

Forestry policies of selected countries in Asia and the Pacific

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FOREWORD

Issues of rural poverty, food security, environmental stability and sustainable livelihoods have increasingly influenced the evolution of forestry in the Asia and the Pacific Region in recent years. Concern has been mounting at both policy and popular levels about the need for forestry strategies and activities to combine the economic importance of forests and trees with their roles in social equity and ecological integrity. An effective contribution of forestry to sustainable development depends on the ability of the sector to reconcile tensions between environment and development, and to establish a real partnership with forest dependent people who in many countries are among the poorest and have been marginalized from the benefits of development.

In this context, forestry in Asia and the Pacific has undergone major reorientation which must be reflected in changes in forest policies. It is essential, therefore, to understand how forestry policies are responding to the growing and more complex demands being addressed to the sector. In particular what are the recent trends in national forest policies and what are the experiences of countries in adapting or reforming their policies in order to integrate economic efficiency with social equity within a participatory mode of development while maintaining environmental stability?

This was the objective of the FAO review of national forestry policies in Asia and the Pacific, which was carried out by the Forestry Policy and Planning Division of FAO's Forestry Department in 1991-92, in collaboration with the FAO Regional Office for Asia and the Pacific. The process started with a number of national experts who were invited to prepare country reports on the forestry policy of thirteen selected countries. This documentation was complemented by three national reports on inter-sectoral linkages.

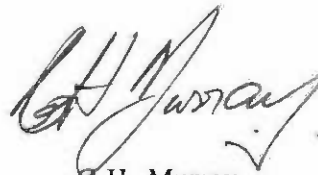
The process culminated in a Regional Expert Consultation on Forestry Policy Developments and Research Implications in Asia and the Pacific, held at FAO Regional Office in Bangkok in October 1992. This Consultation was also sponsored by the International Food Policy Research Institute (IFPRI) and by the newly established International Centre for Forestry Research (CIFOR), in order to link their programmes on forestry policy research to policy development issues emerging from the regional review.

This publication presents the edited concise reports and statements provided by the national experts on the occasion of the regional review and its concluding Consultation. The last chapter is a reproduction of the FAO/IFPRI/CIFOR synthesis of the results of the regional analysis and of the debates at the Expert Consultation.

In the process, the questions raised by the forestry policy experts from the Region included: how to ensure careful monitoring of forestry policies and to verify that they address the right issues and opportunities? If they do not, is it for lack of information or misinformation? Does the policy formulation process encourage consultations with, and involvement of, major interest groups, particularly rural communities and forest dwellers? How are forestry policies influenced by macro-economic forces and interactions with other related sectors? Do current policy instruments provide an adequate incentive framework within which to implement new policy orientations with effective participatory approaches, or do the traditional police oriented attitudes still prevail? What should be the focus and priorities of significantly increased policy research efforts?

Answers to these questions are not simple and they have to be developed in the national context. But what emerged clearly from the regional review was strong confirmation of the new focus of forestry in this Region and the existence of efforts and useful experiences in translating it into policy instruments. The process needs to be intensified and accelerated. National capabilities in policy planning and analysis, implementation and monitoring require substantial strengthening. This is fully in line with UNCED's Agenda 21 with its emphasis on capacity building. It is sincerely hoped that this important document will provide useful information as well as a basis for stimulating regional cooperation and international support which contribute meaningfully to such national capacity building.

The various papers which appear in this publication were edited and brought under consistent presentation by Ms. Yvonne Audrey Byron.

A handwritten signature in dark ink, appearing to read 'E.H. Murray', with a stylized flourish at the end.

E.H. Murray
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PART I

NATIONAL FORESTRY POLICIES

**Bangladesh
China
India
Indonesia
Laos
Malaysia
Nepal
Pakistan
Papua New Guinea
Philippines
Sri Lanka
Thailand
Viet Nam**

BANGLADESH*

1. INTRODUCTION

Population growth and rising living standards create demand for food and wood. Unplanned logging, encroachment on forest lands, and the slower growth rates and low yield of tropical high forests have caused great concern to forest planners. Forestry is faced with the challenge to increase the contribution of national forests to the economic development. This challenge can be met through the enrichment of existing forests, optimal use of marginal and wastelands, and the creation of new plantations of desirable, fast-growing species. At the recent Earth Summit, the environment, preservation of biodiversity and protection of forests were emphasized as essential for the maintenance of a healthy biosphere. A national forestry policy must address economic development, welfare of the people and preservation of the environment.

Bangladesh, a deltaic country, has a land area of 143,998 km² consisting mostly of low, flat and fertile land. It is one of the most densely populated countries of the world with a density of 756 persons per km² and a current population of 108.8 million growing at a rate of 2.18 per cent each year. The total cultivable land is estimated at 9.03 million ha giving a very low per capita cultivated land holding of only 0.08 ha. Agriculture is the mainstay of the Bangladesh economy and about 85 per cent of the population live in rural areas, below subsistence levels and with extensive underemployment.

1.1 Forest resources

Forests play an important role in maintaining the biological productivity of land, especially by water resource management and soil and water conservation. The total area of forest land in Bangladesh is 2.46 million ha, 16.85 per cent of the land area of the country. Forests are separated into three groups: those managed by the Forest Department, Unclassed State Forests and village forests.

Forest Department (FD) areas

Hill, mangrove and *sal* forests constitute the major forest types managed by the FD and cover 1.46 million ha. They differ significantly in structure and floristics. Hill forests - the tropical moist and wet evergreen forests - occupy 0.67 million ha in the eastern and north-eastern part of the country. Of this, about 90 per cent is termed production and the remainder is protection forests. Although about 400 different species are found to grow naturally in these forests, only a few are of commercial importance. In these forests, bamboo occurs as an understorey crop on about 0.13 million ha of the forests and is popularly known as poor man's timber. It is used for pulp and paper production and in construction of cheap rural houses and farm fencing.

Mangrove forests (0.67 million ha) are found on the acid sulphate soils of the deltaic region in the south and are locally known as the 'Sundarbans'. They are criss-crossed by many rivers, streams and natural canals. Because of salinity, to which the vegetation has adapted, the forest flora is neither varied nor rich in species composition. The timber is used for construction, boat building, poles, newsprint pulp and tannin. *Golpata* is used for thatch roofing in rural areas and honey production is also of local importance.

* This is the edited version of a paper presented at the meeting by M. Muzammel Hussain (Deputy Conservator of Forests, Forest Department, Dhaka, Bangladesh).

On the plains, *sal* forests, also known as moist/dry deciduous forests, consist of degraded *Sal* (*Shorea robusta*) with other deciduous and a few evergreen species. These tree species are used for posts, boat building, fuel wood and other constructional purposes.

The natural forests under FD management are unequally distributed and most lie in the eastern and southern parts of the country. The forest resource is very sparse in the north and northwest. About 76,000 ha of FD-managed forests have been encroached and put to uses other than forestry. The small forest area and the high incidence of encroachment and deforestation of the existing forests have resulted in degradation of the soils and water resources of the whole area. Further deterioration of the vegetation will create serious environmental hazards and desertification in the north.

Management of forests

The FD-controlled forests are worked according to management plans prepared for an administrative unit, i.e. Forest Division and are based on the local silvicultural characteristics. The Hill forests are worked under a clear-felling system followed by artificial regeneration with valuable species. The mangrove forests are managed under a selection-cum-improvement felling system with a felling cycle of 20 years. *Sal* forests are operated under a coppice system with a rotation of 40 years.

Unclassed State Forests (USF) are controlled by the Revenue Department and are not under scientific management. These areas, because of excessive over-cut and indiscriminate shifting cultivation, have been converted into tree-cum-grass savanna. The USF holds great potential for tree growing. The local tribes, in the process of shifting cultivation, clear and burn their annual food cultivation areas. The uncontrolled fires spread into reserved and adjoining areas. Attempts are being made to resettle these people and encourage them to adopt horticulture and permanent agriculture as a sustainable income source.

Trade and industry

Extraction and the timber trade in Bangladesh is mostly controlled by private interests. They enter into short-term (6-8 months) harvesting agreements with the FD after the annual felling coupes have been sold by tender or at public auction. In addition to the private traders, Bangladesh Forest Industries Development Corporation (BFIDC) and Bangladesh Chemical Industries Corporation (BCIC) are also engaged in timber and bamboo extraction and in wood and wood-based industries.

Supply and demand

The dense population exerts great pressure on the forest for fuelwood, construction timber and agricultural implements. At the same time demand for agricultural and pasture land is also high. These have resulted in the destruction and loss of substantial reserved forest areas. At present, demand for forest resources greatly exceeds supply, and the situation of deficit is likely continue into the next century based on FD figures, although the gap is expected to narrow.

It is therefore essential to manage the forests in a manner that is socially acceptable, economically viable and environmentally sound for the benefit and well being of the people. Concerted efforts by different government organizations must be directed at curbing forest loss, promoting reforestation, and conserving biodiversity and wildlife.

1.2 Government development strategies.

In an attempt to reduce the imbalance between demand and supply created by population pressure, scarcity of tillable land, etc., the FD implemented several projects between 1980 and 1992. In 1966, the mangrove afforestation programme was begun on newly accreted land created by devastating cyclones and tidal bores. With World Bank assistance, about 115,000 ha of mangrove plantations have been established along the coastline to develop a protective wall of trees. International concern about degradation of forests and the adverse effects on climate, soils, agricultural productivity and biodiversity led the government to undertake afforestation on 69,500 ha of depleted hill forests, including 52,000 ha of Unclassed State Forests up until 1990-91.

Forests cannot be managed in isolation from the needs of the people. The increasing call on forest land for wood, food, fodder and other essentials prompted Bangladesh to launch a massive forest extension programme, the Upazilla Afforestation and Nursery Project, involving participation of the local people. Activities under the social forestry programmes to 1991 include 6,000 ha of strip plantations, 8,500 ha of fuelwood plantations, 1,000 ha of agro-forestry activities, distribution of about 38 million seedlings and 2,800 village afforestation projects.

In 1989, the Forest Act of 1927 was rewritten to enhance the deterrent element for those illegally using the forests. Management plans for hill and mangrove forests were also revised to meet present-day needs.

Brick kilns consume about 23 per cent of the fuelwood produced in the country. The Brick Burning Control Act (1989) prohibited use of fuelwood in brick kilns. In addition, the government has also declared a ban on logging in the state forests except for extraction of top-dying *sundri* trees from the Sundarbans and a limited quantity of timber from Chittagong and Cox's Bazaar forests for supply of railway sleepers.

As part of the Tropical Forestry Action Plan, Bangladesh is presently working towards formulation of a national forest management plan. The objective is to prepare a framework for the protection and development of the forest resources in order to optimize their long-term contribution to sustainable forestry production, environmental stability and economic and social development.

2. FORESTRY POLICIES

If the present situation of over-cutting, illegal felling, encroachment and denudation of forests continues, if industry continues to view forests only as a source of raw materials and not as a renewable resource that needs to be improved and replaced, and if rural poverty forces the poor to cut trees without thinking of the future, then the existing forests of Bangladesh may vanish in a decade or two. Urgent actions need to be taken to replenish the diminishing resources. But this cannot be done in isolation from the people. A vested interest in afforestation and protection needs to be established to ensure cooperation. The National Forestry policy should reflect the needs of all users - local villagers, timber producers, farmers, politicians and environmentalists.

2.1 Development of forestry policy

Forestry policy development in Bangladesh dates back to 1894 when British India's first forestry policy was formulated. This policy emphasized the maintenance of forests in hilly areas for preservation of climate and physical conditions to protect the cultivated land in the plains from floods, siltation, soil erosion, etc. Little emphasis was given to the protection and sustainable management

of the forests. The policy gave preference to agriculture over forestry practices by proposing clearance to provide cultivable land.

Post-1947 Bangladesh was deficient in forest resources and the forestry policy was re-oriented in 1955 to place more importance on improvement of forest areas by creating plantations, improving timber harvesting, managing all forests under management plans, training forest personnel, sound management of private forests, protection and conservation of wildlife and improvement of their habitats.

A review of policy in 1962 intensified management to make forestry a commercial concern. Utilization of forest produce was to be made more efficient in order to reduce rotations and regeneration speeded up to keep pace with increased harvesting. Irrigated plantations, primarily to produce industrial wood, were to be included in new colonization plans and timber harvesting in Chittagong and Sundarbans further accelerated. Soil conservation measures were intensified both by the FD and the Agricultural Development Corporation as part of the water management programme which also included survey of the entire watershed, encouragement of cooperative societies for soil management, planting of fruit trees and elimination of goats from hill areas. Research on farm forestry was undertaken on fast-growing commercial tree crops for different ecological zones and also for shelter belts and windbreaks. Pilot projects for cultivation of trees in saline and waterlogged lands were also implemented.

The policies of the 1962 revision were quite suited to those areas in present-day Pakistan but in 1971 the newly established country of Bangladesh had its own priorities and unique conditions. The Government of Bangladesh (GOB) therefore declared a new and pragmatic National Forestry Policy in 1979 after a National Forest Conference in 1977 discussed management aspects in detail.

The National Forestry Policy of 1979

In formulation of the National Forestry Policy, several key areas were addressed to promote overall development of the sector and the country. These included:

- preservation of climatic and physical conditions;
- recognition of essential non-timber forest products such as food, fodder, fruits, fibrous raw materials and pharmaceutical products;
- conservation of soil, regulation of stream flows, reduction of the impact of storms and tidal surges, reduction of water and air pollution and maintenance of ecological equilibrium; and
- modern technology for afforestation, management practices and establishment and maintenance of game sanctuaries for preservation of wildlife.

To develop, maintain and preserve forests in the interests of ecological balance, the following policy statements were adopted:

- All forest land in the country shall be carefully preserved and scientifically managed for qualitative improvement.
- Government forests shall be designated as National Forests and shall not be used for any purpose other than forestry; and horizontal expansion of the forests shall be in the newly accreted lands in the coastal belt and offshore areas, and in the depleted hills of the USF and suitable *khas* lands.

Tree and timber wealth shall be increased by large-scale planting through mass participation and optimum extraction of forest products shall be undertaken to meet national requirements.

Measures for meeting the raw material requirements of forest-based industries from national forests and for setting up of new forest-based industries shall be adopted.

Utilization of forest products based on modern technology shall be ensured.

Research, education and training shall be organized so as to cater for scientific, technological and administrative needs of the forestry sector.

Measures shall be adopted for manning the forestry sector by properly trained personnel.

Relevant laws shall be adopted for the purpose of implementation of national forestry policy and the forestry sector shall be organized as a separate administrative unit of the government.

Steps shall be taken for conservation of forests for protection of the national environment and preservation of wildlife and for full utilization of recreational potentials of forests; and

Mass motivation shall be initiated through mass media and curriculum for primary and secondary education to arouse national interest and awareness in forestry, and technical assistance shall be extended to those interested in forestry.

Five-Year Plans

National Development Plans play an important role in the effectiveness of implementation of the National Forestry Policy. Since independence, efforts have been made to develop the forest resource base qualitatively and quantitatively. However, over-cutting of homestead and State Forests has continued because of pilferage, encroachment and pressures for fuelwood. On the other hand, the Chittagong Hill Tract forests were under-utilized because of poor accessibility.

The Third Five-Year Plan (1985-90) specified objectives and strategies to remedy this situation. State and homestead production of both timber and non-timber crops were encouraged by afforestation, reforestation and social forestry programmes using community participation, FD extension activities in forestry and agriculture and supply of low-cost seedlings. Reforestation in the government areas was strengthened with both long-rotation and fast-growing species. Short-rotation plants also protect more valuable fruit and timber crops in rural areas. Silvicultural and management operations were instituted to increase yields. Mechanical extraction and processing to more efficiently exploit the forest resources were expanded to meet demands for timber, fuelwood, fodder, rubber and raw materials for paper and other industries, but attention was also paid to protection of ecological balance. To improve the quality and durability of forest products, emphasis was to be given to wood processing, treatment, seasoning and standardization of finished products.

Objectives and strategies changed with changing political and economic conditions. The objectives set out in the Third Five-Year Plan were only partly achieved because of many constraints. Poor identification of problem areas, low participation of local people in forest establishment and protection, inadequate extension services and training of rural people, poor cooperation of local bodies and influential people and a lack of adequately trained personnel all contributed. As a result forest degradation, encroachment, pilferage of forest products could not be checked.

In the Fourth Five-Year Plan, the overall aim was to expand tree cover to provide a supply of forest products and preserve environmental quality. This expanded forest cover was to be achieved by

rehabilitation of denuded and degraded National Forests land and afforestation of all vacant public and private land using agro-forestry techniques and people's participation. Better management practices and organizational/institutional capabilities were to help production, harvesting and preservation of timber and forest products, the environment and biodiversity, as well as create employment opportunities. Integration of trees with farming and traditional land uses within homestead forestry was designed to meet the basic needs of the people. Effective demand management policies and wood conservation techniques should have also reduced the consumption of timber.

Analysis of past policies

The forestry policies formulated prior to 1979 were in the interests of the rulers at the time and did not consider local people's needs, the overall environmental conditions or the sustainable capacity of the forests. The concept of 'Bangladeshi national interest' had been applied in a narrow sense. In the Chittagong Hill Tracts and Sylhet, over-cutting occurred under the Expanded Regeneration Scheme, with revenue raising taking precedence over protection of forests, cultural aspects and tending operations. Forest dwellers or the people living in the vicinity of forests were considered enemies of the forests resulting in fast depletion of the resource.

The National Forestry Policy of 1979 addressed the needs of the local people, their involvement in forestry activities, environmental development through forest protection, social forestry and overall economic development based on forests and forest products. However, the environmental aspects need to be updated and further elaborated.

2.2 Principles and objectives guiding the Forestry Policy

Forestry plays a vital role in the sustenance of the poor, particularly the rural population. Forestry activities contribute nearly 3 per cent to the GDP and employ about 2 per cent of the total labour force. The revised NFP should be guided by the Bangladesh Constitution and the Earth Summit declarations to manage the forests to maximize economic development, meet the basic needs of the people and protect the environment. In brief, the main principles that need to be considered in policy formulation are increased employment opportunity and income, support for social welfare, promotion of socio-economic equality, participation of the people and private sector, improved technology, sustainable management and conservation of the ecosystem and species and genetic diversity.

The objectives of the NFP are guided by the basic needs of the population. Despite all the statements, forest management in the past has resulted in continued depletion, degradation, encroachment, transfer of forest lands for other uses, shrinkage of forest areas, destruction of wildlife habitats and severe depletion of the catchment areas and watersheds. To overcome these shortcomings, the basic objectives of the policy should aim to:

- increase productivity of forests in terms of wood and non-wood products;
- sustainably manage existing natural forests as a renewable national asset;
- involve village people in planting and managing woodlots, homesteads and farmlands;
- undertake a massive afforestation programme on all denuded and degraded public and private lands;
- manage protected areas primarily for conservation of ecosystems, wildlife and biodiversity;
- arrest deforestation and restrict transfer of forest lands for other uses;

- adopt agro-forestry practices and, wherever possible, mixed farming to improve economic benefits of forestry in rural areas;
- promote wood-based industries for primary and downstream products;
- rehabilitate degraded watersheds;
- increase efficient forest management and utilization of forest products; and
- create an atmosphere for full participation of the private sector, farmers and NGOs in forestry development.

The highest priority should be given to conservation of the present resource and restoration of the degraded and encroached lands. This could be achieved by providing sufficient trained personnel for effective scientific management of the forests. Because of population pressure and land scarcity, encroachment on forest lands has become a common phenomenon. These need to be recovered and restocked by modification of existing laws and the Forest Act.

Almost all the forest lands, particularly the plains land *sal* forests, are heavily intersected and intermingled with private and *khas* lands resulting in encroachment and illegal fellings. Immediate steps should be taken for demarcation and delineation of the FD's forest lands on the ground and managed under a multiple land-use concept for the maximum benefit of the people. All the existing forest division maps should be corrected and updated.

The communications system in the forest areas is far from satisfactory resulting in inadequate supervision, movement of staff and few FD visits to the forest areas. For proper management and particularly protection of the existing forest areas, transport and communication facilities have to be improved.

2.3 Policy formulation processes

The First Bangladesh National Conference on Forestry was held in Dhaka in 1977 to discuss a National Forestry Policy (NFP). It was stressed that all government forests should be designated and managed by the National Forest Service (NFS) and the forests should be managed in perpetuity with the objectives of producing goods and services for the benefit of the people. The NFP was adopted on July 8, 1979. It does not adequately address all the important aspects of forestry and, therefore, it needs revision, expansion and reformulation.

Main elements of the Policy

Land is a scarce commodity in Bangladesh. In the absence of a clear-cut land-use policy, the FD has to yield to pressures especially from private enterprises, corporations and other government organizations. Deforestation, faulty cropping patterns and other unscientific management practices cause severe erosion resulting in degradation of soils and seriously disturbing the environmental balance.

Current management practices can neither maintain supply nor meet the requirements of the people. Except in the Sundarbans (the mangrove forests), a clear-felling system is followed, and regeneration is by planting of seedlings or direct sowing. This system not only destroys the gene pool, but it also causes depletion of the land by erosion. The natural forests should be worked on a shelter-wood system and all depleted areas brought under tree cover by natural regeneration and enrichment plantations. The production and protection forest areas should be identified, demarcated and brought under scientific management based on modern technology. The existing management plans should be revised to address preservation and protection of flora and fauna, reversing forest depletion,

establishment of national parks and recreation areas, and designation of protection and production forests.

The mangrove ecosystem of the Sundarbans is fragile and dynamic so needs to be managed as a whole to consider production, hydrology, flora, minor forest products, and also its protective role in cyclones and tidal surges.

All the newly accreted lands along the coastal belt and off-shore islands offer a great scope for extension of forestry. Coastal afforestation programmes should focus on land consolidation and environmental protection as well as protection from the onslaught of cyclone and tidal bores. Existing plantations can be harvested when suitable but a green belt should be maintained for coastal protection. Traditional agricultural practices should be forbidden and a complete land-use and resource study made of the coastal area.

The Unclassed State Forests (USF) represent a great potential for expanding the forest area. Shifting cultivation is a common practice in these forests and is a major cause of degradation. To date about 50,000 ha of plantations have been established by government on USF land to provide raw materials for wood-based industries. Relocation of tribal people into these areas will provide a mechanism for providing them with suitable agricultural lands and amenities and allow their association with reforestation to share the benefits.

Social forestry can minimize the shortage of rural wood energy sources and wood supply. The primary goal is to improve land-use practices and replenish the village forests through people's participation in replanting roadsides, denuded land, etc. Social forestry also embraces training and transfer of technology to local people and others involved, and technical advice and assistance to *thana* nurseries. Women's involvement and establishment of an incentive system will assist success of social forestry schemes. Incentives include a guarantee of some benefit to the people, a sense of ownership, and the security of the rights of use of the forests.

Availability of trained manpower is a pre-condition for successful implementation of the development programmes. Outdated concepts of conservation need to be replaced in the context of development needs. Professional programmes are currently being upgraded and workshops, seminars and training courses are organized but all need expansion and support, as well as research back-up and trained instructors. Research emphasis should be more oriented to field needs and functions and applied/adaptive research. Transfer of technology and coordination between agencies and clients need to be developed.

As many as 500 private sawmills and wood-based industries are dependent, either wholly or partly, on forest products. Outmoded saws and training of the saw operators need to be modernized to minimize wastage in processing logs. Excess employment in mills, especially state-owned corporations, increases production costs. Alternatives to timber should be used where possible, thereby reducing the overall demand for wood as a raw material.

Minor forest products (MFPs) have received little government attention in the past, nor are they managed scientifically. MFPs such as *golpata* (*Nipa fruticans*), bamboo, rattan, *murta*, varieties of medicinal plants, honey and bees wax, fishes, shrimps and shells make a great contribution to the national economy. These products should be included in the priority list and an appropriate policy framed for conservation, management and plantation cultivation of MFPs. Emphasis needs to be given to infrastructure development, trained manpower and a participatory approach.

Siltation has become a major problem in the water supplies of the country. No policy for watershed/catchment management has been followed. All the watershed areas must be inventoried and specific projects formulated to bring those catchment areas under tree cover.

3. POLICIES OUTSIDE THE FORESTRY SECTOR

In Bangladesh, almost all sectors are in some way linked with the forestry sector. Those closely related include agriculture, environment, livestock, fisheries, tourism, industries, flood control and water resources. Some of them are complementary while some others are in conflict with forestry activities.

3.1 Agriculture

Agriculture in Bangladesh produces about 50 per cent of the national output and employs nearly 60 per cent of the labour force. Agricultural performance directly impacts on important macro-economic objectives like employment generation, poverty alleviation, human resource development and food security. An agriculture-led development strategy is therefore important in Bangladesh. During torrential rain, huge quantities of water-borne silts and sands cause tremendous damage to the agricultural land close to hill forest areas, thereby reducing the fertility of soil and productivity of food crops. This can be reversed if encroachment is strictly controlled by the government and emphasis is put on reforestation of the denuded hills.

3.2 Environment

The environment policy, adopted for the first time in 1992, is complementary to the forestry policy and stresses conservation, expansion and development of forests, arrest of forest depletion, conservation of wildlife and biodiversity, forestry research, development of wet lands and augmenting of tree plantation.

3.3 Fisheries

Fisheries play an important role in provision of food, employment and foreign exchange earnings. Fish production has been adversely affected by deforestation in the hills causing siltation in rivers and lakes. To earn foreign exchange, about 10,500 ha of natural mangrove forest lands in Chakaria Sundarban have been developed for shrimp culture by the private sector. Land-use and fisheries policies need to be coordinated in order to preserve the mangrove forest environment and regulate shrimp and marine fishery development by clearly defining private and public areas.

3.4 Livestock

Livestock plays a crucial role in agriculture as animal protein, draft power and a source of cash income for the rural people, as well as leather and leather products, hides and skins which are exported. Increasing livestock numbers have caused damage to the forests and regeneration areas such as strip plantations. Secure development, for both livestock and forestry, needs to be ensured.

3.5 Tourism

Tourism is a prospective growth area in which forests can play a vital role. Forests in the Sundarbans, Chittagong Hill Tracts, Cox's Bazaar, Chittagong and Sylhet are excellent tourist spots to attract visitors. To augment current facilities, the management and expansion of existing national

parks and wildlife sanctuaries are essential. In tourism development, forests should be adequately utilized without disturbing the environment and natural resources.

3.6 Industries

Land and labour are the two major resources of Bangladesh. Land is scarce; it cannot be expanded for agriculture or for forestry purposes. Therefore, the supporting role of industries is essential for economic development. This would, however, generate an increased demand for energy provided by timber. The National Energy Policy of 1980 emphasized use of fuelwood plantations in an economical manner. These objectives have not been met. Inefficient utilization and uncontrolled emissions of greenhouse gases have added to degradation of the environment. Environmental Impact Assessment procedures are necessary for industrial development and a compromise to balance development and degradation is needed.

3.7 Flood control and water resources

Planned utilization and efficient management of water resources is a key to effective changes in agricultural production and productivity in other sectors. The massive damage caused by run-off from monsoonal rains is aggravated by deforestation. The water catchment areas must be protected to prevent run-off, control the flow of silt into rivers and re-establish the water table and water storage.

3.8 Energy

Bangladesh's principal commercially exploitable energy resources consist of substantial reserves of relatively low-cost natural gas and limited hydropower potential. Over 85 per cent of the population live in the villages and depend on timber from village and state-owned forest. The problems of widespread deforestation have led to concern over traditional use of wood for fuel. Increased flooding, erosion, siltation and desertification in the north are all results. Implementation of afforestation programmes in the USF of Chittagong Hill Tracts, homestead and marginal lands can greatly help to reverse the situation.

3.9 Social welfare and rural development

As most rural people are poor and unemployed for some months each year (contributing to encroachment and illegal felling), the country needs productive employment and income-generating programmes. Participatory forestry programmes can help in this goal both in state-owned forests and on marginal land.

4. FORESTRY POLICY RESPONSE

Any policy needs to be coordinated with, and supported by, related sectors to achieve its goals and objectives. The strategies of the national development plans in key development areas have already been discussed. Important relevant issues include poverty alleviation, sustainable development, food security, nutrition and environmental conservation. To address the issue of poverty, a rural development plan needs to develop physical infrastructure such as roads, irrigation, drainage, production and employment. Social forestry holds potential for involving the poor in the rural economy and improving their position.

With the increasing demand for forest products, and direct and indirect benefits accrued from the forest, lands under forestry should be put to those uses which are commensurate with their capability,

to produce most and deteriorate least. To maintain sustainable forestry development, plantations need to be intensively managed for production as well as nursery operations. The Sundarbans, hill and *sal* forests must be protected from encroachment and managed sustainably for economic and environmental benefits. All denuded and marginal lands as well as watersheds need to be brought under tree cover and any forest land transfer should be compensated by plantation establishment. Encouragement of the use of non-forest products and FD management of sensitive lands, such as coastal regions, is necessary. The people should be organized and their participation in forest management activities be encouraged and ensured.

Food security is a prime, but unfulfilled, goal of the Government. Natural calamities such as drought, floods, cyclones and tidal surges greatly jeopardize the food production. Forests can play a significant role in mitigating the sufferings of the people and ensuring food security especially in the coastal zones by providing shelter against cyclones, tidal surges and flash floodwaters. The forests themselves are important sources of food - fish and crabs in the mangrove forests, animal protein, fruits, honey, etc. - especially for the rural poor.

Depletion of forests and watersheds adversely affects flora and fauna, biodiversity and genetic resources. Illegal logging, watercourse diversion, land clearance and poaching of wildlife must all be stopped. However inadequate staff, knowledge and institutional support in the FD are problems. The new environment policy and the Directorate of Environment will concentrate on protection and expansion of wildlife sanctuaries, national parks and protected areas. At present, there are 15 protected areas covering 116,152 ha, including 10 wildlife sanctuaries, 1 game reserve and 4 national parks, most of which are heavily degraded.

5. FACTORS AFFECTING POLICY FORMULATION

A forestry policy aims at providing the greatest benefit to the society as a whole. In formulating a sound policy, a wide range of physical, institutional, socio-economic and technological factors need to be considered. The favourable tropical climate of Bangladesh with abundant rainfall, mild temperatures and fertile deltaic soils offers good scope for forestry development. Average population density is 756 per km², the highest in the world, and 85 per cent of the people live in the rural areas and suffer from poverty and unemployment. Economic growth, employment and income generation in the rural areas are a must for the overall development of the country, as is improvement of productivity in agriculture and forestry.

Because of poverty and poor education, the population is generally apathetic towards the destruction of the forests. A public relations campaign needs to educate the people on the costs of such degradation in terms of their own livelihoods.

The institutional framework is the key to optimal programme implementation for economic development. Efficient mechanisms for increasing production and education are necessary. The use of appropriate and modern technology is required in forest management, development of the communications system, forest inventory and planning, and forest soils study and survey. Low-impact logging, extraction and transportation can only be achieved by new methods, while modern facilities and sufficient funding need to be provided for education and training of FD, public and private-sector employees.

A critical study of the NFP of 1979 indicates that the hopes for expansion and qualitative improvements expressed in the policy have not been realized for lack of implementation. Against the backdrop of limited land under forest, the vast USF area, which has become almost barren and denuded, was not effectively utilized for multiple purposes. The Chittagong Hill Tracts, with almost

half the natural forest, suffers from remoteness, difficult terrain and law and order unrest, all of which have inhibited effective implementation of policies. The traditional custodial approach of forest management practices has proved to be inadequate and ineffective. It is in this area of concern that appropriate and socio-economic research back-up for forestry management is required.

For successful application of policy guidelines several measures which need to be taken are: an understanding of the growth potential of forestry; consideration of inter-sectoral linkages; strengthening the inter-sectoral framework; augmenting need-oriented research activities; participation of NGOs and women; solution to political problems in the Chittagong Hill Tracts; allocation and establishment of effective use of sufficient funds; and establishment of effective monitoring and evaluation mechanisms.

6. POLICY IMPACT

During the pre-independence days emphasis was placed on revenue collection and, wherever necessary, release of forest land for agriculture. That resulted in over-cutting, shrinkage and depletion of the dense forests of the country. However, the NFP (1979) has had an impact on afforestation, forestry extension services and forest protection.

An area of 166,152 ha has been planted in the afforestation activities on the USF, newly accreted coastal land and denuded areas. The management of these plantations needs intensification in order to increase yields and survival. The afforestation activities, particularly in the USF, denuded areas and coastal belts, will reduce soil erosion and increase of the life-span of the Kaptai hydro-electric project and land stabilization in the coastal areas.

Prior to enunciation of the NFP (1979), forest extension services were limited to distribution of seedlings to the people at a break-even price for planting in villages and other areas. Since 1981, these services have spread over most of the country, particularly in the northern districts. Implementation of the Community Forestry Project and Forest Extension Project, and ultimately the Upazilla Afforestation Project, have aroused an awareness in the minds of the general public and represent a big step towards increasing tree coverage through people's participation. The otherwise lost, encroached forest lands are also being gradually brought under tree cover through agro-forestry practices. The marginal lands along roads and railway lines, which were left unused, are now available for strip plantations. This is not only helping to build the resource base, it is also contributing to environmental improvement and economic development in the rural areas.

Forests are being depleted at an increasing rate due to unauthorized logging, encroachments and pressure exerted by the huge population. Poor organization of the existing FD, indifference of the bureaucrats and institutional and legislative weaknesses have all contributed to the failure to achieve the goal of forest protection and preservation.

7. POLICY REFORMS AND CONCLUSION

Past policies have not responded to nor met the requirements of the people. Rural poverty has not been minimized. Foresters must shift away from merely applying silvicultural treatment to existing stands and plantations and must instead place new emphasis on development, investment performance and public accountability. Other disciplines such as ecology, economics and sociology need to be applied to forestry problems. Unless forests are seen as a valuable asset, and used to foster economic development and alleviate poverty, they will continue to be degraded and depleted.

7.1 Major lessons

In the past, policies have been formulated in isolation from the people and their needs to maximize production. Little consideration was given to environmental and social issues. With increasing pressure on land and forests, their value for non-timber uses have been realised - food, protection of environment, biodiversity and poverty alleviation. Forests are now accepted as essential to maintain and increase the productivity of agricultural land and provide employment. The present forestry policy has failed to achieve its goals because of poor recognition of the multi-faceted role that the forests can play in the economic growth of country. The policy itself was formulated hastily and did not adequately consider basic needs of production, protection and participation, diversified roles of forests, and direct and indirect benefits accruing from the forests. An extensive process of consultation with all interested groups is necessary for a fully effective policy. This will make the policy more acceptable and responsive to the needs of the people, and create a sense of participation and responsibility for implementation. Forestry is inevitably linked to many other sectors and cooperation is needed to prevent over-cutting, clearing, illegal settlement, conversion to agriculture and disturbance of environmental equilibrium.

7.2 Policy instruments

Appropriate instruments are of fundamental importance for effective implementation of a policy, otherwise it is merely a pious idea and the proposed techniques are only theories. The instruments that are essential and the factors that influence policy implementation are administrative reorganization, provision of personnel, authorization of finances, proper legislation, coordination and control of activities, and audit and review of results.

The present structure and size of the forest administration is inadequate to administer the policy. In designating forestry as a multi-disciplinary science, there is a pressing need for specialization in various fields of forestry such as management, nature conservation, social forestry and participation, extraction and marketing, forest industries, wildlife and recreation, forest education and training and research. To meet these requirements effectively, the existing FD should be split into at least three departments: Forest Resource Management Department; Social Forestry Department; and Nature Conservation Department. All should be adequately staffed by properly trained personnel at all levels.

The area of personnel management needs review to allow for consultation and participation of all levels of workers in decision making. A regular review process should be implemented to discuss work progress, problems and their solutions. Financial remuneration to foresters should be adequate and fair.

The directives of the forestry policy can only be translated into reality if adequate finance is made available to the sector. In the past development plans, this requirement has not been met. Government funding needs to be assured and regularly reviewed with some power given to those executing policies to spend funds as appropriate.

Proper legislation is one of the most important tools for implementation of the policy. It has been clearly spelt out in the NFP (1979) that 'Relevant laws shall be updated for the purpose of implementation of the national forestry policy...'. Except the Brick Burning (Control) Ordinance 1989 no new legislation has been passed. A new Forest Act is needed to support the NFP and also an environment policy to expand on the Wildlife Regeneration Act of 1973. Clear legislation is needed in the areas of deterrents to forest encroachers, increasing powers for forest officers,

regulation of timber and forest product movements, and regulation of establishment of sawmills and their activities.

In summary, it can be said that the NFP (1979) could not be implemented satisfactorily because of the absence of an integrated land-use plan for the whole country, lack of firm political commitment, population growth and land hunger, negative pressures from influential and interested groups, and indifferent attitudes of bureaucrats and the people towards forests and their role in maintaining the ecological balance.

7.3 Major policy issues

The main needs of the country are wood production, amenity and recreation, nature conservation, provision of employment and economic growth particularly in the rural areas, and protection. The forestry sector has not been able to respond for many reasons. The infrastructure and mechanisms to preserve and protect the natural and plantation forests, biodiversity, wildlife, environment and reserved areas have been inadequate. Coordination of efforts in social forestry have failed to encourage public participation. Inadequate forest and plantation management, out-dated methods of harvesting and processing and poor supply of raw materials to industry have all brought about degradation of resources. Little development in the areas of research, funding, skilled manpower, investment, and education and training contributed to a lack of success in establishing plantations, protecting the environment, providing employment and enforcing policy instruments. These issues all need to be addressed for successful implementation of any future policy.

7.4 Conclusions and recommendations

In the context of present-day social unrest, rural poverty and large-scale unemployment, both in urban and rural sectors, severe pressures will continue to be exerted on the forests. The following recommendations require immediate attention.

A new National Forestry Policy should be immediately formulated, addressing the present-day needs of the society and the nation as a whole.

The national forests should be clearly demarcated on the ground and managed under a multiple land-use concept for maximum benefit of the people.

To help build the forestry sector and remove inter-sectoral conflicts, other national policies for land-use, agricultural, fisheries and livestock, energy and industrial sectors should either be formulated or amended.

Importance should be attached to the recovery of encroached forest lands and the restoration of productivity, either through participatory or agro-forestry practices or both.

The denuded and depleted forests and watersheds of the important river systems should be progressively brought under tree cover, and all the areas clear-felled for timber production must be reforested on a priority basis.

The existing Forest Act, Wildlife Preservation Act, the transit rules, etc. should either be further amended or enacted, so that they become effective tools for implementation of the policy.

Adequate funds should be provided from both the development and revenue budget, if necessary reserving part of forest revenue, to safeguard the future production and conservation of forests.

The work load, in terms of the present-day diversified role of forests, should be assessed and a workable staffing pattern evolved; accordingly, the FD should be re-organized so that it can cater for the needs of the country.

- Forest extension services should be strengthened and expanded on a priority basis to spread the message of 'Forests For All' to villages and to launch a nation-wide motivational drive for tree plantation and conservation through active participation of the rural institutions.
- All the management plans should be reviewed, updated and re-written on the basis of the latest resource management systems. Management plans for coastal afforestation, participatory woodlot plantation and agro-forestry practices should also be prepared.
- Seed sources and planting stock should be improved by establishing seed orchards and future plantations should be raised on an end-use utilization concept.
- Research activities should be client-oriented and augmented to meet the needs of the forestry sector.
- Moratoriums imposed on logging in the State Forests should be withdrawn and at the same time the protection areas should be expanded.
- As a measure to create public awareness about forests, the mass media should be extensively used, and provision for inclusion of preliminary forestry in the primary and secondary school curricula should be ensured.

REFERENCES

- Bangladesh Bureau of Statistics, 1991: *Yearbook of Statistics*. Dhaka, Bangladesh.
- Government of Bangladesh, 1988: *The Constitution of the People's Republic of Bangladesh*. Dhaka, Bangladesh.
- Government of Bangladesh, 1992: *National Environment Policy*. Dhaka, Bangladesh.
- Forest Department, 1979: *Bangladesh Forestry Policy, 1979*. Dhaka, Bangladesh.
- Fernandes, W. and Kulkarni, S., 1983: *Towards A New Forestry Policy*. *First Bangladesh National Conference on Forestry Proceedings*, 1978.
- Gausson, H., 1954: 'Theories et classification des climats et microclimats'. *Proceedings of 8th International Botanical Congress*. Sect. 7, 8.
- Jerram, M.R.K., 1983: *A Text Book on Forest Management*.
- Osmaston, F.C., 1984: *The Management of Forests*.
- Planning Commission, 1985: *The Third Five-Year Plan*. Dhaka, Bangladesh.
- Planning Commission, 1991: *The Fourth Five-Year Plan*. Dhaka, Bangladesh.
- Pant, M.M., 1980: *Forest Resource Management*.
- Sharma, L.C., 1980: *Forest Economics Planning and Management*.
- UNCED, 1992: Press Summaries. United Nations Conference on Environment and Development, Brazil.

