

IUCN - The World Conservation Union

FOREST REHABILITATION POLICY AND PRACTICE IN VIETNAM

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1 November 1999

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PREFACE

The Vietnam office of IUCN has been expanding its programme during the past few years to cover a wide range of conservation and development activities that are of interest to its members and partners. In addition, the country programme is connecting more effectively with IUCN's networks and Commissions throughout the South and South East Asian region and beyond. IUCN's global Forest Conservation Programme has identified the rehabilitation of degraded forest ecosystems as among its major policy objectives, and has been seeking to pursue this priority in regions and countries where the issue of forest rehabilitation is considered important. The Commission on Ecosystem Management is also interested in the question of rehabilitation of degraded ecosystems. In late 1998 and early 1999 an overview study of forest rehabilitation experiences was carried out in the lower Mekong countries of Vietnam, Lao PDR and Cambodia. The study revealed that large scale forest loss and degradation had occurred during the past 50 years, and that there was strong interest in all countries to reverse this on-going trend.

The material presented in this report was used to inform the regional overview study, and has been updated and expanded to form the basis of broadening discussions within Vietnam. It is hoped that the material will assist the many interested groups and individuals in Vietnam to develop a greater understanding of the issues of forest degradation and loss, and the urgent need for the development and implementation of ecologically and socio-economically sound forest related policies and practices.

The original material was collected and collated by Dr. Nguyen Van San through library searches and discussions with government officials, project staff and aid agencies related to the forestry sector. Dr. Nguyen Van San and Dr. Don Gilmour were ably supported by Ms Nguyen Thi Yen, and all have shown great personal enthusiasm for the project and have made considerable efforts to produce this final report.

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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 understorey 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.

1. EXECUTIVE SUMMARY

Vietnam 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 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 eucalypts 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 require substantial technical improvement.

Interest is increasingly turning to obtaining environmental benefits (watershed protection and biodiversity conservation) from rehabilitation activities as well as economic benefits, 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 newly established 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 forest land to one that emphasises facilitation and partnership with local communities.

2. INTRODUCTION

During the decade of the 1990s, Vietnam 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 condition and trend in the country; reviews the way in which forest land 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.

3. TERMINOLOGICAL CONFUSION—RESTORATION, REHABILITATION OR RECLAMATION

While some degraded ecosystems are able to recover naturally, many are not, because of some limitation. 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)

4. FORESTS IN VIETNAM

4.1. General

Over 60% of Vietnam'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 land 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 been 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 Vietnam, 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, Vietnam has a very diverse forest flora. The main forest types are shown in Table 1.

Table 1. Classification of natural forests in Vietnam

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)

4.2. Status of forests

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

Table 2. Loss of forest cover in Vietnam (areas in thousand ha)

Region	Year	Total land area	Forest area	% forest cover

North	1943	11,575	5,500	47.6
	1975	11,000	2,200	20.0
	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	6,470	2,000	30.9
	1975	6,040	1,085	17.9
	1983	6,335	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.

It is clear that the area of forest has declined rapidly. Particularly the Northwest and the 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 Vietnam.

Forest land in Vietnam 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 forest land (Table 3).

Table 3. Forest cover on different administrative categories of forest land (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
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Source: MOF (1995a)

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
North west	2.58	22.6
North east	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
South east	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 (Table 5) (MOF, 1995), but the indications for the current decade are that this rate could be declining (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: 1000 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

5. 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 Vietnam'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.

5.1. Underlying causes

The underlying causes of deforestation and forest degradation in Vietnam are:

- **Rural poverty.** Rural per capita incomes in some parts of Vietnam 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 Vietnam 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 to improving forest land 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 suffer degradation. There is also a lack of dialogue between government officials and ethnic minorities about "local" perceptions of land tenure.

5.2. 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 have 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 biomass (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 much forest harvesting as commercial logging (World Bank, 1995).
- **Logging and illegal 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 Vietnam 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). In addition, during the three years 1997 to 1999, the Forest Protection and Railway sector reported 858 cases of illegally transported forest products transported illegally on trains. They confiscated 1,435 m³ of timber of all kinds, including 1,998 chopping-boards of *Burretiodendron hsienmu*, 5,870 kg of pine resin and 4,912 kg of wild animals (Nhan dan Newspaper, 30-8-99). Other important non-timber products extracted from forests include honey, wildlife (especially snakes, geckos and turtles) for food, 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 (GoV, 1995). 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. It is estimated that 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 (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 Vietnam 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 was used during the war. Large areas of southern Vietnam 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).

