectation

The involvement of local people is important and is a decisive factor to the success of the programme. Party and Government policy is to ensure benefits for citizens, and participation of the local people ensures their real ownership. The beneficiary policy of the Government is in line with people's expectation.

The way local people participate is varied. It is therefore necessary to apply approaches that are appropriate to specific local conditions, local customs and awareness levels of the local people.

When receiving forest allocations, local people expect:

- a certificate on land use right (original right);
- a forest management and protection card;
- protection from the Government over their forest ownership; and
- a clear and specific beneficiary policy.

4.5.4. Budget and time frame

- Forest allocation necessitates financial support from the Government (in Dak Lak, the rate is 50,000 VND/ha). This support should be included in the annual plan as an action point for the Afforestation Yard.
- Forest allocation is a time consuming process due to the need for discussions with local people and comments from local authorities and different sectors concerning implementation. It is therefore necessary to institute time frame planning (in Ea Hleo, the process required about 6 people over a period of 12 months for implementation).

4.5.5. Recommendations for improvements

- People's expectation is to have a certificate on land use right when they receive their forest
 allocation, but no such a certificates have been issued. Land Administration authorities
 should therefore work out appropriate, technical and administrative solutions. This would
 require financial capacity, time and human resources.
- When forests are allocated, local people should be supported financially and technically so that they can make the best use of the forests.
- Different forest allocation modalities should be studied (individual, household, community and private sector-based) for different types of forests (production, protection or special use forests), so that the modalities are appropriate and costs are, kept to a minimum, while effectiveness is maximized.

DISCUSSIONS AND CONCLUSIONS

1. Discussion Topics

The workshop was carried out over two days with group discussions on the issues presented occurring on both days. At the end of the workshop, a plenary discussion session was held to prioritize forest rehabilitation issues to be addressed in the near future (the workshop agenda and list of participants are presented in Annex I and II, respectively).

1.1. Discussion topics of day 1

- 1) What policy changes could be required to promote biodiversity conservation and rehabilitation?
- 2) What planning mechanism could be used to balance local-level needs with regional-level needs for development and conservation?
- 3) What forms of people's participation could be useful and supportive for practical implementation of forest rehabilitation in Viet Nam?
- 4) Based on consideration of questions 1 to 3, what are the major priorities to be addressed in the near future?

1.2. Discussion topics of day 2

- 1) How can the options for forest rehabilitation given by Dr. David Lamb be put into practice in Viet Nam?
- 2) What policies and practical measures are needed to effectively carry out participatory land use planning and land allocation?
- 3) What are the conditions needed to encourage both local communities and the forest industry to become more active in forest rehabilitation programmes?
- 4) What are the major priorities in forest rehabilitation to be addressed in the near future?

2. Discussion Results and Recommendations

Results of group discussions on the above-mentioned topics and recommendations of the plenary discussion are presented in the following table.

Summary of discussed issues and recommendations of the workshop Hoa Binh, 4th 5th November 1999

Achievements	Constraints	Recommendations/Solutions
1. FORESTLAND AND FOREST ALLO	CATION	
 7.7 mil ha of forestland has been allocated to organisations and households. Land use right certificates are often given when forestland is allocated to facilitate investment into, and development of forests. Many pieces of legislation and regulations guiding the implementation of land allocation have been promulgated. Contracts have been signed between local people and governmental forest management organisations concerning management and protection of some areas of protection and special-use forests. 	 The current process of forestland allocation is slow. The current land classification system is not appropriate. Land and forest allocations have mostly been carried out on maps, rarely on the field, so boundaries have not been clearly identified creating disputes among land use owners. There are still gaps in legislation for forestland and forest allocation. There is no database management system for land allocation and equipment for implementation in the field. There is a lack of funds for land allocation in the field. There are still overlaps of functions and responsibilities between forest protection units and Cadastral organisations in land allocation. Capacity of staff, especially field staff, is still, weak for effective land allocation. Land and forest allocation is still considered too work to be done according to plans; there is little local participation. Little attention is paid to local customary practices, culture and history or gender aspects. Investment in forestry is not yet closely linked with the process of land allocation in order to effectively use allocated land. Much of that land therefore, is abandoned, fallow or has low effective use. 	 Promote land and forest allocation with attention to mapping works. Use GIS technology and maps with a scale of 1:5000 in forestland and forest allocation. Issue specific guidance for the application of regulations and decisions concerning forestland and forest allocation. Land classification, planning and mapping need to be done in detail after forests have been inventoried. Clearly identify functions of organisations responsible for land allocation; develop and test land allocation techniques in the field. Increase investment (funds) for land allocation. Forest land allocation planning should be done using a bottom-up approach with participation of local people and authorities. Promote training of cadres who work on land allocation, especially field staff. Attention should be placed to gender aspects of land allocation to ensure equity for women of ethnic minorities. Develop and implement policy based on customary practices of ethnic groups to allocate land to communities and pedigrees. Develop and implement appropriate investment policy to ensure effective land use.