CHINA*

1. INTRODUCTION

China is a vast country of 9.6 million km² with a huge population of 1.13 billion. The geographic and climatic conditions vary from plains with intensive agriculture to mountainous regions which cover two-thirds of the total land area. Population pressure as well as the physiographic features of the country have led to soil and water erosion, shortage of farmland, poor transport systems and lack of fresh water. A wide variety of climatic conditions have created a great biological diversity. There are also frequent natural disasters; only the extent of damage differs.

As a result of the efforts over several decades, forestry in China has shown some improvement. Nevertheless, there are still a lot of challenges, and the situation is critical. The process of reform is essential for continued improvement.

1.1 The situation in Chinese forestry

Since the founding of the People's Republic in 1949, and especially after 1978, encouraging progress has been made in the field of forestry. A large development campaign was carried out in the vast State Forest areas in the northeast, northwest and southwest of the country and the Inner Mongolia Autonomous Region. A total of 131 forest bureaux have been created, which are mainly engaged in forest industries, concentrated on logging. Over forty years, 1.6 billion m³ of timber and large amounts of other forest products have been produced. To ensure the availability of Reserve Forest resources, 4,256 State Forest farms and 110,000 collective farms have been established across the country. In addition, with a view to preserving forest and wildlife, 383 nature reserves have been set up. Substantial progress has been made in the establishment of the 'three north' shelterbelt, the shelterbelt in the middle and upper reaches of Yangtze river and the coastal shelterbelt, as well as a greening-the-plain campaign. Efforts in integrated utilization of timber and the development of a diversified economy have also been successful. Chinese forestry has now become a sector with a comprehensive range of activities, from afforestation, silviculture, timber felling and transportation, timber processing and utilization to a diversified economy, forestry machinery and forestry science and technology. The forestry sector employs over 2.4 million people. By the end of 1990, some 31,011 million ha of plantation had been established and the forest cover had been raised from 8 per cent in the initial period of the People's Republic to the present 12.98 per cent. China's successful efforts in forestry have attracted world-wide attention.

However, Chinese forestry is still unable to meet the needs of national economic development or ensure the conservation of the environment and ecosystems - a situation which is critical. First, the standing volume of forest is shrinking. On the one hand, forested area is increasing each year and the forest cover keeps rising because of the major afforestation drive. On the other hand, the standing volume of forest, particularly mature timber forests and over-mature forests, is dwindling, largely due to the expansion of middle-aged and young forests and a large annual consumption of forest resources which exceeds the increment. Secondly, the input of funds to afforestation is inadequate, due to the scarce financial resources of the state and the irrational linkages existing in forestry production. For instance, the income derived from timber marketing and processing does not go back to reafforestation. The limited forest resources and the shortage of funds are interactive, to hinder the further development of forestry.

* This paper is compiled from three presentations at the meeting by Xu Youfang (Vice Minister of Forestry of China) Yang Yuchow (Director General, Department of Foreign Affairs, Ministry of Forestry, China); and Li Lukang (Deputy Director General, Department of Foreign Affairs, Ministry of Forestry, China).

2. REFORM: THE WAY OUT FOR CHINESE FORESTRY

While there are quite a number of reasons for the above problems, the crux lies in the original forestry economic system which does not encourage the development of forestry. Log production has long been seen as the key activity for State Forest regions, which are mostly engaged in single products, neglecting afforestation while paying too much attention to timber felling. In addition, poor integration of the functions of government administration with those of enterprises, excessive burdens imposed on enterprises, undue interference from the state and egalitarian practices are also critical problems in State Forest regions.

In the rural parts of China, farmers were restricted in afforestation activities, and received little benefit from forestry. Therefore they were reluctant to participate in forestry activities. Timber has been allocated according to a directive plan and sold at unreasonably low prices, without taking afforestation costs into account. This makes it difficult to carry out reforestation.

The management and supervisory system for forestry is not adequate, resulting in the ineffective enforcement of forestry law. The quota for felling is not implemented and, in consequence, illegal cutting often occurs. Within the management system, production, supply and marketing are often independent of each other, while responsibility, rights and benefits are separated, hence the failure in generating enthusiasm for afforestation activities in different quarters.

The problems have become obstacles to the development of forestry. In order to remedy the situation and revitalize forestry on the present basis, continued reforms should be undertaken. The general goal for the reform and development of forestry is to strengthen the productivity, increase forest resources and enhance the vitality of forestry.

3. PRESENT SITUATION OF THE REFORM DRIVE

Since 1978, important reforms have been carried out in the forestry sector and encouraging progress has been made which provides a basis for furthering reform. A clear distinction in ownership of hills and forests has been made between the state, collectives and individuals. Responsibility for afforestation on barren hills has previously been held by the state, with support given to the collectives and restrictions imposed on individual farmers. At present, joint efforts are increasing in mountain afforestation. Until now, 30 million ha of hills have been allocated to farmers, and 40 million ha distributed under the responsibility system. This policy states that those who plant trees shall own the trees and the hills, while jointly established plantations shall be shared by the partners. A new forest ownership system has developed under which, while the socialist public ownership system predominates, various private economic sectors exist. This is an attempt to gain full benefit from the advantages of different types of ownership.

Within the management system, more power has been transferred to enterprises in terms of personnel, funds and materials as well as production, supply and marketing. As a result, enterprises are becoming commodity oriented. Some State Forest farms have been transferred to counties and some 110,000 collective forest farms, which used to be owned by communes and production brigades, are gradually becoming independent accounting bodies, assuming sole responsibility for profits and losses. This represents a new type of collaborative economy. Various forms of contract systems have been applied to properly separate ownership and management. Consequently, the issue of egalitarianism is largely avoided.

A unified marketing and purchasing system in the collective forest farms in southern China has been replaced by negotiated purchasing and selling. In the State Forest areas in northeastern China, the state monopoly in products from thinning has been lifted. Apart from timber, efforts have also been made in the development of a diversified economy in a bid to support forestry with sideline production, and compensate long-term projects with projects which provide immediate benefits. At present, the value of non-timber products accounts for one-quarter of the total production.

This is the process of reform in Chinese forestry over the past ten years. However, internal economic relations have not yet been fully established. Continued reform and further research is necessary.

4. PROSPECTS OF FUTURE REFORM

In the light of the experiences of reform in other sectors as well as the characteristics of forestry, several policies and measures of reform are currently being implemented. Four cardinal policies are to be followed to expand and protect the forest sector:

- Concerted efforts are to be mobilized in an afforestation campaign to raise the national average forest coverage to 17.1 per cent by the year 2000.
- Forest fire, forest pests and disease and illegal timber felling are to be controlled thereby contributing to the conservation of existing forest resources.
- The timber-cutting quota will be the focal point in strengthening forest resource management. A new quota for felling has been in operation since 1991. During the period of the Eighth Five-Year Plan, a maximum of forest consumption is set at 24,360 m³ in an effort to keep the balance between growth and consumption.
- Integrated timber utilization is to be developed with a focus on the production of wood-based panels in order to make full use of the existing forest resources.

Reform will be continued in the following transition:

- from mainly engaging in cutting and utilising natural forests to the establishment of artificial plantations;
- from pure timber production to diversified forest-based production and integrated utilization;
- from extensive management to intensive production while placing great importance to science and technology and rational management; and
- from merely relying on the forestry sector to seeking involvement of the whole society.

The input to forestry, especially to afforestation, will be increased.

The application of science and technology in forestry will be promoted to boost forestry development with the Ministry of Forestry focusing on the development of the productive forces of forestry, increasing forest resources and the strengthening of the vitality of enterprises.

Contract responsibility will be instituted whereby production and supply of raw materials will be by contract with a duration of several years. Management of enterprises will be improved so as to provide a sound basis for development and to strengthen its vitality.

A stable source of funding for forestry development will be established. Financing will be part of overall planning, and be continuous. The existing procedures will continue, and a wide variety of sources tapped. Distribution is to be on a fair basis. The presently available funds for afforestation will be mainly invested in the establishment of timber production bases and in forest fire and pest and disease control.

A forest resources management system will be established and expanded at all levels, with the responsibility for the condition of forest resources lying in each province, municipality and autonomous region. From the Ministry of Forestry down to provincial forestry departments, county forestry bureaus and township forestry stations, the allocations of functions will be designed in order to enhance the management of forest resources. Special importance will be attached to the establishment of forest stations, the implementation of felling quotas and the supervision of quantity and quality of regeneration, maintenance and afforestation. At the same time, efforts will be made to strengthen the forest resource inventory system, improve methods and equipment for survey, establish a forest resource record and improve the system of forest resource statistics and reporting.

Extensive fund raising is vital to boosting afforestation and to increase forest resources. In recent years, financing of afforestation has been carried out in many regions and through eight channels and approaches: from the state, from banks, from local finance, from townships, from different sectors, from different institutions, from the public, and payments instead of taking part in the afforestation activities. For instance, Liaoning Province reallocated some Rmb Yuan 13 million from the water conservancy fund to assure the establishment of forests in mountainous areas in the east of the province. Funds from various sources have been reallocated to specific afforestation projects, showing the full involvement of society. Practice has proved that labour from farmers, funds from various sources and compensation from the state is a suitable mechanism for China to acquire inputs for afforestation. In addition, in accordance with the policy of reform and opening to the outside world, China has obtained financial assistance from international organizations and some countries, which has helped speed up the development of forestry in China.

5. CONCLUSION

Chinese forestry is in the process of reform, and is continuing to develop and broaden its base. Some of the practices in the reform are wholly Chinese initiatives, while others have been introduced from outside the country. Through the reforms, Chinese forestry will undergo a major change, and forest resources will steadily increase along with development of the forestry economy. All will greatly contribute to improvement of the ecosystem and development of the national economy.

INDIA*

1. INTRODUCTION

The first National Forestry Policy of India was enunciated in 1894. It sought to provide guidelines towards uniformity in management of government forests over the entire country. In 1952 the second policy took shape after independence in 1947. Its thrust was on increased production of forestry goods, while stressing its ecological relevance. The latest policy of 1988 seeks to re-orient the management principles, as a result of ecological degradation caused by relentless pressure on forests.

More than half of India is now wasteland, affected by problems of soil degradation and erosion. One-third of the area of Reserved Forests, two-thirds of the area under agriculture and the whole of the area under common privileges are degraded. Half of the total land area is under agriculture, 75 per cent of that depends on rainfall. Droughts and floods lead to massive soil loss. The forests in the country are insufficient, unevenly distributed and over 35 per cent is badly degraded and still suffering continuous depletion. The per capita forest area is only 0.11 ha, one of the lowest in the world. Legally constituted forests in India cover only 75.18 million ha (22.8 per cent) of the land area while tree cover exists only on 64.2 million ha (19.53 per cent) and closed forest accounts for barely 36.1 million ha (10.9 per cent).

The growing stock, even in the better forests, is much below the potential of the sites. The deficit for the most common domestic fuel, firewood, is 145 million m³ per annum. A significant proportion of the country's population of 400 million cattle depend on forests for grazing. Over half of the forest extent is wanting in natural regeneration. Ecological disaster confronts India and one of the major issues concerning the public has been the loss of forests. One of the most frequent causes cited is the reservation of forests 'for commercial interests and over-exploitation by forest-based industries'. These views are in some ways even reflected in the latest forestry policy.

1.1 Historical Background

Before 1850, shifting cultivation was a common practice, but at that time it was sustainable, with a small population and long cycles. By 1850 the population had risen to 200 million and the pressures had begun to be felt. The British continued with the earlier practice of declaring certain tree species as property of the government for collection of royalty and leaving the rest free for the people, to use or destroy. Even at this time, some areas were described by observers as denuded and rivers were no longer navigable.

In 1855 Lord Dalhousie, the Governor General, introduced the 'Charter of the Indian Forests' outlining forest conservancy for the whole of India. A government Forest Act of 1865 was the first attempt at forest legislation and provided for formulation of rules about preservation of tree growth, prohibition of fires, removals of natural produce and cultivation and grazing of cattle.

In 1894, a government resolution on forestry policy was published with the sole object of administration of State Forest as a public benefit. It broadly categorized the forests as: forests for preservation on climatic or physical grounds, and which fulfil the larger good of the community; economically important forests capable of producing large-sized timber; minor forest; and pasture land. The policy noted that the 'claims of cultivation are stronger than the claims of forest preservation' for all qualities of forest. Whenever agricultural land was needed to provide food for an increasing population, the forest area was to be relinquished.

* This is the edited version of a paper presented at the meeting by S. Shyam Sunder (IFS, Retd., India).

Until independence the demands for cultivation were satisfied through grants from the community areas. As demand for firewood, small timber, fodder and mulch increased with the size of the population, the community area for meeting it dwindled. The forests in the good rainfall belt, however, continued to flourish because malaria kept populations in check.

With independence and a population of 330 million, the main thrust of the government was on increasing food production, generation of energy for industrialization and conquest of diseases. All three, while necessary, had serious repercussions on forests. Until the late 1960s, food production was increased by extension of agriculture. Between 1951 and 1976, 43 million ha of tree-covered areas were cleared for agriculture. Irrigation and hydro projects involved clearance of good forests in valleys, while the eradication of malaria permitted widespread settlement. Reserve Forests were released freely when revenue lands were not available.

The Second National Forestry Policy of 1952 stated that the nation as a whole had a vast stake in the conservation of forests and identified the degradations caused by indiscriminate extension of agriculture. It stressed the intrinsic right of forest lands to fulfil both protective and productive functions. This enlightened policy was undermined by objectives of other sectors of the economy. Wholesale clearance for extension of agriculture continued in forest areas and in river valley submersion areas. It was presumed that forest was an inexhaustible resource.

By the early 1970s, the ecological effects were being felt with the incidence of droughts and floods increasing. The Government of India had by then reconstituted the Indian Forest Service in 1966 and, in 1977, amended the constitution to move forestry from the state sector to the concurrent list. Many states had enacted tree preservation acts to regulate tree felling in private areas. The Forest Conservation Act (1980) required national government approval before any Reserved Forest could be released or put to non-forestry use by the State. This cut the release of forests from an average of 154,571 ha per year between 1952 and 1980 to 14,351 ha per year between 1980 and 1987. Tree planting became a major developmental programme and social forestry programmes were encouraged as alternative sources of wood products to the natural forests. A separate Ministry of Environment and Forests was created, where previously forestry was a minor component of the Ministry for Agriculture. Rigorous guidelines for environmental evaluation of projects involving loss of forests were issued under the Forest Conservation Act.

The National Land Use and Wasteland Development Council was constituted in 1986 to take policy decisions on integrated land use, environmental protection, forest conservation, wasteland afforestation, etc. The Environmental Protection Act and Rules of 1986 specifically refer to areas with biological diversity, proximity to sanctuaries and national parks and environmentally compatible land use.

The National Policy of 1988 declared an environmental value of Rs 12.67 million (to accrue over 50 years) for one hectare of closed forest (previously it was nil). Very few development projects involving release of forest could justify implementation on a cost-benefit criteria using these figures. The ecological situation of the country has resulted in a policy totally biased in favour of ecology and conservation of forests. Its success is still to be assessed.

2. FORESTRY POLICY

2.1 Principles and Objectives

The 1988 National Forestry policy set out nine basic objectives on environmental issues as well as forest maintenance and preservation. The principal aim is stated to be environmental stability and maintenance of ecological balance achieved through implementation of the enunciated objectives:

- Maintenance of environmental stability through preservation and where necessary restoration of the ecological balance that has been adversely disturbed by serious depletion of the forests of the country.

The policy aims for a **minimum** of one-third of the total land area under forest, with two-thirds of that in mountainous areas. This goal was prompted by serious ecological disturbances in the form of floods and droughts. In 1988, 12 of the major states out of 25 had less than 20 per cent forest land, while in 6 of these, it was below 10 per cent.

- Conserving the natural heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna, which represent the remarkable biological diversity and genetic resources of the country.

India is one of the world's top 12 mega-diversity countries including habitats from coral reefs to alpine meadows, and rain forests to desert scrub. India is also a signatory to all major international conventions on conservation of areas and species. The Wildlife Action Plan of 1983 set up 10 biogeographical zones with 368 sanctuaries covering 105,310 km² of forest and 66 national parks extending over 33,929 km². The core areas of these are closed to departmental working though it would be difficult to assert that they are free from biotic pressures.

- Checking soil erosion and denudation in the catchment areas of rivers, lakes and reservoirs in the interest of soil and water conservation for mitigating floods and droughts and for the retardation of siltation of reservoirs.

India and Bangladesh account for 70 per cent of the flood damages in the world, and while more than 50 per cent of the land area is arable, much of it is marginal or unsuited for agriculture. Mismanagement of catchment areas has led to very high siltation rates in India's dams. With no further investment in dams, but with improvements in the catchments, the volume of impounded water could be greatly increased. In the past, forests in the catchment areas were cleared for agriculture to rehabilitate people displaced by dam construction. One of the necessary components of river valley projects is improvement of tree vegetation in the catchments.

- Checking the extension of sand dunes in the desert areas of Rajasthan and along the coastal tracts

Rajasthan has just 3.8 per cent of its land area under tree cover though 9.1 per cent is legally constituted extent of Reserved Forests. Tree planting is hence supported with additional funds outside the forestry budget, such as 40 per cent of the Desert Development Programmes. Controlling the extension of sand dunes in the coastal belt has been inhibited by land tenure systems and small holdings. It is now receiving attention through social forestry programmes.

— Increasing substantially the forest/tree cover in the country through massive afforestation and social forestry programmes especially on all denuded, degraded and unproductive lands.

Social forestry was taken up in the mid-1970s in some of the states. It however remained a low priority until the early 1980s, after which it became the key subject in the forestry sector. The annual afforestation is now more each year than that achieved in 20 years prior to 1970.

— Meeting the requirements of fuelwood, fodder, minor forest produce and small timber of the rural and tribal populations.

The national fuelwood deficit of 145 million m³ and the scarcity of fodder have been the main causes of the degradation and loss of forests. Heavy browsing and annual forest fires are common features. When demand exceeds availability, forests are no longer sustainable. This objective implies financial support for social forestry and an increase in the production of minor forest product species in the afforestation programmes.

— Increasing the productivity of forests to meet essential national needs.

This broad recommendation requires effective management of existing forests and forest lands to fully protect them and improve their productivity. The present stocking and annual increment are both barely one-third the capacity.

— Encouraging efficient utilization of forest produce and maximising substitution of wood

Expanded use of technologically improved hearths would improve fuelwood efficiency, which is currently only half that possible. Timber seasoning and treatment and standardization of sizes used in construction are not yet widely accepted. Wood could be replaced in packaging of horticultural produce. One of the major successes has been the drastic reduction in the use of wooden railway sleepers, achieved during the last few years.

— Creating massive peoples' movement with the involvement of women for achieving these objectives and to minimize pressure on existing forests.

This separately itemized objective is also one of the means to achieve other goals.

2.2 The process of formulation of the forestry policy

While laws on government forests enacted since 1977 by the Government of India are binding on the states, policies not covered by this framework are merely advisory. A common forest service and centralized forestry education and research facilities have been largely responsible for uniformity in management policies. Policy issues affecting forestry are discussed and initiated in the Central Board of Forestry meetings which is attended by State Ministers and Conservators of Forests.

The national government also takes into consideration enactments and decisions relevant to ecology and environment when formulating the forestry policy. It is inevitable that the views of forestry represented in the media will also influence the policy statement. This could lead to aberrations as

it is a small militant sector that gains publicity by highlighting failures and projecting the views of a small group.

The final policy statement is based on all these issues as laid down by the Ministry of Environment and Forests of the Government of India.

2.3 Main elements of the Policy

Management of natural forest, forest dwellers, conservation and peoples' participation

The policy statement calls for protection of existing natural forests but tropical rain/moist forests are to be totally safeguarded. No forest is to be worked without an approved plan and productivity enhanced through application of scientific and technical inputs. The policy has advocated extension of a network of national parks, sanctuaries, biosphere reserves and other protected areas for the conservation of biological diversity. At present national parks and sanctuaries cover only 3.85 per cent of the total land area while the global goal is 5 per cent.

Needs of the people dwelling in the forest or its vicinity should be met by developing non-forest resources. Benefits from the protection and development of forests must be identified as accruing to these people. In this way they will participate in the process. Improved production of minor forest products will provide sustenance to tribal populations and other local communities. The policy suggests full involvement of tribals in all forestry work by eliminating contractors. Improvement of the tribal economy by government programmes would reduce dependence on the forests.

The 1988 policy advocates control of forest fires through improved and modern management practices. Introduction of grazing fees and encouragement of stall feeding will reduce overgrazing.

Peoples' participation is advocated in the conservation of forests and development of resources outside the forest. Rights, privileges and concessions must be seen to depend on the well-being of the forest and a direct interest in the forest, its development and conservation through extension methods will promote participation.

One positive and implementable approach advocated is that no encroachments into the Reserved Forest should be recognized in the future. Except for Reserved Forests, practically no natural forests survive in good condition. For this reason, conversion to plantations of natural forests with good stocking is to be stopped.

Illegal felling by contractors has been lowered by the use of government sales depots and concessional firewood lots have also reduced indiscriminate collection. As community grazing land has declined in area, forest lands have been increasingly used for stock. Control of this activity is recommended to prevent further forest damage. Presently 'interface forestry', or the development of forest resources in areas adjacent to a forest, to act as a buffer is encouraged.

Projects have been initiated to develop resources on the outer limits of forest and in areas outside the forest to relieve the pressure. Other components include soil and moisture conservation measures and encouragement of natural regeneration, supported by planting of indigenous species in gaps where regeneration is lacking. Protection from fire will also be a priority. Grazing can be eliminated by cultivation of improved varieties of grasses and legumes for harvest free of charge, while enforcing a ban on cattle entry through effective barriers.

These programmes are important as increased budgetary allocations from national development plans have been directed at social forestry or afforestation outside the Reserved Forest. Investment in the Reserved Forest has remained low. A major allocation of funds is also required to maintain the forest which is outside the plan and has to depend on the states' limited resources.

Forest production including needs for energy and tree growing outside forests

It is estimated that 80-87 per cent of forest biomass produced in the country is used as firewood. While the requirement is put at around 150 million tonnes, barely 7.5 million tonnes is harvested by the government. Free removal is believed to be ten times that quantity. The still wide gap between demand and supply is the main cause of serious ecological degradation and the future situation is expected to worsen. To improve production of the forest to meet the growing needs for timber and firewood, the policy advocates application of scientific and technical inputs to the forest. Only through afforestation of wasteland, 89 per cent of which is outside the Reserved Forests, will the goal of one-third of the land area under tree cover be fulfilled.

Increasing the productivity of forests to meet essential national needs, social forestry programmes especially in degraded and unproductive lands, and meeting the requirement for fuelwood are three specific objectives of the 1988 Forestry Policy. The growing stock in Indian forests varies from 10 to 277 m³ per ha, with an average of barely 65 m³ per ha, which compares poorly with the world average of 110 m³ per ha. It has been estimated that with scientific inputs and investment it should be possible to increase the productivity of Indian forests to about 90 million m³, about three times greater than the actual production.

Social forestry or afforestation outside the forests receives strong financial support through aid projects and poverty alleviation programmes. The denuded community areas are encouraged to be planted by assuring part of or all returns to the community. Planting along the railway lines, canals, roadsides, mine wastes and land belonging to educational institutions and industry, is included in the social forestry programmes. Specifically noted by the policy is that diversion of good and productive agricultural lands to forestry should be discouraged.

Forest industries and trade

The major departure of the 1988 National Forestry Policy from the 1952 policy are in these sectors. The earlier policy proclaimed 'the need for sustained supply of timber and other forest produce required for Defence, Communications and Industry' as a key concern. It also classified forests functionally as protection forests, national forests, village forests and tree lands of which the national forests were those to be maintained and managed to meet the needs of defence, communications, industry and other general purposes of public importance. The 1988 Forestry Policy mentions 'increasing the productivity of the forest to meet essential national needs' without specifying these items. Development of marginal/degraded lands presently under agriculture or fallow is recommended as a source of raw materials for forest-based industries.

The policy also suggests that import of wood and wood products be encouraged. This recommendation would be understandable if a major part of forest biomass were to be used as timber or industrial raw material. On the contrary, both these items together account for barely 13 per cent of total wood requirements of the country.

Extension, training and research

Forestry extension is recommended to foster a direct interest of the people in forests, their development and conservation and as a means of achieving successful implementation of agro-forestry programmes. Agro-forestry activities on, and even total conversion of, large expanses of land currently under unsustainable arable use are essential for the ecological well-being of the country. The Policy recommends recognition of forestry both as a scientific discipline as well as a profession, by promotion of forestry courses available at the agricultural universities. The research base needs to be strengthened by adequate funding and staffing. A major step forward is the granting of independent status to the Indian Council of Forest Research and Education, which was previously a government body.

3. POLICIES OUTSIDE THE FOREST SECTOR

3.1 Effects of policies in other sectors on forestry policy

Agriculture and power generation have always been two major sectors in the Indian economy. Investment in irrigation facilities has reflected this bias. Despite the 1952 National Forestry Policy stressing the need for a system of balanced and complementary land use to provide food without encroachment into or conversion of forests, the governments 'grow more food' policy led to 43 million ha of tree-clad areas being cleared between 1951 and 1976 for mostly marginal agriculture. Private forests in mountainous regions, with high rainfall and evergreen vegetation, were acquired under agrarian reforms for distribution to the landless for cultivation. Even today community land allocated to meet the rural needs for firewood, fodder and mulch, and classified as unfit for agriculture, is being distributed to the landless for cultivation. Encroachments into such areas are being regularized on humanitarian grounds and the social objectives of raising the living standards of the poor.

The policy of limiting agricultural land holdings to 20 ha inhibits afforestation by industry or private enterprise. This is in a situation where 175 million ha of wasteland is demanding attention and the Forestry Policy seeks tree cover over 33 per cent of the land area against the present 19.5 per cent. Agricultural policy has also resulted in conversion of community lands designated for grazing. This has transferred pressure to the government forests.

Forestry is not part of the core sector and budgetary allocations in development plans reflect this low priority. The Forestry Policy of 1988 advocates the import of timber to meet the country's needs. An initial large reduction of duty has been partly reversed because of balance of payments considerations. A cash deposit of 200 per cent of the value of timber to be imported is required at present, making import infeasible.

3.2 Impacts of forestry policy on other sectors of the economy

Heavy restrictions imposed by the Forestry Policy on diversion of forest areas for alternate uses, supported by legal enactments, has imposed a significant embargo on river valley projects. The very high environmental value prescribed for the forest involved in the projects and insistence on funding for compensatory plantations in land outside the Reserved Forests drastically reduces the benefit-cost ratio of proposed projects. Power lines would have to be routed around sanctuaries and good forests at higher costs and forest area is no longer available for rehabilitation of evacuees.

New mining leases and renewals are now severely restricted in forest areas. Applications are reviewed based on plans for rehabilitation of soil and vegetation after mining, possible damage to forests, the distance from perennial water sources, highways, national parks and sanctuaries, expected subsidence in underground mining operations, impacts on water and forests, and phased reclamation programmes to be carried out concurrently with the mining operation.

Past destruction of wildlife during large-scale clearance of forests has resulted in present-day over-reaction. Severe restrictions and penalties affect agricultural activity. The restrictions imposed on the working of the forests, more conservative than silviculturally required, have considerably reduced the availability of timber for the construction industry resulting in the use of alternatives like aluminium and steel. Forest-based industries have suffered increased shortages of timber under this policy with capacity utilization as low as 60 per cent. Further restrictions on imports will exacerbate the situation.

4. FORESTRY POLICY RESPONSES TO KEY DEVELOPMENT ISSUES

The 1988 National Forestry Policy is centred on conservation of natural forests, protection of Reserved Forests, meeting the needs of the forest dwellers and those residing nearby, and increasing production of forest goods to meet the demands of society. A common thread is the social aspect of support to be provided to the poor, even if this is at the cost of production. Key development issues to which the policy has responded, or around which it has been moulded, are discussed below.

Forestry's role as part of rural welfare improvement

A large percentage of forest-dwelling tribals and those living around the forest are below the poverty line. Both groups rely on forestry and forest products to meet their survival needs - food, timber, medicine, income sources, etc. The excessive pressures have resulted in degradation of forests, thus reducing the availability of many such items. Forestry policy has prescribed that the forest products of food and commercial value should be protected, improved and their production enhanced. Instead of contractors with interests limited to immediate gains and whose extraction methods can be destructive, it is suggested that the forest dwellers and the nearby poor should be offered these contracts. This way, they have an interest in sustaining the resources. Harvest of several forest products previously sold has been prohibited as part of changing management criteria.

The role of forests in stabilising the natural resource base

In the tropical region the indirect benefits from forests are beyond their value as producers of timber and firewood especially in fragile ecosystems and also in the case of rain-fed farming areas as over vast tracts in India. The forests in India are not only insufficient (barely 19.52 per cent of the land area) and unevenly distributed (most of the forests being confined to the Himalayas, Western ghats and Andaman & Nicobar Islands) but are being rapidly degraded (26 per cent of the Reserved Forests face soil erosion). The consequences are felt in the form of regular droughts and floods over large areas of the country.

In the situation where over 75 per cent of the population relies on agriculture, ecological restoration and environmental protection have received priority at the expense of principles of multiple use and sustained yield. Preservation of the natural forests and their variety of flora and fauna to maintain biological diversity and a genetic resource is the next most important goal. Stress has been laid on strengthening and extending the network of national parks, sanctuaries, protected areas and biosphere

reserves and provision of 'Corridors linking the protected areas in order to maintain genetic continuity between artificially separated sub sections of migrant wild life'.

Environmental protection/restoration and poverty alleviation

Some of the major social programmes of the Government of India, such as the Rural Landless Employment Guarantee Programme, National Rural Employment Programme and Drought Prone Areas Programme seek to provide needed employment in rural areas. Tree-crop plantations offer employment opportunities in raising seedlings, transport, site preparation, pitting, planting, weeding, soil working, tending and harvesting for most of the year. If the country's target of establishing 5 million ha of plantation per year is achieved, it would generate 2000 million man-days of work in just the first year. This employment generation is incidental to the creation of assets and ecological restoration.

The policy has provided an incentive to the local community organizations to participate in the tree-planting programme through an assured share in returns and usufruct rights in return for taking responsibility for the security and maintenance of seedlings planted on public land. Proposed leasing of degraded government lands for afforestation will in effect be limited to the poorer sector because of land grant rules and ceiling laws. The needs, rights and privileges of the forest dwellers and surrounding residents should be the first charge against the forest produce. It is recommended that they be encouraged to identify their interests with the protection and development of forests.

Access to and management of resources

The blame for forest degradation has been long laid with the forester, yet much more degradation occurs outside the Reserved Forests. The community areas have suffered from excessive pressure brought about by the demands of increasing human and livestock populations. This community land has also been readily converted for agriculture. What is left of the areas today are bereft of vegetation. The human population of India, since the time of reservation establishment, has trebled and that of cattle increased by 275 per cent!

A detailed study on this subject by Dr Nadkarni of the Institute of Socio-Economic Change, Bangalore, revealed that if not for reservations, there would have been disaster in the Indian forestry sector. He noted the lack of dependable machinery for care of village or community forests. Personal interests have often taken precedence over community welfare. This very same view was spelled out clearly in the policy of 1952. The Forestry Policy of 1988 makes no recommendation on management of the Reserved Forests by the people, though on issues of access to its resources and management of community areas, it has recommended peoples' full participation. In Reserved Forests, any actions must be specifically permitted, while in community areas, also belonging to the government, only prohibited activities are defined. In private areas specific enactments, such as constraints on felling in certain states, are the only restrictions to the rights of owners. The first call on forest produce is clearly the needs of the people dwelling in and around the forests.

The policy has recommended the development of forest villages on encroached public land or land under cultivation by leasehold in the same way as other villages receive assistance.

Privatization in forestry and the role of market forces

To have tree cover over one-third of the land area will require afforestation of over 46 million ha. All sectors including the private sector will need to be involved. The Policy seeks to mainly involve

the poorer section of the population, by making available land and financial support for inputs and guaranteeing usufructuary rights. Conversion to tree cover of marginal/degraded lands presently under agriculture in order to produce raw material for wood-based industries, fuel and fodder is also recommended. Regulations governing the felling of trees on private lands as a safeguard of ecological/environmental significance could act as a disincentive.

5. FACTORS AFFECTING POLICY FORMULATION

5.1 Positive factors

The basic structure for the policy of 1988 was already set in place in 1952. The National Commission on Agriculture, in its report during the mid-1970s, emphasized the seriousness of the ecological disaster caused by clearing of tree cover beyond the regeneration capability and overgrazing, and recommended a massive afforestation programme. The increasing costs of firewood and forest commodities since 1970 have led to further illegal activities.

Environmental awareness of the effects of unsuitable land uses was heightened by the more frequent recurrence of droughts and floods. Tree planting was a feature of the Ghandi era and establishment of the National Wasteland Development Board included afforestation as part of all poverty alleviation programmes.

All these factors provided support to the definition of the new forestry policy.

5.2 Negative factors

The lack of an implementable national land-use policy has led to indiscriminate extension of agriculture on unsuitable land. The loss of community areas and increasing population has resulted in transfer of the biotic pressure to the Reserved Forest. Privileges and concessions meant to fulfil certain obligations have been allowed to become rights without responsibility.

Land ceiling laws have kept private enterprise from making large investments in forestry where degraded land is demanding attention. Afforestation has received a boost by its inclusion in the poverty alleviation programmes, but low investment in poor quality areas cannot produce the desired results; the deficiencies are compounded by the long gestation period of the programmes.

Blaming industry alone, and forest-based industries in particular, for deforestation is not justifiable. Forest-based industries use less than 5 per cent of the output from forests. The vocal environmentalist arguments have led to a few aberrations in the Policy: demand for raw materials for the forest-based industries cannot be met from 'natural' forests on the grounds that the forests constitute the genepool; and exotic species cannot be introduced into plantation programmes 'without long-term scientific trials undertaken by specialists in ecology, forestry and agriculture'. The latter recommendation is not logical when the country faces a deficit of firewood and timber and the species of eucalyptus identified for planting have been present in India for over 225 years.

6. POLICY IMPACT

The effectiveness of a policy depends on political, financial and legal support. Where policies from different sectors conflict, one must be given priority. The Forestry Policy of 1952 was framed by the Ministry of Food and Agriculture and stressed intensive cultivation rather than extension into

forest areas. Yet the 'grow more food' policies (from the same Ministry) were of far greater importance to the government than ecological concerns. It also satisfied the people.

In the 1988 policy, the position changed dramatically by an enactment of the parliament which prohibited de-reservation of Reserved Forests or diversion for alternative use by the states without the Government of India's approval.

Recommendations to narrow the gap between supply of and demand for firewood by the turn of the century and to reclaim all degraded and denuded land will require investment several times present levels. Despite all the efforts, the area of degraded and denuded land is increasing, but not as fast as would have otherwise been the case. Incentives by the national government to the states in the form of investments has brought action in the areas of protecting wildlife (Project Tiger), genetic diversity and sanctuaries and national parks. Overall the policy has had some impact.

7. CONCLUSIONS: POLICY REFORM AND POLICY INSTRUMENTS

7.1 Lessons

The Forestry Policy of India (1988) was moulded by environmental concerns at best only partially understood. Pressure from environmentalists brought a hurried, defensive response from foresters. Continued adherence to official figures that 22.8 per cent of land area was under forest cover brought false comfort that all was well with the forestry sector. When satellite imagery revealed the true situation, blame was laid on foresters when most causes have been long term and are beyond their control. Successes of the foresters receive little acknowledgement outside the sector.

Inter-sectoral cooperation is essential for solution of the problems such as cattle grazing, which cause deforestation and degradation. While the policy suggests regulation and charging of fees to discourage non-essential livestock, this is a sensitive issue and is unlikely to be implemented by any state government. However, improvement in the quality of livestock with the help of the Animal Husbandry Department may help to alleviate the problem.

Policy decisions need supportive legal enactments as was the case with the policy on non-release of forests for agriculture or regularization of encroachments into forests. The Forest Conservation Act needs to be used sensitively when interests of the public are involved so foresters are not seen as anti-development causing the withdrawal of the Act. Import of timber for forest-based industries has been abandoned because of balance of payments problems which forced a change in the policy on reducing import duties.

The policy has over-stressed the subject of poverty alleviation through afforestation and particularly on degraded sites. Even the nursery stock is now largely raised in 'KISSAN' nurseries by farmers of the lowest income strata. Regulation of tree felling in private land implemented through the Tree Preservation Act is also a clear disincentive to tree planting.

7.2 Current issues

Half of the land area of the country is cultivated and 56 per cent is degraded and requires soil conservation measures. The National Land Use and Wasteland Development Council decided in 1986 that land-use policy must be evolved and enforced through legislation, with heavy penalties for interference with the land resource and its productivity. Further, land-use planning should be

integrated with rural employment programmes so that incentives are provided for efficient land use. Those responsible for degradation should be held accountable for reforesting the degraded areas.

The Forestry Policy of 1988 should have leaned heavily on decisions of this Council and followed up with legislative measures. Scientific land use is necessary to preserve the ecology of the country and simultaneously fulfil the goal of afforestation required to meet the timber and firewood needs of the population. Implementation of some of the 1952 policies would have brought ecological equilibrium closer. A few directives, such as no more release of government land for cultivation in mountainous or drought-prone regions, bringing cultivated slopes of more than 20° under tree cover, and a ban on entry of cattle above the carrying capacity of forests, would all have reduced pressure on resources.

While the 1952 policy clearly stated that the use of the forest by neighbouring village communities for their needs should not be at the cost of the national interest, the 1988 Policy does not do so. This approach, while appearing pragmatic, may lead to serious consequences. The size of the projected deficit of timber and firewood at the turn of the century should have brought encouragement of multi-sector tree planting rather than confining it to poverty-alleviation programmes. Further, recommendations about the need for sanctioned working plans, no clear-felling of adequately stocked natural forests and long-term trials of exotic species before introduction imply a lack of appreciation of the competence of foresters as well as diluting the seriousness of the situation. Details have been allowed to over-ride essentials.

The use of timber and wood for raw materials is only a minor contributor to deforestation. Firewood removal, livestock grazing and the use forest fires to induce new grasses all are more important. Recommendations should be made on this basis. While some illegal activity does occur, this alone does not lead to degradation or decimation of forests. No regeneration occurs in 52 per cent of the forests.

In the strategy for afforestation, stress is on the production of fuelwood and the areas targeted are degraded with poor soil conditions. With this combination plus low investment, the programme will never be viable. Efforts should be to maximize production with necessary inputs to yield profitable timber or industrial raw materials. Firewood should be an incidental by-product, but one that makes up 30-35 per cent of the total biomass.

Forest dwellers see the Forest Department as a foe who enforces the law and has little to give, despite the proposal of several welfare measures in the interests of these people. Such measures are usually undertaken by other departments. If the Forest Department is to be the prime implementor of all welfare measures, a much better relationship must be established to be of benefit to the forests and its inhabitants. Perhaps suitable departmental positions could be filled by tribals.

7.3 Effective policy instruments

The National Forestry Policy is presently binding on the Forest Departments only. Other sectors may follow those policies which are of benefit. The Policy should be binding on all departments and ministries. The Ministry of Environment and Forests has established its strength and competence in the environmental sphere by the Environmental Protection Act and Rules. Similar concern and effort should be directed at ecological issues.

Decisions of the National Land Use and Wasteland Development Council should be used by the Ministry and cooperation with other sectors on common subjects used to arrive at a binding consensus on policies. Thereafter, each ministry could issue guidelines to departments under its control to conform with policy mandates. It may only need a few legislative measures to be effective.

INDONESIA*

1. INTRODUCTION

Indonesia's forests are an important contributor to the economic development of the country in terms of gross national product and foreign exchange earnings. The forests provide a livelihood for people, directly or indirectly, through their contribution to employment and income over 4 million families. However, the ecological value of the forests is also significant. Forests must therefore be managed to provide an economic base as well as environmental support for the continued development of Indonesia. Sustainable forest development is of primary interest and concern to the Indonesian government, as evidenced by numerous relevant Acts, Government Procedures, Regulations and policies. The major concerns of the government for the sustainable future of forests and the environment are also reflected in the establishment of forestry as a full Ministry and the creation of the Ministry of Population and the Environment.