5.3. Summary of causes of forest loss

A recent attempt has been made by the 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 lost by zones in Vietnam (percentage)

Zone	Over exploitation	Shifting cultivation	Exploitation for agriculture	Free Migration	War	Exploitation for other purposes	Total (%)
Northern delta	12		17	41	9	21	100
North east	27	29	11	7	8	18	100
Central north	29	27	16	9	5	23	100
North west	11	36	12	11	3	27	100
North central	34	21	14	6	14	11	100
Central coast	28	17	11	9	29	6	100
Central Highlands	31	24	21	5	17	2	100
South east	29	15	13	9	24	10	100
Mekong delta	19	4	19	21	31	6	100

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 Vietnam have tended to focus on mitigating immediate causes and their direct effects, rather than seriously tackling the underlying, root causes. Vietnam'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:

- 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.

6. 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 the Ministry of Agriculture and Rural Development (MARD). 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).

In January 1994, the Prime Minister signed 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 or 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 leasing all lands to organisations, or 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 peoples' committees.

There are two main types of forest land allocation taking place: *first*, existing forests are allocated to households or other economic entities for protection on payment of a fee; *second*, degraded lands are 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 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 which 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, do 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 the 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 forest lands 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 attract farmers to commit themselves to effective plantation establishment and management on behalf of the government. In the cases of land allocated for protection of natural forests (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 in the second year for gap filling and VND 50,000 thereafter for protection. Amounts paid for initial planting and gap filling cover only about half of the actual costs.

Land allocation has not been equitable. Bigger farmers have obtained large tracts of land near the villages for protection or planting, while there is little interest in taking lands located far from the village, especially on the part of small farmers who 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 most policy relevant issue 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.

7. 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 had to be carried out in a diversified manner. The improvement of forest production include the strengthening of the production organisation, its management, as well as the expansion of the number 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 should, among other things, "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 Vietnam and an intensified war effort in southern region. The agricultural policy emphasised the cooperativisation of production in the uplands. Agricultural production should be intensified, and both food and "industrial" crop production was 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 the agricultural (watershed protection) and industrial production while increasing the production of timber and non-timber forest products.

Timber exploitation was restricted, however, by the 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 built on provincial and district levels (MOF, 1991).

Forestry activities were carried out in the state sector and under the authority of the People's Committee at local levels. 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 protective activities more than previously. The role of forestry production was not restricted to the construction of a socialist economy. 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

The economic crisis of 1979-1980 and the severe inflation in 1986 as the result of the centrally planned economy, led to the Sixth Party Congress in 1986 committing to a reform policy. However, it was not until 1989 that real renovation became firmly established.

Since 1989, the Government has 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 resulted in a rapid increase in agricultural production. In particular, rice production has risen rapidly and Vietnam 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 as well as 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). 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; Decision No. 801/QD-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 co-operatives, 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 (Guideline No. 24/1984; 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 Vietnam 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 Vietnam and put in place the guiding principles for forestry development. These were decentralisation and peoples 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 other mechanisms have been put in place to guide forest development and protection (including such things as forest land allocation) to try to achieve sustainable forest management (Nguyen Ngoc Lung, 1998a; Pham Hoai Duc, 1998). These include the Law on forest protection and development (1991); Land law (1993); Decree No. 02/CP (1994); Decree No. 01 (1995); Decision No. 327/CT (1992) and others (see Appendix 1 for details).

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 eucalypts and acacias) in order to increase the economic production from the land by "regreening 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.

8. 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 for the year 2000 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 six 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.

9. 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 greening of bare lands; its follow-on, the 5 million ha Programme, and the Fixed Cultivation and Sedentarisation Programme.

9.1. 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 move 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 tax, 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 which 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 target of plantation establishment and maintenance 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):

- Forest assignment 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.
- Forest plantation: 1,386,618 ha, of which new plantations accounted for 638,500 ha, and natural regeneration 748,118 ha.
- 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.
- 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, plough virgin soil: 24,900 ha).

9.2. 5 million ha 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 economic 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).
- One million ha of natural regeneration with enrichment planting in suitable areas.
- One million ha of new forest for protection purposes in critical regions (such as water catchments, coastal eroded areas or areas needing urgent ecological restoration). Efforts will be concentrated on northern mountainous areas of low forest cover and central regions which are flood prone.
- Production forest (3 million ha).
- Two million ha of industrial forest plantation with major species consisting of acacia, bamboo, pines and eucalypts, with some special purpose and high value species.
- One 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 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 are to be

carried out "...in public to ensure democracy at the grass roots level".