Achievements Constraints Recommendations/Solutions 2. FOREST PLANTATION AND REHABILITATION Continue to identify species structures appropriate · The government considered forest Low investment into forest plantation and for typical sites of ecological regions. plantation and rehabilitation as a high regeneration. Little attention paid to matching priority activity for its socio-economic species to site. Promulgate benefit-sharing policies encouraging development strategy. This is reflected in Lack of an appropriate benefit sharing policy for local people to participate in plantation and the implementation of Programme 327 protection of forests, especially protection and plantation of protection forests and forest (1993 - 1998) and the 5MHRP (1998-2010). special-use forests. protection. · A national protected areas system with a · Investment is erratic and not comprehensive Develop attractive and stable investment and credit total area of about 2 million ha has been policies in order to promote different parties. (lack of attention to infrastructure development, established especially farmer households, to participate in forest nurseries, seedling, techniques, protection and . The country's forest cover increased from plantation and protection. Credit should be conservation). 28% (1994) to 33.2 % (1998). The area of compatible with the size of allocated land; reduce Species structures for many important sites have the interest rates and increase levels and duration of natural and plantation forests increased not vet been identified; there is a lack of credit to comport with the forestry development from 9.3 million ha (1993) to 10.9 million ha silvicultural techniques for plantation of many (1998). Forest cover rapidly increased in cycle. indigenous species. The quality of plantation some provinces such as Tuyen Quang forest is low and growth is poor. Increase investment levels for research on (increased by 10%) and Yen Bai (increased improvement of silvicultural techniques in forest Forests in many places have no real owners: the by 6%). Watershed functions have been regeneration and plantation. relations between forest owners and other main well restored, erosion has decreased, and Strengthen extension activities, improve transfer of organisations are not clear. the environment has been improved in modern techniques and technologies, and review · Illegal exploitation, encroachment into forests, some places. and disseminate effective agro-forestry and and shifting cultivation are still observed in many . The donor community (UNDP, FAO, WB, sustainable forest management models. places. ADB, EU, Sweden, the Netherlands. · Development of production forest should be Many plantation forests have no market. Germany, and Japan) has sponsored accompanied by the creation and development of plantation activities significantly markets. contributing to the increase of the forest cover mentioned above. · Many effective agro-forestry models have been developed.

3. FOREST PRODUCTS AND MARKETS

- Forest plantation has step-by-step been closely linked to the building of forest product processing establishments, encouraging foreign investors to invest in processing of major forest products and utilisation of materials exploited from plantation forest.
- Small-scale paper pulp and chip board processing mills have been established in districts. Investments have been made into improved processing of bamboo, rattan, and pine-oil and making art handicrafts from wood.
- A sustainable forest management programme has been developed and implemented. A forest certification programme contributing to protection of the quantity and quality of existing forests has also been developed.

- There is a lack of modern processing technologies; the value of forest products is still low. Currently, the main forest product processing technology in Viet Nam is the pulp technology. (In this pilot stage, board-processing technologies are being tested).
- The system of information on market prices of forest products is still poor and does not fully cover all necessay aspects.
- Forestry planning is not yet closely linked with investment into markets for forest products.
- There is a lack of a marketing strategy and marketing capabilities.
- There is a lack of regional planning for materials and markets for forest products.

- Clearly identify and create markets for NTFPs and plan processing for market-oriented forest crop structures.
- Develop policies to support the consumption of forest products produced by local people or to create markets for forest products.
- Attention should be paid to the links between raw materials and products. Therefore, there is a need for planning and zoning of forest products in forest plantation and rehabilitation.
- MARD should pay attention to the forest product staff system of the entire country and planning should go one step ahead to lay a clear foundation for people to participate in plantation.
- Pay attention to training staff working in the forest product market, and support service organisations supplying forestry units and farmers with forest product market information.
- Improve capacity of staff and technologies in forest product processing.
- Use of raw materials exploited from plantation forests is new to local people; there is a need to guide them to use plantation forest products instead of natural forest products.