1.1 Administration

The country's forests are mostly owned and administered by the state and the primary responsibility for forest development is in the hands of the Ministry of Forestry (MOF). Central-level responsibilities cover national administration, research and development, forest utilization, reforestation and land rehabilitation, forest protection and nature conservation, and forest inventory and land-use planning. The Regional Forestry Office and Provincial Forestry Office operate at the provincial level. The Regional Forestry Office coordinates the activities of various Technical Implementation Units, while the Provincial Forestry Office organizes the implementation of forest activities in the province. The former reports to the Minister and the latter to the Provincial Governor.

There are six state enterprises which are technically under the control of the MOF. PERHUTANI manages the teak and other plantation forests in Java. The state corporations, INHUTANI I, II and III, possess forest concessions and wood-processing industries located mainly in Kalimantan, while INHUTANI IV and V have the concession for forest plantations in Sumatra. The private forestry sector organizations include the Indonesia Loggers Association (APHI).

2. FORESTRY POLICIES

The National Forestry Policy of Indonesia, along with all development, is based on: Pancasila, the Five Philosophical Principles of the nation; the 1945 Constitution; guidelines of state policy set out each five years under the National Development Plans; the directives of the President; and the Kaliurang declaration of 1966 on sustained yield. These embody the development and preservation of the forests for national development, the good of the people, ecological balance, promotion of industry and conservation of the environment. The main objective of the National Forestry Policy is to guide forestry activities in supporting national development. It is a dynamic policy instrument designed to respond to national and international issues.

The long-term goal of forestry development is a situation in which each piece of forest land is well managed and produces the maximum sustained yield to provide maximum benefits for the people. In the process of national development, the main functions of forestry are to support socio-economic development and to create and maintain environmental quality for human life.

* This paper was compiled as a presentation to the meeting by Wartono Kadri (Director-General, AFRD-MOF, Indonesia) and a prepared paper by Wartono Kadri and Piran A.roatmodjo (MOF, Indonesia).

2.1 Legislation

Three major items of legislation are relevant to forestry development: Act No. 5, 1967 on Basic Forestry Law; Act No 4, 1982 on Basic Environmental Management; and Act No. 5, 1990 on the Conservation of Natural Living Resources and their Ecosystems.

Under the Basic Forestry Law (BFL), the government received authority to control, manage and administer the resources of the forests. The principles of sustained yield and the right of present and future generations to benefit from the forest is covered in the BFL. Foreign and domestic private investors in logging are offered favourable conditions and forest-based industry development is encouraged. The BFL marked the beginning of modern logging operations. Prior to exploitation, a forestry agreement must be signed by concessionaires (HPH) specifying the conditions of operation. These could be use of a prescribed management system, establishment of a wood-processing plant, development of staff training programs or contributions to local infrastructure and social services.

The Law determined that forestry development be directed to: water management regulation, flood and erosion prevention, through soil and water conservation to support production of food, clothing and energy; production of wood and non-wood forest products to meet the needs of domestic and international markets and to support the development of industry; creating income sources for the people; protection of endangered biota and biodiversity for the interests of science, cultivation, national defence, recreation and tourism; support for transmigration, agriculture and other sectors' development; and other benefits for the people.

2.2 Objectives

Objectives are defined under a 25-year plan, 5-year plans (REPELITA) and annual plans. Each objective is guided by the goal of related national development plan. The objectives of the long-term national development plan, from 1968 to 1993, encompasses economics, religion, culture, defence and security, and politics.

In the First Five-Year Development Plan (REPELITA I, 1969/70-1973/74) forestry was a sub-sector of agriculture and the goal was to support agriculture. For the first three Plans, the main objective of forestry policy was the development of forest-based and agricultural industries. In REPELITA IV (1984/85-1988/89), the development of downstream forest industries, rehabilitation and improvement of the potential of forest resources through reforestation and enrichment of natural forest stands, and critical land rehabilitation were emphasized. In REPELITA V (1989/90-1993/94), food self-sufficiency, increased agricultural production, improvement, rehabilitation and conservation of forests and critical land rehabilitation are major goals. The main purpose of the rehabilitation of production forests through establishment of plantations is to support the continuity of forest industries and promote export-oriented industries.

The objective of national forestry annual plans is quantitative and based on the availability of budget funds and manpower.

2.3 Formulation

Forestry policies at different levels are developed through different mechanisms. The National Forestry Policy is formulated by the Minister of Forestry, for statement by the President, with the participation of the related Ministers and agencies through formal or non-formal procedures. It emphasizes specific activities in forestry. Operational policy is formulated by the relevant directors. Public participation is achieved through NGOs, groups or individuals and the private sector.

2.4 Main elements of the Policy

Several areas of concern are addressed in the National Forestry Policy.

Forest land use

About 62.8 per cent of the total land area of Indonesia is declared as forest, and under the national forest land-use allocation, 64.4 million ha are allocated for commercial purposes where logging activities are typically managed by the private sector under government regulation and supervision. Conservation forests, which are required for preservation of biological diversity and where logging and hunting is prohibited, cover 18.8 million ha. There are 30.3 million ha of protection forests for soil and water conservation and watershed protection. To meet the needs for development, such as agriculture and transmigration, 30.5 million ha have been allocated as conversion forests.

Unplanned conversion of forest land is to be reduced by improving the welfare of the people, improved security and better gazettal of land. Conversion to non-forestry uses will be discouraged and strictly prohibited in densely populated areas such as Java.

Production of forest products

Policies emphasize the implementation of the sustained yield forest management principle and improvement of logging efficiency to reduce waste and eliminate the damage to residual forest stands. The utilization of lesser known wood species is encouraged and the production capacity of forest land to produce non-wood products, such as rattan and resin, will be improved. Involvement of the private sector in production activities is promoted.

Land rehabilitation and forest plantations

All parties are to be involved in critical land rehabilitation. Forests and other vegetation are important in maintaining the fertility of agricultural land and quality of climate. Emphasis is on forest plantations to produce wood and other forest products to meet the rising domestic demand and to ensure the continuity of supply for forest-based industries. Watershed management and land rehabilitation are key policies.

Nature conservation and forest protection

Nature conservation, environment and forest protection are seen as being the responsibilities of government, private sector and all individuals. Policies emphasize conservation and protection of biodiversity, allocation and protection of areas for nature conservation and improvement of management of conservation and recreation areas. Endangered plant and animal species are to be domesticated as a means of preservation.

Local community

Participation of local communities in forestry activities is seen as very important and promoted in forestry policy by broadening the implementation of agro-forestry techniques on forest lands, agricultural lands and settlement areas. In the social forestry system, the local community, either as cooperatives, groups of smallholders or individuals, take part in forestry activities. The forest concession holder is encouraged to be more involved in activities of rural development. Creation of job opportunities for the local community is also a goal of forestry activities.

Processing and marketing

Policies are aimed at reducing the waste of industry and increasing the production capacity for higher quality finished products for export. Improved efficiency of processing will make the products more competitive and new international markets are to be developed while continuing to maintain traditional markets. The development of downstream forest industries is to be accelerated in Sumatra, Kalimantan, Sulawesi, Maluku and Irian Jaya.

Human resources

Improvement of the quality and quantity of manpower in all forestry activities is a key policy objective. Improved conditions of employment and creation of more job opportunities for local people are also goals.

3. POLICIES OUTSIDE THE FORESTRY SECTOR

The National Forestry Policy is closely related to policies on investment, finance, trade, transportation, industry, housing, transmigration, agriculture, tourism, environment and human resources. Each policy has an effect on the formulation and implementation of forestry policy and in turn forestry policy has an influence on each of these. Policies on investment, finance and trade are the core of all economic policies and include banking, tax or tariff, budgeting and monetary policy. Economic policy strongly affects the provision of capital goods (such as equipment for logging, transportation, industry) and also production activities. The main objective of economic policy is to improve economic well-being of the community in terms of average income per capita and to achieve an equitable distribution of income thereby enhancing socio-political stability.

Forestry plays a significant role in advancing economic development through foreign exchange earnings, creation of job opportunities, business opportunities and acceleration of the development of remote areas. Since 1967, average income per capita has increased from \$US 80 to \$US 545 per year. During the last decade, forestry earned an average 16 per cent of foreign exchange per year, and created job opportunities of 3 to 4 million man years per year, in both forest management and industry.

The main objectives of policies on the forest industry are also to improve value added, labour opportunities, income distribution and distribution of business opportunities. The security of small and medium-scale industries is maintained through policies on raw material distribution and marketing of products. All development of primary processing industry is dependent on the sustainable supply of wood and non-wood raw materials. Implementation of housing policies for lower and medium-income people rely on the availability of low-price construction timber.

Transmigration and agricultural policies relating to forestry mainly deal with forest land. The uses for conversion forest land depend on the physical and chemical conditions of soil and the accessibility of the land. Development of tourism is designed to generate more foreign exchange by the management of recreation forests.

Government policies on the environment of rural areas have strong links with the formulation and implementation of policies on land rehabilitation which aim to better regulate watersheds and prevent soil erosion and floods. Forestry policy on human resources management is in line with the overall policy of the government. Intensive on-the-job training should reduce substantially the number of foreigners employed in the industry.

4. FORESTRY POLICY RESPONSES TO KEY DEVELOPMENT ISSUES

Since 1980, a large number of domestic and international issues have influenced forestry. Most have increased public awareness of the importance to the environment of the existing forest. A wide media coverage of forestry issues is common today and the value of Indonesia's forest resources for the global society is highlighted. Global change is one of the most important issues facing mankind, including the basic changes in climate associated with deforestation. Environmental concerns include global warming, deforestation and species extinction. The Anti-Tropical Timber Campaign has generated a serious debate between the buyers and the exporter countries. For Indonesia, it has heightened the awareness of the government and the public for wise forest management and efficient utilization because successful forestry development can only be achieved when there is a balance of economic growth and continued environmental quality.

Other issues emphasize that the forests are important and potential resources that can be managed to support economic development, especially in developing countries. To meet the needs for national development and of population pressure, some conversion of forests to other purposes is still necessary. However, the conversion must be done on a planned basis to minimize undesirable environmental impacts. Hence, conversion is not deforestation; forestry supports all areas of national development

4.1 Rural development

The objective of rural development is poverty alleviation. Forestry plays an integral role in rural development and development in remote areas by promoting food security, creating labour opportunities and income sources. The participation of the local community in forestry activities is always encouraged. The implementation of mixed-farming techniques in forest plantations and land rehabilitation are the main employment opportunities for the local community, at the same time producing food and forage,

4.2 Forests and sustainable development

To date, forestry policies aim to ensure the sustainability of development activities. The natural resources for agriculture are improved and maintained by forestry through land rehabilitation and improvement of watershed management. Conservation of genetic resources and biodiversity is sought through the allocation of protection and reserved areas.

4.3 Environmental protection and poverty alleviation

The main forestry activities for environmental protection and restoration are critical lands rehabilitation, preservation of protection forests, and reforestation for soil and water conservation purposes. Involvement of local communities is stipulated and funding is through the national development budgets. The activities create new income sources for the poor while improving the natural resources for agriculture, thereby directly supporting poverty alleviation.

4.4 Ownership and management of land

Land ownership and access are regulated by agrarian acts. Land resources can be owned by private interests, local communities or the government. Licences can be granted for access to a specific area for a certain period. Concessions for forest land can be granted to private companies for 20 years.

4.5 Increasing off-farm employment and income opportunity

The Department of Forestry and the forest concession holder have a responsibility to encourage and to support the development and the continuity of home industry and small-scale industry processing forest products. The concession holder is required to supply raw material for the local forest industries. To accelerate the development of local industries, the concession holder is expected to be the nucleus of local small-scale forestry and non-forestry industries.

4.6 Inter-agency dialogue on land use

Dialogue on development of a national land-use plan was initiated by The Department of Forestry with the final outcome of provincial forest land-use maps for the whole country. Non-forest land and forest land is delineated in more detail according to the forest land-use plan. Inter-agency dialogue on development of a general land-use plan for non-forestry purposes is organized by the Department of Internal Affairs in cooperation with relevant departments and local government offices.

4.7 Involvement of the private sector and local organizations

The final decision in the national policy-making process is on the hands of the central government but the private sector and local organizations can have input through direct contact, correspondence, media, conferences, etc. The Department of Forestry has organized local and national open seminars on various forestry topics.

4.8 Decentralization

The provincial forestry office is responsible for detailed forest management plans and the draft of overall provincial forestry plans. Planning of forest unit management is the responsibility of concession holders or the administrator of the related forest area. Technical guidance is provided by the Department of Forestry.

4.9 Privatization

The private sector plays important roles in all aspects of forestry including forestry planning, forest plantations, forest harvesting, industry and marketing of forest products. The private sector also participates in recreation, forest utilization and biodiversity conservation. In marketing, the forestry industry association takes responsibility for maintaining and developing markets.

Issues and problems in forestry can be overcome by the Department of Forestry through coordination with related departments and parties.

5. FACTORS AFFECTING POLICY FORMULATION

Several of the factors affecting policy formulation are closely related, such as the condition of the resource, objectives of development, the overall national policy and socio-economic conditions. Industry and marketing are more independent factors, while international issues are not closely affected by national conditions.

The extent, distribution, physical condition and accessibility of forests, stand density, biodiversity, hydrological and other ecological conditions all define the potential and possible role of forests in the process of provincial and national development and in the international environment. Any available resource can be utilized to support national development and that is also the main function of forestry.

Forestry policy is formulated with that in mind and can be revised or even cancelled subject to the requirements of national development.

National policy is the implementation strategy for national development and defines provincial and regional policies and actions. In specific instances, the policy is a response to national development issues as well as international issues. Development in some sectors has a strong dependency on forestry. These include transmigration, agriculture, industry, trade and tourism.

The national socio-economic condition has a strong influence on formulation of the National Forestry Policy. The main purpose of national development is improvement of socio-economic conditions of communities, including those living around the forests. During the first years of national development after 1968, the main objective of National Forestry Policy was to support this goal and the success of socio-economic development itself could support the implementation of sustainable forest management.

Forest management is designed to produce output, such as wood and non-wood products and tourism. The poor condition of industry and stagnation of marketing of forest products could lead to the shortage of budget funding for forest management. In Indonesia, stagnation of export of forest products, mainly timber, could cause large deficits in state budgets and international trade. One possible answer to financial problems is to convert the available forest to agriculture land to produce agricultural commodities for export.

The response to national and international issues is based on the national interest which includes a better international relationship. To date such responses have not deviated from the national development guidelines. Indonesia has displayed awareness of the sustainability of natural tropical forests and the environment of the world.

6. POLICY IMPACT

Implementation impacts between forestry policy and policies of other sectors sometimes create problems or handicaps in the pursuit of national development or even divert the implementation of policy to unexpected objectives. These problems arise usually because of slow provision of technical guidance for implementation or by non-coordinated implementation. Hence technical guidance, accurate field data and information are urgently needed. To date, all national forestry policies have been effective to some degree, depending on the availability of supporting factors, and have had impacts in other sectors.

6.1 Forest land assessment

Forest land allocation is based on socio-economic considerations and the ecological and physical condition of the areas. The physical condition of areas is determined on the basis of the most accurate available topographic maps compiled through field surveys, geodetic measurements and photogrammetric mapping techniques. Inappropriate field assessment of forest land can be caused by inaccuracy of the base map in defining distances, location and land use. Some parts of defined forest land have even been occupied by people or even utilized by government agencies for other purposes, such as transmigration and infrastructure. Errors can also occur because of shortages of funds and field staff support and unavailability of accurate, recent maps.

To overcome the handicaps on forest land assessment, the Department of Forestry developed a stronger unit for mapping, equipped with a photogrammetric and satellite imagery analysis unit in

Bogor and field gazettal units in every province. Staff training on mapping and geodetic techniques have been upgraded and continue.

6.2 Forest plantations and rehabilitation

Assessment of forest land, funding and trained staff and silvicultural technology all affect implementation of forestry policy in forest plantations and rehabilitation. To overcome the problems, the Department of Forestry has emphasized efforts to collect royalties for forest plantation and forest rehabilitation, and encouraged field activities for forest plantation, land rehabilitation and staff training. The involvement of private companies, cooperatives and local communities is also sought.

6.3 Production of timber

The government designates that timber production be based on the sustained yield forest management principle. Implementation of this policy is inhibited by weakness of field control of the activities and forest areas, economic needs for increased foreign exchange and more economic development, and shortages of trained staff and forestry technology for field operations. To address these concerns, the government has stressed field control activities, encouraged timber industry development and emphasized research to develop the necessary technologies.

6.4 Forest protection

Forest protection includes all activities to protect forests and forest land from fire, illegal cutting, pest, diseases, land encroachment, illegal hunting, etc. Forest fire mainly arises from negligence of shifting cultivators during burning in the dry season for land clearance. Illegal cutting and hunting, and encroachment are mainly due to the poor socio-economic conditions of the local community. To reduce activities incompatible with forest protection, extension and rural-development efforts are needed. While pest and diseases do not inflict significant damage to forestry, they can be controlled through silvicultural techniques.

6.5 Rural development and social forestry

Problems arise in the implementation of forestry policies for rural development and social forestry because of remoteness of rural areas, shortage of finance and facilities, lack of coordination of activities with related agencies, and lack of technology and awareness of the rural community about the sustainable utilization of forests. To overcome these problems, the Department of Forestry organized interdisciplinary teams, working groups, open seminars and discussions to encourage the development of coordinated plans and field actions. One realistic activity is broadening the use of agro-forestry in Java and the more populated outer islands, such as Sulawesi and Sumatra Barat. The main handicap is product marketing.

7. CONCLUSION: POLICY REFORM AND POLICY INSTRUMENTS

National Forestry Policy is an integral part of the overall national policy and its formulation is strongly affected by the objectives of national development. It is dynamic and responsive to key development issues. Potential elements to support the implementation include more effective forestry organization, more reliable forestry data, appropriate guidelines for implementation, stronger personnel and budgetary support and accurate plans.

International discussion of National Forestry Policy is necessary to encourage optimal forest utilization for national and international development, to stimulate the development of a common understanding

among nations on the importance of forests for economic and environmental development, and to strengthen cooperation to emphasize the implementation of the progressive sustained yield principle for forest management.

REFERENCES

- Directorate General of Forest Utilization - MOF and FAO, 1990: *Situation and Outlook of the Forestry Sector in Indonesia. Vol. 1. Issues, Findings and Opportunities.*
- Ministry of Forestry of the Republic of Indonesia, 1991: *Indonesia Forestry Action Programme, Country Brief, Vol 2 of 3.*
- Ministry of Forestry, 1990: *Forestry Policy and Strategy in the Fifth Five-Year Plan (REPELITA V).* Exposé to the meeting between Congress Staff of USA and H.E. Minister of Forestry of R.I.
- Ministry of Forestry, Republic of Indonesia, 1992: Policy Paper on Forestry Development.

LAOS*

1. BACKGROUND

1.1 Physical features

The Lao People's Democratic Republic covers an area of 236,800 km² and is surrounded by China, Vietnam, Kampuchea, Thailand and Myanmar. The topography of the north and east is rugged, giving rise to 10 tributaries of the Mekong River which drains practically the whole country. The alluvial delta of the Mekong covers about 20 per cent of the total land area. The rest is covered by mountains with altitudes ranging from 1,500 to 3,000 metres.

Geological features of the higher altitude and mountains of the north and northeast are characterized by sedimentary rocks (sandstone and limestone). Porphyritic, granitic and crystalline formations occur in the centre, and basalt lava covers the Boloven in the south and the alluvial deposits on the Mekong River plains.

Two seasons dominate the climatic conditions. Ninety per cent of the annual rainfall is received during the wet period of May to October. Average annual rainfall is 1,500 to 1,800 mm with a range of 1,200 to 3,000 mm. The mean annual temperature is 24°C with variations dependent on distance from the equator, altitudes and continental location.

1.2 Demography

The population of Laos is 4.2 million people, consisting of three main racial groups: the Lao Lum (lowland Lao) living in valleys and low, flat land areas; the Lao Theung (middle land Lao) living in medium high mountains and low hill areas; and the Lao Sung (highland Lao) living at high altitude in the mountainous areas confined mainly in the northern part of the country. This multinational population is further split up into 68 different lingo-ethnic groups of which the Lao Sung and Lao Theung are the minorities. Average population density is about 17 persons per km². However, in the urban and fertile lowland areas, the density can be up to 40 persons per km².

Because of the multi-cultural composition of the population, which includes many different traditional lifestyles and, more importantly, widely divergent levels of education, comprehensive and flexible policies are needed to administer and develop the country.

1.3 Economy

Agriculture has long dominated the economy with the Lao people farming the rain-fed areas on a subsistence basis. At the present time about half of the total arable lowlands (0.9 million ha) is cultivated and the productivity is low (1 to 2 tons per ha on the average for one crop). This could be increased by improved technical measures such as irrigation, farming techniques and crop varieties. About 60 per cent of the agricultural output is produced by permanent lowland farming. The remainder is derived from shifting slash-and-burn practices in hilly areas.

Economic infrastructure is seriously lacking. The road network is inadequate and most of the existing roads can only be used during the dry season. This, of course, hinders easy access to rural areas where 80 per cent of the population lives, so development is necessary. The telecommunications

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system is very poor and unreliable and serves only some parts of the country. Transport and communications during the rainy season are heavily dependent on the Mekong and its tributaries, while air transport is considered the only means of access to remote and mountainous township centres.

Industrial development has been retarded by the poor infrastructure. Only in the forestry sector has some kind of preliminary industry been developed such as sawmilling and plywood manufacturing. However, improvement is necessary in order to reduce residual waste and thus raise the product quantity and quality to a level acceptable to the international market.

Laos has a high potential for hydro-electric development but, at the present time, only one medium-sized, hydro-electric station exists on the long river of Nam Gnum with a capacity of 150 megawatts. Seventy per cent of the power is sold to Thailand. Feasibility studies have been carried out to assess the possibilities of expanding this industry.

With a 2.9 per cent birth rate, population pressure on land, employment, education facilities and other social welfare institutions will be more keenly felt in the future. Sound development planning and implementation is imperative.

1.4 Forest resources

A number of assessments have been undertaken to discover the extent and state of the forests in the country but no accurate results are available. Based on preliminary investigations in 1981 and further 1989 studies, the forest cover of the country was put at about 11 million ha or 47 per cent of the total land area. Most of these are secondary forests, with low economic value. Much that remains is in less-populated, inaccessible hilly areas and mountain chains. It has been reported that, since 1940, nearly half of the forest cover has been lost due mainly to the traditional practices of shifting cultivation, frequent uncontrolled forest fires and the impact of war. The once densely forested areas have been converted to *imperata* grasslands, scrubby bushland and open woodlands of very low economic value.

Of the remaining forests, 30.5 per cent are evergreen forests, 51 per cent mixed deciduous forests, 14 per cent deciduous forests and 4.5 per cent other types of forests including pine. The total wood volume of all types of forests is estimated to be 1,200 million m³, around 80 per cent of which is currently commercial volume, but mostly located in rugged, different areas.

The forests play a very important role in the socio-economic development of the country by providing raw materials in terms of timber and other minor forest products to meet internal needs, as well as for export to earn foreign exchange. They also constitute an effective ground cover providing an efficient protection against soil erosion and increasing the underground water retention capability of the soil. Moreover, the natural biological diversity is conserved. A substantial part of the national income is derived from the forestry sector and as much as 40 per cent of export earnings. The rural economy depends entirely on the forests, with about 4 million m³ of wood used for fuel (about 1 m³/person). Nearly all of the food intake, medicinal and other household utility items of the rural population come from the forests and natural waters. Overall, the stability and the development of Laos depends very much on the existence and sustainability of the forests.

1.5 Deforestation

The forest cover of the country has been reduced over the last decade for several reasons. Excluding the extended damage inflicted by the war, the causes of deforestation are recognized as shifting cultivation, logging, encroachment and indiscriminate burning.

Shifting cultivation

Shifting cultivation is the only farming system which has been practised by all national and ethnic groups in Laos. However, the areas most affected are the uplands which are not suitable for permanent types of cultivation. In the flat lowlands, shifting cultivation is not widely practised and agriculture is becoming more permanent due to the availability of machines to expand agricultural plots.

Up to 1.5 million people rely on slash-and-burn activities for their livelihood and as much as 300,000 ha of land is under such land use.

This slash-and-burn cultivation destroys large areas of forest cover every year. Estimates range from 250,000 to 300,000 ha, of which a considerable portion is dense, high forest of commercial importance. About 277,000 families, concentrated mainly in the northern region of the country, rely on this practice for their subsistence.

Logging

Timber extraction is one of the major causes of damage to the forests. Most logging activities are carried out in the low-density forest, so an extensive area is needed to reach the targeted extraction volume. Therefore, a large area needs to be opened up for skidding and handling. Log removals are reported to have reached over 300,000 m³ annually since the early 1980s.

Encroachment

In many parts of the country, particularly lowlands, it is common practice for people to carry out shifting cultivation on small plots in areas adjacent to their rice paddy as a secure supplement to their paddy production. However, since the larger proportion of the population lives in these lowland areas, the pressure on land is increasing. Expansion of cultivated land areas must be accompanied by development of new methods and techniques of production such as the construction of irrigation systems, application of fertilizers and use of improved varieties of crops.

The rural population relies totally on the forest for fuelwood, housing, fencing and other household utility articles. The fuelwood consumption accounts for about 4 million m³ annually.

Indiscriminate burning

Forest fires rage over immense areas every year during the period from February to April. These fires are usually man-made and started for some purpose, sometimes not justifiable. They may be started in the logged forest as preparation for slash-and-burn cultivation and in dry grassland to promote new green, fresh grass for cattle. Sometimes fire is used to trap or chase wild animals. On the other hand, they may be started just for cooking or for fun. Whatever the purpose, the fire is usually left unattended and often spreads uncontrolled, raging over the forest for days.

2. FORESTRY POLICY

2.1 Principles and objectives

With awareness of the importance of forests to stability and development, and the recent decline in their area, central focus has been placed on protection and conservation of the forests. Taking into account the prevailing domestic and international conditions, the government needs to promote socio-economic development and at the same time develop the forest resources.

2.2 Development processes

Policy guidelines are drafted by the party committees after wide-ranging consultation with eligible organizations, individuals and parties and adopted by the Party Congress which is held every four years. All adopted Policy guidelines are then passed down through organizations to the people to encourage clear understanding of the details.

During the four-year period between Party Congresses, many government meetings are convened in which resolutions on various topics are examined, adopted and endorsed. These resolutions are also passed down to government mechanisms of administrations for thorough consideration and successful implementation by the people. Based on the main guidelines and the resolutions, the Council of Ministers endorses government decrees and the ministries issue rules and regulations on specific policy matters, to make sure that the policies are satisfactorily implemented.

During the course of implementation, feedback is obtained and reviews made at conferences. Amendments are drawn up and proposed for approval by ministries and the Council of Ministers. The Ministry of Agriculture and Forestry, with the Department of Forestry as secretariat and advisory body, drafts and issues rules, regulations, decrees and laws concerning forestry matters. Seminars and workshops are considered as effective measures to consolidate ideas, comments and suggestions for the process of developing policies.

2.3 Main elements

In recognition of the value of forest resources to socio-economic development and the environment of the country, the policy related to forestry focuses on the protection and rational utilization of the existing forests and the expansion of forest cover of the country.

Forest protection

As already noted, substantial parts of forest areas are destroyed every year, mainly due to shifting cultivation activities. This traditional way of cultivation is considered to be very detrimental to forest resources and the environment.

The biodiversity of the forests must be preserved to maintain the richness of nature and equilibrium of the universe. Shifting cultivators have to be resettled or directed away from the traditional practices to a more productive lifestyle which is less harmful to the forests. New farming systems need to be developed for all affected areas so that farmers will be assured of adequate means of production and basic needs, and even possibly trading of production surplus.

The system of cultivation offering the best solution is agro-forestry techniques whereby forest trees, fruit trees and other short-term industrial or agricultural crops are inter-planted. This would meet

both the long-term and short-term requirements of the people, though with emphasis on the former. Even though some form of agro-forestry system has long been practised in Laos, improvement is necessary to reach a satisfactory productivity level. This requires planning and systematic introduction of new techniques and better crop varieties.

All operations in existing forests must strictly adhere to sound principles and be subject to proper control and supervision. Logging and all other forest-related activities should be carried out in accordance with rules and regulations which safeguard the principle of sustainable management. Fires that wipe out substantial forest areas every year have to be checked and only controlled burning should be allowed.

Forest utilization

The biggest users of the forest are the people living in the rural areas. Almost all of their daily activities are somehow connected with the forest - collection of food, wood and minor forest products for household use. Rural use of the forests involves mainly indiscriminate cutting with negative effects. Rules and regulations or guidelines under which these forest activities can be performed need to be established.

Commercial logging also has a major impact on the bio-ecological conditions of the forests and adherence to sound management principles is imperative. Prior to any logging operation in a forest area, a proper management inventory should be carried out and this information used for further planning. Forest industries should enhance the rational utilization of the forest by improving old technology and introducing new methods so that a wide variety of natural forest products can be harvested and a range of finished products manufactured with minimum waste.

Forest legislation needs to be drawn up, promulgated and enforced to provide legal support for the implementation of sustainable forest management and rational utilization principles. Although forest resources are considered to be replenishable and renewable, without sound and sustainable management practice, forest land will be depleted or exhausted in the near future.

Forest rehabilitation

The Lao government has set a target to rehabilitate degraded and unstocked forest land and restore forest cover to 70 per cent or about 17 million ha. Rehabilitation work will rely mainly on limiting further destruction of degraded and secondary forests. In the high-potential marketable areas, plantations of teak and fast-growing species will be greatly encouraged. In the remote areas, natural regeneration is possible and should be promoted.

3. POLICIES OUTSIDE THE FORESTRY SECTOR

3.1 Interaction of policies

National development of Laos depends heavily on its natural resources. In 1989, wood products accounted for some 40 per cent of official exports, while the share of forestry in Gross Domestic Product was estimated at about 15 per cent. Therefore, any reform introduced in forestry policy will have impacts on the economic and welfare sectors.

3.2 Economic sector

Concern expressed by the Lao government about forest protection and rational utilization of forest resources was transformed into action by the promulgation of the Ministerial Council Decrees No. 66 approving the Tropical Forest Action Plan and No 67 on the cessation of logging and forest industry operations. According to this decree, new cutting will be allowed only based on an approved management plan of the Forest Department. Referring to the same decree, sawmills and other wood-working factories which are found illegal and inefficient will be suppressed or modernized. In recent years, log exports have been discouraged to promote wood-based industrial development, while the export of finished wood items has been greatly encouraged.

A desire to protect the environment resulted in postponement of a project to construct a hydro-power station of 600 megawatts in Nakay plateau of Central Laos.

The policy of rational utilization and protection of forests reduces short-term government income from taxes. However, with effective management and strict control, greater benefit from forests can be expected in the long term.

3.3 Social welfare sector

The new policy aims to reduce areas under shifting cultivation. Out-dated, wood-based industries have both negative and positive effects on social welfare. Reduction of sawmills will put thousands of workers out of work. At the same time, the creation of wood-working factories will create more jobs. Higher wages are also expected because finished products need qualified and skilled labour. Plantation forestry will create jobs in these areas. If a programme to plant 10,000 ha is successful, as proposed by the Asian Development Bank, about \$US 10 million will be spent. This will bring income to the rural communities and plantation workers.

Participation and coordination of key ministries at the grass-roots level is vital for the success of the shifting cultivation programme. These include the Ministry of Transport, Communications and Construction, Ministry of Education and Sport, Ministry of Trade and Tourism, Ministry of Finance and Planning and Ministry of Public Health. Without rural development works, the programme has very little chance of being successful.

4. FORESTRY POLICY RESPONSES TO KEY DEVELOPMENT ISSUES

4.1 Forestry's role

The introduction of radical economic reforms in 1986 paved the way for the reforms and policy development in the agricultural and forestry sectors. For many years, forest resources have been regarded as the sole source of government income and exchange. This has been the major cause of their depletion. Now the government is committed to diversify income sources such as agriculture, handicrafts, electricity production and tourism. The role of forestry in maintaining the potential of these sectors is vital. As Laos is a mountainous country, if the forest cover is reduced to less than 30 per cent, development of these sectors could be compromised forever.

4.2 Forest management

Fully aware of the damaging environmental implications of different activities in the forests (shifting cultivation, excessive logging, encroachment, illegal cutting), the Lao government is looking for ways

and means to manage its forests sustainably. The New System of Resource Management (NSRM), proposed by the World Bank, is under consideration. According to the proposal, the NSRM will complement the changes that have been made at a national level in areas of decentralization of economic and fiscal management, improving resources mobilization and increasing the efficiency of public sector support services. To implement the NSRM, several elements need to be initiated.

- Institutional reform is required to give national jurisdiction and enhanced implementation capability for the Department of Forestry to carry out core functions.
- A single national system of natural resource planning and management using the Resource Management Area as the operational unit of all resource users' activities must be established.
- Reform of the system of forest management and forest products marketing, pricing and taxation must be executed.
- Incentives could be used as a means of improving conservation management among resource users.
- Apart from the system of protected areas, biodiversity preservation will be achieved by a combination of conservation in production forests and in community managed areas.

The role of government is to provide effective national planning, regulations and implementation capability. The Department of Forestry, in accordance with the instructions from the Cabinet of Ministers, is implementing a number of programmes.

- Forest management planning for sustained use of forest resources.
- Watershed management, protection of natural environment and conservation of biodiversity through zoning, public education and establishment of protected areas.
- Stabilization of shifting cultivation, through rural development and improvement of farming practices.
- Reforestation of degraded forest land.
- Wood industries development and increased efficiency of wood utilization.
- Institutional development and training of forestry staff.

4.3 Forest conservation and poverty alleviation

The problems of forest destruction cannot be solved without addressing the problems of rural poverty. These will be difficult to solve quickly. Since the causes of poverty are diverse, integrated rural development is likely to be the only successful approach. The government has made concerted efforts to develop the rural areas by constructing basic infrastructure such as roads, hospitals, schools and irrigation.

The policy of allocating up to 500 ha of forest land to a village and up to 5 ha to a family is aimed at solving problems of forest encroachment and unregulated slash-and-burn practices. Any management plan for protected areas must include the management and development of buffer zones.

4.4 Employment opportunities

It has been estimated that the forest industry provides about 30,000 jobs, mainly in logging companies, allied industries and factories. The government is presently considering a project for a

plantation of fast-growing species. If the project is accepted, it will create 1,500 to 2,500 jobs for nursery and plantation work.

4.5 Land use development dialogue

To be successful, forestry policy must emphasize land-use planning. Sustainable land use is essential and vital for the sustainable use of forests. According to the new policy, forest land will be zoned and managed, with forest in watershed areas protected. Degraded forests are to be rehabilitated by means of natural regeneration or plantation works, and unstocked and very degraded forest land will be allocated to Lao citizens and private investors to plant trees and agricultural crops.

4.6 Decentralization in policy making, planning and management

In the past, the Ministry of Agriculture and Forestry was responsible for issuing general policy and guidelines. Provincial authorities were quasi-autonomous in the management of their forest land and forestry industry. This created some problems for national management. In December 1991, the Ministry of Agriculture and Forestry was given national jurisdiction over the management of forest land and the forest resource. Now Provincial and district forest bureaus are included into a single-streamed structure. Provincial authorities no longer have the power to make decisions on forestry issues, but retain the task of coordinating different sectors and providing feedback to the central government.

4.7 Privatization perspective

Radical economic reforms introduced in 1986 paved the way for a market-oriented economy. Described as the New Economic Mechanism (NEM), the reforms were designed to improve productivity and efficiency of the economy. In the past, state-owned enterprises have been operating inefficiently. A government decision was made to lease or sell most of its enterprises to the private sector. Central and provincial logging enterprises have been abolished or moved from only cutting trees to undertaking multiple activities like road construction, irrigation works, etc. Wood-based industries have been leased and sold to private companies.

5. FACTORS AFFECTING POLICY FORMULATION

The main factors affecting policy formulation can be identified as the conflicts between conservation, production and income generation, land tenure and forest management, and the administration system.

5.1 Conservation and production

The Lao government emphasizes a policy of self-sufficiency. Therefore domestic production has been strongly encouraged at all levels. A high rate of growth in production has been observed in the agricultural and service sectors. Expanding agriculture has had a great impact on forest conservation. People encroach and clear forest land to increase their fields.

In the past, the timber industry has suffered from temporary bans issued by the government. Although the ban may be temporary, a reduction of government income from loss of taxes and special fees follows such actions.

5.2 Land tenure

Under the National Constitution, land belongs to the community which means each citizen has an equal right of use. The government acts as the legal management representative of the community. Private property is not recognized but the right to use the land is. Unused land can be reclaimed by the government and reallocated to another citizen.

5.3 Administration system

The political administration system in Laos is somewhat unique. The Lao Revolutionary Party issues general guidelines on goals, whereas the ways and means to fulfil the goals are the government's responsibility. Formulation of forestry policy must take into account the general guidelines of the party which is enunciated by a Party Congress every five years.

6. POLICY IMPACT

6.1 Forest management and utilization

In order to achieve sustainable use of forest resources, the government is consolidating the reforms already begun in the forest sector. Over the medium term, strategies and actions will be implemented that directly address the causes of deforestation and environmental destruction. The government is carrying out reform on three key elements. Institutional reform will give national jurisdiction and enhanced implementation capability for the Department of Forestry to carry out core functions. A single national system of natural resource planning and management is being instituted and the government places great importance on fieldwork and minimizes unnecessary bureaucracy at head office. Periodically, staff is sent from the Ministry to the provinces to help local staff in management planning.

6.2 Economic gain

The most obvious gains of the new Policy are the reduction of areas under shifting cultivation by 5 per cent or about 15,000 ha, of which one-third or 5,000 ha are commercial forest. If we assume one hectare yields 20 m³, annual reductions could reach 100,000 m³. One cubic metre is valued at \$US 50, so the total gain could be \$US 5,000,000. The overall income of government is maintained while the total volume of logs harvested is reduced by one-third.

Public awareness is being promoted by placing forest officers and forest guards in the villages and communities.

7. POLICY REFORM AND POLICY INSTRUMENTS

7.1 Major lessons

It is clear that forestry policy cannot be considered separately from others sectors, economic as well as administrative and political. Policy reform must take into account social and historical as well as technical aspects. Decisions must not be made without considered assessment of all factors.

7.2 Policy instruments

Policy formulation has been facilitated by the fact that there is a one-party political system. However, the outlined policy and programmes will only be successful if they are accompanied by financial support. A major problem of implementation is that Laos does not have that necessary financial support.

7.3 Conclusion

The forestry sector of Laos is currently being restructured in an effort to fulfil the resolutions on forestry adopted by the Party Congress in 1990. According to the resolutions, forests and forest lands should be protected, rehabilitated and used rationally. Institutional and administrative reform are considered necessary for effectiveness in policy formulation, forest regulations, plans, strategies and personnel upgrading programmes. The reforms will not be carried out without difficulties and the obvious ones include the lack of necessary funds and qualified personnel. The success of the reforms will depend largely on how well the country can overcome these problems.

MALAYSIA*

1. INTRODUCTION

Malaysia has abundant renewable natural forest resources which have satisfied the people's basic needs of food, fuel, shelter, medicine, income and general welfare in the past and contributed significantly to socio-economic development in recent years. They also constitute an integral part of the socio-cultural and religious activities of the indigenous people of the region (Werner, 1991). Besides direct economic benefits, Malaysia's forests have heritage, cultural, aesthetic and recreational values which enhance quality of life. They play a vital role in the protection of soil and water resources, the maintenance of environmental stability and quality, and the conservation of biological diversity, all of which are essential for sustainable development.

Except for traditional hunting, gathering and shifting cultivation there was little development of forest land in Malaysia until the 19th century as occupation and activity were confined mainly to the coasts and rivers. The clearance of forest land from the 19th century for mining and spice plantations prompted the 1879 report on the forests of the Peninsula, reservation of forests from the 1890s, and the 1900 report on forest administration with plans for management of the forests (Menon, 1976). In Sarawak, shifting cultivation was restricted by the Land Order of 1875 with fines imposed for land cleared and abandoned (Anon., 1990a).

During the first quarter of the 20th century, rubber was widely planted and tin mining expanded. The growing threat to the forests prompted the appointment of the first Chief Forest Officer for the Federated Malay States and Straits Settlements in 1901 (Menon, 1976). Forestry policies were evolved, forest laws and rules were enacted in the 1930s providing scientific management and control over the protective and productive functions of the forest, and systematic forestry operations, research and training were initiated (Ismail Hj. Ali, 1972). The Sabah (North Borneo) Forest Department was formed in 1914 in response to the increase in logging activities and the first Conservator of Forests appointed in 1920 (Anon., 1989). Sarawak's Forest Department was established in 1919 'to manage and conserve the State's forest resources wisely and efficiently' (Anon., 1990b).