9.3. 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 increase incomes and living standards of minority people living in the mountainous areas. The main way to do this is by providing 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 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, agro-processing 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 Peoples' 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 providing 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.

10. RESULTS OF FOREST REHABILITATION ACTIVITIES

10.1. Technical approaches

Vietnam 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.

Two basic approaches can be taken to forest rehabilitation—reafforestation and natural regeneration. There can be a gradation between these two approaches depending on the regenerative capacity of the site and the level of human input. If natural regeneration does not provide sufficient cover, it can be supplemented by low levels of planting, maybe as low as 500 trees per ha, in order to expedite the regeneration process (Nguyen Ngoc Lung, 1998b).

10.2. Physical achievements

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

- **1955-1975:** A total of 219,290 ha were 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: Government budget, loan, WFP and other foreign donors' support, private sector and people.

A discussion about tree planting and forest rehabilitation in Vietnam 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 until 1990, 400-450 million trees were planted annually and since 1991, 350 million trees were 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 their use for fertiliser. Plantation forests and scattered trees also contribute to conserving biodiversity and providing environmental services. From 1955 to 1993 a total 3.77 million ha were planted (Table 8). However, it should be noted that these figures do not take account of plantation areas that failed or have been harvested. Estimates given by MARD (1996c) indicated that the actual area of plantations in 1995 was 1.05 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)

It should be noted that, although Table 8 indicates that more than two 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 area of plantation across the country at the end of 1997 was about 1.37 million ha. With the increased emphasis on rehabilitation in forest policies in recent years, plantation forest has increased in all ecological zones including watershed and special-use 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)

10.3. 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 ha per 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, but the potential of plantations to meet future demands for industrial timber and fuel wood is substantial. The government considers that forest plantations are 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; 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.

11. 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. Vietnam'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, *doi moi*. 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 two 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 wide spread 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 has been the major vehicle to deliver this policy.

The 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 of the SFEs (in terms of their organisation and management) has been clarified by the Prime Minister's Decision 187/1999/QĐ –TTg dated 16/09/1999. Without doubt, 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, the 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 forest land 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 at all correspond 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 to 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 these two approaches (i.e. the community and the government) to resource allocation and use together, 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 cheap to apply.

12. REFERENCES

1. Bui Minh Vu, Vu Hoai Minh and Nguyen Thi Thuoc, 1986. Problems in investment and purchasing policy related to collective and people's agroforestry production in Vinh Phu Province. Summary of Forestry Scientific and Technological Projects (1981-1985). Center for Scientific and Technological Information and Forest Economics, Ministry of Forestry, Hanoi.
2. Do Dinh Sam, 1998. Shifting cultivation and issue of sustainable forest management in Vietnam. (Đu canh vùi vùn ở quốc lý rông bôn v:ng ẽ ViỐt Nam). National Workshop on sustainable forest management and forest certificates (Héi thố quéc gia vỒ quốc lý rông bôn v:ng vù chong chỒ rông). Thụnh phè Hả ChỖ Minh 10-13/2/1998. Trang 83-88.
3. FIPI, 1995. Report on forest cover and forest change processes from 1991-1995.
4. Fingleton, J. S. 1990. Report on forest policy and legislation. Forestry Sector Review, Tropical Forestry Action Plan, Vietnam. VIE/88/037. Technical Report No. 5, 58p.
5. General Statistical Office, 1996. Vietnam: trade in the open door time. Statistical Publishing House, Hanoi.
6. GoV, 1994. Biodiversity Action Plan for Vietnam. Hanoi, November, 1994.
7. Lamb, D. 1999. Rehabilitation of degraded forest ecosystems (draft manuscript).
8. Le Hong Tam and Nguyen Quoc Hung, 1991. Research priorities for sustainable land use in Vietnam.

National Seminar: 3-13 September 1991, Hoa Binh.