Achievements	Constraints	Recommendations/Solutions
4. FORESTRY POLICY		
 Many regulations and pieces concerning the legislation of forestry sector have been promulgated and their implemention guided to encourage economic and collective units and individuals to participate in forest protection and development. Other policies and measures related to forestry, such as policies on resettlement, poverty alleviation, and rural development in 1,500 highland communes, have been synchronously implemented in order to support the protection of forests. 	 Forestry policies are unstable. Overlaps, lack of harmonization and low feasibility still hamper forestry policy (327, 475, 556/TTg., 02/Cp and now 661/TTg). Investment policy is unstable and incompatible with the scale and demand of forest rehabilitation and forestry development. Benefit-sharing policies are not in line with forest development, thus, they have not yet promoted the active participation of local people. There is a lack of specific guidance on the implementation of regulations (for example Decision 245, 168, investment for infrastructure development in silviculture). 	 Refine the policy system to make it appropriate to the practice and to the needs of local people. Develop policies on responsibilities and interests of forest owners of each type of forest. Refine policies on benefit sharing for forest owners and people participating in forest development, management and protection. Develop policies for forestry staff at local levels and field forestry staff. Promulgate documents guiding the implementation of forestry policy, review and assess policies in order to supplement them as necessary and eliminate inappropriate documents and policies. Develop a network on propaganda and awareness raising for local people on policies and regulations.

Achievements	Constraints	Recommendations/Solutions
5. SCIENCE AND TECHNOLOGY		
 Investment has been made in research and application of sivilcultural techniques and development of agro-forestry models. A system of forestry research and training establishments including research institutes, colleges and centres has been built. 	 Limited development of forestry science and technology in Viet Nam does not meet the requirements for industrialisation and modernisation of the country. Species for each site have not been carefully identified. Low investment in scientific research means that it does not meet development needs of the forestry sector. Forest product processing technologies are out-of-date and inefficient. Capacity of staff from central to local levels, especially at the commune level, is still limited. The effectiveness of awareness raising and propaganda is still low. 	 Develop policies on continued training for forestry staff and attract graduates with forestry backgrounds to work in the forestry sector. Improve varieties and create new ones by applying biotechnology to cross-breeding, seedlings, and extensive plantation in order to increase the production of plantation forests; develop subsidy policies to provide existing seedling units with forest tree varieties. Apply modern measures in forest fire forecasting forest fires control. Apply biological pesticide management methods. Develop farming models on hilly lands typical for every region in order to replicate them throughout the country.

Achievements	Constraints	Recommendations/Solutions
6. INSTITUTIONS AND MANAGEME	NT	
 State forest enterprises have been reformed and many have been shifted from forest production units to forest plantation and protection units. Forest management has been initially decentralised to the provincial level with the aim to strengthen local authorities' responsibilities and power over forest management and protection. A forestry management system has been formulated from the central to local levels (supported by the department for Forestry Development at the national level and Divisions for Forestry Development at the provincial level). 	 With regard to state management, there are still overlaps between the Forest Protection and Forestry Development units (for example, currently, in many localities a part of protection forest is under the management of DARD, while Forest Protection units or SFEs manage other parts). There is a lack of local forestry staff, especially at the commune level. Collaboration and coordination between related parties is still poor. Mechanisms for management of forestry programmes and projects are complicated. There are gaps in funding and credit mechanisms. A forestry cadre system has been proposed (in Decision 661) but has not yet been realised. 	 Unify focal points in forestry management. Reform the apparatus, reduce overlaps, clarify functions and responsibilities of related organisations and units, and develop an appropriate executive mechanism. Forest protection forces should be constantly field-based. Develop special regulations for special-use forest protection forces because they are working in very difficult conditions lacking many resources. Strengthen local extension networks. Create good working conditions to attract more staff and graduates to work in forestry establishments. Develop investment policies for infrastructure development for remote communes because forests are mainly located in remote areas. Improve coordination in forest management and development. Pay attention to village and commune planning. Forest owners should take the lead in their work.