The first notable official statement of forestry policy in 1922 declared that 'The forests properly managed are an asset of continually increasing value and the government attaches the greatest importance to their maintenance, not only as a source of revenue, but on account of the many other benefits that accrue from the possession of them' (Anon., 1959). The statement was expanded to encompass self-sufficiency in timber and waste minimization.

The country was criticized during the 1930s as too blindly following a forestry policy developed by India and an Interim Forestry Policy for the Federation of Malaya was prepared in 1952 (Anon., 1959) which advocated in explicit terms the constitution of Protective Reserves and Productive Reserves with an even geographical distribution in the interest of local self-sufficiency. A proportion of the revenue derived from Productive Reserves 'should be reinvested in the form of silvicultural operations' for cultivating fresh timber'. It proposed to foster a real understanding among the people of the value of forest and became a working policy but was not adopted as the official National Forestry Policy.

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Sarawak's 'Statement of Forestry Policy' was approved in 1954 (Anon., 1954) and remains in effect. The policy provides for the reservation of a permanent forest estate for protection and production, sustainable management of the productive forests, economical utilization of forest products and promotion of exports. Sabah promulgated forestry policies for forest management, planning and implementation to ensure that the forest as a renewable resource is maintained and managed properly.

A memorandum on 'Forestry Policy in the Federation of Malaya and Proposals for its Amendment and Clarification' was prepared in 1955 and revised in 1959 to guide government planning for land use (Anon., 1959). The proposed plan of management indicated that the Federation could have a timber deficit by the year 2020. In view of this, it was proposed that a Federal Forestry Policy be formulated to ensure attainment of self-sufficiency in timber and other forest produce by constitution of a permanent forest estate for protection and production. A production area of 12,500 square miles was to be managed in accordance with sustained yield principles. Maximum exploitation and regeneration of Forest Reserves, systematic exploitation and clearance of State Land forests, controlled development of wood-based industries and research and development financing from a central fund were all part of the policy proposed.

An interim National Forestry Policy for Peninsular Malaysia was approved by the National Land Council in 1969 which catered for developmental forestry and forest industries, consistent with the country's development (Menon, 1976). This policy was considered to be 'still restrictive in nature and quite vague' on matters concerning socio-economic benefits and forest production (Zainal Abidin, 1972). It argued for greater participation of people as well as the conservation, production and export roles of forestry. Reforestation would ensure forestry's role in national development (Ismail Hj. Ali, 1972).

A draft 'National Forest Act' was introduced in 1973 to provide for necessary administrative and legal machinery to give effect to the forestry policy and for integration of forestry activities in Peninsular Malaysia (Anon., 1973). Forest development strategies aimed at maximising sustainable socio-economic benefits from forestry were proposed for Peninsular Malaysia and Sarawak in the 1970s.

After 1963, there was rapid conversion of forests for rubber, oil palm and cocoa to satisfy demand from the developed countries. Forestry contributed significantly to government revenues, export earnings, gross domestic product, employment and politico/socio-economic development. It played a major role in achieving the goals of the country's five-yearly National Development Plans, the Industrial Master Plan and the New Economic Policy which aimed to eradicate poverty and restructure society.

Forestry features prominently in the Sixth Malaysia Plan (1991-1996), the Second Outline Perspective Plan and the National Development Policy which aim for economic, environmental, social and cultural sustainability of the country. Forestry's role in development will change from primarily production and export to focus increasingly on the conservation of environmental quality, soil and water resources, and biological diversity essential for sustainable development.

2. FORESTRY POLICIES

Past forestry policies in Malaysia generally aimed at the conservation and protection of the environment and the attainment of sustained and maximum yield (Anon., 1973). Current policies, however, are more comprehensive and are often complemented and supplemented by *ad hoc* policy statements and decisions, specific policies and strategies, appropriate policy instruments, and plans and programmes with explicit goals.

Malaysia has yet to adopt a truly National Forestry Policy which covers the whole country. Nevertheless a National Forestry Policy for Peninsular Malaysia was approved by the National Forestry Council and endorsed by the National Land Council in 1978. It has been adopted by all the States in Peninsular Malaysia and is supported by Sabah and Sarawak which have forestry policies with similar objectives.

2.1 Principles and objectives guiding forestry policy

The National Forestry Policy is supported by the National Forestry Act and the Wood-based Industries Act. The current State Forestry Policy of Sabah is supported by the Forest Enactment (Anon., 1989), while Sarawak's Statement of Forestry Policy is supported by the Land (Classification) Ordinance, Forests Ordinance, National Parks Ordinance and Wildlife Protection Ordinance (Anon., 1990b).

Peninsular Malaysia

The National Forestry Policy has been declared as follows (Anon., 1978):

_ To dedicate as Permanent Forest Estate sufficient areas of land strategically located throughout the country in accordance with the concept of rational land use, in order to ensure

— the sound climatic and physical condition of the country, the safeguarding of water supplies, soil fertility and environmental quality and the minimization of damage by floods and erosion to rivers and agricultural land; such forest lands being known as *protective forests*;

— the supply in perpetuity, at reasonable rates of all forms of forest produce which can be economically produced within the country and are required for agricultural, domestic and industrial purposes, and for export; such forest lands being known as *productive forests*;

— the conservation of adequate forest areas for recreation, education, research and protection of the country's flora and fauna; such forest lands being known as *amenity forests*.

_ To manage the Permanent Forest Estate with the object of maximising social, economic and environmental benefits for the Nation and its people in accordance with the principles of sound forest management.

_ To pursue a sound programme of forest development through regeneration and rehabilitation operations in accordance with approved silvicultural practices in order to achieve maximum productivity from the Permanent Forest Estate.

_ To ensure thorough and efficient utilization of forest resources on land not included in the Permanent Forest Estate, prior to the alienation of such land, by means of proper coordinated planning by land development agencies in order to obtain maximum benefits for the people through complete harvesting and processing of such resources, adhering strictly to the optimum need of local processing industries.

_ To promote efficient harvesting and utilization of all forms of forest produce and to stimulate the development of appropriate wood-based industries with determined capacities commensurate with the resource flow in order to achieve maximum resource utilization, create employment opportunities and earn foreign exchange.

_ To ensure the sound development of trade and commerce in and to promote the exportation of forest products.

_ To promote effective Bumiputra participation in forest and wood-based industries consistent with Government policy.

_ To undertake and support an intensive research programme in forest development aimed at achieving maximum yield from the Permanent Forest Estate, maximum direct and indirect benefits from harvesting and utilization and above all maximum financial return on investment in forest development activities.

_ To undertake and support a comprehensive programme of forestry training at all levels in the public sector in order to ensure an adequate supply of trained manpower to meet the requirements of forestry and wood-based industries.

_ To encourage private sector involvement in forestry research and training at all levels with a view to accelerate industrial development and enhance the quality of professionalism in forestry and forest industrial practices.

_ To foster, by education and publicity, a better understanding among the community of the multiple values of forests to them and their descendants.

_ To foster close cooperation among all in order to achieve optimum utilization of the valuable natural resources of the country.

Guidelines for policy implementation are provided and defined specifically for the constitution of Permanent Forest Estate (PFE); management of PFE; forest regeneration and rehabilitation; harvesting of forests; development of wood-based industries; Bumiputra participation; forestry research; training; and education in the value of forestry. The National Forestry Policy is supplemented by specific policies to guide forest management, development and conservation and the development of forest industries (Mok, 1977; Thang, 1991). The policies seek to promote efficient harvesting, value-added processing, regulation of log flows, reforestation, plantation establishment, multiple-use forestry and environmental conservation. Comprehensive forest land use and management plans are to be employed in the utilization of the forests.

Sabah

The State Forestry Policy, which serves as a guideline for the sustainable management of the forests, planning and implementation of Forestry Department activities and promotion of awareness of the values of forests, is as follows (Anon., 1989):

_ To preserve permanently for the benefit of the present and future inhabitants of the State sufficient forested land:

— for the maintenance of the sound climatic and physical condition of the State, and for the safeguarding of water supplies and the

prevention of damage to rivers and agricultural land by flooding and erosion; and

for the supply in perpetuity at reasonable rates, of all forms of forest products required by the people for agricultural, domestic and industrial purposes.

_ To manage the forest estate with the objective of obtaining the highest revenue compatible with sustained yield, in so far as this is consistent with the two primary objectives set out above.

_ To provide the technically trained staff necessary for forest management and revenue collection and for research.

_ To support and cooperate in all appropriate schemes of regional forest research.

_ To accept in principle that security of tenure and long-term planning is necessary for the successful management of the forest estate.

_ To foster, by education and propaganda, a real understanding amongst the people of Sabah of the value of forests to them and their descendants.

Sarawak

The general Statement of Forestry Policy is (Anon., 1954):

_ To reserve permanently for the benefit of the present and future inhabitants of the country forest land sufficient:

for the assurance of the sound climatic and physical condition of the country; the safeguarding of soil fertility, and of supplies of water for domestic and industrial use, irrigation and general agricultural purposes; and the prevention of damage by flooding and erosion to rivers and to agricultural land; and

for the supply in perpetuity and at moderate prices of all forms of forest produce that can be economically produced within the country and that are required by the people for agricultural, domestic and industrial purposes under a fully developed national economy.

_ To manage the productive forests of the Permanent Forest Estate with the object of obtaining the highest revenue possible compatible with the principle of sustained yield and with the primary objects set out above.

_ To promote, as far as may be practicable, the thorough and economical utilization of forest products on land not included in the Permanent Forest Estate, prior to the alienation of such land.

_ To foster, as far as may be compatible with the prior claims of local demands, a profitable export trade in forest produce.

Guidelines are provided for the realization of the policy objectives in the areas of classes of permanent forest: Forest Reserves, Protected Forests and Communal Forests; constitution of permanent forests;

management of permanent forests; exploitation of other forests; forest revenue and rights to free produce; forestry research; education in the value of forests; and staff and finance.

2.2 Process of forestry policy formulation

Prior to independence, the formulation of forestry policies was initiated by the Forestry Departments as there were little public interest in forestry and few conflicts in land use. The process usually involved some consultation between government departments and agencies concerned with land use and natural-resources development. Since independence, the formulation of forestry policies has become more structured and open. Land, agriculture and forestry are within the jurisdiction of the respective states, who can enact laws on forestry and formulate forestry policy independently. The National Land Council (NLC) was set up to formulate a national policy for the promotion and control of the utilization of land and for the administration of any related law. This includes the establishment and implementation of a national forestry policy and the federal and state Governments are obliged to follow the formulated policy (Anon., 1973).

In order to facilitate the adoption and coordination of a common approach to forestry, the NLC established the National Forestry Council (NFC) in 1971. It serves as a forum for governments to discuss and resolve common problems and issues relating to forestry policies, administration and management. The responsibility for implementing decisions of the NFC lies with the respective state governments and the federal government only has jurisdiction over research and maintenance of experimental and demonstration stations; training and education; the provision of advice and technical assistance; and the promotion and facilitation of trade, commerce and industry.

In recent years, rapid deforestation and its increasing impacts on the wood-based industries in Peninsular Malaysia and the environment have generated public concern and increased awareness of the importance of forests and forestry. Regular consultation with the private sector is increasing under the Malaysia Incorporated concept and the establishment of the Malaysian Timber Industries Development Council. The Non-governmental Organizations (NGOs) and local people's groups are beginning to take an active interest in forestry and related environmental issues.

2.3 Main elements of forestry policy

Land use

Despite extensive conversion of forest land for oil palm and rubber estates, Malaysia has yet to formulate a National Land Use Policy although steps have been initiated to prepare a National Land Use Master Plan. Consequently forestry has no security of tenure, leaving the Permanent Forest Estate vulnerable to excision and conversion to other uses, making long-term planning and development in forestry to ensure sustainable development virtually impossible. Allocation of land for forestry is generally based on land capability classification or soil survey and achieved largely by means of legal definition and constitution by political decisions: in Peninsular Malaysia under the National Forestry Act; in Sabah under the Forest Enactment; and Sarawak's Forests Ordinance.

Although land development has been on-going for more than three decades, Malaysia still had 18.40 million ha of natural forests or 56 per cent of the total land area of the country at the end of 1989 (Peninsular Malaysia: 5.51 million ha; Sabah: 4.44 million ha; and Sarawak: 8.45 million ha) (Thang, 1991). About 4.3 million ha or 86 per cent of the agricultural land were under perennial tree crops of rubber, oil palm, cocoa and coconut in 1988 (Anon., 1990c).

Classification of the Permanent Forest Estate

By the end of 1989 a Permanent Forest Estate of 12.73 million ha had been established (Peninsular Malaysia: 4.74 million ha; Sabah: 3.35 million ha; and Sarawak: 4.64 million ha) (Thang, 1991). Of the total area, 9.99 million ha have been identified as production forests, (2.84 million ha; 3.0 million ha; 4.15 million ha). Sarawak has plans to increase its Permanent Forest Estate to about 70 per cent of the current total forested area (Anon., 1990b).

The National Forestry Act requires the classification of every permanent reserved forest under categories descriptive of their uses. These purpose classes are timber production under sustained yield; soil protection; soil reclamation; flood control; water catchment; sanctuary for wildlife; virgin jungle reserve; amenity; education; research; and federal purposes.

The Forest Enactment of Sabah provides for the forest reserves as protection forests, commercial forests; domestic forests; amenity forests; mangrove forests; and virgin forests. Sarawak's Forests Ordinance provides for Forest Reserves for controlled production; Protected Forests for people's rights of collection, pasture and hunting; and Communal Forests to be determined by a community for domestic use.

Management of natural forests

The natural forests in Malaysia have been managed under sustained yield principles since 1900. Ecologically and environmentally sound forest conservation and management policies are applied to ensure sustainable development. Traditionally, the Malayan Uniform System has been used which involves the removal of the mature crop in a single felling and the selected natural regeneration by poison girdling of defective trees and non-commercial species (Thang, 1991). The System has since been modified towards more selective felling and less poison-girdling.

The Selective Management System (SMS), since adopted in Peninsular Malaysia, involves the selection of a management regime to optimize harvesting, utilization, and sustained yield but, more importantly, to ensure environmentally sustainable forest development. The SMS requires an adequate pre-felling inventory and simulation of alternative felling options. Integrated studies in forest management and operations have been initiated to develop and refine information and techniques for the effective implementation of the system.

Besides the specific policies for forest management and development, Peninsular Malaysia has adopted Forest Harvesting Guidelines, Standard Road Specifications and other strategies for the management of natural forests (Thang, 1991). Forested land for conversion will only be released in a planned manner to ensure maximum utilization of wood supply and reliable flow of logs. That area not to be converted will be sustainably managed as Permanent Forest to maximize economic returns compatible with environmental preservation. Forest inventories are to be carried out to ensure appropriate management and silvicultural systems. Regeneration sampling to assist silvicultural management, soil surveys for optimal planning, multiple-use forestry and research into productivity, growth and yield will all help preserve the forests.

To ensure sustainable management, the National Forest Act requires, and facilitates by the operation of a Forest Development Fund, the preparation and implementation of State Forest Management Plans. These plans prescribe allowable cuts, reforestation programmes and amenity programmes. Peninsular Malaysia also initiated forest plantations in 1957 to overcome timber deficits, relieve pressure on forests and to rehabilitate degraded and deforested land. The Compensatory Plantation Project (1982) planned to plant 188,000 ha with fast-growing species.

Sabah set a goal to reserve at least 50 per cent of the total land area as permanent forest cover and still sustain commercial harvesting by logging agreements, management and operational plans (Anon., 1989). Strategies were adopted to rehabilitate 540,000 ha of forest degraded by intensive use and fires; to establish commercial public and private forest plantations of over 390,000 ha; and to establish a pilot plantation project.

Sarawak also has strategies for conservation, management and development of the natural forests (Anon., 1990b). The Permanent Forest Estate is to be enlarged to cover forest land not reserved for other development, and forest management is to be for the common benefit and optimal use. Conservationist harvesting by selective felling and with minimum damage will ensure sustainability as will continuous refining of management plans by appraisal and research on the resource base. Multiple-use forestry will be promoted whenever possible and wildlife preservation, national parks and sanctuary establishment and tourism potential will all be areas for attention. Research on wildlife preservation, improved utilization, investment potential and potential for employment is to be initiated.

Each forest concession area or forest management unit in Sarawak has a management plan to ensure sustainable management and carefully planned harvesting operations by optimising utilization, regulating harvest, regenerating forest, etc. (Anon., 1990b). A reforestation programme also will establish plantations of fast-growing species in degraded/deforested shifting cultivation areas within the Permanent Forest Estate (Anon., 1990b). This will restore deforested areas to productive forests, restore fertility and environmental protection functions, provide employment to shifting cultivators and ensure a sustainable supply of timber for industrial use. The role of forestry in rural community development will also be emphasized.

Conservation of protected areas

Forest reservation for protection was initiated towards the end of the last century. Forestry policies and legislations have been supplemented by the Land Conservation Act; National Land Code; Protection of Wildlife Act/Ordinance/Enactment; Environmental Quality Act; National Parks Act/Ordinance/Enactment; and National Agricultural Policy (Anon., 1988). Active conservation strategies were incorporated in the Third Malaysia Plan (1976-1980), while the Fifth Malaysia Plan (1986-1990) provided for additional forest areas for nature conservation; preventive measures against the deterioration of the environment; and the promotion of greater involvement of the whole of society in environmental awareness campaigns.

Recent management of protection forest areas has become fragmented, due largely to the idealistic influences of conservation and environmental NGOs from developed countries. In Peninsular Malaysia, two agencies hold jurisdiction for policy with three in Sabah. Fortunately, all protected forest areas in Sarawak remain the responsibility of the Forest Department facilitating sustainable management and development of the forests for production, environmental protection, conservation of biological diversity and recreation.

Of 1.39 million ha of conservation areas, 1.06 million ha are located outside the Permanent Forest Estate in the form of national parks, wildlife reserves and sanctuaries, nature parks, bird sanctuaries and marine parks (Thang, 1991). A further 1.42 million ha are under consideration for reservation with priority being given to under-represented habitats. A unique feature of Malaysia's protected area system is the Virgin Jungle Reserve (VJR) which serves as a permanent nature reserve and natural arboretum; a control for comparing harvested and silviculturally treated forests; an undisturbed natural forest for ecological, phenological and general biological studies; and a seed stand and gene pool. About 110,000 ha represent all the major forest types in the country.

Conservation strategies have been formulated for most of the states in Malaysia, while a National Conservation Strategy is being developed. The present strategy for conservation in Sarawak (Anon., 1990b) includes establishment of national parks and wildlife sanctuaries, detailed resource inventories of these areas, enhancing tourism potential and research on protection, conservation and habitat management of wildlife. A Special Select Committee in Sarawak reported on depletion of flora and fauna in 1988, and was approved for implementation (Anon., 1990b).

Forest production, industries and trade

A forest industrial development policy (Anon., 1988) has been adopted to: promote efficient harvesting and utilization of all forest produce; balance national industrial processing capacity with resource availability; stimulate planned development and product diversification; promote the export of value-added forest products; ensure domestic supply of products will be adequately met; and encourage use of the under-utilized species, small logs and new forms of wood-processing industries.

Forest products are harvested in Malaysia from the production forests of the Permanent Forest Estate, which are managed under sustained yield, and State Land forests, which are normally cleared and converted for agricultural, infrastructural and other purposes. During the past decade, annual log production from the natural forests fluctuated between 27.9 million m³ in 1980 to 39.7 million m³ in 1989. Of the total 1989 production, 17.0 million m³ were harvested from the permanent production forests while the balance of 22.7 million m³ were logged from conversion forests (Thang, 1991). A substantial volume of rubber wood and non-wood forest products, notably rattan, have been harvested in recent years. Sabah began harvesting its plantation forests recently. Log production is projected to decline over the next decade with the gradual depletion of the State Land forests but to increase again as forest plantations mature.

Wood-based industries are amongst the oldest processing and manufacturing industries in Malaysia. They developed rapidly in recent years as large volumes of high-quality logs became available and international demand for tropical hardwood products escalated. In 1988 there were 919 saw mills which produced 6.6 million m³ of sawn timber, 1.0 million m³ of plywood and 0.4 million m³ of veneer. Other wood-based industries included an integrated pulp and paper mill, and numerous mills producing woodchips, mouldings, joinery, furniture, paper products, boxes, crates, blockboard and particle-board.

The Industrial Master Plan identifies the development objectives of the wood-based industry sector as transforming the industry into a major contributor to the national economy, generating maximum value added from the declining resources and promoting Malaysia's position as an international supplier of furniture and joinery/mouldings. The manufacture of value-added products is to be concentrated in Peninsular Malaysia with timber-processing zones in Sabah and Sarawak. Strategies include establishment of a large production base, more efficient utilization of existing resources, close coordination between regions, rationalization of saw-milling sub-sector, training incentives, active marketing and development of the indigenous technological base.

Tree growing outside forests

Malaysia has a long tradition of growing trees outside forests as the people are accustomed to planting trees around their houses for food, other non-wood products and for commemorating special events.

The bulk of commercial agricultural crops for export are from perennial trees. In 1988, 86 per cent of the total land area under agricultural crops was under rubber, oil palm, cocoa and coconut. Rubber and oil palm estates provided employment for more than 220,000 people while about 500,000

smallholder families were involved in rubber growing and some 72,000 householders were in public-sector land schemes under oil palm (Anon., 1990c).

Various community and social forestry programmes involving the local people and forest dwellers have been initiated in recent years. In Peninsular Malaysia, local people have been encouraged and assisted to plant high-quality timber trees on idle lands and rattan in maturing rubber smallholdings and fruit trees on forest fringes. Sabah has instituted forest settlements with large-scale forest plantations and in-situ afforestation of degraded waste lands, tree farming on unproductive private smallholdings and agro-forestry. In Sarawak, community and social forestry programmes involve the local people in planting fruit and timber trees and animal husbandry on degraded shifting cultivation areas and rattan planting on Native Customary Lands.

Urban forestry has expanded the number of trees for recreation, environmental improvement, aesthetics and landscaping.

Training and extension

Although the current National Forestry Policy advocates a comprehensive programme of forestry training formal training programmes are only recent. The limited number of professional and technical staff required in the early days were trained overseas. The first Forest School was established in 1926 to train technical staff. Since then responsibility for formal education was transferred to the University of Agriculture and field staff are trained at the Forest School. In Malaysia, higher education in forestry is available from the University of Agriculture which was established in 1972, and advanced training in forest management, particularly in the use of modern management techniques and high technologies, is also provided by the regional ASEAN Institute of Forest Management located in Malaysia.

Forest workers receive training in surveying, inventory, operation of machinery and logging operations. Technical-skills training is also available from the regional forest departments and the Forest Research Institute, the Timber Industry Board, and the Industry Development Corporation. Education on nature conservation, forestry and the environment is being actively promoted by public and private agencies through NGOs and the schools.

Research and development

Forest research and development began in Malaysia with the appointment of a Forestry Research Officer in Peninsular Malaysia in 1918. This was followed by lowland silviculture research and experimental plantations in the 1920s. Research in Sabah and Sarawak was initiated in the fifties.

The Forest Research Institute was originally established in 1929 and its programme covered all aspects of forest management and utilization. In 1985, a national Forest Research Institute of Malaysia (FRIM) was charged with developing knowledge and technology for conservation, management, development and utilization of forest resources (Salleh Mohd Nor, 1991). The strategic goals incorporate sound management and conservation systems for natural and plantation forest, agro-forestry practices, rehabilitation systems for degraded lands, genetic resources, optimum recovery technologies of timber and other forest products and product diversification and processing technologies for all forest produce.

Applied forest management and development studies are also carried out by the Forestry Department, Peninsular Malaysia. The most notable include studies on forest resources monitoring, management of watersheds, assessment of varying cutting regimes, economics of harvesting and reforestation and

environmental quality. Projects are often undertaken in cooperation with international organizations such as ITTO and UNDP/FAO (Thang, 1991).

Research in Sabah is conducted by the Sabah Forest Research Centre, the Sabah Forestry Development Authority, government-owned enterprises and the private sector. Areas of study include all fields of forest management and utilization of natural forests and forest plantations such as seed production, tree improvement, plantation silviculture, reforestation, agro-forestry (Anon., 1989).

In Sarawak, forestry research is undertaken by the Forest Department in applied forest management, forest resource survey and monitoring, silviculture, reforestation and rehabilitation, forest environment and protection, forest products and national parks and wildlife management (Anon., 1990b).

Principles, policies and practices

Malaysia's forestry policies are comprehensive, rational and fundamentally sound. They continue to be relevant and valid and are regularly supplemented by necessary strategic, legislative and executive measures and development programmes in line with national policy objectives. The sustainable forest management policies in Sarawak have been recognized by ITTO as 'admirable'. It is the interpretation and execution of policies that need to ensure current practices remain consistent with conditions, needs and priorities.

3. POLICIES OUTSIDE THE FORESTRY SECTOR

The only declared policy which is of direct relevance to the forestry sector is the National Agricultural Policy. The objective of the Policy 'is to maximize income from agriculture through efficient utilization of the country's resources and the revitalization of the sector's contribution to the overall economic development of the country' (Anon., 1984). New land development programmes are to create employment opportunities, establish economic farm units, introduce efficient agricultural practices and new crops, raise incomes, and contribute to the growth of exports. *In situ* development will resolve problems of uneconomic farm size, unprofitable crops, low productivity, and idle lands. Agricultural support services will to be established, especially in the areas of research, extension and marketing. Social and institutional development will modernize the agricultural sector. The Policy provides guidelines for the development of specific crops, including rattan, and recognizes the need for public-private sector coordination. It also seeks to limit forest conversion to preserve forest resources.

While the strategy for new land development will involve the conversion of forest land, the other strategies will help to minimize deforestation. Planting of tree crops on the new land could supplement production from the forests. Consequently, with effective implementation of the National Forestry and Agricultural Policies, forestry and agriculture should no longer be considered as competitive but complementary. The demand for agricultural land is expected to continue due to population growth, the need to raise rural income, and the demand for commodities for export and food for domestic consumption but careful planning can cope with anticipated changes (Abu Bakar Mahmud, 1991).

The Environmental Quality Act will require several forestry-related activities to be subject to environmental impact assessment (Abu Bakar Jaafar, 1991). These include large land development schemes using forest land, drainage of wetlands, wildlife habitat or virgin forest, conversion of hill forest land to other land use, logging or conversion of catchment areas, large-scale logging and conversion of mangrove swamps.

Energy sector policies are unlikely to affect forestry because of limited hydro-power potential. On the other hand, the development strategy of the Industrial Master Plan to transform the present wood-based industries into large-scale, export-oriented industries could eventually have very significant effects on the forest resource base. Proposals for the formulation of a National Land Use Master Plan, the establishment of a National Water Authority, the development of a National Conservation Strategy, and the promotion of ecotourism will inevitably affect the forestry sector.

4. FORESTRY POLICY RESPONSES TO KEY DEVELOPMENT ISSUES

Malaysia's forestry policies have always been responsive to key development issues. Since the very first statement of forestry policy the role of forests and trees in sustainable development of agriculture, environmental conservation and protection, and improvement of the quality of life has been recognized. The complementary role of forestry is integral participation in rural development by providing land, employment, income-earning opportunities, non-timber and timber products for domestic consumption and export as well as by establishing small-scale, forest-based industries.

Linkages between environmental protection and restoration is reflected in the country's community and social programmes involving the rehabilitation of degraded land. Access to the resource, especially by the indigenous people and forest dwellers, are provided under the various forest legislations and regulations. Inter-policy dialogue and cooperation have been achieved through the inter-agency land capability classification and natural resources evaluation programmes coordinated by the country's Economic Planning Unit. Opportunities are also provided for the involvement of the private sector and local organizations in the policy formulation process and participation in forestry development.

The lack of support for the forestry sector has often constrained its efforts to improve implementation of policies and resolve problems. In order to ensure that the Permanent Forest Estate remains a renewable asset, the attitudes of policy makers need to become more development-oriented rather than revenue-oriented.

In Peninsular Malaysia many specific issues have been identified for resolution under the Sixth and Seventh Malaysia Plans (Leong, 1991). These are security of tenure for the PFE, a National Land Use Plan, training and manpower, comprehensive data base for forest resource management, upgraded capacity and responsibility of contractors, marketing, long-term supply of raw materials, silvicultural treatments, appropriate harvesting systems, maximum utilization, modernization of plant, restructure of wood-processing industry, overcoming Anti-Tropical Timber Campaign and development and conservation of Forest Recreation Areas.

Sabah's key areas of concern are reduction of harvest levels and log exports, scientific, sustained yield management of Commercial Forest Reserves, improved plantation management, strategic sectoral planning, levels of royalty rates, alternatives to export revenue, capacity of the Forest Department, regulated utilization of State Land forest areas, strengthening the forest industry, stabilization of shifting cultivation, improved soil, water and nature conservation and greater awareness of the need to implement state Forestry policy (Tay, 1991). In Sarawak, guidelines for effective implementation are being developed to address management of natural forests, plantations, timber production, log export and processing, forest conservation and wildlife management (Anon., 1990b).

Malaysia is in the process of finalising its national Tropical Forestry Action Plan which will focus on forestry in land use, forest-based industrial development, watershed and environmental management, fuelwood and energy, conservation of forest ecosystems and biodiversity, and forestry institutions.

5. FACTORS AFFECTING POLICY FORMULATION

Factors highlighted in 1959 as affecting forestry policy are still relevant today although reappraisal is important. Land available for forestry, plans for the lowland forests, finance, inter-state demand/production links, exports, control of State Land, proposed Federal Forestry Policy, sources of supply and position of the Forest Department all impact on policy development.

Current forestry policies also recognize the role of forests in contributing to the well-being of the community and the economy by rational utilization of forest resources consistent with the need to conserve biological diversity and environmental quality. A wide range of factors affect policy formulation to meet the wide-ranging objectives of a forestry policy.

5.1 Site conditions

Malaysia's soils are generally poor and unstable, the climate is harsh and topography quite steep except for a narrow coastal, often swampy belt. With such conditions it is imperative that all steeplands should be forested permanently to ensure conservation and maximum environmental functioning.

5.2 Land use

Rational land use will not only generate maximum socio-economic benefits in the short term but more importantly, ensure the sustainable use of the land in the long term. Land use has been determined systematically on the basis of land capability classification or soil survey, land resources evaluation, and soil-crop suitability classification. Land with slopes exceeding 20° and land with no potential for agriculture are classified for productive forests or environmental conservation. Priority in land use is given to agriculture because of its higher socio-economic benefits from employment and income opportunities. However, the present classification of land resources does not preclude sustainable forest development on land suitable for agriculture provided it can compete economically.

5.3 Forest resources

The abundant natural forest resources have served the people's basic needs and contributed significantly to socio-economic development and industrialization. They play a vital role in protecting the fragile environment and maintaining the socio-economic activities and quality of life. A secure Permanent Forest Estate of sufficient area must be established, not only to meet the increasing demand for wood and non-wood forest products, but to ensure that environmental protection, biological diversity conservation, watershed management, wildlife, recreation, aesthetic, research and education requirements are satisfied.

5.4 Forest industries

Forest industries were amongst the earliest processing and manufacturing enterprises in Malaysia and expanded rapidly with increased log supply from conversion areas and demand from developed countries. The Industrial Master Plan has furthered this development. Rationalization is necessary to achieve greater efficiency in the use of available forest resources. An adequate forest resource base must be developed and managed sustainably to meet the long-term requirements of the forest resource-based industries.

5.5 Socio-economic development

The forestry sector in Malaysia creates both rural and urban employment and income opportunities, earns foreign exchange, promotes industrialization and generates revenue to fund infrastructural development and social amenities. The policies of poverty eradication and society restructuring of the New Economic Policy have been implemented through the participation of indigenous people in the forestry sector. Provision of raw materials for industries and environmental services will ensure sustainable development of the country.

5.6 Non-wood products

The non-wood products of the tropical rain forests are well known to the indigenous people but have yet to be inventoried and documented systematically. Some, like rattan, bamboo and sago, have become commercially important while many others offer potential for commercialization. Emphasis on timber products have previously relegated these products to a minor role in development (Mok, 1991c).

5.7 Biological diversity

Malaysia's tropical rain forest has a unique heritage evolved over millions of years. It is a highly resilient ecosystem and is biologically one of the most diverse in the world. There are over 22,500 plants of which about 2,650 are trees and around 1,000 species of vertebrates; and up to 80,000 invertebrate species (Thang, 1991). A high degree of endemism, ranging from 30 per cent of all tree species to 80-90 per cent of some families, has been observed. The immense potential of the biological diversity in the tropical rain forests has been known for a long time but its critical importance to the future well-being of humankind has been recognized only fairly recently as a result of the escalating rates of tropical deforestation world-wide.

5.8 Environmental concerns

The role of forests in environmental protection, particularly in watershed management and soil and water conservation, has been recognized in all forestry policies. One of the recent issues of international concern is the role of the tropical forest in maintaining climatic stability and mitigating global warming. Although the global effects of tropical deforestation are highly debatable, there is ample evidence to indicate that removal of the forest cover from a sufficiently large area can significantly affect the micro-climate, especially local rainfall and the hydrological characteristic of watersheds.

6. POLICY IMPACT

The impacts of forestry policy implementation in Malaysia have been generally positive and effective, especially in relation to socio-economic development. Some shortfalls have been evident as a consequence of inadequate human and financial resources. The absence of a National Land Use Policy or Master Plan has delayed the final constitution of the Permanent Forest Estate and its security of tenure. Information and human resources have been inadequate to implement forest management prescriptions effectively and to monitor changes in the forest resource base.

Excessive harvesting, inconsistent with the approved allowable annual coupe, has resulted in problems of control, regulation, and sustainability which will inevitably undermine future production. A backlog in plans for reforestation, due to insufficient human and financial resources, will affect sustainable management and development of the forest resources. Excess industrial capacity,

especially in primary processing in Peninsular Malaysia, which is characterized by low productivity and high overhead costs, lead to excessive and illegal logging. The Anti-Tropical Timber Campaign imposes added constraints on policy implementation.

A 'National Seminar on the National Forestry Policy' was recently convened after review of forestry policies in Peninsular Malaysia. It had several objectives including providing public information on the status of the National Forestry Policy and its role in sustainable forest management, and obtaining feedback and views on forestry and environmental issues related to problems in implementing the Policy. Public understanding of the National Forestry Policy and its acceptance as a guideline for management and development of the forestry sector and forest industries were also goals.

The impacts of policy implementation on forestry sector development were reviewed and discussed at length and in-depth during the National Seminar by Haron Hj. Abu Hassan (1991a), Thang and Masran Mhd Salleh (1991), and Ong (1991). The most notable achievement include:

- The adoption of the National Forestry Policy and the National Forestry Act by all the states in Peninsular Malaysia and the support given by Sabah and Sarawak in achieving the policy objectives.
- The acceptance of the concept of a Permanent Forest Estate to ensure sustainable forestry development and the commitment of substantial areas of forest land for the purpose.
- The introduction of a conservational approach to forest management based on the Selective Management System which ensures that forest development will be realistic and economically, ecologically and environmentally sustainable.
- The approval of the concept of allowable annual coupe for harvesting the Permanent Forest Estate by the National Forestry Council and the principle of harvesting State Land forests first.
- The intensification of reforestation by silvicultural treatment of naturally regenerated forests and the implementation of the Compensatory Plantation Programme based on fast-growing timber species.
- The rapid expansion of wood-based industries, especially those involved in downstream value-added manufacturing of finished products based on rubberwood and rattan.
- The increased involvement of the rural and indigenous people in the forestry sector in line with the twin objectives of the New Economic Policy.
- The establishment of the Malaysian Timber Industry Board to promote wood-based industry development and forest products trade and export.
- The reconstitution of the Forest Research Institute Malaysia as the national statutory body for the promotion and implementation of forestry research and development.
- The establishment of the ASEAN Institute of Forest Management and ASEAN Timber Technology Centre as potential centres of excellence in the region for the transfer and development of appropriate and effective forest management and timber utilization technologies.
- The enhancement of awareness and appreciation of the values of forests and the contributions of forestry to socio-economic development and improvement of the people's quality of life.

7. CONCLUSIONS

During the colonial era of Malaysia, there was a small population, ample land and adequate forest resources. People displayed no interest in the formulation of forestry policy. The basic statement of policy was formulated by forestry professionals with implicit objectives to ensure future satisfaction of needs, security of the forests and appropriate management and development. There was no need for specific policies.

With independence and rapid socio-economic progress based largely on the conversion of forest land to agriculture and the development of wood-based industries, forestry policies had to be strengthened to ensure rational land use and sustainable development. More detailed and more precisely defined forestry policies with explicit objectives and guidelines were needed. The current forestry policies in Malaysia were formulated based on the perceived needs and priorities, anticipated changes in socio-economic and environmental conditions and society's future expectations.

Current forestry policies have proven to be basically sound and effective and have enabled constitution of a Permanent Forest Estate which will ensure a major role for forestry in sustainable socio-economic development. They contain necessary elements for forestry development to be sustainable socially, economically, biologically, ecologically and environmentally. Some policy objectives have not been achieved fully mainly because of inability to interpret and translate policy intentions into realistic strategies and programmes; institutional and technical constraints; inadequate policy instruments; and/or insufficient human and financial resources. Review of the policy should be a continuous process in response to changes in local and international conditions and expectations.

The National Seminar on the National Forestry Policy adopted numerous resolutions to improve policy implementation in relation to the Permanent Forest Estate, management of the Permanent Forest Estate, reforestation, forest harvesting, forest industries development, participation of the indigenous people, forestry research, human resources development, and education in the values of forests and the benefits of forestry (Haron Hj. Abu Hassan, 1991b). A project on 'Development of Forest Sector Planning in Sabah' was completed recently 'to optimize the contribution of forestry through sustained development of forest land use and management, and forest based industrialization' (Anon., 1989). The objectives of the project included the formulation of specific forest land use, reforestation and forest industry development policies consistent with the long-term productive capacity of the resource and the general economic development of the state. Recommendations included a reduction of the annual timber harvest levels and log exports; development and application of a system of scientific forest management based on integrated multiple-use management planning to incorporate timber production, soil conservation, non-timber forest produce, community needs, and conservation of native flora and fauna; improvement of plantation research, management and planning; development of a forestry sector planning system to reflect the economic, social and environmental benefits from forestry; modernization of the wood-processing industries; and development of a state conservation policy (Tay, 1991).

In Sarawak, a revised Statement of Forestry Policy has been proposed to strengthen the existing policy. The proposal recognizes the need to reserve forests permanently not only for protective and productive purposes but also for the preservation of wildlife and scenic areas as well as for recreation and tourism. It provides for the economic and sustainable management and utilization of forests consistent with the need for ecosystem and environmental protection; rehabilitation of harvested and degraded forests, establishment of forest plantations; export of timber and non-timber products with emphasis on manufactured products; creation of public awareness in the values of forests; vocational

training to upgrade industrial capability; intensive forest research and development; and adequate human and financial resources necessary for the advancement of forestry.

Recent incidents of illegal logging in various parts of the country have prompted proposals to amend the National Forestry Act with the primary objective of reinforcing provisions for effective forest management and control of harvesting to ensure security of the Permanent Forest Estate and sustainable development. Proposals have also been formulated to strengthen and restructure Forestry Departments.

Although a National Land Use Master Plan has been advocated and is apparently under serious consideration, it is debatable if such a plan would result in rational and optimal land use. Malaysia is a major producer and exporter of primary commodities, including tropical hardwoods, which are harvested from perennial tree crops. In the light of the vagaries of the world market for such commodities and the increasingly acute labour problems in the country, the rigidity implied in the master plan approach could be counter-productive. As flexibility is imperative for coping with short-term changes, a National Land Use Policy based on the concepts of rational and integrated land use with guidelines for sustainable development of the land resources would seem to be more appropriate and beneficial.

Sustainable development can only be achieved with a conservational approach which ensures that the productive capacity of the land and the condition of the environment remains unimpaired. In Malaysia, such an approach has been adopted for forestry development with the introduction of the Selective Management System. However, effective implementation of the System has been constrained by numerous factors. Appropriate measures have been initiated to resolve these problems. The conservational management and sustainable development of the natural tropical rain forests require highly competent, innovative and motivated forest managers and operators with the relevant expertise and skills; appropriate technologies and techniques, timely and reliable information, and adequate human and financial resources. Forestry staff will need to acquire or upgrade their expertise and skills to effectively conduct policy and economic analysis and implement appropriate strategies in all areas relevant to sustainable management of the forest resource.