9. MARD, 1996a. Summary report on forestry development plan in period 1996-2000 and to 2010.
10. MARD, 1996b. Renovation of strategies for forestry development project. Vietnam case study: Development of the forests in a brief historical perspective. Hanoi, July 1996.
11. MARD, 1996c. Forestry in Vietnam: Country report. Paper presented in Ministerial meeting on forestry for continental South East Asian countries by Prof. Nguyen Quang Ha, Vice-Minister of Agriculture and Rural Development, Hanoi, September 1996.
12. MARD, 1997. Report on Master Plan, institution and management of special forest. Cuc Phuong, 11/1997.
13. MARD, 1998a. Evaluation report on technical issues of six-year implementation of 327 Programme, Hanoi, October 1998. (Bao cao danh gia ve ky thuat nghiep vu 6 nam thuc hien chuong trinh 327).
14. MARD, 1998b. Plan for implementation the 5 Million ha afforestation national programme 1998-2010. Hanoi, 1998.
15. MARD, 1999. Statistical data of agriculture, forestry and fishery, 1990-1998 and forecast in the year 2000. General Statistical Office, Department of Agriculture, Forestry and Fishery, Statistical Publishing House, Hanoi.
16. MOF, 1984. Guideline No. 29-CT-/TU/1984: Strengthening forest and land allocation, forest construction and the organization of agro-forestry. Agriculture Publishing House, Hanoi, 1984.
17. MOF, 1985. Agroforestry develops labour, land and natural resources potential. Agriculture Publishing House, Hanoi, 1985. (Vietnamese).
18. MOF, 1987. Agroforestry models in Vietnam. (mot so mo hinh nong lam ket hop o Viet Nam). Science and Technology Department of the Ministry of Forestry. Agricultural Publishing House, Hanoi.
19. MOF, 1991. Vietnam Forest Sector Review, Tropical Forest Action Programme, Hanoi.
20. MOF, 1995a. Vietnam Forestry. Agricultural Publishing House, Hanoi.
21. MOF, 1995b. National report on sustainable forestry in Vietnam.
22. MOSTE, 1998. Report on environmental status of Vietnam in 1998: Degradation status of forest resources. Volume 3. (Bao cao hien trang moi truong Vietnam 1998: Hien trang suy thoai tai nguyen rung. Tap 3).
23. Nguyen Khac Vien (Ed), 1975. Ethnographical data Volume 3. *Vietnamese Studies*, No. 41, Hanoi.
24. Nguyen Ngoc Binh, 1985. Agro-forestry models for different regions. In: Agro-forestry develops labour, land and natural resources potential. Agriculture Publishing House, Hanoi, 1985. 83-160 (Vietnamese).
25. Nguyen Quang Ha, 1993. Renovation of strategies for forestry development until the year 2000. MOF, Hanoi-1993.
26. Nguyen Van Dang, 1998. Policies, solution for forest restoration and development. *Forestry Journal*, Vol. 9/1998: 10-13 (ChÝnh s, ch, gi¶i ph, p @Ó kh«i phc vµ ph, t triÓn rng. Tp chÝ Lm nghiÖp, s¸ 9/1998. Trang 10-13).
27. Nguyen Ngoc Lung, 1998a. Forest management system and forestry policies in Vietnam. (H thng qu¶n lý rng vµ c, c chÝnh s, ch lm nghiÖp ¸ Vit Nam). National Workshop on sustainable forest management and forest certificates (H¸i th¶o quc gia v qu¶n lý rng bn v-ng vµ chng ch rng). Th¶nh ph¸ H¸ ChÝ Minh 10-13/2/1998. Trang 28-36.
28. Nguyen Ngoc Lung, 1998b. Science and technology issues in five million-hectare programme. *Forestry Journal*, Vol. 9/1998: 14-17 (Vn @ khoa h¸c-cng ngh trong d ,n trng m¸i 5 triu hecta rng. Tp chÝ Lm nghiÖp, s¸ 9/1998. Trang 14-17).
29. Nguyen Cong Tan, 1999. Forest area protection and selection of forestry tree structure in five million hectare programme. *Nhan dan Newspaper*-27/9/1999. (B¶o v vn rng vµ vic la ch¸n c- cu cy lm nghiÖp trong d ,n trng m¸i 5 triu ha rng. B, o Nhn dn-27/9/1999).
30. Pham Dinh Huan, 1991. Initial results of social forestry activities in recent years in Vietnam. (Ket qua buoc dau trong viec phat trien lam nghiep xa hoi o nuoc ta nhung nam qua). *Forestry Journal (Tap Chi Lam Nghiep)* Vol. 29.
31. Pham Hoai Duc, 1998. Forest certificates with natural forest sustainable management (Chng ch rng v¸i vn @ qu¶n lý bn v-ng rng t¸ nhi¸n). National Workshop on sustainable forest management and forest certificates (H¸i th¶o quc gia v qu¶n lý rng bn v-ng vµ chng ch rng). Th¶nh ph¸ H¸ ChÝ Minh 10-13/2/1998. Trang 37-47.
32. Phan Nguyen Hong, 1994. Proceedings of the National Workshop on Reforestation and Afforestation of Mangroves in Vietnam. Organized by MERC & ACTMANG. Can Gio, Ho Chi Minh City, 6-8 August 1994.
33. SPC/UNDP, 1990 Report on the economy of Vietnam.
34. STRAP, 1995. National workshop on Strengthening Re-afforestation Programmes in Vietnam. Thua Thien Hue, Vietnam, 20-22 December 1994. FAO Regional Project Strengthening Re-afforestation Programmes in Asia (STRAP)/JICA. UNDP/FAO Regional Project, RAS/91/004 (FORTIP) (in Vietnamese and English).
35. STRAP, 1996. National Workshop on Strengthening Industrial Plantation Programmes in Vietnam, Pleiku, Gia Lai, Vietnam, 9-11 January 1996, STRAP Field Document No. 7.
36. To Dinh Mai, 1987. Reforms in forestry construction and development. Social Science Publishing House, Hanoi, 1987: 123-137 (Vietnamese).