ANNEX I AGENDA

National Workshop on Forest Rehabilitation Policy and Practice in Viet Nam

4 - 5 November 1999 Hoa Binh, Viet Nam

Day 1: Thursday, 4th November 1999

Day	Time	Activity	Input by
1	08.30 to 09.00	Registration of participants	DFD and IUCN
	09.00 to 10.00	I. Opening ceremony	Chairman: Dr. Nguyen Ngoc Lung, Director, DFD
		Welcome and opening speech	Dr. Nguyen Ngoc Lung, Director, DFD
		Speech on behalf of IUCN	Mr. Andrew Ingles, Director, IUCN Forest Conservation Programme in South and Southeast Asia
		Speech on behalf of SMRP	Michael Gluck, SMRP
	10.00 to 10.20	Tea/coffee break	
		II. Technical session	Chairman: Dr. Nguyen Ngoc Lung, Director, DFD
	10.20 to 11.15	Forest rehabilitation policy and practices in Viet Nam.	Dr. Nguyen Van San, IUCN Consultant.
	11.15 12:00	Incentive policies for forest rehabilitation in Viet Nam	Hoang Ngoc Tong, DFD
	12.00 to 13.30	Lunch break	
	13.30 to 15.00	Formation of 2 working groups to address the topics presented on the first day	
	15.00 to 15.30	Tea/coffee break	
	15.30 to 16.50	Group work in 2 working groups (continued)	
	16.50 to 17.30	Presentation of group work results and discussion	
	18:00	Reception and Cultural show	

Day 2		II.Technical session	Chairman: Mr. Andrew Ingles
	08.30 to 9.00	 Overcoming tropical forest degradation: Whether to plant many species or just many seedlings 	Dr. Don Gilmour, IUCN Consultant
	9.00 9:30	 Participatory land use planning and land allocation: practical experiences in the Song Da watershed 	Ms. Nguyen Tuong Van, SFDP Song Da project
	9:30 -10:00	Initial experience in forest allocation in Dak Lak	Mr. Nguyen Hai Nam, SMRP
	10.00 to 10.200	Tea/coffee break	
	10.20 to 12.00	Group work in 2 working groups to address topics presented on the second day	
	12.00 to 13.00	Lunch	
	13.00 to 14.30	Group work in 2 working groups (continued)	
	14.30 to 15.00	Presentation of group work results and discussion	
	15.00 to 15.30	III. Conclusion session	DFD and IUCN
		Summary of the workshop results	
		Follow up action	
	15.30 to 17.30	Visit to a natural regeneration forest	Man and the first of

ANNEX II

List of Participants

National Workshop on "Forest Rehabilitation Policy and Practice in Viet Nam" Hoa Binh - Viet Nam, 4-5 November 1999

No.	Name	Organization	
1.	Nguyen Ngoc Lung	Department for Forestry Development (DFD)/MARD	
2.	Vu Huu Tuynh	Policy Department (PD) /MARD	
3.	Ngo Sy Hoai	International Cooperation Department, MARD	
4.	Tran The Lien	Forest Protection Department, MARD	
5.	Hoang Ngoc Tong	Planning and International Cooperation Division, DFD/MARD	
6.	Cao Vinh Hai	DFD/MARD	
7.	Nguyen Kim Xuan	DFD/MARD	
8.	Pham Hoai Duc	DFD/MARD	
9.	Pham Minh Thoa	DFD/MARD	
10.	Nguyen Thi Ninh	DFD/MARD	
11.	Kim Kieu Anh	DFD/MARD	
12.	Nguyen Hoang Nghia	Forest Science Institute of Viet Nam (FSIV)/MARD	
13.	Nguyen Thuy Hai	International Cooperation Division, Forest Inventory and Planning Institute (FIPI)/MARD	
14.	Le Hai Duong	Committee of Ethnic Minorities and Mountainous Areas (CEMMA)	
15.	Bui Van Huy	Hai Phong DFD	
16.	Ha Tien Hung	Planning Division, Hoa Binh Service of Agriculture and Rural Development	
17.	Nguyen Van Dinh	Hoa binh Service of Agriculture and Rural Development	
18.	Bui Van Chuc	Hoa Binh DFD	
19.	Pham Thuy Duyen	Hoa Binh DFD	
20.	Le Quy Vuong	Ca Mau DFD	
21.	Vo Thi Xuan Hien	Binh Dinh DFD	
22.	Dao Ngoc Sam	Quang Ninh DFD	
23.	Ho Si Hong	Lai Chau Agriculture and Rural Development Service	

Government Office

Organization

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No.

46.

Nguyen Tuan Phu

Name