Although competent forest managers and appropriate forestry technologies are the most effective policy instruments for implementing sustainable development of the forestry sector, a relevant forestry culture is imperative and a necessary prerequisite. The formulation and implementation of realistic policies, pragmatic strategies and effective programmes can only be accomplished successfully after the evolution of a national tropical forestry culture which is compatible with the social, cultural, political, economic, ecological and environmental conditions in the country. Sustainable development of forestry to realise policy objectives can then be achieved with CARE (Mok, 1991b):

- C = Conservational and sustainable use of the natural forest resources and biological diversity.
- A = Afforestation and reforestation of degraded and deforested lands.
- R = Research and development to optimize forest resources utilization, improve forest management and operations, and conserve biological diversity and environmental values.
- E = Education to create or enhance awareness and appreciation of the multiple values of forests and to promote forest conservation.

Forestry has been a major force in socio-economic development in Malaysia. It has immense potential to contribute further to the advancement of the country's economy and the people's quality of life. If forestry is to remain viable under rapidly changing conditions and be prepared to meet

challenges of the future, it is imperative that Malaysia develop VISION 2020 FORESTRY to enable the people to see and enjoy both the wood and the trees.

REFERENCES

- Abu Bakar Jaafar, 1991: 'Forestry and the Environment: Progress in the Implementation of EIA in the Forestry Sector'. *Proceedings of the National Seminar on the National Forestry Policy*.
- Abu Bakar Mahmud, 1991: 'Kesan Pembangunan Pertanian Terhadap Sumber Tanah Perhutanan di Semenanjung Malaysia' (Impact of Agricultural Development on Forest Land Resources in Peninsular Malaysia). *Proceedings of the National Seminar on the National Forestry Policy*.
- Anon., 1954: *Statement of Forestry Policy*. Government of Sarawak.
- Anon., 1959: 'Some Aspects of Forestry Policy in the Federation of Malaya'. Research Pamphlet No. 25, Forest Research Institute Malaysia.
- Anon., 1973: 'Forest Legislation in West Malaysia. Forestry and Forest Industries Development Project'. Working Paper 18.
- Anon., 1978: *National Forestry Policy*. National Land Council.
- Anon., 1984: National Agricultural Policy. Cabinet Committee on Agriculture.
- Anon., 1988: *Forestry in Malaysia*. Ministry of Primary Industries.
- Anon., 1989: *Forestry in Sabah*. Sabah Forestry Department.
- Anon., 1990a: 'Native Customary Land'. *Borneo Research Bulletin*, Vol. 22, No. 1.
- Anon., 1990b: *Forestry in Sarawak, Malaysia*. Forest Department, Sarawak.
- Anon., 1990c: *Statistics on Commodities*. Ministry of Primary Industries.
- Haron Hj. Abu Hassan, 1991a: 'Tahap Pelaksanaan Dasar Perhutanan Negara' (Status of Implementation of the National Forestry Policy). *Proceedings of the National Seminar on the National Forestry Policy*.
- Haron Hj. Abu Hassan, Ed., 1991b: *Proceedings of the National Seminar on the National Forestry Policy*, Forestry Department, Peninsular Malaysia.
- Ismail Hj. Ali, 1972: 'Forestry in National Development'. *Proceedings of Fourth Malaysian Forestry Conference*.
- Leong, H. N., 1991: Personal communication.
- Menon, K.P.V., 1976: 'History and Development of Forestry and Forest Industries in Malaysia'. F.R.I. Bibliographies No. 4, Forest Research Institute Malaysia.
- Mok, S.T., 1977: 'Forest Management Strategies for Sustained Maximum Socio-economic Benefits'. *Malaysian Forester*, 40: 1.
- Mok, S.T., 1985: *Sustained Use and Management of Forests: A Malaysian Perspective. Land Use, Watersheds, and Planning in the Asia-Pacific Region*. FAO Regional Office for Asia and the Pacific.
- Mok, S.T., 1990a: 'Predicted Future Directions in the Management of Forestry. *Proceedings of the Seminar on Research Policy for Community Forestry, Asia-Pacific Region*, Regional Community Forestry Training Centre, Bangkok.
- Mok, S.T., 1990b: 'Asia-Pacific Forest Resource Trends and Environmental Considerations'. *Proceedings of GLOBE '90*.
- Mok, S.T., 1990c: 'Asia-Pacific Tropical Rain Forest Management Policies and Future Timber Yields'. *Proceedings of MTIB Asia-Pacific Timber Conference 1990: New Opportunities in the Wood-based Sector*.
- Mok, S.T., 1991a: 'Strategic Options for Forestry Development in Asia-Pacific Countries'. Regional Conference on *Environmental Challenges for Asian-Pacific Energy Systems in the 1990s*.
- Mok, S.T., 1991b: 'Forest Biological Diversity Interactions with Resource Utilization'. Symposium on *Tropical Forestry for People of the Pacific*, XVII Pacific Science Congress.

- Mok, S.T., 1991c: 'Production and Promotion of Non-wood Forest Products'. *Tenth World Forestry Congress*.
- Ong Meng Seng, 1991: 'Kapasiti Industri dan Bekalan Kayu-kayan di Semenanjung Malaysia' (Industrial Capacity and Timber Supply in Peninsular Malaysia). *Proceedings of the National Seminar on the National Forestry Policy*.
- Salleh Mohd. Nor, 1991: Personal communication.
- Tay, Richard, 1991: Personal communication.
- Thang, H.C., 1991: 'Forest Conservation and Management Practices in Malaysia'. IUCN/ITTO Workshop on *Realistic Strategies for Tropical Forests*.
- Thang, H.C. and Masran Md. Salleh, 1991: 'Pengurusan Hutan Secara Berkekalan di Semenanjung Malaysia' (Sustained Yield Forest Management in Peninsular Malaysia). *Proceedings of the National Seminar on the National Forestry Policy*.
- Werner, R., 1991: 'The Aboriginal Culture of Healing. Wings of Gold', *Malaysia Airlines*.
- Zainal Abidin Mohd, Shariff, 1972: 'Forestry Policy and Legislation'. *Proceedings of the Fourth Malaysian Forestry Conference*.

NEPAL*

1. INTRODUCTION

1.1 Forestry policy context

Nepal is a small country of 14.7 million ha. The topography ranges from the tropical Terai and Bhabar plains in the south through sub-tropical hills and temperate mountains to the alpine highlands and high Himalayan ranges with Mount Everest in the north. Consequently, it has a great many types of forest vegetation and wildlife. More importantly, the people of Nepal with varied ethno-cultural origins have also adopted a nature-centric existence where forests play a significant, if not the major, role in their livelihood. Any forest management policy must give due consideration to these issues.

1.2 The country background

The forest

The forested land comprises of 5.6 million ha, which constitutes about 38 per cent of the land area. Forest types vary with altitude and climate ranging from tropical species in the Terai, the Bhabar plains and the Siwalik valleys, through sub-tropical, temperate and sub-alpine types to alpine shrubs above the timberline.

The survey of the Land Resources Mapping Project (LRMP), based on 1978/79 aerial photographs and its update by the Master Plan for the Forestry Sector (MPFS), classified the distribution of forests in 1985-86 by broad species groups, crown cover, maturity and physiographic zones, highlighted the poor condition of the Nepalese forests. Moreover, most of the valuable timber loss has taken place in the past few decades. Between 1964 and 1979, more than 454,000 ha of forests were cleared and 1.05 million ha degraded from high to low-density forests, especially in the Terai-Bhabar plains and the Siwalik valleys. (WECS, 1986).

For the past few decades the Department of Forests has undertaken planting and afforestation programmes in addition to distributing seedlings to the people for individual and community planting. To 1986, a total of 95,800 ha had been planted in this way, but the survival and success rate of these plantations have not been assessed.

The people

The 1992 population of Nepal was estimated at more than 19 million with a growth rate of 2.5 percent per year. Over the past 20 years, the percentage of population in the Terai has grown from 37.6 per cent to about 45 per cent. Malaria has been controlled, government resettlement programmes have been supplemented by illegal squatting and industrial, agricultural and infrastructural development has been greater than in other regions. Urbanization has also increased.

Rural people collect fuelwood and timber as well as other forest products including leaf fodder, bamboos and thatching grass, directly from nearby forests. Livestock populations are also high.

* This is the edited version of a paper presented at the meeting by K.M. Bajracharya (Forest Research and Development Centre, Nepal).

Ethnicity

Nepal is a multi-racial and multi-lingual country. Each group has its own pattern for utilising the products of the forests within the framework of geographical potentials and constraints. The highlanders practise animal husbandry and trade; subsistence farming is followed in the midlands supplemented by cottage industries. The plains dwellers also keep large animal herds, but these have been declining due to reductions in natural forests for pasture.

The liberal or restrained use of forest resources is most vividly seen in the design of traditional house construction among various ethnic groups in different geographical regions and even in the capital of Kathmandu.

The economy

Agriculture dominates the Nepalese economy contributing more than 60 per cent to the Gross National Product. Per capita income is only \$US 160 per year and the rural people do not have basic utilities such as electricity or drinking water. A large part of the goods and services consumed are not fully counted in statistics as they do not pass through the market system. The main source of foreign income used to be from salaries to the Ghurkhas. Tourism is becoming increasingly important along with export of handicrafts. Traditional exports of rice, timber and jute have declined and imports of luxury goods and petroleum products have expanded. Sustained economic growth is becoming highly dependent on foreign sources such as development aid.

2. FORESTRY POLICY

2.1 Past policies in brief

Nepal has a tradition of using its forest resources for both environmental and utility purposes. Special reserved forests were established at various locations for religious, ceremonial and medicinal reasons as well as for paper making. From the Terai region, however, timber and other forest products were traditionally exported to India. Conservation of the forests of the Bhabar and the Siwalik zones for national security became a priority in the late 18th century.

A national code for the use and management of forests was promulgated in 1854. Later the forestry organization was expanded to include offices to deal with exports, inspection, supply, etc. After 1922, large-scale exploitation of the Terai forests provided logs for export to India.

When the Forest Department was established in 1942, there was an effort to regulate exploitation as well as introduce basic management practices in the Terai and Siwalik regions. This was unsuccessful because of the lack of trained foresters. Moreover, the Rana family rule was interested primarily in personal profit from the forests. This policy of over-exploitation was pursued even after the introduction of democracy in 1952 as a means to raise government operating revenue, for settlement and agricultural expansion and because of the false view that the forests were inexhaustible. With malaria eradication programmes in these regions in 1956-57, emigrants from the over-populated mountain regions entered the area.

Alarmed by the uncontrolled destruction and degradation of the forest resource, the government adopted a number of over-ambitious and restrictive policies. The Forest Nationalization Act of 1957 could not be effectively implemented because of insufficient trained personnel as well as lack of finance and infrastructure. It also alienated many mountain communities who already had a balanced

system of use and protection for 'their' forests. The Forest Act was promulgated in 1960 and the Forest Protection (Special Arrangement) Act in 1967. The latter shifted the role of trained, professional forest officers from managers to policemen and judges. Although this act was promulgated as a temporary measure, it has been continually extended even in July 1992.

Because of poor basic policy planning in the forestry sector, the Forest Department has been unable to act as a lead in forests management despite outside financial and technical support from donor agencies. Trained personnel are also at a premium.

2.2 The National Forestry Policy of 1976

The long-term National Forestry Policy was first formulated in the Nepal National Forestry Plan (NNFP) of 1976 to guide government planning in the use and management of the forest resources in the country. Major statements were made in several areas:

_ To obtain maximum contributions from the country's forests by: (a) flood, landslide and erosion control and maintaining ecological balance; (b) achieving self-sufficiency in the basic forest products of timber, fuelwood and fodder; (c) mobilising the forest resource for sustained economic growth; and (d) preserving wildlife and forest vegetation in important natural areas.

_ To relate forest lands with other land uses by: (a) reservation in coordination with agriculture, settlement, pasture and other land-use categories; and (b) by re-establishing new forests in abandoned cultivation, barren land and river banks.

_ To define forest land ownership as: (a) Government forests; (b) Panchayat (community) forest and Panchayat Protected Forest; (c) Private forests; (d) Leased forests; (e) Temple/religious forests; and (f) Special forests.

_ To introduce a system of forest management all over the country on the basis of the geographic speciality, social priority and multiple use as well as direct and indirect benefits.

_ To strengthen wildlife management through establishment of a chain of national parks and wildlife reserves, legal protection of threatened species and controlled hunting of other species, study and research and publicity of educational, scientific and cultural values of wildlife.

_ To support animal husbandry by controlled grazing in suitable forests in addition to providing grass and fodder.

_ To publicize the impact of forestry on national development.

_ To promote forest-based industries by providing assistance to entrepreneurs, incentives for semi-finished and finished exports instead of raw materials and by dealing with the raw products under a competitive environment instead of monopsonistic situation.

_ To conduct regular forest survey and inventory to assess supply potential, as well as to conduct research on various aspects of forest protection, production and utilization.

_ To educate Nepalese technicians in foreign countries to pre-service graduate level until the Institute of Forestry (IOF) at Tribhuvan University is developed and to send Department of Forest staff overseas for higher degrees and specialization.

_ To adapt labour intensive methods in forest management and utilization in order to generate employment and income opportunities for the local people.

_ To introduce scientific organization and management into forestry by integrating District Forest Officers' authority with responsibility and by coordinating the various hierarchical levels in addition to extending forestry organization all over the country.

_ To muster public cooperation and participation in the use and management of forests.

_ To incorporate economic perspective in forestry by considering not only the forest revenues but also other socio-economic impacts; to allocate increased governmental resources in forestry in order to compensate for little or negligible private investment; to operate all commercially viable projects in the sector under a revolving fund; and to finance economically sound projects in forestry through loans from existing financial institutions or a special fund to be established for the development of forest and forest industries.

2.3 Forestry policy in the Seventh Five-Year Plan

In addition to the long-term forestry policy formulated in the NNFP of 1976, the Planning Commission adopted relevant policy measures in the Seventh Five-Year Plan (1980-85) to:

- raise extensive forest plantations and afforestation as well as to protect them through people's participation in order to meet the basic needs of timber, fuelwood and fodder;
- protect and promote natural vegetation through public participation in order to protect catchment areas and maintain water supply;
- encourage commercial cultivation of medicinal plants in addition to their collection from forests as well as processing them for domestic use or for export;
- increase employment opportunity through labour-intensive technology in the protection, production and development activities of the forestry sector;
- meet the industrial requirements for forest raw materials through domestic production on allotted forest land in addition to supply from the government forests.
- allocate a minimum of forest land for the development of other sectors and infrastructure in order to minimize negative environmental impacts.

2.4 Forestry Sector Policy of 1989

In 1989, in association with the formulation of the Master Plan in the Forestry Sector, the Government of Nepal promulgated five forestry sector policy statements.

Production and utilization

The forest resources are to be managed and utilized for the basic priority products of fuelwood, timber, fodder and medicinal plants and those near villages are to be managed with the people's participation. Wood supply to urban areas with cash economies is to be intensified by promotion of wood production on farms and commercial plantations.

Conservation of ecosystem and genetic resources

Land and forest resources are to be managed and utilized according to their capability so as to conserve the forests, soil, water, flora, fauna and scenic beauty. Representative and unique ecosystems of Nepal are to be protected for their special values and evaluation of environmental impacts will be required when implementing development programmes.

Social aspects of land use

The principles of the decentralization policy are to be applied in the forestry sector by community forestry as the priority management strategy. If the availability of forest land exceeds the needs of the local communities, the excess is to be allocated for forest management in the following priority sequence: people living below the poverty line, small farmers, and forest-based industries. In general, no more forest land will be released for cultivation. Emphasis will be placed on multiple use of land for integrated forestry and farming systems.

Role of the private sector

Establishment of private forests on leased and private land is to be promoted and the parastatals will have to compete with private enterprise on an equal basis. The government will lease land to forest-based enterprises for growing raw materials.

Classification of the forests and the protected areas

Taking land ownership into consideration, forests and protected areas are to be classified into seven categories. *Community forests* are of two types, Panchayat forests and Panchayat protected forests, and are to be entrusted to Panchayats and to user groups. *Private forests* will include trees/forests on privately owned land. *Leasehold forests* are on land that has been leased by government agencies to Panchayats, private individuals, cooperatives, institutions or commercial firms. *Religious forests* belong to religious institutions. *Conservation areas* cover land such as national parks, reserves, protected areas or other categories gazetted under the forestry sector legislation. *Protected watersheds* are any lands in public or private ownership designated as protected watershed under the Soil and Watershed Conservation Act. *National forests* will include all others not specifically designated otherwise.

2.5 Forestry policy in the Eighth Five-Year Plan (1992-97)

The process of changing to a multi-party democracy delayed adoption of the Eighth Five-Year Plan until 1992, but the 1989 forestry sector policy was adopted with some minor modifications. The prevailing practice of posting government-paid *Heralus* (watchers) in community forests will be phased out and the responsibility for their management as well as protection handed over to user groups. A separate trust fund for the national parks and wildlife reserves will be established so that revenue from this sub-sector can be re-invested for their effective development and management. Small and marginal farmers will be encouraged to take up leasehold forestry in order to enhance their livelihood and public participation in soil and water conservation works will be promoted.

Several programmes have been defined by the Plan. The Community Forest Management Programme will meet local requirements for forest products as well as income and employment opportunities for the communities. The Leased Forest Management Programme is aimed at allocating forest lands to marginal farmers for intensive agro-forestry. A Private Forest Management Programme will enhance

private tree planting, raising of homestead gardens, farm forests, windbreaks and shelter-belts, contour planting, etc. The National Forest Management Programme promotes intensive development and management of the remaining major tracts of government forests in the Terai, the Siwalik Valley and the mountain region.

The Soil Conservation and Watershed Management Programme will help control soil erosion, floods and landslides as well as improve watershed conditions in the catchment areas. Conserving natural ecosystems and biodiversity is the aim of the National Parks and Wildlife Conservation Programme. The Forest Products Industries Development Programme should improve harvest of both wood and non-wood forest products as well as promote their industrial processing and marketing. Integrated research and development of the sector will be the goal of the Forest and Plant Research Programme, while other supports such as survey, planning, extension, training, monitoring and evaluation will come under an Ancillary Support Programme.

2.6 Principles and objectives of forestry policies

In the NNFP of 1976, the two basic principles considered were that the forest resource is an unalienable property of the society, and that the systems approach be adopted in formulating policies and plans. Its basic objectives were to make the forest resource contribute to the development and prosperity of Nepal and her people. These objectives were to be achieved by: maintaining natural and ecological balance; raising the economic standard of the people through mobilization of the forest resource; introducing scientific forest management for protection, production and utilization; developing knowledge and skill of all participants; and developing public cooperation and awareness in the proper use and management of forests. The forestry policies of the Seventh Five-Year Plan, however, were guided by the three major socio-economic objectives of GDP and national income growth, increased employment and income opportunities and basic needs provision.

Four guiding principles were considered in the Forestry Sector Policy (1989). These were satisfaction of basic needs, sustainable utilization of the forest resource, people's participation in decision making and sharing of benefits and socio-economic growth. Accordingly, this policy aimed for the long-term objectives of meeting the people's basic needs on a sustainable basis, food production through an interaction between forestry and farming practices, protection of land against degradation, conservation of ecosystems and genetic resources, and generation of income and employment opportunities by developing forest-based industries.

Medium-term plans also envisaged increased people's participation in forest-resource development, management and conservation, establishment of a legal framework to enhance these contributions, and a stronger organizational framework for the forestry sector.

2.7 Forest legislations as policy reflections

Forest legislations reflect policies adopted by the government with special focus on certain aspects of management and utilization. Some forestry legislations include Nationalization of Private Forest Act (1957); Nepal Forest Act (1961); Forest Products Sales and Utilization Act (1961); Wildlife Protection Act (1962); Forest Protection (Special Arrangement) Act (1967); Forest Product Sales and Distribution Rules (1970); National Parks and Wildlife Conservation Act (1972); Panchayat Forest Management Rules, Panchayat Protected Forest Management Rules, Leased Forest Management Rules (1978); Soil Conservation and Watershed Management Act (1982); and Private Forest Management Rules (1984). The newly elected government has also introduced the new Forest Act (1992) which has significantly simplified forestry sector legislation.

2.8 Policy processes

Various administrative processes are adopted in formulating forestry policies in Nepal. The long-term forestry policies are prepared initially by a special team of forestry and related experts for discussion.

A tentative outline is circulated and discussed as widely as possible. The final version is prepared by the MFSC and approved or amended by the Cabinet.

The medium-term policy outlines are prepared jointly by the National Planning Commission (NPC) and the MFSC and incorporated in the national five-year plans. In the newly reconstituted political system such policy outlines are likely to be discussed in the parliament. The legislations, although drafted primarily by the MFSC, are subject to review and scrutiny by the Ministry of Law and Justice before passing through parliament. However, the King of Nepal has to approve the bill in order for it to become the law of the country.

3. OTHER SECTORAL POLICIES AND THEIR INTERACTIONS

Other sectors related closely to forestry in Nepal include agriculture, animal husbandry, resettlement, public health, water-resources, industries and tourism. Policies in these sectors/sub-sectors have far-reaching effects on forestry. Similarly, forestry policies impact on other sectors of the economy.

3.1 Policy Conflicts

Agricultural expansion

The agricultural sector has always been emphasized in Nepal. In order to meet pressures of population growth, forest lands were converted to croplands. While farmers have always used forest fringes, clearance for land settlement has taken place since 1952 in the Terai and Siwalik valleys. Forest clearing was further strengthened by the various programmes including malaria eradication, planned settlement, transport and communications.

Settlement

Resettlement of people in cleared forest lands in the Terai and Siwalik regions was begun as a means of raising revenue during the Rana rule but was hampered by the fear of malaria. Settlement of political sufferers, flood and landslide victims and repatriated Nepalis from Burma further opened the area. These factors, as well as speculation in scarce land, have created chaos over the past three decades. Despite establishment of agencies to resolve problems, lack of coordination led to clearance of nearly 450,000 ha between 1964 and 1979 alone, in addition to degrading most of the remaining forests in the Terai and the Siwalik regions. Neither were the forest products, nearly 100 million m³ of valuable timber, utilized fully.

Tourism

Tourism is a growing sector of the economy. By 1986, 220,000 tourists visited Nepal - most from advanced countries. Many come for trekking and mountaineering which helps the local economy but fuelwood consumption increased and the environment was degraded.

Industrial use of fuelwood

Many industries use large quantities of fuelwood. Although industrial consumption of fuelwood is much lower than that of the households, the damage inflicted by concentrated harvesting, in some cases hacking, is much more severe.

National security

Forest clearance was ordered during the 1960s along the Indian border as a security measure to reduce insurgency. It is noteworthy some 200 years ago this was a reason to preserve the forests in the Terai.

3.2 Policy complementarity

Although few in number there have been occasions where forestry policy has been complemented by other sectoral policies.

Hydro-electric projects

The government recognizes the value of forests in watershed management and erosion control. Consequently conservation areas have been declared around such hydro-power installations as Trisuli, Keulkhani and Phewa Lake.

National parks and wildlife conservation

The policy of wildlife conservation has complemented forest protection measures and the first national park was established in 1973 (Royal Chitwan). A number of other national parks and wildlife reserves have been set up in different ecological regions.

Rural water supply

Supply of good drinking water in the rural areas by the Ministry of Local Development complements forestry policy in conservation of catchment areas. Local highland people have traditionally preserved the forests in the catchment areas of their springs and wells.

3.3 Policy compromise

Inter-sectoral policy conflicts often occur because of inadequate consultation between responsible agencies. Compromise rather than formulation of totally new policies should be recognized as a possibility for cooperation between forestry and other sectors.

Exploitation of mining areas led to mismanagement of the forest resources and development of transport and communications infrastructure brought forest degradation. Once land became alienated from the Forest Department control, it could no longer influence management policy. Forest management has been incorporated into rural development projects since the mid-1960s with afforestation, plantations, farm forestry and efficient fuel stove programmes.

Production and marketing of forest products have been poorly and improperly managed in the past by different agencies. Charges for royalties and fuelwood were too low and irregularity, corruption and mismanagement were present. Recent centralization of these functions under the Ministry of

Supply should improve the situation in the effort to enhance production, utilization and marketing of forest products for the best interests of the country.

4. POLICY RESPONSES TO KEY DEVELOPMENT ISSUES

Early, isolated industrialization began in the 1940s with plywood, bobbin and match factories. They remained minor enterprises until after the political change from the Rana rule in 1952.

4.1 The early democratic era (1952-60)

During this period the forest resource was seen to be the most important resource for development. The Private Forest Nationalization Act was promulgated in 1957 with the objective of socio-economic development. It was partly successful in the Terai, but failed in the hills and mountains, primarily because of the lack of territorial organization and manpower. Consequently, people in the hills and mountains were alienated from the traditional practice of informal community forestry.

Heavy exploitation of the commercial forests of the Terai and the Siwalik for log export to India served as a revenue earner. The mistaken view of inexhaustible supply brought mismanagement. Clearance policies for settlement, agriculture and food supply brought revenue but threatened sustainability and the environment. With rapid development in the Rapti River valley, aspects of forestry development including survey, management, logging and sawmilling, accompanied clearance for expansion of cultivation and settlement. Much of the virgin forests along with the rich fauna was lost. The Timber Corporation of Nepal (TCN) conducted a logging and sawmilling spree. After exhausting the Chitwan valley, TCN moved to the Terai, where it repeated the same over-exploitation.

4.2 The Panchayat period (1961-1990)

Several important forestry policy responses were addressed during this 30-year period. The border forests adjoining India were cleared along a belt for a minimum of two miles for the resettlement of the expatriates/domicile Nepalese from Burma. The King believed that political dissidents living in India could be checked if there was resettlement along the border. Resettlement programmes were instituted in the Terai and Inner Terai to accommodate victims of natural disasters, political refugees and repatriated Nepalis. An influx of hill people encroached into the national forests after planned programmes of agricultural expansion, malaria eradication and infrastructural development were initiated. Despite agencies to regulate this, the settlement programme led to the loss of about 1 million ha of forest land and associated timber.

Following the implementation of the five-year plans for national socio-economic development the demand for local timber as a construction material increased rapidly. The TCN was given control over logging, sawmilling and supply of timber at nominal rates, while exporting for profit. To maintain its monopoly, the TCN participated in some less than acceptable practices. Since 1965, the Nepal Fuelwood Corporation has joined in the exploitation of the valuable timber resource in the accessible areas of the Terai and the Siwalik regions. The Department of Forests has little control over forest management.

The Trisuli Watershed Pilot Project was initiated in 1966 to develop and manage forest and other natural resources in the hills and mountains as a watershed or catchment area for the benefit of the local/rural people. Activities led to a number of developments including the establishment of the Department of Soil Conservation and Watershed Management (DSCWM) in 1973 in the Ministry of

Forests (now Ministry of Forests and Soil Conservation), and the initiation of integrated rural development projects in many hills and mountain districts.

One of the most important responses made by the government with respect to overall developmental needs was the promulgation of the National Forestry policy in the National Forestry Plan of 1976 as already described.

In response to national and international publicity about environmental degradation, the government has established seven national parks, three wildlife reserves, one nature conservation area and one hunting reserve - all covering various ecological sites. A separate Department of National Parks and Wildlife Conservation was set up in 1980. With a loss of officers to the new departments, the Department of Forests has become weak and unable to manage the forests in its own jurisdiction, for conservation of soil, water, flora, and fauna.

The Panchayat System of government was overthrown by a popular movement in early 1990 and from the beginning of 1991 a multi-party system of democratic government has been in power. A new orientation to socio-economic as well as forestry sector development has been adopted. Privatization, rural upliftment and streamlining of government machineries are some of the general reform thrusts of the new government. These are reflected in the new forestry sector policies, plans and legislations. However, their effective implementation is still awaited.

Government has tried to respond to social and economic development issues but has had limited success in the management of the forest resource for a sustainable supply of forest products. The Department of Forests responded inadequately in an attempt to provide short-term solutions to problems. The establishment of inappropriate management bodies and the misuse of individuals' positions have led to social, economic, institutional and administrative confusion in the forests and forestry. It remains to be seen whether the present government will be willing and able to resolve the problems and restore the forestry sector to fulfil its potential role in the economy. The pro-active forestry policy will need immediate implementation for success to be achieved.

5. INFLUENCES ON POLICY FORMULATION AND IMPLEMENTATION

5.1 Positive factors

Major factors that helped in formulation of forestry policies in Nepal include: (i) awareness and articulation of the problems and opportunities for the forestry sector in the local and national economies; (ii) availability of trained personnel to carry out policy analysis; (iii) the tradition of formulating medium-term, national socio-economic plans; and (iv) the availability of financial and technical assistance from the donor community.

Despite these positive influences, appropriate policies in the forestry sector are still lacking due to poor utilization of organizational and management skills, and bureaucratic rules and regulations. Problems and potentials of the Nepalese forestry sector have been identified in reports and documents, but appropriate analysis in a systems framework has not been carried out. The NFP of 1976 made a rudimentary beginning of the systems approach but this was not followed up, even by the MPFS exercise.

Similarly, the government has been unable to use the services of senior qualified personnel outside the government service because of rules as well as personality factors. The new government has indicated that it plans to mobilize expertise outside the government for problem analysis and

resolution in various sectors of the economy including policy formulation, implementations and evaluation.

Foreign assistance is beneficial only if the host country directs the policy formulation task, rather than the other way round. In fact that is why the government could not derive full advantage from the Master Plan exercise of the late 1980s, which was conducted by foreign consultants.

5.2 Negative factors

Numerous problems have beset the forestry sector. There has been a lack of a firm policy commitment on the part of relevant authorities as well as by the Panchayat government as a whole. Despite a directive to regularly update the NFP of 1976, this process of policy review has not been followed. Occasional policy analysis and formulation exercises have been insufficiently resourced in terms of time and personnel. The lack of available data also hinders progress.

Vested interests, inside and outside government, have promoted an *ad hoc* and haphazard approach to forest use and management. Personal advantage has played a role in decision making by senior officials of the government and the MFSC. With the recent institution of the multi-party political system many of the above problems may be resolved primarily because the ruling party cannot, and will not be able to, shun responsibility nor behave arbitrarily if it wishes to remain in power.

5.3 Implementation

Even when correct policies have been framed, governments have been unable to implement them. Why has there been such a poor performance? Could there be non-governmental alternatives in the forestry sector? The reasons lie at all levels of decision making. Inappropriate goals were set in isolation by central planners without consideration for sustainable development of the sector. Officials responsible for policy implementation placed personal gain paramount in deciding their actions.

Programming, coordination, monitoring/evaluation, supervision of development work at the regional level is lacking. At this level the responsible forest office became a sort of exchange post office between the centre and the districts with few development or management functions.

The district-level forest office should be a vital element in the implementation of sectoral policies and plans. However, this role has been restricted by continuous administrative reorganization. From 1982 to 1991 there was an effort to decentralize administration at the district level. Attempts by the Department of Forests to introduce a system of forest working schemes and plans were unsuccessful. Current activities at district level are foreign-aid funded and, despite some success, are not institutionalized for expansion or sustainable management.

Evidence shows that community management and development of forestry has been effective and sustainable. Department of Forests management could be maintained with distribution of benefits to the district economy and local people. Harvesting and marketing of raw forest products have, at various times, been the responsibilities of government departments, statutory bodies and public and private agencies separately or concurrently. But in all cases the products were harvested in a destructive manner which left the forest resource base in a degraded state, mainly for commercial or illicit gains.

6. POLICY IMPACT

The NFP of 1976 was the first consolidated policy plan formulated. Prior to that there had been, of course, minor policy implementation through legislation or isolated decrees. Along with these developments, there were also a number of institutional reforms as well as reorganization of the government agencies.

6.1 Impact of the Nationalization Act

The Private Forest Nationalization Act of 1956 was promulgated hastily without adequate preparation and without sufficient trained supporting personnel. Most important, the Nepal Forest Service at that time operated only in the accessible areas of the Terai and the Inner Terai in addition to the Kathmandu Valley. Under this Act, some of the Terai forests appropriated by the ruling Rana family were nationalized with some compensation (WECS, 1986). Despite assertions by some that this Act led to forest clearance in the hills and mountains, the traditional owners/managers of the *Kipat* private forests knew nothing of the Act and continued their activities unchanged. However, when district forest offices were extended to hill districts in 1959, some of the local people stocked timber in their houses believing that future timber harvesting would no longer be possible.

6.2 Impact of government marketing

As already mentioned, the operations of the Timber Corporation of Nepal (TCN) and the Nepal Fuelwood Corporation (NFC) proved counter-productive and destructive. Established to meet the timber and fuelwood demands of the general consumers, industries and nation-building agencies, they became inefficient because of a lack of responsibility for the conservation or regeneration of forests. Government mismanagement of these agencies, as well as corruption, meant that they became national liabilities. These two corporations have suffered losses of millions of rupees annually since the 1981/82 fiscal year in spite of the large profit margin between the nominal royalty they pay to the Department of Forests and the sale prices of their products (Sheikh, 1989). The government is apparently being held to ransom by threats of job losses and interruptions to timber supplies for government services such as army, police and hospitals.

6.3 Impact of the 1976 Policy

Only 5 of the 22 programmes identified in the 1976 NFP to cover all aspects of protection, production, utilization, and infrastructural development in the forestry sector have been implemented. The Nursery and Plantation Programme, Forest Research Programme, Forest Education and Training Programme, Public Co-operation and Participation Programme and International Co-operation Programme were all implemented with financial and technical supports from various bilateral and multi-lateral agencies. Despite incomplete application, the impacts of these programmes are now being appreciated with nursery, plantation, and afforestation activities spread all over the country. Better techniques and follow-up protection are needed to enhance plantation benefits. Nepal has also established a small but effective forest research establishment (in close collaboration with the ODA of the United Kingdom) and an Institute of Forestry in Pokhara for graduate training in forestry and related professions. Most importantly, the impact of the 1976 policy is seen in the community-forestry activities operating in 37 hill districts with two IDA (World Bank) loans and in 21 plains districts with an EEC loan. International cooperation in forestry has been encouraged with more than two dozen bilateral and multilateral donors plus some 56 international NGOs.

Forest protection and production programmes have not been implemented in the national forests of the Terai-Bhabar and Siwalik regions. As a result, the forest resource has been degraded and exploited by encroachers, squatters and poachers. TCN and NFC activities have added to this illegal usage. For this reason, protection of these forests is top priority for the forestry sector in Nepal.

7. POLICY REFORMS AND CONCLUSION

7.1 Major lessons learnt

The needs of a nation vary over time with changes in political, social, economic and demographic conditions and, therefore, the country's forestry policy must evolve along with these changes. Hence, border forests have been cleared for security reasons at one time and preserved for the same reason at another time in history. Policy changes in forestry need to consider problems and potentials in a holistic manner or a systems approach. If such a procedure had been adopted, Nepal would have mobilized her forest resource instead of destroying it in the Terai plains while undertaking agricultural expansion, settlement and infrastructure development.

Forests are closely related to the land and the people, so policies for their use and management should reflect the many topographic and socio-economic regional variations in Nepal. Forestry sector policies should be prepared and implemented in close coordination with other sectoral policies in line with the socio-economic goals of the country. Had Nepal followed such an approach, the valuable timber resource contained in nearly 1 million ha of forest land in the Terai and the Siwalik regions would not have been destroyed during the past three and a half decades.

Commitment to national socio-economic goals needs to take precedence over personal gain by government and political personnel. Without this, Nepal's future is under threat. Formulation and implementation of forestry policies need to be coordinated to avoid misuse of expansion programmes and concessional distribution. The 1976 National Forestry Plan incorporated some elements to resolve socio-economic and technical problems, but these need to be extended through institutional support by appropriate agencies. Management functions of the directing agencies (MFSC, DF, territorial offices) should be improved or reformed by resolving conflicts between personnel, eliminating favouritism, encouraging participation and also matching authority to responsibility. These would lead to maximum effectiveness and efficiency in the implementation of forestry policy directives in Nepal.

7.2 Major issues at present

Major issues currently faced by Nepal in the forestry sector centre on how to fulfil the basic needs of the increasing population with respect to timber, fuelwood, fodder and other minor forest products from the dwindling forest resource in the country. Economic, environmental, cultural and social contributions from the forestry sector, which are feasible as well as legitimate, are also important.

The use and management of the forest resource as an integral part of the natural-resources management system in Nepal requires close coordination with the use and management of soil, water, land use and watershed resources in various physiographic regions of the country. There is a need to institutionalize forest protection, management, and utilization activities among the various operational sectors including the government, non-government, community and private business organizations on the basis of their comparative advantage in production and distribution of social and economic services to the people in general, and the poorer section in particular. A legal framework

and social norms should support effective and efficient operation of these various organizations by discouraging corruption and illegal activities.

7.3 Policy instruments

Institutional

The Government of Nepal should delegate the use and management of the country's forest resources to government, non-government, community and private business organizations according to their comparative advantage in varying geographical and institutional frameworks.

Legal

Legal instruments should be simplified as well as streamlined in order to minimize intra-sectoral conflicts, to enhance the multiple and sustained-use system of forest management, and to avoid adverse environmental impacts.

Fiscal

In addition to undertaking forestry activities in sectors where NGO, community, and private enterprises do not participate, the government must institute appropriate fiscal policies including revenue sharing, taxation, and subsidy to encourage participation. In many cases establishment of a revolving fund will be helpful. However, transparent transactions and impartial auditing and evaluation will be necessary.

Management

The management functions of each category of forestry organization need improvement, especially with respect to staffing and personnel administration, budgeting and financial administration, organization and motivation, monitoring and evaluation. Most importantly, the organizational dysfunctions and corruptions that are evident in Nepal should be minimized through democratic processes, transparent transactions and independent auditing.

Technological

Technological innovations in all aspects of forest management and utilization, such as nurseries and plantations, genetics and tree physiology, protection and tending of tree crops, agro-forestry, logging and harvesting, handling and transportation, processing and marketing should be initiated as well as enhanced through proper incentives.

7.4 Conclusion

Past experiences must serve as lessons for Nepal in formulation and implementation of forestry policies. Identification and analysis of problems and potentials, adoption of appropriate policy instruments and fair implementation of this policy will all need to be attained to meet peoples' needs as well as to contribute to economic welfare and environmental sustainability in the future.

REFERENCES

- Anon., 1976: *Nepal's National Forestry Plan 1976*. An unofficial English translation of 'Rastriya Vana Yojana, 2033 B.S.'. Published by Nepal Australia Forestry Project, Kathmandu/Nepal. Tech Note 1/B2.
- Anon., 1988: *Statistical Pocket Book - Nepal, 1988*. Central Bureau of Statistics, National Planning Commission Secretariat, Kathmandu, Nepal.
- Bajracharya, K.M. and Ansari, H., 1990: *The Effects of India-Nepal Trade and Transit Crisis on Fuelwood and Forests in Nepal*. Submitted to US-AID, Nepal.
- MFSC, 1988: *Master Plan for the Forestry Sector, Nepal*. (Main Report; Forestry Sector Policy; Institutional Development Plan; Forestry Resources Information: Status and Development Plan). Ministry of Forest and Soil Conservation, Nepal.
- Sheikh, A.M., 1989: *The Forest Products Marketing System in Nepal: Case Study of the Urban Areas of Kathmandu Valley*. Report written in association with IDS Kathmandu and submitted to US-AID, Nepal.
- Tiwari, K.B., 1986: *Nepalko Vana Byabasthapanko Aitihasik Sinhavalokan, B.S. 2047* (Historical Review of Forest Administration in Nepal). Abarta Press, Kathmandu.
- WECS, n.d.: *Energy Sector Synopsis Report 1985/86*. Report No 4/2/140288/1/4 Sq. No-279. WECS, MWR, Kathmandu.
- WECS, 1986: *Land Use in Nepal. A Summary of Land Resources Mapping Project Results* (with emphasis on forest land use). Rep no. 4/1 310386/1/1/ Sq. No-225. Water and Energy Commission Secretariat (WECS) of the Ministry of Water Resources, Kathmandu.

PAKISTAN*

1. INTRODUCTION

When Pakistan was established in 1947, there was a meagre forest resource in the western half, but the country remained self-sufficient in wood and wood products until 1971, because the shortfall in West Pakistan was offset by the surplus in East Pakistan. With the independence of Bangladesh, the supply to Pakistan declined. Efforts to increase the forest area since 1971 have had limited success, due to the arid climate in most parts of the country, the low priority assigned to forestry in the planning process, and consequent inadequate funding. Today Pakistan's forest resource is inadequate to meet her needs.

Pakistan is mainly a dry country; 51 per cent of the land area is an arid zone where tree growth is extremely limited. Bushes and grasses grow in this region but they are devoured by large herds of livestock, which are the mainstay of the inhabitants. Approximately 37 per cent of Pakistan is semi-arid where tree growth is possible but this area is mostly utilised for rain-fed agriculture since marginal agriculture gets preference over tree culture in a food-deficit country.