37. To Dinh Mai, 1991. Organizing individual households for forestry development and effective forest land use. National Seminar: 3-13 September 1991, Hoa Binh.
38. Tran Dinh Dan, 1995. Strategy for greening barren lands and hills in Vietnam. A Paper Presented to the World Bank. 14p.
39. World Bank, 1995. Vietnam: Environmental program and policy priorities for a socialist economy in transition. Document of the World Bank. Report No. 13200-VN.

13. APPENDICES

Appendix 1. 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 25,00 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 person's 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 establishment Nam Cat Tien Nature Reserve with 35,000 ha.
9. Decision No. 65-HDBT dated 7 April 1982 on establishment of Mon Ray-Ngoc Vinh with an area of 10,000 ha.
10. Decision No. 85-CT dated 1 March 1984 on establishment Con Dao National Park with an area of 6,000 ha.
11. National Conservation Strategy (1985).
12. Decision No. 79-CT dated 31 March 1986 on establishment of Cat Ba National Park with an area of 15,200 ha.
13. Decision No. 194-CT dated 9 August 1986 on establishment 73 Natural reserves of which is Cuc Phuong, with an area of 769,512 ha.
14. Decision No. 801-QD dated 26 September 1986 by 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 (dated 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 Department of Science, Technology and Environment in provinces).
19. Vietnam 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 Council of Ministers on implementation of forest protection and development law.
22. Regulation 18-HDBT dated 17 January 1992 by Council of Ministers on list of endemic forest plants and animals and protection and management.
23. Circular 1171-QD by Minister of Forestry Ministry (1992) on regulation of production, watershed and special used 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 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 plants species and animals.

27. Decree No. 130-TTg dated 27 March 1993 by Prime Minister on management and protection of endemic plant and animals.
28. Circular 1586 LN/KL dated 13 July 1993 by Minister of Forestry Ministry on Buffer zone of Nature Reserves and National Parks.
29. Land Law dated 24 July 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 (1994).
34. Biodiversity Action Plan for Vietnam (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 establishment Xuan Thuy Nature Reserve with an area of 7,100 ha.
38. Regulation 4991/KGVX dated 2 February 1994 on establishment Tram Chim Tam Nong with an area of 7,500 ha.
39. Government Decree No. 02-CP dated 15 January 1994 on forest land allocation to organisations, households and individuals for long term and stable use on 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 Forestry Ministry on strengthen of special used forest management and protection.
42. Decision No. 556/TTg dated 12 September 1995 by the Prime Minister on revising and supplementing Decision No. 327 of 15 September 1992 of Chairman of Council of Ministers.
43. Circular No. 04 NN/KL-TT dated 5 February 1995 by Ministry of Agriculture and Rural Development on implementation Decree No. 02-CP of 5 January 1995 by the Prime Minister.
44. Regulation No. 359-TTg dated 29 May 1996 by the Prime Minister on urgent methods for wildlife protection and development.
45. Official correspondence No. 2472-NN-KL/CV dated 24 July 1996 by Ministry of Agriculture and Rural Development on strengthening of 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 Implementation Organisation of the 5 Million Hectares Afforestation National Programme.
48. Decree No. 145/QD-TTg by the Government on management policy, utilization of PAM plantation forest.
49. Decision No. 245/1998/QD-TTg dated 21/11/1998 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 on the implementation of the Decision No. 661/QĐ-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. 187/199/QD-TTg dated 16/9/1999 by the Prime Minister on renovation of organisation and management of State Forest Enterprises

International conventions of environment and biodiversity

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.