Only 12 per cent of Pakistan (16 per cent if Azad Kashmir is included) is sub-humid. This area is located in the Himalaya, Karakoram and Hindu Kush mountain ranges. It is extremely well-suited for tree culture because of climate, topography and soil conditions. About 20 per cent of this region is already under dense, productive natural coniferous forests.

1.1 The situation before 1947

Hazara, Malakand, Murree Hills and Northern Areas had dense forests prior to 1947, mostly along the borders of the northwest portion and Afghanistan and Kashmir. The border tract was mostly comprised of tribal territories and constituted a buffer zone between British and Russian influences on the two sides. The terrain in these areas where natural forests occur is mountainous; means of communication are still underdeveloped and sources of income are scarce. Forests were, and still are, the main source of livelihood. People derived income from the sale of timber and from the jobs created by forest operations and had unlimited rights in many forests during the colonial rule. The British gained cooperation from tribesmen by granting them generous rights in the forests and adjoining land. Dependence of the local agro-pastoral economy on grazing of livestock was recognized and any restrictions on forest use were seen as a possible source of uprisings. Also, low population densities of livestock and humans posed no threat to the forests.

Forests were divided into two categories, namely Reserved Forests and *Guzara* Forests. The people lived and farmed in the valley floor. The slope from the valley bottom to the hill top was covered by dense forest. The portion of a forest adjacent to a large settlement was declared as a *Guzara* Forest where the ownership of land and its trees was vested in the people, either individually or jointly as family ownership or as village *shamilaat* (common property). The British government, however, retained the right to receive a fee at a fixed stumpage rate for every tree felled in the *Guzara* Forests for domestic or commercial purposes. This preserved the legal claim to the forests for the British.

The higher and more distant forests were notified as Reserved Forests and they were clearly demarcated with boundary pillars and mapped. A similar fee was applied to sales from Reserved Forests. These measures worked to the satisfaction of local people who exercised unlimited rights

* This is the edited version of a paper presented at the meeting by Abeerullah Jan (Inspector General of Forests, Ministry of Food, Agriculture and Cooperation, Pakistan).

in *Guzara* Forests and they also conserved an adequate proportion of forests by prohibiting all acts in Reserved Forests except those permitted through separate notifications.

1.2 Impact of important events after 1947

With independence in 1947, the range of problems facing the newly created Pakistan meant forests received little attention. A small provision of only Rs 39.1 million was provided in the First Five-Year Plan to be shared between the eastern and western parts. Forestry first received some priority when the Indus Water Treaty (1960) allowed large, newly irrigated areas of Punjab and Sindh provinces to be colonized. Government policy earmarked 10 per cent of the new barrage areas for raising trees in block plantations.

When the states of Dir, Swat, Chitral and Amb were merged into the Northwest Frontier Provinces in 1970, the forests were brought under the control and scientific management of the NWFP Forest Department through the implementation of regular management plans. About 1 million ha were added to the official forest area of Pakistan to reach 3 million ha.

The control of roadside and canal-side strips was transferred to the provincial Forest Departments during the sixties and seventies for use as linear plantations for amenity purposes. About 17,000 ha was added to the forest, providing shade and reducing dust and noise on roads and railways.

Land reforms were introduced, first in 1960, and again in 1972, to reduce the influence of big land owners, to discourage absentee landlords, and to boost agricultural production by distributing land among landless tenants (*haaries*). Owners were required to surrender land in excess of a certain limit of rain-fed and irrigated agricultural land. Large land owners preferred to retain agricultural land so they surrendered woodlands and wildlands. Resumed land was handed over to the provincial Forest Departments for management. Such areas, called Resumed Lands, were notified as Protected Forests under the Pakistan Forest Act (1927). Under this arrangement, about 100,000 ha were added to the forest area. Special provisions exist for the FD to take over control and management of private land if erosion or landslides threaten public safety or infrastructure.

During British rule, land tenure was established by a land settlement process. In areas with coniferous forests, wooded areas were classified as Reserved Forests, Cantonment Forests, Municipal Forests, *Guzara* Forests and Communal Forests. The first three were vested in the government whereas the latter two were owned by private individuals or village communities. In areas with other forest types, government-owned lands were termed Crownlands. When these were entrusted to the Forest Departments they were called State Forests in Baluchistan and Unclassed Forests in Punjab. Lands evacuated by migrants in 1947 were allotted to the Forest Department for raising trees and managed as Protected or Unclassed Forests.

The legal classification does not necessarily include areas which have tree growth. Some areas of official forest may not have any tree cover, while other areas with a dense growth of trees on small or large sites, either publicly or privately owned, may not have been legally classified as forests and so are not included in national statistics.

In order to protect the multi-million dollar investments in dam construction (Mangla and Tarbela Dams), a programme of protecting the catchments was introduced. Planting bare hills, terracing fields, erosion prevention measures and slope consolidation was supported by a World Food Programme food-for-work scheme. More than 200,000 ha of young forests have been raised in this way.

Under programmes and policies described, forest area and cover has increased gradually since 1947. Some small fluctuations occur owing to return of special categories to farmers following rehabilitation and allotment of forest land to non-forest users.

1.3 Evaluation of forestry policies

Forest management in Pakistan has moved through several stages and past policies have played a key role in the development of the forest resources. Evaluation of these policies is helpful in appreciating the trends in the statements leading to the policy of 1991.

Forestry policy of 1894

The Forestry policy of 1894 was framed for British India where forests occupied more than 25 per cent of the area and the human and livestock populations were very low, urban development was slow, and levels of wood consumption were also very low. The main objectives of the Policy were to conserve the existing forests, preserve the physical and ecological balance, and fulfil the needs of local communities. However, this policy was not relevant for the new state of Pakistan which inherited forest cover over less than 2 per cent of its territory. The existing Policy neither accounted for the change of forest area nor did it emphasize sustained harvest from the existing forests. Furthermore, it excluded the private forests from its control.

Forestry policy of 1955

Scarcity of forest resources was recognized in the Forestry policy of 1955 which assigned higher priority to funding forest development and forest production, with equal emphasis on non-tangible benefits of the forest resource. Sound management by use of approved working plans for public and private land, irrigated plantation establishment, land use and conservation control, forest classification based on utility and adequate funding were all emphasized.

Forestry policy of 1962

Important developments took place between 1955 and 1962 which influenced the land use, land tenure, economy and forestry in the hills and plains. For example:

- Several dams and barrages were constructed in the Punjab and Sindh and an intensive irrigation network was extended to new areas. Therefore, conservation of soil and water in the catchments through proper watershed management assumed greater importance and high priority.
- The control of NWFP Forest Department was extended to the princely States of Dir, Swat, Chitral and Amb. Similarly, scientific management was extended to virgin forests in the Neelum Valley of Azad Kashmir and logging operations were started in the Chilas Valley of Northern Areas.
- The gap between supply and demand increased resulting in a staggering bill for the import of wood and wood products. The situation was likely to be aggravated further with the increase in population and rising standards of living.

Thus, the Forestry policy of 1955 was further revised to form the bold and forward-looking Forestry policy of 1962 which attempted to deal with these issues.

Government forests were to become more concerned with production and regeneration, and improving processing techniques to better utilize forest products. Provincial governments were to transfer large areas of suitable land to the Forest Departments and land along roads, railways and canals were to be afforested and managed. A provincial plan for all forest types was to be drawn up to meet national needs and forest development not foregone for agricultural production land. Requirements were included for reforestation by landholders and provincial regulations of grazing rights were introduced. River-bank planting plans were also to be developed.

To improve watershed management in West Pakistan, the Forest Department was to assume direct responsibility for proper soil conservation measures within the government-owned forests. Guidelines were established for a watershed management and rehabilitation programme including survey of all watershed areas. The gradual shift of hill populations from forest land, the supply of electricity wherever possible and subsidies on kerosene stoves were forest preservation measures. Subsidies for terracing for soil conservation and higher taxation on highly eroded areas not reclaimed or afforested within a specified time, were part of the policy statement. Cooperative groups for soil conservation and planting of fruit trees on private land were encouraged and grazing of goats progressively eliminated over 3 years.

Farm forestry should be a key concern of the relevant authorities and the 1962 Policy encouraged research into appropriate species for wind-breaks, shelter belts and communal purposes. Pilot projects on farms, and for trees on saline and water-logged lands, were to be introduced.

Forestry policy of 1980

Since the wider scope of the Forestry policy of 1962 involved many different departments, it was difficult to assign clear-cut responsibilities, coordinate activities and evaluate performances. This difficulty was further accentuated by a lack of expertise in raising trees among the staff of some authorities. Other difficulties arose during implementation including the limited scope for forestry development on the state-owned forest lands, financial and other constraints. The need was felt to extend tree plantations outside forest boundaries into farmlands as they provided about 90 per cent of fuelwood and 50 percent of timber consumed in the country.

As a part of the National Agriculture Policy further policy guidelines were issued in 1980. A bigger thrust was to be placed on the planting of fast-growing tree species in areas outside forests while development of compact fuelwood plantations in areas of wood scarcity and watersheds were to be encouraged through public motivation and incentives. People needed to be motivated to become involved on a mass scale in tree planting activities and nature conservation. Wildlands were to be managed in accordance with their potential for optimum utilization in various forms, including recreation and wildlife.

Forest harvesting was to be undertaken on scientific lines, departmentally or through the public sector corporations, to avoid waste of wood and to improve utilization. Increased production of industrial wood would gradually meet the full requirements of wood-based industries. Forestry development needed integration, planning and coordination with other sectors at provincial and national levels.

Policies were formed for wildlife conservation consistent with other land uses and to ensure that wildlife values were preserved and enhanced. A scientific approach for the management of wildlife would be achieved through wildlife surveys, research and management plans. The creation and development of national parks to preserve major ecosystems and for public recreation and education received attention along with production of medicinal herbs in wildlands.

1.4 Implementation of policy statements

The implementation of the Forestry policies of 1955, 1962 and 1980 faced enormous difficulties. Funding and staffing were inadequate, personnel were poorly trained and problems of control and land tenure arose frequently. In each of the Five-Year Development Plans since 1955, forestry has received an allocation of only 1.1 per cent of the total or less. With increasing population, agriculture often received priority and illegal forest use for livelihoods continued. Public interest, and hence cooperation, in some projects were limited because benefits were not clear to the local people. Lack of organization within government departments and inter-departmental disputes over jurisdiction also hampered implementation. However, some positive steps were made over the period. Indiscriminate grazing was curtailed, watershed management improved and farm forestry pilot projects were set up. National parks, game reserves and wildlife sanctuaries also have been established since the 1980 Policy.

2. PAKISTAN'S NATIONAL FORESTRY POLICY (1991)

The purpose of a national forestry policy is to define basic principles and goals for the conservation and development of forest resources in the country to meet social, economic and ecological needs. The policy statement is necessary to obtain maximum benefits from the forest resource on a sustainable basis; to fix short and long-term goals and identify strategies to achieve those goals; and to promote and ensure cooperation between government and private agencies having land-use responsibilities that affect forestry activities directly or indirectly.

The formulation of the National Forestry policy of 1991 has been influenced by the social, economic and environmental needs of Pakistan. The country's mainstay is agriculture, which is dependent on canal irrigation. Sound management of watersheds should, therefore, constitute the basic objective of a forestry policy. Development of new plantations will supplement inadequate forest resources and all sources of funds need to be utilized. The large population creates an energy crisis. In order to meet fuelwood needs, agro-forestry programmes entailing planting of fuelwood and fodder crops along with agricultural crops on farm lands, should constitute a key principle. Forestry policy should be able to adjust to changes in the pattern of wood consumption resulting from development and advancement of technology. Promotion of industry must form an important component of present and future plans.

2.1 Objectives the Policy

Based on the country's needs and conditions of topography and climate, the basic objectives of the 1991 National Forestry policy are to:

- meet the country's requirements for timber, fuelwood, fodder and other products and environmental needs by increasing the forest area from 5.4 per cent to 10 per cent during the next 15 years;
- conserve the existing forest, watershed, rangeland and wildlife resources by sustainable utilization and develop them to meet ever-increasing demands;
- promote social forestry programmes;
- encourage planting of fast-growing, multi-purpose tree species in irrigated plantations, riverine forests and private farmlands to meet industrial and domestic demands;
- conserve biological diversity and maintain ecological balance through conservation of natural forests, reforestation and wildlife habitat improvement programmes;

- contain environmental degradation in the catchment areas of rivers to check soil erosion and accretion of silt in water reservoirs, and to regulate water supply to increase the life span of multi-purpose dams and to mitigate floods;
- take anti-desertification measures and rehabilitate water logged, saline and degraded lands through vegetation treatment;
- generate opportunities for income and self employment for the rural populace; and
- promote non-governmental organizations (NGOs) and private voluntary organizations (PVOs) to educate masses and create public awareness for environmental improvement.

2.2 Goals of forest management

The policy objectives will be achieved through the following goals of forest resource management:

- Existing forest resources shall be scientifically managed for optimum productivity to meet the local need for wood and wood products and to reduce reliance on imports.
- All forest areas will be covered by regular working plans during the next 10 years.
- Social forestry shall be adopted as a standard practice and extended to all farmlands to increase productivity and to improve the environment. Every farmer shall be induced, encouraged and motivated to raise at least 10 trees per acre.
- The network of protected areas for conservation and propagation of wild fauna and flora will be increased to from 7 per cent to 12 per cent of the total area of the country. The additional area should cover those ecological zones which are not adequately represented at present.
- Wildlife management plans will be formulated for protected areas, i.e. national parks, wildlife sanctuaries and game reserves. All national parks and wildlife sanctuaries will be covered by management plans during the next 10 years.
- Existing wings of Forest Departments dealing with range management will be strengthened or new development agencies to improve the management of rangelands for higher productivity of fodder, will be created.
- Productivity of minor forest produce such as resin, medicinal plants, edible mushrooms and *mazri* shall be enhanced and their industrial utilization promoted to strengthen the economies and enhance employment opportunities in rural areas.
- The sericulture industry will be promoted to provide opportunities for employment and income for the rural populace.

2.3 Main elements of the Policy

Land use

Land under public ownership which can be set aside for forestry purposes is limited and much of the area that is available is not suitable for tree growth because of the lack of water. In the revised Policy, the emphasis has been shifted from traditional forestry to social and farm forestry.

Hill forests

The existing pattern of forest management in the hills is traditional, with fellings mostly based on single-tree selection with reforestation depending on natural regeneration. This does not ensure complete re-establishment of these forests. The Policy statement of 1991 has therefore tried to specify appropriate management techniques. Forests should be managed intensively and current pilot projects, as in Kaghan Valley and Kalam Valley, replicated at other suitable locations.

Extraction from coniferous forests is to be limited to the public sector only and artificial re-stocking of cut-over areas will be conducted with central nurseries providing stock from known seed sources of good quality. The existing working plans are to be revised to ensure multiple and integrated use of the forest resource, in conformity with wildlife conservation and other environmental and social needs.

The existing road density of 2 metres per hectare is to be increased to at least 10 metres to facilitate timber extraction in log form. Forest operations will be mechanized by installation of aerial ropeways and skyline cranes, in particular for sites where road construction is undesirable, difficult or expensive.

Jurisdictional charges of forest personnel need to be rationalized to make them more manageable.

Degraded watersheds

Trees in the watershed areas contribute to the environmental stability of the ecosystem and also play a very significant role in food security for millions of people. A sustained supply of water from Pakistan's rivers, reservoirs and canal systems is required for agriculture and industry. Removal of trees and over-grazing in the watersheds have led to rapid silting up of the reservoirs and flash floods which cause severe damage to infrastructure, thereby destabilising the food delivery systems. Accelerated siltation of dams leads to loss of storage capacity, increase in maintenance cost of infrastructure, loss of electricity and decreased agricultural and industrial production.

The Forestry policy has therefore tried to address these issues by specifying that all watershed projects be planned and coordinated by the Federal Government but implemented through Provincial Forest Departments. Fodder production in the northern areas would be included as a multiple-use input in forest management, adding substantially to the area available for extension of forests. A reforestation programme for denuded watershed areas will be implemented after classification and inventory based on susceptibility to erosion and landslides. Grazing in these reforested areas would be controlled and incentives provided to land owners to establish tree and horticultural crops on lands exceeding 30 per cent slope, to reduce the incidence of soil erosion.

Rangelands

A development programme for rangelands will emphasize fodder tree planting programmes and creation of grazing lots on an experimental basis to induce private investment by livestock owners in rangeland management. Reseeding of depleted rangelands with nutritious and high-yielding grasses will be accompanied by encouragement to produce fodder for stall feeding to reduce pressure on rangelands. Other projects include promotion of livestock feeds made from agro-industrial wastes and by-products and support for stall feeding rather than open grazing.

Legislation is needed to support range management agencies and their programmes as is integrated management of range, crop and forest lands to ensure optimum provision of fodder and forage.

Expanded research activities and the results should be disseminated through an improved extension service.

Wildlife protected areas

Flora and fauna are essential elements in the welfare of human beings, providing the material bases for life, food, clothing and fuel. Population expansion, development in agriculture and industry and meeting other essential human needs have caused damage and destruction to wildlife habitats such as forests, rangelands and wetlands.

Emphasis is placed on conservation of all endangered and endemic species of wild fauna and flora by ensuring the survival of the critical ecosystems that support such wildlife. Periodic surveys of the country's wildlife and its habitats are to be conducted to monitor ecological changes. Habitat management plans, species recovery plans and habitat improvement programmes for conservation and improvement of species of wild animals and plants are to be developed.

Infrastructure for the management of species and habitats is to be strengthened at all levels of administration and investment in the sector increased. Federal infrastructure responsible for planning, policy and implementation must be stronger. Public awareness programmes by NGOs and government will be expanded to gain support for wildlife conservation and local participation enlisted for management of species and habitats. Federal assistance for national parks and nationally important and endangered species of wild plants and animals will be provided. The private sector is to be encouraged to breed wild animals, in particular the endangered species.

Private forestry

Despite no new public lands being allotted to the Forest Department more farmers are planting trees on their marginal lands and along their field bunds. To expand these actions the new Forestry policy will adopt a wide variety of measures. Vast public and private degraded, waterlogged and marginal farmlands could be developed for tree culture and fodder production. Selected public lands will be leased out to forest industries and other interest groups for the growing of trees or range management with development of water resources or water conservation measures.

In addition, the government will arrange adequate and effective distribution of saplings and seeds at nominal cost, promote the use of village *shamilaats* for social forestry and encourage rehabilitation of degraded forest lands. The introduction of a forestry grant scheme and rationalization of the price structure and marketing of wood produced on marginal and wastelands will facilitate private participation.

Forest extension

An effective outreach and extension system is the key to success in growing enough wood to satisfy increasing national needs. Forest extension will launch programmes featuring social forestry concepts, ideas and opportunities for the relevant audience. There is a great need to train staff, motivators, NGOs and PVOs in outreach and extension techniques and methods.

Development of a system for monitoring and evaluation of the programmes will provide a feedback mechanism whereby researchers can interact with both professionals and practitioners of farm forestry to guide research efforts to solve constraints. Demonstration areas to serve as visit points for farmers' tours and workshops and on-farm research trials in collaboration with research institutions should be set up to attract active participation of the farmer community.

Research and education

Up-graded forestry education and expanded training facilities will produce a corps of specialists in forestry-related disciplines to expand research for sustainable utilization and development. Forestry education in the Pakistan Forest Institute will be integrated with the university system and women encouraged into the forestry profession through training programmes.

Modern in-service training for the Forest Service cadres, which emphasizes social aspects of forestry, is needed. Research programmes which provide technologies on the social and scientific management of forest and rangeland resources will be established along with regional research stations to conduct research on specific local problems. Provincial Forest Departments and industries need to be involved and encouraged to finance research on problems relating to forestry and forest products. An effective mechanism for coordination of research on forestry and forest products by Federal and Provincial institutions and universities is to be evolved.

Environmental forestry

World-wide environmental crises have highlighted the role of forests in global well-being and the Pakistan Forestry policy will attempt to minimize environmental pollution and environmental hazards through tree conservation and planting. A framework and programmes for establishing green wind-breaks on arid lands will check erosion and desertification and green areas are to be set up in all cities with populations of 50,000 or more. At least 25 per cent of the area in new townships and industrial estates will be reserved for use as parks, recreation spaces and green belts.

The government will formulate, enact and enforce pollution standards for emissions and discharges impacting on the wildlife protected areas and wetlands and strengthen the capacity to implement these measures.

Resource surveys

To provide a sound planning base for the forestry, wildlife, watershed and rangeland sub-sectors, periodic physical and mapping surveys will be undertaken. A programme for the improvement of statistics relating to forests and wildlife, including a remote sensing laboratory and Geographical Information Systems (GIS), will be implemented.

Incentives

Several incentives have been provided in the Forestry policy of 1991 to assist in achievement of its objectives. Aerial rope-ways and sky-line cranes used exclusively for forest exploitation and management will be exempt from customs duties. Tree insurance schemes will be introduced on a pilot project basis. Enhanced concessions to certain agro-industries (sericulture, apiculture and wood carving/sawing) will provide a debt-to-equity ratio of 80:20 and cheaper credit. Long-term credit on concessional terms will be advanced to farmers raising block plantations. Study tours abroad will be available for progressive farmers to update their knowledge.

2.4 Policy formulation process

The 1991 Policy began with an international seminar on Pakistan's Forestry policy in 1989. Local participants included the Forest Ministers, Provincial Secretaries, Chief Conservators of Forests, serving and retired senior forest officers and representatives of wood-based industries, related NGOs and other concerned ministries of the federal Government. Five working groups provided

recommendations on socio-economic conditions, international linkages, forestry legislation, future objectives and directives, and financial and political support. Based on the recommendations of the seminar, a draft Forestry policy was developed and distributed to the participants for comment. The draft was then revised and distributed to government agricultural staff, industry and farmers for further comment.

The final policy was discussed in the National Assembly in June 1991 and approved by majority vote. It is elaborate, innovative, progressive and demand-oriented, and a great improvement over previous policy statements. It encompasses a viable strategy and an attractive package of incentives which, when implemented, should have far-reaching positive results.

3. POLICY RESPONSES TO KEY DEVELOPMENT ISSUES

The successful implementation of any policy depends upon enlisting the support of all interest groups and on the availability of essential inputs, identification of priority areas, and fixing clear targets. The chances of success are greater if expected benefits are likely to accrue to larger sections of the population. The Forestry policy of 1991 is a part of the overall National Agriculture Policy which has the goals of social equity, self-reliance, export-orientation, sustainable agriculture and enhanced productivity. Based on these, the Forestry policy objectives are: conservation of forest, watershed, wildlife and range resources; promotion of social forestry programmes to increase existing forest areas; and containment of environmental degradation and conservation of biodiversity.

Strategies have been developed to meet these overall goals and related objectives. Agricultural growth at a rate higher than the population growth will enhance food security, self-sufficiency and provide surpluses for export. Productivity in crop, livestock, fisheries and forestry sectors will be increased and an export-oriented or import-substitution strategy evolved. Natural resources are to be conserved and developed. Institutional reform will improve agrarian structure and achieve institutional development. Focus will be placed on small farmers and *barani*-area development. Industrialization should help achieve full employment in rural areas. The action plan for achieving the stated objectives has already been outlined.

Rural development

Rural development provides the means to improve the quality of life for rural people. Improved communications and transport systems help to break the isolation of the remote areas. Similarly job opportunities are created by development projects. Transport and communications links facilitate marketing, education, health care and the provision of food. Increased road density will improve the harvest of wood and reduce timber wastage while provision of incentives in the form of relief, concessional credit and tax exemptions will encourage participation.

A focus on forestry will lead to rural development by increasing the forest area from 5.4 per cent to 10 per cent during the next 15 years and by promotion of social forestry programmes. Planned anti-desertification measures and rehabilitation of waterlogged, saline and degraded lands through vegetative treatment will improve the rural situation. Opportunities for income and self-employment will be generated for rural people. The payment of salaries, wages, food for work and training imparted to improve skills all relieve poverty and benefit workers. Forestry examples range from nursery manager to wood logger to industrial worker.

Sustainable development

Sustainable development requires a good base of natural resources, their uniform distribution and growth at or above the increase in population. The 1991 Forestry policy considers these essential prerequisites and aims at doubling the forest area during the next 15 years by laying greater emphasis on social (farm) forestry. It also aims at tree development in all regions for meeting local needs for fuelwood, small timber and supply of industrial raw materials near the centres of consumption and for environmental benefits.

Conservation of biological diversity and ecological balance will be promoted and environmental degradation contained, including use of anti-desertification measures. NGOs and PVOs will be encouraged to educate the people and create public awareness.

Better management, efficient logging practices and reduction of waste in timber harvest and utilization will be introduced along with incentives to land owners to establish trees and horticultural crops on lands exceeding 30 per cent slope. Habitat management and species recovery plans and habitat improvement programmes will help conserve and improve species of wild animals and plants.

Poverty and environmental abuse

Poverty leads to environmental degradation and a depleted environment leads to poverty. Indiscriminate use of natural resources interrupts supplies and as a result lowers the standard of living. The wise use of natural resources is the aim of the Forestry Sector Master Plan being currently formulated with the technical and financial support of ADB/UNDP.

Food security and nutrition

The quality and quantity of water as well as its regular flow from catchment areas is vital for agriculture, hydro-power and industries dependent upon water. About 20 million ha of irrigated agriculture in the Indus Plain, known as the grain bowl of Pakistan, is dependent on good water husbandry practices in the Himalayan-Karakoram region of Pakistan. Thus forests are important not only for food security but for the whole range of human activities including social well-being, industrial development and resource conservation.

Nutrition is part of food security, and forests provide a large number of fruits, nuts, flowers and seeds which are consumed by human beings, animals and birds. These promote the health and well-being of the people living in remote and inaccessible localities. Forests are often valued by local people more for fruits and nuts than for other known economic benefits. Mushrooms, medicinal plants, aromatic plants, wildlife and fish are a few other products taken for nutrition.

Increasing off-farm employment

In addition to increasing the forest area by more than 100 per cent in the next 15 years, the 1991 Forestry policy stipulates intensification of forest management practices. This would entail increasing road networks and mechanization operations, raising improved stock in nurseries, better protection for new trees from grazing, fire, insects, fungi and other causes through fencing, and increased protective staff. All these works are likely to increase jobs in the Provincial Forest Departments.

Competing land uses

Competing demands for different land uses, such as agriculture, communication, infrastructure, mining, energy and settlements, make them the biggest constraints on forestry. These are minimized when farm forestry activities are targeted towards saline, waterlogged and wasteland areas. Farmers are encouraged to grow the maximum number of trees possible on farm lands and the Forestry Policy provides for a farm forestry package which contains incentives such as insurance schemes, enhanced concessions, credit and study tours abroad.

Mining may be a conflicting land use with forestry in mineral-rich forests. Cement and phosphate fertilizer industries are centred on scrub and chir pine forests which grow on limestone and phosphatic rocks. As a result of mining, forests have been damaged and destroyed. To date mining use has been preferred over forestry but the problem has been partly addressed in the 1991 Forestry policy revision by restricting denotification of forest areas and change in land use without legal authority.

Some major conflicts between forestry and other land uses arise because of the land tenure system in Pakistan which is extremely complex. All productive natural forests are located in the region where ownership rights are neither well-defined nor adequately documented in the government revenue record. Wherever settlement of rights has been attempted, local people have boycotted the proceedings as they dispute the validity of the whole process. The issue varies between regions.

In Malakand Civil Division in NWFP, more than 1 million ha of coniferous forests previously belonged to three princely states and forest revenue went to the rulers. When these states were merged with the NWFP, the people received a share of sale proceeds and later demanded ownership rights. Government land-settlement activities have been disrupted by agitation and interference from local people. The Forest Department considers forest lands as public property whereas local people contend that forests belong to them. Thus there is confusion, uncertainty and dispute.

There is another linked issue. Royalty is distributed only among the male members of the local communities. Those who have few or no male members, have little interest in the protection and conservation of forests. On the other hand, agricultural land ownership belongs to the individual, and consequently there is a growing tendency to convert forest areas to cultivation, to claim ownership. This encourages encroachment on forest land and the government is not effective in controlling the trend with a resulting decline in forest areas.

In Hazara there are settled districts and tribal areas. In the latter the forests are being damaged and destroyed because of lack of staff or policies to protect the resource from encroachment by settlement. In land settlement areas two types of forests have been notified, namely the Reserved Forests and the *Guzara* Forests. The latter are large, wooded areas set aside to meet the bonafide domestic needs of local people. Less than 50 per cent of *Guzara* Forests are owned by individuals who protect them against cutting of trees or encroachments. Those forests jointly owned by communities in the form of village *shamilaat* (joint property) are subjected to all sorts of abuse. However, the *Guzara* Forests have been properly surveyed and demarcated on maps as well as on the ground and currently are managed and treated under working plans.

The *Guzara* Forests in Rawalpindi and Murree Hills are still not demarcated or managed by plans because of opposition from the people. As a result, they are managed on an *ad hoc* basis through a remote, central *Guzara* Committee which is not conducive to efficient protection and conservation. The resource is being widely used without responsibility for its protection, conservation or improvement, resulting in its depletion and deterioration.

The forest situation in Azad Kashmir is similar to Malakand except that the sale proceeds are not shared by the people. The forests in Neelum Valley are fully owned by the state and are a significant source of revenue. This revenue comes mainly from the sale of timber and minor forest produce. Elsewhere in the state, the forest growth is sparse and unsuitable for commercial harvest. Traditionally, the people use these forested areas to meet their domestic needs and claim ownership.

Conclusion

The Forest Departments are no longer effective in protecting forests against abuses by local people due to declining village institutions, declining respect for law, excessive rights granted to local people and pressures caused by increases in human and cattle populations. The Forestry policy has not addressed the question of land tenure because of its complex nature and the tribal lifestyle governing the use of forests. Past experience has shown that policy resolution of land tenure problems is not likely within the foreseeable future.

4. FORESTRY LINKAGES

Forestry has linkages with the crop and livestock sub-sectors of agriculture and cross-sectoral linkages with energy, trade, housing and communications, as well as with the human environment. Under the socio-economic and climatic conditions of Pakistan, a farm is incomplete without the components of trees and livestock. Such a mixed farm is more profitable than one with just agricultural crops. A common farmer is traditional, conservative, illiterate and poor, with little exposure to the market economy. Livestock and trees are the only capital a farmer can use for the education of his son, medical treatment, marriage or death of family members.

However, farmers prefer dairy animals and fruit trees as sources of food and income, because woody trees are believed to adversely affect agricultural crops due to their shade, root competition and as habitats for pests and diseases which damage crops. Currently, social forestry research projects are concentrating on tree-crop interactions. These studies cover economic, sociological and anthropological factors; design and yield of farm-forestry systems; species trials and tree-seed propagation; tree-crop interface; and hydrological aspects of tree-crop establishment.

4.1 Energy

Energy, both commercial and traditional, is a resource for domestic consumption and is a prerequisite for economic development. Biomass includes fuelwood, cow dung, wheat straw, bagasse and grasses and is extensively used for cooking and heating in rural areas where other sources of domestic energy are neither available nor affordable. Pakistan's rural population use biomass as the only source of energy and 50 per cent of the urban population also uses biomass as the main source. According to World Bank estimates, 24.3 million m³ of fuelwood is consumed in Pakistan each year.

Several major industries also use biomass either as a raw material or as an energy source. These include the pulp and paper, chipboard, hardboard, veneer and plywood, matches, sports goods and mining industries. Rural industries which consume fuelwood for energy include tobacco and brick kilns. Therefore, any change in the energy policy is bound to affect the forestry sector.

During the energy crisis in the 1970s and 1980s, allocation of financial resources to the energy sector was increased and funding was provided to the forestry sector in the Seventh Five Year Plan period (1988/89 to 1992/93) to expand energy plantations on private lands. This was accomplished through the Forestry Planning and Development Project.

4.2 Timber trade

The sale of standing trees from state forests to contractors was stopped under the 1980 Forestry policy and the contractors were replaced with government corporations. The objectives were to safeguard against theft and other malpractices in the felling coupes, generate resources for forest development and expansion, and induce efficiency, speed and economy in forestry operations.

Wood and wood products have been retained on the free list for reasonable amounts of import due to their shortage within the country. However, because of foreign exchange considerations, excessive imports are controlled by customs duties on logs, timber and wood products. Such a high tariff restricts the import to high value timber and products such as teak, chemical pulp and newsprint. The export of timber and many forestry-related items has been prohibited. Value-added products such as furniture, veneer, sports goods are, however, allowed to be exported since their export encourages the creation of job opportunities and earns additional foreign exchange.

Housing

The housing sector responds readily to increases in per capita income and levels of remittances from abroad, affecting both domestic and commercial housing. This activity has, therefore, direct bearing on the availability and prices of constructional timber. According to the latest official estimates of the National Housing Authority (NHA), there is a shortage of 3.5 million houses. The Seventh Five-Year Plan envisages that distribution of 3.2 million plots will be provided to the rural homeless. The consumption of constructional timber will increase many times due to this project, as well as the need to meet the existing shortage of housing: and the tendency to convert mud (*kutch*) houses to concrete (*pucca*). This pressure on the meagre forest resources will increase and the prices of timber will escalate.

Communication

The small percentage of forest area and its uneven distribution are two of Pakistan's critical issues in forestry. All the forests providing construction timber are located in the north and are remote, difficult and remain snow-bound in winter. Consequently, extraction of timber is slow, inefficient, wasteful and expensive. Major consumption centres of wood and wood products, population, industry and economic activities are concentrated in big cities distant from these forests. Industries using wood as raw materials are also located away from the source of timber. For example, poplar trees are grown in Peshawar and Mardan Valleys but used mostly in Sialkot, Punjab and Sindh.

On average, more than 200 trucks carry wood daily from one part of the country to the other. With increased residential and commercial activities, and intensification of forest management, the pressure on the existing communication facilities will increase, creating more congestion on roads and adding to the cost of raw materials. A further problem arises because direct contact between growers and users is difficult, and contact is maintained through a strong group of middlemen who exploit both. Growers do not get fair prices and users do not get adequate and reliable supplies.

It is for this reason that the 1991 Forestry policy has placed great emphasis on social/farm forestry to produce industrial, commercial and construction timber close to the centres of consumption.

5. FACTORS AFFECTING POLICY IMPLEMENTATION

Effective implementation of forestry policy depends on three factors, namely proper organization, adequate finances and strong legislation. Earlier policies provided none of these pre-requisites.

5.1 Organization

The existing federal and provincial administrative structures are a legacy of the colonial past. Outdated patterns of administration, vast territorial jurisdiction, low input-output types of forest management, emphasis on forest protection rather than on management, antagonism between forest staff and the people living around the forests have all persisted. The only concern of the forest owners and the Provincial Governments is the planned exploitation of trees and progressively higher income from the forest resources.

While forestry policies have changed, the forest administrative structure to implement them has remained the same. Extensive jurisdictions, inadequate staff, inaccessible forests, complete reliance on inadequate natural regeneration, open grazing, death and decay due to old age and illicit damage have taken heavy toll of forests which have been depleted in area and growing stock. Provincial forest staff are aware of this phenomena but they seem to be unconcerned about it. On paper the forest areas stay unchanged because it is the legal definition which determines the status of forests rather than their physical condition. An area once notified as Reserved Forest remains forest, irrespective of the quantity and quality of vegetation. Any increase in area is notional rather than real. The custodians of forests are not aware or even bothered about the disappearance of trees and decline of the forest estates. Treeless hill slopes produce grasses which support more livestock. This suits the farmers who favour cutting of trees rather than planting them. All innovative ideas contained in the forestry policies have not been implemented.

5.2 Finances

The implementation of forestry policies and execution of development programmes have suffered due to inadequate funding in the Five-Year Plans and Annual Development Programmes. Furthermore, funds released have failed to reach the levels provided for in the plans. Despite increased funding, increased forest areas, extensions of scientific management, escalation of costs and inflation have all led to a gradual decline in resource allocation per unit area. With this pattern of funding support, the prescriptions and targets envisaged in forestry policies were difficult to achieve.

5.3 Legislation

The forestry policies enunciated in the past have made definite recommendations to amend the existing forestry legislation or to enact new laws which may be promotional, based on customs and traditions and backed by strong enforcement machinery. In the Forestry policy of 1962, clear and bold recommendations were made regarding required planting, rights of use, cutting, taxing eroded lands and grazing, but none was implemented. Reasons could either be impracticality due to social unacceptability or lack of interest and resolve on the part of governments. In either case, what cannot be implemented, should not be mandated.

6. POLICY REFORMS AND OPTIONS

A National Forestry policy for Pakistan must be implemented on the ground to be effective. Otherwise, the process of formulation is a waste of time, energy and resources which Pakistan can ill afford. In the past, policies were not put into practice because of poor understanding of social needs, lack of political commitment, inadequate resources and the absence of monitoring and evaluation mechanisms. To avoid these problems, the role of forests and their importance to individuals, communities and the society need to be understood.

Individuals see forests as a source of food, fuel and fodder to meet immediate requirements, even if it involves cutting of trees, clearing of forests or cultivating steep slopes. A forest community values forests more for income, jobs and raw materials for industry, thus providing the basis for social and economic development. The national significance of forests is much wider than their traditional role as a source of raw material. Forests ensure the quality and quantity of water required for agriculture and hydro-power generation, and a clean and healthy environment. These divergent needs must be recognized, understood and reconciled in order to preserve the forest resource.

6.1 Background

The forest resource of Pakistan is confined to a region constituted by the three mountain ranges where the highest rainfall and snowfall occur. Because of favourable climate and physiographic conditions, more than 80 per cent of total forest resources are located in this region and are dense, valuable and extremely productive. Ten million people living in these mountains are directly dependent on them, while the remainder of the population is indirectly affected by what is happening in this region. These special conditions affect conclusions drawn and, consequently, decisions on the intensity of forest management.

The survival and prosperity of Pakistan depends on matching the water potential of the north with the soil fertility of the Indus basin in the south in order to produce food grains for the ever-increasing population and cash crops for their economic benefit. Proper protection of unstable hill slopes against erosion with dense tree cover ensures the supply of good-quality water. Forest protection is a difficult task, however, because of increasing mountain populations meeting their survival needs. With the remote location of forests in the northern region, strict enforcement of laws is not possible.

The hill forests provide an excellent resource base for economic development, hence their sustained utilization needs to be ensured for their long-term use by the people and state, and for the survival of the resource itself.

Social and economic considerations

Mountain forests in Pakistan are either privately owned or the local people have a 60 to 80 per cent share in sale proceeds. The owners wish to derive maximum financial benefit from their forests and are not concerned with watershed benefits which accrue to other segments of the society. In the plains of Punjab and Sindh the temperature goes beyond 45°C and the shade provided by trees protects farmers and their livestock from this heat. Under such conditions raising of trees is a social necessity. Trees with large and dense crowns are valued more for shade than other uses.

Demographic pressure

Ineffective forest management and enormous increases in human and livestock populations are causing gradual depletion of the forest resource by illicit damage and inadequate natural regeneration. The growing stock of some hill forests, based on working plans data, showed 50 per cent reduction in volume and 40 per cent reduction in number of trees between 1958 and 1985. Governments are reluctant to intensify forest management for fear it will cause denudation and depletion which is already taking place but is not being recognized by the policy makers.

Conflicting interests

Forests in the Himalayas-Hindu Kush region receive little attention because of vested private interests working against the national interest. The conflict is not visible and is even more difficult to resolve

because the benefits of conservation measures tend to accrue in the long run, are difficult to quantify and, to a large extent, go to segments of society which make no sacrifice.

Farmland potential

The irrigated land and water of the vast 16 million ha of fertile agricultural land in the Indus Basin can support large numbers of trees on boundaries of holdings along water channels and in courtyards, home gardens and other vacant places. The greatest potential for tree cultivation does not lie in the 4.5 million ha of state forests, but on 19.5 million ha of the 4 million individual farms with an average size of 4.7 ha. If this potential was realised the present supplies from public and private forests in Pakistan could be doubled. The aim of the new Policy should be to develop this potential while minimising negative impacts on agricultural crops.

6.2 The need for policy change

Management considerations

In the forests mature trees are utilized and replaced by new ones. Delay in harvesting results in the degeneration of mature and over-mature trees causing considerable financial and timber loss. Consequently, forest owners and royalty shareholders are frustrated by the reduced income. Fundamental changes in policy leading to intensive management is necessary to achieve high input-output forest management which would result in a greater contribution of forests to economic prosperity, sustainable development, environmental health and job opportunities. This will also help to reduce rural-urban migration.

Because the canal systems have been laid out against the natural slopes and without lining, problems of waterlogging and salinity have arisen. Wind and water erosion is another problem and floods cause considerable damage to agriculture and infrastructure. According to estimates worked out for the National Conservation Strategy (NCS), 24.6 million ha (30 to 40 per cent of the areas surveyed) suffer from some threat: water or wind erosion; salinity and alkalinity; waterlogging; or flooding.

The cheapest and most effective treatment available for these problem areas is tree planting. It can reclaim the land and restore it to agricultural use in addition to providing income to farmers from the sale of timber and other raw materials to wood-based industry. Even in waterlogged areas with moderate infestation, each tree can act like a small tube-well pumping out excess water. This operation can boost wood production and satisfy local needs.

The need for policy reform has been already been identified. The conditions prevailing in Pakistan should influence the emphasis in policy. Only 5 per cent of the land area is under forests whereas it must be at least 20-25 per cent to meet material needs, social benefits and environmental considerations. Demand for wood products will grow by at least 6 per cent annually with rising population and standards of living. The needs for house construction will also increase demand for timber.

Thirty per cent of the area in the mountains, and 20 per cent in irrigated plains are suitable only for tree culture. Restoring such areas to their appropriate use would increase fertility, farm income and wood productivity. Forests in Pakistan are concentrated in the north whereas population and consumption centres are located in the south and central parts of the country. The share of wood-based industry to the narrow industrial base is quite low - hardly 2 per cent. This can be raised if raw material is made available by increasing the area under forest.

Pakistan's prosperity depends on the integrated and well-coordinated programme of rural development in which forestry can play a major and important role by providing job opportunities, conserving soil and water, correcting land use, and ensuring food security and a balanced diet.

Rational approach

Increasing area under forests from 5 to 20 per cent would require zoning suitable land for afforestation. The best lands for tree culture lie in hills where rainfall is substantial and slopes without trees are exposed to erosion hazard. This situation calls for classification of land into three zones, each with distinct uses: agriculture up to 30 per cent slope; horticulture between 30 to 50 per cent slope; and forestry and range management beyond 50 per cent slope.

The three land uses in the specified zones can be enforced through enactment of legislation. These changes would improve the situation for the rural poor by replacing marginal agriculture with better land uses. Unstable slopes of more than 30 per cent would be withdrawn from agriculture which promotes erosion, landslides and siltation. The land re-zoned from agriculture can best be used for raising nurseries, planting trees, introducing sericulture, encouraging wood-based industry and promoting tourism and wildlife. These activities would provide jobs to those who are presently engaged in the marginal agriculture which is devastating the land and economy.

Similarly in the plains, tree planting integrated with agriculture will better utilize land and water resources to address the under-employment of farmers who, after sowing and before harvesting, have surplus labour.

6.3 Reorganization

There is a need to widen the scope of forestry from state lands to private farmlands as well as the role of foresters from enforcers of punitive laws to facilitators as agents of social change. Under a new system forestry will be broken up into the fields of traditional, social, industrial and amenity. Each should be a separate entity to ensure growth in all fields of forestry.

Traditional forestry would have protective functions (watersheds, biodiversity, wilderness, national parks) and productive functions (management for reforestation, production and utilization). Intensive forest management would require the revision of working plans and changes in silvicultural systems to make productive forestry operations cost effective. Structural reorganization will be necessary to increase staff, reduce territorial charges, introduce specialization and delineate functions and responsibility clearly. Adequate funds need to be provided for infrastructure, machinery, nurseries and measures of protection and care. Wood-based industries should be established to produce standard items for building construction.

Social forestry functions will involve community forestry in the hills, farm forestry in the plains and home garden plantings around dwellings in cities and towns.

Industrial forestry should promote the planting of trees as raw materials in Pakistan's industrial sector such as eucalypts for pulp and paper and poplars for matches. The industries can provide a market for trees grown on farmlands and plantations. With the expansion of industry and an increase in the raw material requirements, problems which are likely to arise include availability of adequate supplies at the right time, desired sizes and dimensions, quality control and excessive procurement costs due to transportation over long distances. The wood-using industries should thus set up their own industrial plantations on lands to be purchased or acquired on long lease from Forest Departments or

private individuals. This will also help to increase the area under forests which is a major objective of the Forestry policy of 1991.

Planting of trees for public amenity to relieve heat, dust and noise deserves greater attention and emphasis and it should become a part of mass tree planting programmes under the new Forestry policy.

6.4 Legislative measures

The blueprint presented in the preceding paragraphs can succeed only if backed by a viable structure, institutional development and change in the existing legislation, preferably enactment of new legislation in line with the present-day needs and future requirements. There is a strong need to replace the old hierarchical structure of the Provincial Forest Departments with a functional organization, i.e. specific and specialized jobs and training for officers. Forestry should no longer be the exclusive responsibility of the Provincial Forest Departments. All local government organizations should have forest and environment wings adequately staffed by professionals with sufficient funds to carry out afforestation, tree planting and landscaping activities within their respective jurisdictions. The idea of village woodlots envisaged in the Policy Statement of 1962 should be translated into reality. This will expand the base of forestry and ensure greater achievement of afforestation targets.

The implementation of existing legislation for forestry and wildlife is poor due to deteriorating law and order situations, political victimization or corruption of the forest staff. As a result, the depletion of the resources and pollution of the environment are taking place.

Concerned citizens are helpless because of a non-responsive administration and ineffective legal procedures. While illicit cutting often is not noticed or faced, any punishments do not provide for recovery of the value of the forest produce. Owners receive no compensation for illegal cutting on their land so have no interest in protecting their forests or in helping the Forest Department prosecute the forest offenders.

Deodar (*Cedrus deodara*) is government property in Kaghan and Azad Kashmir no matter where it is grown. This special status was conferred during colonial times and has rendered the people unsympathetic and rather hostile to deodar trees. Their protection and re-introduction on private property is difficult due to the non-cooperation of owners. The law needs amendment to promote forestry in Hazara and Azad Kashmir.

In all new settlements and townships, ideally one-third of the area should be reserved for trees, parks, wildlife enclosures, lakes and recreational areas. Other legislative impediments to forest development include misplaced, ill-timed and undesirable provisions in the existing forest and wildlife legislation. All these require immediate attention in order to make the legislation supportive, need-oriented and conducive to development to ensure maximum financial return to the owners and the state, and to adequately safeguard the interest of forest dwellers, holders of rights and the public at large. The intended approach provides the last hope and minimum guarantee for the continued existence and sustainable development of otherwise dwindling forest resources in the vulnerable region of northern Pakistan.

PAPUA NEW GUINEA*

1. INTRODUCTION

1.1 The resources

Papua New Guinea, with an area of about 46.9 million ha and a population of about 4 million people, has a large natural forest resource. Types range from pristine mangrove forests on sheltered coasts to rich lowland, swamp and montane forests in rain-shadow areas and anthropogenic grasslands. These forests fulfilled almost all the basic needs of the people in the past and are still an integral part of their social and cultural heritage besides providing the natural habitat for high biodiversity, protecting vital watersheds and preventing soil erosion. Their protective influences probably reach far beyond the shores of PNG.

The land and all the resources on it - whether forests, minerals or oil - are the most valuable possessions of a Papua New Guinea clan. Apart from town sites and a few other larger areas, the government owns only about 3 per cent of total land. The rest of the land ownership and land rights are vested in 700 ethnic groups. Individuals have rights of usufruct, but guardianship is vested in patrilineage. When land is held under such a closely interlocking system of rights and obligations, transfer to individuals is difficult and rare. It also makes it difficult to obtain general agreement for long-term land uses which may have no immediate benefits, such as reforestation.

The forests that are utilizable, estimated to be about 15 million ha, can be developed to supply logs for export and domestic processing into plywood, furniture, sawn timber and other wood products. About one-third of the potentially merchantable forests have been assessed to a level where development planning is possible. To December 1991, timber rights had been purchased from customary owners on 5.7 million ha, out of which 0.85 million ha have been logged (Anon., 1990, 1991a; Bun, 1992). Although 200 tree species have commercial value (besides non-wood products), only about 40 have been accepted in the market and have been exploited in increasing volumes since the early 1970s. In 1991, a total of 1.5 million m³ of timber was exported (mostly in log form) out a harvest of about 3 million m³ - an increase of 15 per cent in export volume and 28 per cent in earnings over 1990 figures (Anon., 1991b).

1.2 Management

The country is divided into four distinct regions, namely Southern, Momase, Highland and Island. The management of the forest resource is controlled by the Ministry and Department of Forests at the national and provincial levels with strong linkages to the Departments of Environment and Conservation, Trade and Industry and Agriculture and Livestock.

2. 1979 WHITE PAPER 'REVISED NATIONAL FORESTRY POLICY'

2.1 Summary

The emphasis of the previous forestry policy, known as The 1979 White Paper, 'Revised National Forestry policy' was on forest industries development and export of logs. The major aims of the policy were for the forest industry to make a significant contribution to national development objectives, especially in the form of revenue generation, national ownership and participation, employment creation and regional economic development.

* This is the edited version of a paper presented at the meeting by P.B.L. Srivastava (Forest Research Institute, Lae, Papua New Guinea).

To achieve these objectives, provisions were made for the government to concentrate its efforts in efficient utilization of the existing sawn timber capacity and formation of Papua New Guinean-owned export logging enterprises. The policy placed less emphasis on creating additional processing capacity until there was a marked improvement in international markets for timber products. The existing processing industry was expected to play an important role in penetrating the export markets to form the foundation for future expansion of onshore processing.

With new timber development projects, the immediate emphasis of the policy was on the formation of locally owned export logging enterprises, established with firm organizational guidelines and commenced in accordance with strict national forest development priorities. Encouragement of foreign investment was to be restricted to the firms with wide experience in timber processing and management, adequate marketing organization and financial capacity.

In order to prevent uncoordinated exploitation of forest resources, the policy provided for a National Forest Development Plan. It was thought that such a plan would resolve the competing needs of various provinces. It was recognized from the history of log-exporting countries, that it could be exploitative and could adversely affect people and the environment, thereby yielding less than compensating benefits to the nation.

The White Paper noted that unless land was made available for follow-up development on areas already logged, it was not possible for the national forest estate to be managed on a permanent basis for the benefit of current and future generations as is required by the Constitution. In light of this, the Policy provided for a land-use plan to be formulated for each timber area. Without such a plan and without sufficient suitable land being made available prior to commencement of logging operations, development of a particular area was deferred in favour of areas where land could be secured.

2.2 Review of the White Paper

A review of the White Paper concluded that although the major aims of the policy were still relevant, it was not as successful as was hoped. The market and production base for Papua New Guinea timber products, especially logs, has been too limiting to change. The main importing countries have strong preferences for log imports rather than processed wood. Their commercial practices and strengths also enable them to thwart attempts to develop new markets elsewhere.

The effects of the devolution of control and operations of forest activities from a single forest authority (Department of Forests) into 19 separate forest organizations and the procedural difficulties involved were greater than expected. The process of decentralization was not adequately anticipated in 1979.

Lack of attention or genuine interest in local processing in favour of log exports actually led to a decline in processed timber from 60,000 m³ in 1979 to 7,000 m³ in 1986. The policy emphasis was on more efficient utilization of existing sawn timber capacity. Inability to secure land leases prior to the issuance of timber permits, and to some extent lack of funds, prevented large-scale reforestation from being carried out.

Monitoring of logging operations in a growing number of timber projects, mainly based on export of logs, became difficult due to an acute shortage of adequately trained staff at both the provincial and national levels. It was concluded by a Commission of Inquiry (Anon., 1989b) that poor monitoring also resulted in transfer pricing in many ways. These comprised: misdeclaration of

species; downgrading of log grades; under-scaling of volumes; under-valuing log prices; over-valuation of costs; mistallying of ship loading; over-stated freight rates and claims for damages; nil-profit accounting; third-country invoicing; complex distribution networks; and collusion by importers. An extreme case of transfer pricing was revealed in New Ireland where a Commission Inquiry member intercepted a log-export ship loading logs which were not documented at all.

3. NATIONAL FORESTRY POLICY

3.1 Process of developing the new Policy

The weaknesses of the 1979 policy were recognized within a few years of its promulgation and a need was felt for a more comprehensive forestry policy for proper management and utilization of the forest resource. In 1984, the Department of Forests started a draft for a comprehensive National Forestry policy. A five-man committee reviewed the 1979 White Paper and prepared a draft forestry policy statement which was widely circulated for comments. Subsequently, the policy was further developed with the assistance of FAO consultants and revised forest legislation was drafted. A policy statement and outline for a new Forestry Act was produced in 1986 based on their discussions with officials of DOF, other national departments and provincial forestry officers. A further FAO assessment made proposals on strategies to be adopted in a PNG forestry policy. There were also several consultations between the DOF and provincial forest officers.

However, as a result of a scathing attack on the appropriateness of the 1979 Policy (and the Forestry Acts) by Justice Barnett in his Inquiry Commission Report, an urgency was felt to revise the two documents. The National Executive Council directed the establishment of a steering committee to formulate the new Forestry policy and supporting legislation in 1989. The 13-member committee consisted of representatives from national government, provincial governments and forest industry, with the Secretary for Forests as the chairman.

The final draft of the new National Forestry policy was submitted to the Minister in April 1990 and the National Forestry Act was passed by the National Parliament in July 1991 to take effect on 25 July 1992. It replaced previous national legislation relating to forestry matters and provides legislative support to the new Policy. The new Policy has tried to remove the weaknesses of the previous policy and to address the recommendations of the Barnett Forest Industry Inquiry (Anon., 1989b) and the World Bank Review (TFAP Report) of 1990. It also attempts to adjust to new situations in the forestry sub-sector at a time when proper management and conservation of tropical forests has become a global concern.

3.2 Objectives of the new Policy

The National Goals and Directive Principles as set out in PNG's Constitution provide the basis for developing the forestry policy. The fourth goal states '... for Papua New Guinea's natural resources to be conserved and used for the collective benefit of us all, and to be replenished for the benefit of future generations'. The Policy has two main and three supportive objectives.

Main objectives

— Management and protection of the nation's forest resources as a renewable natural asset.

- Utilization of the nation's forest resources to achieve economic growth, employment creation, greater PNG participation in industry and increased viable onshore processing.

Supportive objectives

- The collection of information and advancement of knowledge relating to the utilization and maintenance of PNG's forest resources through forest research.
- Increased acquisition and dissemination of skill, knowledge and information in forestry through education and training.
- Effective strategies, including administrative and legal machinery to manage the forest resource, and incorporating national, provincial and local interest.

The objectives are consistent with the government's overall development objectives (Anon., 1989a) with particular reference to provision of adequate means for shelter and water, provision of adequate infrastructure, education and manpower development and economic growth and job creation.

3.3 Main features of the new Policy

The most distinguishing features of the new Policy are in the areas of management, resource acquisition and tenure, resource allocation, environmental safeguards, forest industries, forest research policies and strategies and forest organization and administration.

Forest management

In acquiring the rights to manage the forest resources, the state which will have the overall responsibility to encourage and replenish the forest resource, will always recognize the rights of the customary owners. Sustained yield management shall be the guiding principle for production forests. The provincial forest plans will be amalgamated to form the basis for the National Forest Development Programme.

The planning process, which began with the formulation of the National Forestry policy, will involve a national forest inventory by the National Forest Service and guidelines for development of the forestry sub-sector to be devised by the National Minister and the National Forest Board. Forest classification and a schedule for forest development in each province are to be prepared by provincial forest management committees. The National Forest Board will have the responsibility to determine an allowable cut for each province and also propose a National Forest Development Programme. Each step will be reviewed and approved before implementation.

Resource acquisition and tenure

The Papua New Guinea Forest Authority will be empowered to acquire, on behalf of the state, authority over forest resources by means of a Forest Management Agreement (FMA). Resource owners would guarantee rights of access to the Forest Authority or its representatives for the purpose of planting, managing and harvesting timber, building associated roads, wharves and bridges, and constructing infrastructure which may be required by timber permit conditions. The agreement would set out the monetary and other benefits to be received by resource owners in consideration for the rights granted.

Resource allocation

Where forest resources are on state land, state leasehold, private freehold or are covered by a Forest Management Agreement, a timber permit will be granted only by a set procedure. First, a resource area will be developed only in accordance with the National Forest Programme. Secondly, after a state feasibility study has been completed in a forest area, the National Forest Board will seek expressions of interest from potential investors, both local and, in some cases, international. Finally, the Provincial Forest Management Committee will evaluate proposals before submitting them to the National Forest Board for final approval.

Environmental safeguards

The new policy emphasizes that no permit will be issued until an environmental plan (EP) is submitted, assessed and approved by the Minister for Environment and Conservation. This was not the case in the previous policy and many timber companies continued to log without an approved EP due to poor control from DEC and DOF. All permits, past and present, include clauses to minimize adverse environmental impacts of timber harvesting. While no clear-felling is allowed on slopes up to 20°, selective logging only is allowed on slopes up to 30°, and no logging at all is allowed on slopes greater than 30°. A 50-metre buffer must be observed along rivers, streams and creeks, while no logging is allowed within 100 metres of any garden (field), burial ground or area of cultural importance and within 500 metres of any inhabited village.

Measures to minimize soil erosion must be taken and precautions set in place to ensure that banks of any river or stream are not damaged, and the course of any river or stream is not altered by logging operations. No hauling or snagging of logs, timber or other forest produce is allowed through any flowing river or stream is allowed, nor is any obstruction of rivers or streams by logs, timber, other forest produce, debris or other materials. Any pollution of rivers and streams by sawdust, oil, waste or debris is prohibited. Should logging activities adversely affect community or domestic water quality and/or quantity, the permit holder is required to provide an alternative water supply.

Forest industries

The fundamental objective will be to develop a financially and economically viable forest industry with meaningful participation and involvement for nationally owned enterprises and Papua New Guinean citizens, especially resource owners. Domestic processing of forest products will be encouraged wherever this is economically and financially possible. An increased percentage in domestic processing of the annual log harvest will be sought for products intended for both domestic and international markets.

Measures will be taken to maximize in-country returns and to minimize transfer pricing in the log export trade. This will include use of the State Purchase Option. Efforts will be directed to the promotion of marketing Papua New Guinea's lesser-used species and non-timber forest products, exploring new markets and diversifying the export-market base. Direct sales between suppliers and end-users will be encouraged, more competitive freight rates pursued, and grading rules established and enforced for domestic and foreign markets. A priority will be to satisfy domestic demand and to replace imports of timber and timber products with local products. Charges will be levied in order to generate revenue which will be distributed fairly. These measures include royalties and a log export tax, as well as levies for follow-up development, agricultural development, forest management, resource replacement and to fund the Papua New Guinea Forest Authority.

A separate State Marketing Agency (SMA) will be established within the PNG Forest Authority to exercise the State Purchase Option for logs and be available for appointment as general log-marketing agent at the discretion of the producer. It will also promote forest products for export and domestic use and provide promotional material and information to producers and buyers. Other functions are to explore market diversification and undertake market intelligence for advising the National Forest Board on export licensing. The State Purchase Option of 25 per cent of annual log export quota will continue to apply for all permits and agreements. Individual log volumes as offered by producers must be aggregated as fresh logs into an acceptable commercial volume which, as a guideline, must comprise at least 3,000 m³ of normal log production.

Forest research policies

The state will promote forest research activities which support the operational aspects of the management and utilization of forest resources so as to provide a sustained supply of timber and other forest products. This support will be provided by the Papua New Guinea Forest Research Institute to work in several areas. Silvicultural, forest management and logging techniques should be developed to enhance the continuity of forest resources and utilization of timber and other forest products. Research is needed on botanical aspects of forests and protection of resources from degradation and fire. Agro-forestry and community forestry, and environmental and social impacts of forest exploitation are important areas for study. Effective evaluation, execution and coordination of appropriate research programmes must be undertaken. There will be collaborative research with other institutions and agencies at home and abroad. Information gained from research is to be disseminated to the industry and general public.

Forest research strategies

The role of the Papua New Guinea Forest Research Institute is to coordinate forest research as well as to enhance research efficiency and avoid duplication of activities among various departments and institutions. Programmes and priorities for forest research include development of appropriate silviculture and tree-improvement techniques for increasing the productivity and economic returns from commercial plantations. There should be studies into stand development and management of natural forests as well as logging techniques conducive to natural regeneration. Suitable methods will be investigated to enhance wood processing through sawmilling, seasoning, grading and preservation of timbers. Emphasis will be placed on utilization of lesser-used species for domestic use and export.

The capacity of cultivation, management and utilization of minor forest products to increase the income of the rural population should be studied. Appropriate techniques need to be developed to protect plantations and natural forests from insects, fungi, marine borers and fire. The country's unique flora and fauna should be collected, identified, cultivated and preserved in such institutions as the National Botanic Gardens and herbarium. Techniques for multiple use of land and rehabilitation of degraded areas through agro-forestry and community forestry programs are to be developed, environmental impact assessments of forest exploitation instituted and sociological aspects of forests studied.

Information gained from all research work will be made available to other research institutions, the forest industry and the general public through newsletters, popular articles, reports, workshops and scientific papers. The National Forest Board will establish a Research Advisory Committee to review research programmes and projects, consider and recommend new research, give advice in seeking assistance from donors and consider and recommend on the exchange of scientists with overseas organizations and collaborative projects.

Forestry training and education is to be aimed at human resources development at professional, technical and vocational training levels. The National Forest Service will provide on-the-job training for technical staff at the Forestry College, Timber Industry Training College and the Forest Research Institute. The PNG University of Technology will offer professional forestry courses. The institutions are open to overseas students, especially from the South Pacific. A governing council for the Forestry College and the Timber Industry Training College was established recently. It provides guidance and assistance in various aspects of training and management.

Forestry organization and administration

A new institutional framework is envisaged in the new Forestry policy. The Papua New Guinea Forest Authority will replace the Department of Forests, the Forest Industries Council and Divisions of Forests in the provinces. It will consist of the National Forest Board (NFB), a unified National Forest Service (NFS), a Provincial Forest Management Committee (PFMC) in each province and advisory committees as required. Through the National Forest Board, the Authority will provide advice to the Minister for Forests on forestry policies and legislative issues, and prepare the National Forest Plan. It will also direct and supervise the NFS. Other major functions include: negotiate Forest Management Agreements; select operators and negotiate conditions of timber permits, authorities and licences; appoint and supervise the State Marketing Agency; control and regulate exports; oversee administration and enforcement of the new Forestry Act; undertake evaluation and registration of participants in the industry; and act as state agent in international agreements.

The National Forest Board is required to carry out the objectives and functions of the Papua New Guinea Forest Authority and exercise its powers. It will consist of eleven members including representatives from the Forest Authority, four regions of PNG, related sectors of the economy (environment, trade, finance), NGOs, and forest industries.

In each province, a 6-member Provincial Forest Management Committee will be established consisting of representatives from the provincial administration, the National Forest Service, local/community governments having forest resources and NGOs. Among other functions, the PFMC is fully responsible for making recommendations to the NFB on the terms of FMAs, the selection of operators and the enforcement of timber permit conditions and the Act. It will also make recommendations to the Provincial Minister on issuing of timber authorities and extension, renewal, transfer, amendment or surrender of timber authorities which were previously undertaken by the forest inspectors.

The NFB will have committees to provide special advisory services as the need arises. A unified National Forest Service has been established under the Forestry Act which is the operational arm of the Forest Authority and will initially consist of the former National Department of Forests staff, provincial Divisions of Forests, and the Forest Industries Council.

4. CONCLUSION

The new policy and the supporting legislation show tremendous improvement on the previous policy, such as agreements between the resource owners and the state in the form of FMAs, a better planning process for resource development, sustained yield management, emphasis on onshore processing, improved marketing strategies, research in forestry and infrastructural and institutional development. It is hoped that these changes will result in better management of the resource for the benefit of Papua New Guineans provided the policy directives are followed and implemented as set out.

It is, however, difficult to tell whether a complicated institutional framework in the form of a National Forestry Board, Provincial Forest Management Committees and numerous advisory councils and committees will be able to work smoothly in the country's present state of development. Even today, a large proportion of the population derive economic and other benefits from the forest which are inseparably linked with people's lifestyles besides their unquestioned role in maintaining the environmental balance on global scale. It is therefore obligatory that this unique natural resource of Papua New Guinea is properly managed.

REFERENCES

- Anon., 1989a: *Development Plan 1989-1993. Sector Policies and Strategies*. PNG Ministry of Finance and Planning.
- Anon., 1989b: *Commission of Inquiry into Aspects of Forest Industry (1987-89) Report*. Port Moresby.
- Anon., 1990: 'The Forestry Subsector in the Medium Term Development Strategy 1990-1994'. PNG Department of Forestry.
- Anon., 1991a: 'Country Report (PNG)'. Prepared for South Pacific Heads of Forestry Meeting, October 1991, Suva, Fiji. PNG Department of Forestry.
- Anon., 1991b: *Timber Digest*. PNG Department of Forestry.
- Bun, Y., 1992: 'Present status of natural forest management in PNG'. Paper presented at a seminar on *Management of Logging over Forests*, 14-15 May, FRI Lae.
- World Bank, 1990: Papua New Guinea Forestry Sector. Tropical Forestry Action Plan Review.

PHILIPPINES*

1.1 INTRODUCTION

Over the last five years, fundamental policy reforms in the Philippines have been installed to bring about a radical transformation in the forestry sector. New policies envision the dismantling of a quasi-monopolistic forest industry controlled by a select few. In its place, the objective is to install community-based management of the forest resource, thus maximising the contributions it can make towards poverty alleviation and socio-political advancement.

The uncontrolled and excessive exploitation of the country's forests in the past have led to depletion of the resource and an urgency in moves to preserve the forests. Ultimate survival of Philippine forests lies in the hands of millions of smallholders. Integration of their concerns and urgent needs in overall strategic policy is considered to be an imperative pre-condition to sustainable development in the forestry sector. Three major programmes exemplify this new thrust.

Under the Community Forestry Programme (CFP), long-term management contracts over natural forests are awarded to local residents. Contracts include authority to practise sustainable harvesting of forest products through labour-intensive systems, using draft animals for primary extraction. Communities are allowed to use, sell and process the products they harvest. Ownership of the benefits creates strong incentives for conservation through sustainable forest management.

Contract reforestation employs upland occupants to develop tree farms and plantations. After completing a three-year planting and maintenance contract, the young tree farms/plantations are turned over to the occupants under a 25-year Forest Land Management Agreement (FLMA) that is renewable up to 50 years. The occupants are authorized to implement sustainable harvesting, and to use, sell and process whatever is grown on the site. To retain this privilege, the beneficiaries are required to comply with replanting obligations and to reimburse initial development costs through a production-sharing arrangement with government.

A revitalized Integrated Social Forestry Programme (ISF) grants tenure security to occupants of denuded public-domain lands, assistance in converting these areas into viable agro-forestry farms and training in social and entrepreneurial skills with a view to development of organized, economically self-reliant communities.

An array of additional projects and special task forces address issues which cut across the forestry sector and impact on these major programmes. High on the list of priority issues are the confirmation of ancestral domain (i.e. tribal lands), conservation of biodiversity, multiple-use land management and family planning.

Recognising its resources and personnel limitations, the government has joined with non-government organizations (NGOs) to assist in policy formulation, programme and project design, implementation, monitoring, evaluation and community organization. Implicit in these partnerships is a clear shift in operational policy. NGOs, people's organizations (POs) and private sector entities will gradually assume the lead in rural-development programmes - a role previously dominated by government agencies.

* This paper is compiled from a paper prepared for the meeting by Victor M. Ramos (Former Undersecretary, Department of Environment and Natural Resources, Philippines) and a presentation to the meeting by Ricardo M. Umali (Undersecretary, Department of Environment and Natural Resources, Philippines).

The framework for implementing the new initiatives is set out in a 25-year Master Plan for Forestry Development (MPFD), prepared within the context of the Tropical Forestry Action Plan (TFAP). Formal approval of the MPFD by all departments has confirmed its official status as the guideline for future development in the sector. Philippine experience provides clear evidence that integration of rural development, forest management and environmental conservation is crucial to the survival of Philippine forests and the downstream benefits dependent on a stable upland ecosystem.

2. BACKGROUND

The Philippines has a long history of colonialism, first under Spain and later the United States of America. The process of shaping policy was driven by two tiers of priorities identified by two sets of decision makers; one set far-removed from local conditions and the other directly exposed to on-site realities. As a result of this dichotomy, certain imbalances were introduced which continue to affect the forestry sector. For example, promulgation of the Regalian Doctrine during the Spanish era, and the concept of Public Domain installed under the American regime, both upheld the doctrine of state ownership over all natural resources, including forests. This doctrine has since become policy through the National Constitution.

Officially, all natural forests, and areas designated as forest lands, are owned by the state and any use is subject to legal prescriptions and government control. As a consequence, forest-management systems have evolved in the context of national government ownership of the resource, with utilization perceived as a 'privilege' granted by the state.

Local customs and traditions, however, pre-date the colonial era and assign ownership, usufruct and other rights based on the principles of first occupancy and hereditary cession. In practice, these principles continue to be applied, despite their frequent inconsistency with the concept of Public Domain, such as the conflict between tribal rights and state ownership. These same principles of first occupancy and hereditary succession also influence the behaviour of an estimated 8 to 10 million non-tribal settlers who currently occupy Public Domain lands and forests.

Both tribal communities and non-tribal settlers tend to treat forests and forest lands as their private property insofar as use of resources is concerned. But due to uncertainty over legal ownership, they often fail to practise the sustainable forms of utilization one would normally expect from an owner. Much of the deforestation which has occurred originates from the conflicts and uncertainties implicit in a situation of perceived but unconfirmed ownership. Resolution of these issues is one of the major thrusts of on-going policy formulation in the Philippines.

The Philippines is an archipelago with a total land area of 30 million ha, 90 per cent of which is distributed among two large islands (Luzon and Mindanao) and nine medium-sized islands. With the exception of several large river basins, most of the land is hilly or mountainous; about 55 per cent of the terrain having slopes greater than 18 per cent. Roughly 6.5 million ha, or 22 per cent of the land, is forested. Forest cover consists of some 3.4 million ha of logged-over residual dipterocarps, 2.0 million ha of mossy forests and 0.8 million ha of old-growth dipterocarps. Pines, mangroves and miscellaneous forest types make up the balance.

In 1900, the population was estimated at less than 8 million, and about 80 per cent of the land was thought to be covered by old-growth forests, primarily dipterocarps. By the end of the Second World War, the population had increased to about 18 million and forest cover had diminished to about 50 per cent of the total land area. With a 1991 population of 63 million people and total forest cover of 6.5 million ha, per capita forest resources are only 0.1 ha.

There is very little data on forestry prior to the 1900s, but the forest industry was generally limited to production of local building materials, timber for boat construction and small export shipments of premium hardwoods. From the early 1900s until the Second World War, industrial forestry was confined to a few relatively large corporations, most of which were foreign-owned. Non-wood commodities were lumped together under the category of forest products - a clear indication of failure to recognize the importance of any variety of species used by local residents. It is only in recent years that decision makers have begun to realise how vital these so-called 'minor' products are and the contributions they can make to national development. After 1945, timber companies proliferated in response to world-wide demand for tropical hardwoods. Government policies encouraged forest exploitation, primarily to generate foreign exchange.

Conversion of forest lands into farms accelerated rapidly in the 1950s as a growing population increased the demand for land to produce food and other agricultural crops. Concurrently, resettlement from over-populated areas into virgin lands was encouraged by government policies and programmes that provided free land and start-up assistance in farm development. On land delineated for settlement, there was no legal impediment to slash-and-burn clearing of forests. On the contrary, the deliberate removal of forests was considered essential to national development.

Commercial use of the timber and non-wood products was prohibited, except by permission from government. Permits were issued exclusively by the central government, thus effectively excluding settlers from any of the financial benefits to be obtained from forest products. Ironically, total slash-and-burn destruction of forests was legitimate but beneficial use as a source of livelihood was effectively denied. Under these terms, there was no incentive to conserve forests for the sustainable income they could provide.

In areas not officially delineated for settlement, unplanned conversion of forests into farms was inadvertently facilitated by road construction activities of a growing number of timber companies. Landless rural poor moved into logged-over areas and illegally practised the slash-and-burn conversion others had already implemented legally in settlement areas. Neither government nor the timber companies could prevent entry into the logged-over forests by land-hungry settlers. The non-availability of permits for sustainable forest management practices ensured that forests would be decimated through slash-and-burn. Ironically, higher returns could have been generated from non-wood products and low-quality logs left behind by the loggers. This anomaly is precisely what government now seeks to correct through the Community Forestry Programme.

The major activity in the forest industry was exportation of raw logs rather than finished or semi-finished products. Although gradually reduced over time, raw log exports continued to be the principal strategy of most companies engaged in the industry until 1986, when a total ban on exports of logs from the natural forests was imposed.

Policies installed in the late 1800s and early 1900s sought to establish a framework for development of the forestry sector, within the overall context of national development. During the Spanish era, royal decrees were promulgated to govern utilization of forest resources which prevented unauthorized slash-and-burn (*kaingin*) farming and levied taxes on forest products. Apart from these issuances, there was little in the way of 'forestry policy' because of the abundance of forest resources at that time.

The Forestry Act of 1904 (FA-1904) aimed to encourage rational exploitation of the forests by installation of an appropriate regulatory environment, to prescribe fees and taxes, and to define the parameters for conversion of forest land to agriculture. It also prescribed organization of a Forest

Service which eventually evolved into an independent Bureau. This led to development of a forestry curriculum within the University of the Philippines College of Agriculture and, some years later, the establishment of a College of Forestry.

In over-populated areas, the negative impacts of deforestation were already being felt in the early 1900s and led to reforestation projects which were first launched in 1916. A Reforestation Administration dealt exclusively with rehabilitation of degraded watersheds. No firm policies were established for treating reforestation as a resource generating activity which envisioned the eventual harvesting of forest plantations. Over time, new rules and regulations were issued to strengthen implementation of the policies contained in FA-1904. The implementation of a selective logging, sustained yield exploitation system for dipterocarp forests was prescribed. This system included the setting of diameter limits, tree-marking requirements, parameters for computation of annual allowable cutting rates, establishment of rotational cutting cycles, and rules governing the conservation of residuals.

Policy revisions primarily dealt with operational issues and regulatory matters pertinent to industrial forestry and (to a lesser extent) use of forest land for other purposes such as farming ranching and conversion of mangrove forests to fish ponds and salt beds. The principal features of national forestry policy embodied in FA-1904 continued to govern forestry operations and the use of forest land until the early 1970s. Most policies were drawn up with a view towards controlled development of a capital intensive extractive industry, managed by organized corporations granted the privilege to exploit resources owned by the state, and strictly regulated by a professional government bureaucracy. Timber extraction permits were awarded for short terms, often for a period of one year and rarely for more than four years.

Renewal of permits was subject to periodic review by the bureaucracy. Given insecure tenure conditions, the lucrative returns from log exports, and a bureaucracy vulnerable to political pressure, the granting/renewal of permits was often influenced by considerations outside the realm of judicious forest management. Furthermore, the concerns of tribal communities, and non-tribal settlers were seldom incorporated in official policy, except to the extent that Public Domain lands were formally turned over for conversion to agriculture.

By the late 1960s, there was a proliferation of timber companies, rampant over-cutting, excessive export of raw logs, an underdeveloped wood-processing capability, widespread unauthorized conversion of forest lands to agriculture and the negative impacts of insecure tenure on forest management. At this time, the rate of deforestation reached a peak of around 150,000 ha per year.

Consequently, the first comprehensive revision of the forestry policy of FA-1904 occurred with the Forestry Reform Code of 1974. Primary focus was on the industrial forestry sector including abolition of short-term permits and the granting of 10 to 25-year licences, establishment of forest plantations and mandatory investment in processing facilities. It also reiterated provisions of earlier regulations concerning pasture leases, conversion of mangroves to fish ponds and salt beds and the use of Public Domain land for miscellaneous purposes such as agriculture, industrial sites and tourist resorts. Significantly however, the Code also contained provisions designed to improve tenure security for settlers occupying Public Domain land - the first policy-level shift away from regulatory approaches to control the spread of slash-and-burn farming, and to deal with the socio-economic realities of this problem.

A number of key issues were not addressed, however, due largely to the lack of public consultation in the process of formulation. A Revised Forestry Code in 1975 extended the earlier issuance to

include the concept of multiple-use, advancement of forestry-related science and technology, rehabilitation of degraded ecosystems, encouragement of wood processing and the gradual phase-out of log exports. Later promulgations strongly emphasized regulatory prescriptions and tightening of central government control. At the same time, the concept of social forestry began to emerge as the basis for a new direction in forestry policy.

With the restoration of democratic government in 1986, after political and economic stagnation in the years of martial law, long-suppressed concepts of decentralization, people's participation and the socio-political dimensions of forestry moved into the mainstream of policy formulation. The new Constitution also contains provisions reinforcing the concept of Public Domain and state ownership of natural resources, including forests.

To guard against monopolistic allocation, equitable access and distribution of benefits from natural resources is mandated. Joint venture, co-production and profit sharing are prescribed as the three modes through which usufruct of natural resources may be carried out. Furthermore, the new Constitution identifies environmental conservation as a fundamental policy of the state and a basic right of all citizens.

The office directly responsible for administration of forest lands and resources is the Department of Environment and Natural Resources (DENR). The legislative process for development of forestry policies includes open debate by elected representatives and public hearings to discuss proposed legislation. Within government departments, the policy formulation process includes consultation with concerned sectors including non-government organizations (NGOs), municipal and provincial authorities, the business sector and people's organizations. Openness in the conduct of these processes is guaranteed by freedom of the press provisions.

Traditionally, DENR has taken the lead in drafting new policy initiatives and taking them through the consultation process. Lately however, NGOs, legislators and local governments have assumed a major role in this regard. This is exemplified in a continuing debate on the issue of imposing a total or selective log ban.

Since 1986, several factors have led to significant improvements in the consultation process for policy development. First, increased international NGO involvement in environmental issues has led to organization of lobby groups demanding a role in policy formulation. Although many of these groups lack a comprehensive understanding of cause-and-effect dynamics in the forestry sector, their aggressive advocacy of issues helps ensure a high degree of transparency in policy formulation.

Secondly, the DENR has devolved much of the authority and responsibility previously held by its central office to more than 200 regional, provincial and community offices. In their day-to-day contact, these field offices are able to facilitate consultation and dialogue on new initiatives with those most directly affected. A policy environment that is responsive, practical and realistic will help these offices to effectively implement any policy directives.

Thirdly, deliberate government encouragement of NGOs, people's organizations and multi-sectoral participation has created an environment conducive to dialogue and consultation. Finally, decentralization of powers has occurred in many areas of political and economic decision making. Local officials now exercise authority over many matters formerly controlled by the central government. Significantly, the Local Government Code (presently in the final stages of legislative enactment), transfers authority over forest resources to provincial and municipal governments.

3. PRINCIPAL FEATURES OF CURRENT FORESTRY POLICY

3.1 Land use

Natural forests and areas designated as forest lands are considered property of the state. Approximately 15 million ha (about 50 per cent of total land area) fall within this category. Utilization of forest resources is subject to government control. Usufruct is defined as a 'privilege' which may be granted and withdrawn by the state.

Forest land may be re-classified as 'alienable and disposable' (A & D) property to which private individuals and entities may acquire a Torrens Title which signifies legal ownership, the right to transfer by way of sale or inheritance and the other rights which accrue to private property. However, the state retains its authority to exercise the right of 'imminent domain' through which it can repossess privately-owned land through expropriation if this is deemed to be in the national interest (e.g. to carry out land reform).

Policies and laws governing use of the remaining 50 per cent of land owned privately, deal with zoning (e.g. allowing the construction of houses, factories, etc.). If forests are on private lands, the products are treated as agricultural commodities, i.e. no government permits are required for harvest, use, processing or sale.

'Forest lands' consist of areas deemed more appropriate for forestry than for agriculture and generally comprise areas with slopes greater than 18 per cent. Although some 15 million ha are classified as 'forest land', only 6.5 million ha are actually forested. With government permission, private individuals and entities may use 'forest land' for traditional forestry purposes, pasture, agriculture and other pursuits (e.g. conversion of mangroves to fish ponds) under short-term permits and long-term licences. Roughly 2 million ha are currently covered by timber production licences and around 0.4 million ha have been leased to ranchers.

For upland settlers, occupancy is legitimized through issuance of Certificates of Stewardship Contracts (CSC) which grant 25-year tenure, renewable up to 50 years. CSC grantees receive assistance in agro-forestry development and are encouraged to plant trees on at least 20 per cent of the land they occupy. They have full ownership of any harvests and pay a token rental for use of the land. To date, about 10 per cent of these settlers have obtained CSCs.