Appendix 2. The main organisations involved in the forestry sector and their evolution

An understanding of the evolution of today's forestry administration can help to explain some of the institutional issues surrounding forest rehabilitation policy formulation and implementation.

The General Department of Forestry (GDF) was formed in 1961 from departments within the Ministry of Agriculture and placed directly under the control of the government. The GDF managed several forest enterprises which were engaged mainly in logging and reforestation activities. Other smaller forest enterprises were placed under the control of provincial governments. Both types of enterprises sold logs to wood industries under the control of the Ministry of Industry.

By 1968, The GDF had become more of an advisory body, while local authorities were given more power over forestry management. At the same time, many wood industries were transferred to the GDF. A parallel organisation of "People's Forest Protection Units" was built up at provincial and district levels. Activities at the local level were normally placed under the authority of the People's Committee at that level.

By the second half of the 1970s, decentralisation had progressed to the district level in most matters concerned with forest operations. This led to a fragmentation in the management of larger forest blocks that spread over several districts. Qualified manpower was often not available at the local level, so management standards declined in many places. The GDF was upgraded following the reunification of Vietnam in 1976 and became the Ministry of Forestry (MOF).

The Ministry of Forestry had eight operational departments as well as the Forest Inventory and Planning Institute (FIPI), the Forest Science Institute of Vietnam (FSIV), and a number of forestry unions and enterprises that came under direct control of the central government. At the provincial level, Forest Departments operated under the Provincial People's Committees, often connected with the agricultural services. Some forest enterprises were controlled at the provincial level. At the district level, Forestry Sub-Departments and district forest enterprises answered to the District People's Committees.

The dominating principle in the forestry sector had been that the direct responsibility for day-to-day forest management rested with provincial and district administrations, while MOF was responsible for providing technical support and a range of specialist services, such as forest research, inventory and education. In other words, MOF did not have general executive authority over the field units, mostly central or provincial forest enterprises, carrying out forestry operations.

At the ministerial level, this fragmentation of responsibilities led to a considerable amount of overlap between the various bodies and functions within the forestry sector. While some ministerial departments retained direct responsibility for field operations in the provinces, others, such as the FSIV and FIPI, became involved in what might be termed production activities. Forest administration from the central level of government was further complicated by the fact that other ministries, notably the former MAFI and the Ministry of Defence, were in control on considerable areas of productive natural forest and were themselves engaged in wood harvesting and processing.

At the local level, institutional fragmentation led to a considerable gap between national policies and local practices. Each level of authority generally develops its own localised policy priorities which do not always complement national development objectives. Policy interpretation varies, while policy expectations and targets do not always match the actual conditions, capacities and available resources prevailing in each area.

The complexity of the administrative structure was compounded by the fact that technical personnel in the field generally reported to both the provincial services (which in turn are responsible to the provincial leadership) and central ministries. This dual loyalty often further confounded the consistent application of national policies.

Even at the central level, the Ministry of Forestry historically had been given conflicting mandates. On the one hand, MOF was responsible for the administration and management of the forestry sector, including conservation. On the other hand, it was also responsible for forest production and commercial activities, which generated badly needed revenues. As a result, policy formulation and management, ostensibly the main functions of MOF, were given less emphasis than was placed on production.

No further profound reorganisation in the forestry sector took place until late 1995 when MOF was merged with the Ministry of Agriculture and Food Industries (MAFI) and the Ministry of Water Resources (MWR) to form a new ministry called the Ministry of Agriculture and Rural Development (MARD).

The basic unit of production in the forestry sector is the forest enterprise. As a result of new economic

policies, forest enterprises are now required to generate sufficient funds to support their operations. Disregarding national forest policies, some state forest enterprises, provincial and district organisations, and private companies continue to over-exploit natural forests. Sustainable forest management and its wider environmental, social and cultural benefits are often ignored by these groups.

At the same time, revenues derived from the exploitation of the remaining natural forests are used to fund research into watershed management, developing "special use" forests, national reserves, etc. In a market-oriented economy, the primary role of the central government is increasingly to establish and support an environment that facilitates reforestation investment, rather than being directly involved in the investment themselves.