3.2 Demarcation and management of natural forests

Licences to exploit natural forests are covered by 25-year Timber Lease Agreements (TLAs) defined by transit survey and requiring submission of annual operational plans indicating where logging will take place and what volume will be extracted. Compliance with selective logging rules and reforestation of an area equivalent to that logged annually is also required. A cash bond of P10,000 (about \$350) for each hectare logged is returned after compliance (i.e. reforestation) and confiscated in the case of non-compliance. Forest charges and an environmental fee equivalent to 20 per cent of the market value of harvested timber are collected from TLA holders. The funds generated are used to support government operations, including administration of the forestry sector.

Government is currently experimenting with new modes of timber licensing to replace TLAs. One proposal is the Timber Production Sharing Agreement (TPSA) wherein timber-harvesting privileges are sold at auction to the highest bidder. However, the major emphasis at present is on issuance of

Community Forest Management Agreements (CFMA) under the Community Forestry Programme (CFP).

Pursuant to the Master Plan for Forestry Development, approximately 1 million ha of residual (i.e. logged-over) forests are targeted for CFP coverage within the next 25 years. It is envisioned that most of the natural forests will eventually be managed by communities. Industrial forestry investors will be encouraged to shift out of woods operations and concentrate on down stream processing of hand-sawn timber purchased from the communities. This demand could easily be filled by using local upland labour-intensive and animal-supported extraction methods. Unfortunately, reliance on capital intensive systems and the quasi-monopolistic structure of previous years restricted the use of such traditional methods. Significantly, the CFP places high priority on non-wood products, which often have a greater value per hectare than timber.

Industrial investors have the capability to produce added value through kiln-drying, finishing and other technology that communities lack. With raw material supplied by the communities and processed by industrial investors, the two parties will implement in the forestry sector, something akin to the contract growing arrangements prevalent in the agricultural sector. It is hoped that the symbiosis created through this relationship will address fundamental problems, including slash-and-burn deforestation and tenure-related conflicts

Reliance on labour-intensive, animal-supported extraction methods will reduce the negative impacts caused by mechanized extraction. In areas previously managed through labour-intensive, animal-supported methods, scars and damage to the forest floor were negligible and vigorous regeneration has taken place. Indeed, such a shift to traditional methods may be essential if sustained yield is to be achieved in tropical rain forests.

Sustainability is also a significant factor in the context of export revenues. Major importers of tropical wood have already signified their intention to prohibit imports of forest products not from sustainably managed forests. Vigorous implementation of the CFP, which supports traditional techniques, is highly relevant to the future of the timber industry. Obviously, sustainable forest management is important for the export industry and has even greater importance for conservation, biodiversity and multiple on- and off-site benefits.

A significant development in recent forestry policy is the decision to ban all logging in old-growth forests, effective January 1992. From that date all timber production is to shift to residual forests, starting with those which have not been subjected to logging for at least 25 years. On-going timber evaluation studies will determine those forests with sufficient volume to warrant a second cutting cycle. Logging will be prohibited in areas without sufficient volume, until ample regeneration has been achieved.

3.3 Conservation of protected areas

Concurrent with the prohibition on logging, all old-growth forests, national parks and sites with unique and/or endangered flora and fauna will be placed under an Integrated Protected Areas System (IPAS) with the aim of preserving biodiversity and environmental value of tropical rain forest and other unique ecosystems, whether terrestrial, wetland or marine. The IPAS will identify and delineate wilderness sites where no form of utilization or occupancy will be allowed; sites where utilization/occupancy are permitted for nature tourism, harvesting of non-timber products or controlled settlement; and a range of subcategories between these two extremes. It will also establish buffer zones within the periphery of the protected areas where development activities may be permitted.

Proposed preservation methods include organized protection by tribal communities, protection contracts awarded to upland settlers, aerial overflights combined with interdiction by guards or, most likely, a combination of approaches.

3.4 Tree growing outside forests

The Contract Reforestation Programme, begun in 1986, has reforested approximately 400,000 ha that were previously denuded due to the combined impacts of excessive logging, followed by slash-and-burn farming and ranching. To date nearly all contracts have been with upland families working individually, in family groups or with NGOs. After 3 years, and subject to an 80 per cent survival rate and satisfactory growth, the areas are turned over to the contractors under a 25-year Forest Land Management Agreement (FLMA) renewable up to 50 years. The contractor becomes a virtual owner/operator with associated rights of future harvest.

Inter-planting of food and temporary crops is encouraged, with all benefits accruing to the FLMA awardee. When the major reforestation species is harvested, the government receives a share to recover investment costs disbursed during the 3-year reforestation contract, after which all future income goes to the FLMA awardee. For the duration of the agreement, the manager is required to replant and maintain tree cover. Security of tenure and income-generating opportunities are the main motivations to practise sustainable management.

Through Contract Reforestation, the FLMA and the CFP, the government seeks to have millions of smallholders become the country's principal suppliers of forest products. Successful pilot projects demonstrate the potential to achieve this goal. Smallholders who developed 30,000 ha under the Smallholder Tree Farm Project have become the major pulpwood suppliers for the Paper Industries Corporation of the Philippines (PICOP).

Corporate sector investments in tree planting are also being encouraged through the Industrial Forest Plantation (IFP) Programme. Large areas of denuded land are leased for 25 years (renewable to 50 years) to private entities at minimal rates for the establishment of forest plantations. Investment costs can be written off as expenses. Forest charges are levied on timber harvests, at rates much lower than for timber from natural forests. The government has received low-interest loans from overseas donors for on-lending which may be used to finance planting of timber crops, bamboo, rattan and rubber, thus providing investors with several options.

3.5 Trade

Government regulations prohibit the export of raw logs from natural forests. Additionally, rough lumber exports are prohibited unless significant added value has been achieved, e.g. wooden furniture, door-jams and plywood. No restrictions are placed on exports of either raw logs or finished products derived from plantations. Local trade is not restricted. Forest products in any form may be freely bought and sold in the local market, subject only to evidence that these were derived from legal sources such as TLAs or CFP awardees.

3.6 Education and training

There are 20 universities and colleges offering forestry curricula, the foremost of which is the University of the Philippines at Los Baños, College of Forestry. Students may obtain both undergraduate and graduate degrees in-country. Several universities and colleges offer a variety of

short courses for in-service training of government and private sector foresters, NGOs working in the environmental sector, farmers groups and others.

In addition to formal training, the DENR maintains a full-time Human Resource Development (HRD) division with a principal focus on development of extension capabilities for agro-forestry and community forestry technicians. Much of the training is conducted by private sector training organizations and NGOs in order to reduce government overhead expenses and draw on all available expertise.

In the field, training for CSC grantees, CFP beneficiaries and participants in Contract Reforestation is conducted by DENR extension agents, NGOs and consultants with expertise in special fields. Three areas of training deserve special mention because of their relevance to major programmes.

Training for CSC grantees

Because of their diversified interests and requirements, CSC grantees are offered training in a broad range of topics including soil conservation, nursery and tree planting methods, backyard animal husbandry, construction of trails and small water-impoundment structures, community organization, establishment and management of cooperatives, handicraft and miscellaneous off-farm enterprises and leadership development.

The employment of village-based technicians to conduct training has received special emphasis by identifying upland dwellers with skills in the required areas and making suitable arrangements for them to share their skills. Visits between village-based trainers from different sites have become a standard operating policy in the implementation of training programmes for CSC grantees.

CFP training

CFP training seeks to develop village-based teams of 'barefoot foresters' with practical skills in selective logging/sustained yield forest management and is conducted by NGOs. All CFP projects are to be implemented in collaboration with NGOs acceptable to the concerned community who must employ professional foresters to help communities prepare forest management plans. Villagers (CFP participants) are employed as tree-markers, slashers and handymen to assist in conducting forest resource inventories to assist planning. In the process, the foresters teach the principles of sustained yield forest management in a real-world environment.

Tree marking is done by species and by diameter class. While this is under way, the foresters are able to physically point out which trees may be harvested immediately and which must be conserved for future use. Thus, 'sustained yield' principles are taught through tangible examples. When inventory data are transferred to stock-and-stand tables, the community learns how field data can be organized and used in day-to-day planning and management. The same 'hands-on' training procedures are applied to draw up plans for timber stand improvement (TSI), enrichment planting, reforestation and agro-forestry development.

The NGOs are also required to help communities develop skills (accounting and marketing) for management of a small-scale, forest-based enterprise. Furthermore, the upland CFP participants are also provided with the training provided to CFC grantees. As the number of CFP projects increases, it is envisioned that experienced 'bare-foot foresters' from participating communities may gradually take over work currently implemented by NGOs. This is consistent with the policy to use village-based technicians wherever possible.

NGO training

The DENR is taking a leading role in the training of NGO personnel to meet the needs for assistance in implementing development projects. It has already financed a number of training programmes for NGOs participating in contract reforestation, agro-forestry and CFP projects. NGOs with experience in forestry-related projects are hired as trainers for other NGOs which intend to work in the forestry sector.

3.7 Research

Significant gains in forestry research and training have been difficult because of an emphasis on the needs of agriculture, centralized research management, the short-term nature of research projects and single commodity emphasis. New policies have decentralized decision making, whereby each of DENR's 14 regional offices has its own research unit and budget providing more autonomy to focus on locally relevant topics. Also systems-oriented research now takes priority over commodity research emphasising the inter-relationships among species, multiple land-use systems and various modes through which appropriate technology is applied. Studies are presently exploring a range of options for stimulating private sector research. Tax incentives, government subsidies and contracting arrangements are several of the approaches currently being considered.

3.8 Extension

Extension objectives are being aligned with national development policy objectives (e.g. increasing smallholder equity in the forestry sector) and NGOs and village-based technicians are taking over many of the extension responsibilities formerly assigned to government technicians. Out-moded policies have also been set aside. Significant changes have taken place in operational policies for extension. Extension workers must now reside in their assigned villages and be available to their clientele at all times rather than making visits.

3.9 Forest industries

Given the smallholder orientation of overall development policies, one of the government's major policy objectives is to transfer raw materials extraction and primary processing responsibility and benefits to communities. Traditional forest industry investors would be encouraged to divest themselves from woods operations and to concentrate on secondary and tertiary processing.

Consistent with these objectives, three policy-based initiatives are highly relevant to the forest industry. The first two are the Community Forestry Programme (CFP) and issuance of Forest Land Management Agreements (FLMA) to reforestation contractors, already discussed. The third is to give top priority to tribal communities in the awarding of rattan-gathering permits. This policy has direct implications on the organization of the rattan furniture industry.

Next to timber, rattan is by far the most valuable forest product currently entering the market. Rattan furniture accounts for approximately 30 per cent of total export earnings from the forest industry. Rattan moves through many purchasing agents before reaching the furniture factories. The raw-material producers (usually tribal groups) are only paid a fraction of the rattan's true value. This leads to pressure to over-cut in order to earn a living wage, insufficient funds and motivation to apply appropriate post-harvest treatment of the cane, high rate of spoilage due to lack of post-harvest treatment and less incentive to conserve the forest habitat for rattan.

With more than 50 per cent of all recent rattan-gathering permits issued to tribal groups, furniture factories will need to negotiate supply contracts with tribal leaders. In the process, factory owners are finding it necessary to help the tribals organize and finance their gathering operations. Some have responded positively to this new challenge, others have shifted to imports as a less-complicated method for securing raw materials.

Over time, it is hoped that more rattan factory owners will deal directly with primary producers by providing assistance in quality control, organization, finance, etc. Progressive agri-business processors are moving aggressively in this direction. The new policy on gathering permits may induce rattan factory owners to adopt similar strategies.

Financing for village-based processing is also now available from several sources. New banking policies have improved access to credit for small and medium-scale entrepreneurs. With an anticipated increase in the volume of smallholder-produced raw materials and expansion of village-based processing, the government envisions greater value-added over time at or near the farm-gate.

While some revisions have occurred over the years, the policy environment for the operations of the majority of corporate investors still conforms in most respects with the provisions of the 1975 Revised Forestry Code which were designed to increase added-value contributions of the industry to the national economy. Among others, the Code mandated the establishment of processing facilities by all timber licensees. It also provided for a time-bound phase-out of raw log exports. Ideally, these two objectives should have been achieved in tandem through a gradual shift from raw material to finished-product exports. However, for companies lacking experience and confidence in manufacturing, the cyclical rise and fall in demand and prices created disincentives for investment in processing. This situation was further aggravated by conditions of insecure tenure.

During the martial law years (1972 to 1986) many long-time investors in the industry were replaced by new owners whose principal asset was political leverage and who were unable or unwilling to take a long-term view of the industry. These new owners succeeded in postponing the phase-out of log exports because the quick returns from log export suited their short-term planning horizons. Long-time investors who made the necessary accommodations to remain in business, discovered that token compliance with the 1975 Code was possible by simply establishing low-quality processing facilities. Meanwhile, they could continue to rely on log exports as their principal source of income.

Some companies moved whole-heartedly into processing and installed state-of-the-art facilities. But on the whole, the forest industry is characterized by low-grade obsolete equipment and an installed capacity that exceeds the available supply of raw materials. Several studies have been conducted and followed up to identify policy revisions which would encourage re-tooling and modernization.

The government has repealed former policies which mandated establishment of mills by all licensees and led to a proliferation of inefficient mills and under-utilized milling capacity. Tax incentives and a recently enacted foreign investments law, designed to stimulate new investments, have convinced quite a few secondary and tertiary processors to modernize. Uncertainty of tenure and raw material availability have discouraged many primary processors.

Two inter-related policy issues bear heavily on the matter of raw materials and therefore on investment decisions. The first is the ongoing debate whether to impose a total logging ban or a partial (selective) ban. The second issue has to do with regulation of log supplies. Current policies require processors without timber licences to enter into log supply contracts with existing licensees, in an effort to prevent milling of illegally cut logs. However, total installed milling capacity is

greater than the combined annual allowable cut from natural forests and not all processors can be assured of adequate raw materials. Some have resorted to imports encouraged by no taxes levied on raw log imports. But importation may not be a sustainable strategy because many countries are banning log exports.

4. POLICIES OUTSIDE THE FORESTRY SECTOR

Many policies outside the forestry sector have impacted on the sector in the past, and will continue to influence policy development in the future.

4.1 Agricultural development

Policies to the mid-1960s encouraged the deliberate removal of forests to make way for agricultural development. Re-classification of lands to the alienable and disposable (A & D) category legitimized this conversion, and rational criteria for re-classification (e.g. slope) were often ignored. Hilly lands that should have remained in forest were released for agricultural development and planted to annual crops which could not provide adequate vegetative cover to prevent erosion and loss of fertility. Eventually, these lands were abandoned, such that approximately 3 million ha of privately owned land is now infested with *cogon (Imperata cylindrica)* and other low-value vegetation.

Rice, corn and other annuals have had priority in agricultural development in terms of extension, research and credit, while most of the perennial crops have been neglected. Moreover, government re-organization in the early 1970s separated the former Department of Agriculture and Natural Resources, with each then developing its own policies, despite the obvious inter-relationship between forestry and agriculture. Coordination has improved in recent years but compartmentalized policy development is still a problem.

4.2 Labour

Labour laws are a disincentive to full utilization of labour-based systems of primary extraction (from forests) where prevailing customs, management efficiency and commonsense indicate that piece-work arrangements are more practical than current daily wage agreements. Studies by the CFP may help establish officially approved piece-work wage rates that ensure against unfair exploitation of workers.

4.3 Trade

Restrictions on export of forest products have already been discussed. Foreign exchange policies, which influence trade, have acted against producers in the past. Primary producers received less than free market rates for their products, while importers purchased foreign exchange at subsidized rates. In recent years, the gap between free market and official rates has decreased, thus increasing incentives for producers.

4.4 Investment of government funds

Under prevailing rules, government funds may not be invested on private property. This has been a constraint to development of policies and programmes for reforestation of private lands. The long time horizon of forestry projects discourages private sector investment in such projects as reforestation of degraded land. Among the options being considered to address this problem are additional tax incentives and inclusion of private lands in contract reforestation with government recovering its investment through an arrangement similar to the FLMA.

5. FORESTRY POLICY RESPONSES TO KEY DEVELOPMENT ISSUES

5.1 Rural development

Rural development is the fundamental theme of on-going forestry policy development in the Philippines. The CFP contract reforestation with FLMA and the ISF exemplify the types of programmes through which rural development objectives are being pursued. Secure tenure and increased income are matters of high priority for the intended beneficiaries and are therefore specified as the initial targets of these programmes. The role of forests in sustainable development is universally recognized. Stability of forest ecosystems is a precondition to sustained productivity of agriculture, fisheries and other occupations.

Global concerns such as conservation of genetic resources and biodiversity, reduction of atmospheric pollution and climatic change all relate to the sustainable management of the forests. In the Philippine situation, none of the above can be effectively addressed in isolation from demographic and socio-economic realities. An estimated 8 to 10 million desperately poor people live in the forest ecosystems. By actual presence and sheer weight of numbers, these *de facto* land-use managers will determine the fate of Philippine forests. If sustainable forest-management rules and procedures are irrelevant to their daily struggle for survival, sustainability cannot be achieved. The objective of on-going policy development is to establish the conditions which create that relevance.

There has been a sense of urgency in policy development over the last five years. A long history of centralized decision making and disenfranchisement of forest-based communities, combined with a huge increase in population, has led to one of highest rates of deforestation in the world. Millions of hectares have been degraded through careless logging, and thereafter completely deforested through slash-and-burn farming. The rapid pace of new policy innovations and implementing programmes seeks to reverse this trend before it is too late.

Despite the damage that has occurred, Philippine forests still contain an enormous volume of resources. Among others, there are still about 3.4 million ha of residual forests with a mean annual increment of about 4 m³ of timber per hectare, equivalent to a potential sustained yield of roughly 14 million m³ per annum. This is about seven times larger than current annual demand of 2 million m³. The immediate challenge is how to prevent loss of this potential due to slash-and-burn forest conversion and other non-sustainable use.

Conservation is being pursued through policies which seek to place forests under private sector management and provide strong incentives to practise sustainable management. In the Philippine context, privatization in forestry is directed primarily towards millions of smallholders who have the most to gain from sustainable forest management, the most to lose if current trends are not reversed and the most reliable on-site capability to prevent forest destruction.

CFP pilot projects are demonstrating that labour-based timber production can provide an average annual income at least 300 per cent higher than slash-and-burn farming, at cutting rates lower than mean annual increment. With upward movement on the economic scale, education for the children, better food and capital for farm improvement have become realistic goals that are now being achieved. This potential was not previously captured in rural development programmes because the privilege to harvest forest products was reserved for a select few. With the CFP in place, sustained yield forest management has become a more attractive option than slash-and-burn farming, and a way to escape from grinding poverty. Concurrently, the age-old problems of tenure security and tribal land rights are being addressed.

Where forests have disappeared, contract reforestation, the FLMA and the ISF Programme (agro-forestry) are seeking to restore sustainable productivity. Upland farmers are the principal implementers. Government is investing seed capital to subsidize the early phases of restoration (e.g. tree-planting and soil conservation measures). Currently, about 50 per cent of DENR's annual budget is disbursed for these investments. Follow-up development will be carried forward by millions of private sector smallholders whose tenure is guaranteed by issuance of a CSC or FLMA.

5.2 Information and communications

Traditionally, forestry has been administered and perceived as an extractive industry dominated by corporate investors. It is important to make the public aware of the role of forestry in rural development to maintain strong public support for sustained government financing of programmes. NGOs have joined government in explaining to the general public that it is realistic and imperative to create new roles for forestry in national development.

Initially, the government financed information and communications programmes to increase public awareness on environmental issues. Several private corporations are now funding their own programmes. Following world-wide trends, the media has included environmental reporting in its agenda, thus further helping to focus public attention on issues ignored in the past.

A second phase of information and communication is gradually getting under way, where the inter-relationship between forestry and rural development issues must be explained using real-life examples. For instance, the government has granted awards to upland farmers who have established viable tree farms, thus increasing their income while creating off-site benefits for others who live downstream. NGOs that have increased off-farm employment through small-scale village-based processing have been similarly recognized.

Experienced rural-development workers know that a coordinated approach to development and conservation is feasible and necessary. But it is often a mistake to assume that others understand and support this approach. Sustained repetition of important messages is a pre-condition to obtaining public support for new directions in rural development.

5.3 Broadening participation

The pressure to meet deadlines often leads to formulation of policies and programmes which satisfy the requirements of government bureaucracies and donors, but fail to incorporate the thinking and concerns of intended beneficiaries. As a result many programmes fail due to public apathy. The DENR has found it necessary to deal with this problem in several ways. Seminars and workshops on policy issues have been carried out in collaboration with NGOs and other concerned sectors. Planning, financial management and project implementation authority has been devolved to field offices and inter-agency meetings discuss proposed and on-going forestry programmes, resolve problems and explore areas for collaboration. Implementation of forestry and agro-forestry projects are contracted out to NGOs and other competent groups who are given sufficient autonomy to adjust project-implementation plans when the need arises. Interaction and collaboration on policy formulation and project implementation has been facilitated by establishment of an NGO desk at all levels of operations.

A new Local Government Code, now in its final stages of approval, will transfer administration of forest resources to provincial and municipal governments. This will further decentralize decision making and broaden public participation in the development of forestry policies. Increasing the

involvement and returns to local government will increase the incentive to conserve and develop resources.

6. FACTORS AFFECTING POLICY FORMULATION

6.1 Inappropriate development models

Forestry in the Philippines has been greatly influenced by forest management models from western countries which regard it as a capital-intensive industry. Generations of professional foresters have been trained this way. A capital-intensive bias has led to development of policies which encouraged investment in economies of scale based on heavy machinery, large-volume extraction on long-rotation schedules and concentration on timber as the major product. Another consequence has been that shaping of forestry policy was confined to a relatively small group of investors, a bureaucracy trained in western concepts, and political leaders interacting with investors and the bureaucracy.

Development based on inappropriate models has often ignored the concerns of rural communities and tribal claims have frequently been set aside when these interfered with capital-intensive operations. Policies perceived to be unjust have spawned resentment and caused otherwise peaceful citizens to make common cause with armed insurgents. Environmental damage caused by heavy equipment has become a major factor in soil erosion. Slash-and-burn destruction has proliferated because rural communities had no financial incentive to conserve forests.

6.2 Indigenous forest management models

Decades of empirical evidence clearly indicate that indigenous management using labour-intensive, animal-supported timber extraction is more economical than capital-intensive, machine-based systems. This realization is now beginning to influence forestry policy as exemplified in the CFP.

Low-volume timber extraction on short-rotation cycles is a common feature of indigenous forest management systems. Vigorous regeneration occurs because there is minimal damage to the forest floor and large gaps in the canopy are avoided. Another important feature is the high priority given to non-wood products. These often provide more year-round income on a sustainable basis than can be obtained from timber. The environmental and economic advantages of these two factors have become very apparent and are influencing formulation of forestry policy.

6.3 Compartmentalized planning

The lack of integrated planning between the agriculture and forestry sectors in conversion of forests into farms has impacted on both sectors. In the agriculture sector, tree-farm development (e.g. orchards) has been slow due to an over-emphasis on annual crops and millions of hectares have been abandoned because annual cropping could not be sustained. In forestry, the resource base was severely reduced because of widespread ill-advised conversion. Where rehabilitation has been initiated, opportunities for food and tree crop integration have often been ignored. The current emphasis on agro-forestry should help avoid the compartmentalized planning of previous years but integrated planning and implementation is still at the early stage of development.

6.4 Public perceptions

One of the major impediments to rational development of forestry policies has been the widely held perception that logging and deforestation are synonymous. Relatively few persons outside the forest

sector understand the difference between forest degradation and deforestation. As a consequence, there has been a sustained clamour favouring a ban on logging. Log bans have been imposed in many areas since the mid-1970s.

Deforestation has accelerated wherever log bans were imposed as these areas deteriorated into 'commons' when private sector protection was removed. Despite this evidence, the general perception that log bans can solve the deforestation problem still prevails. Official reports which identify slash-and-burn as the principal cause of deforestation tend to be ignored and are often ridiculed by political leaders, many NGOs and the media. Most of the public remains convinced that slash-and-burn is a minor problem and that loggers are the major culprits.

Given this situation, it has often been difficult to obtain sustained local support for agro-forestry programmes and for new forestry programmes such as the CFP. Fortunately, multi-lateral and bilateral donors continue to finance these types of programmes. Over time, this may help convince a sceptical public, political leaders, NGOs and the media to re-examine their views.

7. POLICY IMPACT

It is clear that certain forestry policies have encouraged rapid development of the forest industry. For a time, timber exports were a major source of foreign exchange and helped propel national development. The demand for expertise helped stimulate the expansion of forestry schools and universities. Income derived from forestry financed the development of ancillary industries and investments in many sectors. Shipping ports were developed and spawned the growth of seaside communities in formerly remote areas.

The forest industry also created communities in many remote upland areas and logging roads linked these communities with market centres. Schools and hospitals serving the industry have spread education and health care in places where these benefits were not previously available. Conversion of forest land to farms helped expand the agriculture sector thus providing additional food for a growing population. People who could not be absorbed in urban industries found a livelihood in agriculture.

Unfortunately, many of the benefits resulting from forestry policies could not be sustained. Inappropriate conversion of forest land into farms has degraded millions of hectares in the uplands, and lowland productivity has been reduced due to erosion, siltation and flooding. Inequitable allocation of access to forest products and displacement of tribal communities have generated resentment and fuelled insurgency.

Many forestry policies which were effective in the short-run, are proving to be less effective as time goes on. Others were seriously flawed from the start. The slow adaptation of forestry policies to rapidly changing conditions has been a major impediment to their effectiveness. As early as the 1960s, it should have been clear that a surge in population growth would require a major re-shaping of forestry policy along people-oriented lines. But it was not until the mid-1970s that 'forestry and people' concepts even began to be seriously advocated and programmes did not begin in earnest until 1986 when a major political upheaval took place.

The fuel crisis of 1972 should have forced planners to re-examine the concept of economies of scale in forestry operations and look more carefully at labour-based systems which offered opportunities to reduce costs and absorb more people in the forest industry. Many forest planners have yet to grasp

the reality that traditional economies of scale can no longer be sustained in woods operations without causing serious (often irreparable) damage to the forest resource.

An over-riding emphasis on unrealistic regulation without support has been a major deterrent to the effective implementation of forestry policy. Insecure tenure, for both industrial forestry investors and upland settlers, exacerbated the problems of enforcement. Confronted with an uncertain future, the logical reaction was to pursue short-term strategies and ignore or circumvent regulations. After decades of insecure tenure, some sense of permanence was implied in the Revised Forestry Code of 1975 but events during a martial law regime eroded confidence in the future, and short-term strategies continued to prevail.

8. CONCLUSIONS: POLICY REFORM AND POLICY INSTRUMENTS

Lessons from the past make it clear that policy reform is long overdue. The favourable response to new 'people-oriented' policies furnishes encouragement that reform can reverse negative trends and place forestry in the forefront of rural development in the Philippines as in other tropical countries. The concept of 'Forests for People' is not new. The challenge is converting this concept into practical programmes and projects that make sense to those on whose behalf the concept has long been advocated.

Reform will not be easy. Outmoded planning assumptions must be cast aside, but this will be resisted. Bureaucracies will be hesitant to surrender power exercised for decades and vested interests in the forest industry will be hesitant to accept a new role in forest management. Changing public perceptions will be difficult and until these are changed, support for new policies, programmes and projects cannot be assured. Above all, the scepticism, distrust and resentment built up over generations in tribal and other upland communities will not be readily set aside.

In the Philippines, there is confidence that new initiatives exemplified by the CFP, contract reforestation with the FLMA and a revitalized ISF can make a difference. Administratively, the policy instruments are in place but these must eventually be consolidated in legislation which ensures against a return to ineffective policies of the past.

Recent events in world history are demonstrating that sustainable development cannot be achieved through government decree or by a rigid bureaucracy unwilling to change. Regulatory norms need to be replaced by policies which stimulate individual initiative and actions dictated by enlightened self-interest. In the Philippine forestry sector, the opportunity to move in these directions is at hand.

SRI LANKA*

1. INTRODUCTION

Sri Lanka has a land area of about 6.56 million ha and can be classified into two major topographical divisions; a highland area in the central part of the country rising above 2500 metres and a lowland plain surrounding it. It has a tropical maritime climate and remained almost completely covered with natural forest and vegetation up to the British period. These forests provided the local people with most of their daily needs for food and firewood, as well as economic needs. They also regulated stream flow, stabilized steep land by controlling soil erosion, reduced the occurrence of floods and landslides, prevented land degradation and protected agricultural lands and human settlements. Agriculture (rice) and village settlements have been established in the lowlands and lower slopes of the hills for centuries. Only the forest cover on the ridges, upper slopes, and hill tops remained undisturbed (Anon., 1991).

The situation dramatically changed during the British rule, when forests of wet-zone hills were cleared to plant export crops such as coffee and tea, and dry-zone forests for export of valuable local timber. The natural forest cover, estimated at 85 per cent of the land area in 1881, decreased to 70 per cent by 1900. A comprehensive forest survey of the country conducted in 1956-1961 found that the area of forest was 2.9 million ha, or 44 per cent of the total land area of the country. Since the 1950s much of the forest lands have been cleared for large-scale agricultural expansion and irrigation schemes such as the Mahaweli Development Scheme, Udawalawa Scheme and Kirindioya Scheme.

During this period, the practice of shifting cultivation increased sharply and has been another major cause of the degradation of forests. In 1956 the area under shifting cultivation was 1 million ha or 15 per cent of the total land area, while at present the extent is 1.2 million ha or 18 per cent of the total.

The present forest cover is estimated to be only 1.58 million ha or 28 per cent of the land area (FAO, 1989) - slightly above the Asian average of 21 per cent. During the period 1956-89, forest cover declined at the rate of 42,000 ha per year with the dry zone being affected more severely. This deforestation rate is one of the highest in Asia. The wet-zone forest, which only occupies 9 per cent of the land area of the region, exhibits the highest degree of species diversity and endemism.

Over 95 per cent of Sri Lanka's forests have been state-owned since British times. The Forest Ordinance of 1885 proclaimed some Reserve Forests under the jurisdiction of the Forest Department. Several more areas were set apart as proposed Reserves but not proclaimed. Village forests were placed under the District Government Agent and other Crown Forests were at various times transferred between the Forest Department and Government Agents. There are also several national reserves and sanctuaries established under the Department of Wildlife. They include 11 national parks (460,000 ha), 5 nature reserves (64,000 ha) and 50 sanctuaries (256,000 ha).

The forest sector contributes only 1.7 per cent (Central Bank of Sri Lanka figures) of the Gross Domestic Product, but this figure greatly under-values the direct and indirect services provided to the people and the economy by forests. For instance, the contribution of exports of natural forest products, medicinal and horticultural substances is currently not calculated for Sri Lanka. Conservation and medicinal values of the forest are also hardly recognized.

* This is the edited version of a paper presented at the meeting by Professor H.P.M. Gunasena (Dean, Faculty of Agriculture, University of Peradeniya, Sri Lanka).

2. NATIONAL FORESTRY POLICY DEVELOPMENT

The commencement of the coffee industry after 1830 led to the establishment of a regular timber trade. Felling operations were on a permit system controlled by Divisional Revenue Officers under Government Agents. Local control fell to village headmen and this led to abuse. This mismanagement prompted the British Auditor-General to enact reforms by appointment of foresters, but abuse of position continued. A timber supply scheme allowing operators a share of the timber and proceeds was also unsatisfactory.

A Forest Ordinance was passed in 1885 to regulate *chena* cultivation and forest reservations. The first Conservator of Forests, appointed in 1887, was given administrative control over the main forests of the country from 1899 when the Forest Department was created. Other less-valuable 'Provincial Forests' were administered by Government Agents. However, the defects of a dual administration were recognized, and in 1904 the control of the entire forest was placed under the charge of the Conservator of Forests. No forestry policy was thought necessary at that time. Any regulation was postponed except for the areas of commercialization of the Forest Department and the free collection of minor forest produce by villagers to meet their legitimate needs. The British colonial rule permitted vast destruction of montane catchment forests for planting coffee and later tea.

A Forestry Policy was enunciated by the British Governor in 1929 with emphasis on timber supplies and export of timber, in keeping with British foreign policies at that time. Reforestation, conservation of water, preservation of indigenous fauna and flora were also stressed in this policy. Exports, however, led to the near extinction of valuable species of indigenous timber. In 1931, the Forest Department was placed under the Ministry of Agriculture and Lands.

The alarming situation created by the clearing of montane forest areas for conversion to tea plantations brought further clarification of policy. Later modifications required the supply of timber, poles and fuelwood to government departments by the Forest Department to be made from local resources wherever possible and where local supplies were either inadequate or unsuited, then by imports. Therefore it is clear that during the British rule, the national forestry policies of Sri Lanka placed much emphasis on supply and export of timber from the natural forests.

Five years after independence the National Forestry Policy was redefined to stress the importance of forests in agriculture and other forms of land use and the vital role of forestry in the economic, social and physical development of the country. Maintenance of a sustained yield of timber for industry, defence and other requirements was acknowledged. More specific requirements for the preservation of local fauna and flora for aesthetic, scientific, historical or economic reasons were also noted.

Specific policies for achievement of objectives were outlined in the fields of conservation, wind-belt planting, stream reservation, catchment forests, forest administration, legislation, working plans, management, afforestation, tree planting, research, education and financial provision. Despite the National Forestry Policy, forest resources have diminished dramatically during the 20th century as a result of population growth and pressure on forests for other uses.

Because of the population pressure on forest land, the National Forestry Policy was reformulated in 1980 in order to give more emphasis to the preservation of the environment and to include a new objective to involve the local community in forestry activities through a programme of Social Forestry (Nanayakkara, 1981).

2.1 The present National Forestry Policy

The present National Forestry Policy emphasizes the need for conservation of the environment while maintaining a sustained yield of timber from forests. The main objectives are:

- To maintain, conserve and create forest for the preservation and amelioration of the environment, soil and water resources and for the protection of the local fauna and flora when they are required for aesthetic, scientific, historical and socio-economic reasons.
- To ensure and increase, as far as possible, the supplies of small wood for agricultural requirements and fuelwood for domestic consumption.
- To maintain, as far as possible, a sustained yield of timber and other forest produce for general leasing, industrial communication and defence requirements of the country.
- To work the forest to the highest possible economic advantage as is consistent with the foregoing objectives.
- To involve the local community in the development of private woodlots and forestry farms through a programme of social forestry.

To achieve policy objectives, the Forest Department has created the necessary organizational structure and launched comprehensive programmes of action covering the fields of forest management, conservation, reforestation, forest protection, research and extension, community and social forestry. For instance, in 1970 the Forest Department commenced the Man and Biosphere-UNESCO Programme to preserve the natural environment and, to date, 12,700 ha of natural forest ecosystems in different climatic zones of the country have been preserved. One such reserve is the Sinharaja tropical rain forest which covers about 11,000 ha. Greater emphasis has also been given to research and extension activities to promote multi-purpose tree species with the development of community and social forestry.

The Forestry Master Plan (FMP) prepared with assistance from FINNIDA in 1986, under the Forest Resources Development Project of the Ministry of Lands and Land Development, proposes the dynamic development of the forestry sector as well as the conservation of water, soil, fauna and flora. The main rationale is for intensive logging of wet-zone natural forests and over-mature forest plantations during the next 25 to 30 years to provide maximum benefit to consumers by supplying the market with adequate timber and fuelwood. This premise is unsound from a practical forestry point of view, and has been severely criticized by the forest sector, NGO groups and the general public.

The re-formulated National Forestry Policy of 1989, aimed to conserve forests for preservation of the environment, conservation of soil and water and protection of local fauna and flora while maintaining a sustained yield of timber and other forest products. The following strategies for conservation of national forest resources are being adopted.

Environmental management in forestry

Environmental management has been incorporated in the Forestry Sector Development Project (FSDP), to adequately address all the conservation issues related to forestry, such as maintenance of

biodiversity. An Environmental Management Division has been established in the Forest Department to meet this task.

Ecological assessment of natural forests

Under the environmental division of FSDP all the natural forests, including mangroves and grasslands, are being ecologically evaluated to identify the areas primarily for preservation of flora and fauna and protection of the environment and no future commercial timber extraction will be permitted from these forests.

Alienation of forest land

All the remaining forests in the wet zones are to be permanently dedicated to forestry and no release of forest land should be allowed over an elevation of 1500 metres. The National Conservation Strategy (1988) also recommended the cessation of haphazard alienation of natural forests in the wet zones, both low country and in the montane regions.

Environmental impact assessment

All development programmes must be subjected to Environmental Impact Assessment (EIA) under the National Environmental Act.

Establishment of forest plantations

It has been proposed to establish over 150,000 ha of forest plantations before the year 2000 to supply enough timber for industry and fuelwood to cover the deficit and minimize the pressure on natural forests.

People's participation

Greater participation of local communities in the development and implementation of forestry activities through programmes of social forestry are anticipated and should be encouraged as the only way to expand tree cover in the country.

Conservation education and awareness

Conservation education and awareness programmes are being conducted by the Forest Department for the public and school children using the mass media to convey the message of conservation.

Expansion of research activities

Forestry research activities are expanded to cover all the important fields of forestry research including conservation-oriented research. The on-going research activities on multi-purpose tree species (MPTS) are to be strengthened to make agro-forestry systems sustainable and more productive.

Forest management

Scientific forest management plans now being prepared by the Forest Department should be implemented. Pre and post-harvest monitoring will be carried out to safeguard the interests of environmental conservation.

2.2 Review of the National Forestry Policy and the legislation

The present National Forestry Policy should be revised to place more emphasis on the environmental and conservation needs of the country. Stress needs to be placed on sustainability, integrated and appropriate land use, wetland conservation, maintenance of ecological processes and preservation of genetic diversity with emphasis on research and social forestry to establish a firm relationship with people. The legal provisions under the Forest Ordinance should be strengthened to combat illicit activities, and the National Heritage and Wilderness Areas Act should be amended to include multiple use management activities in the buffer zones of protected areas.

3. THE NEED FOR SECTORAL LINKAGES

Traditionally the Forest Department of Sri Lanka was concerned primarily with classical forestry, namely forest protection (conservation) and supply of timber for all national and international trade. As the population has increased, the forest cover has declined with satisfaction of basic human needs. This has caused environmental degradation and so the traditional forest system needs to change in order to satisfy needs and ensure forest preservation.

Information gathered for the Forestry Master Plan revealed that only 50 per cent of timber needs are supplied by the forests, while the balance is provided by home gardens, farmlands, roadside trees, etc. Furthermore, 80 per cent of the fuelwood needs are also met from outside Reserved Forests, primarily from private lands of the estimated 1.8 million farm families. The potential for production of both timber and non-wood products is great but inputs are required from the Forest Department and other departments. Some efforts are being concentrated on the conservation of the small forest cover still intact and on tree-planting activities in home gardens and farmlands. The long-term development strategy outlined in the Forestry Master Plan envisages the establishment of plantations on private and public lands in order to expand the productive forest base. An FAO mission report (1989) also emphasizes the expansion of non-forest wood resources and intensive management of the existing plantations as the most profitable approach to supplying human needs and conservation under the current context.

Therefore, at the present time, non-forest resources have assumed greater importance. These include the major plantation crops of tea, rubber, coconut and spices, home gardens, mixed trees and other perennial crops, trees on sparsely planted croplands, urban lands and roadsides.

Although non-forest areas supply 50 per cent of industrial logs and 80 per cent of fuelwood requirements, it is at a cost of degradation of land resources by soil erosion which cannot be sustained on a long-term basis. The Forestry Master Plan envisages establishment of forest plantations to achieve self-sufficiency in both industrial and fuelwood production. These include regeneration of existing forest, new industrial plantations, blockwood plantations, farmer's woodlots and protection plantations totalling 151,000 ha of forest lands in the country. Some of these will involve major changes in forestry policy direction and formulation.

It is clear that forest sector development and its long-term sustainability will depend on close interaction with other sectors of the economy. Population pressure on land is encroaching on forests and converting them to agriculture leading to deforestation and environmental degradation. The removal of forest cover reduces fallow periods as crop yields and sustainability decline. Despite this the basic needs of the people, in terms of food, shelter and employment, need to be met. Mechanisms need to be devised for bringing together existing government institutions, universities, NGOs and grassroots-level organizations of the farmers and the private sector, to devise policies and programmes to cater for the conflicting demands.

4. FOREST SECTOR INSTITUTIONS

4.1 Present administrative structure

The present administrative structure of Sri Lanka provides for a Provincial Council in each of the nine provinces. The ministries must devolve authority to the Province. The effects of this decentralization is not yet obvious. There are many public sector agricultural institutions and research and extension is carried out in thirteen different ministries. The diverse nature of the agricultural sector has led to a multiplicity of agencies with narrow areas of responsibility, multiple lines of authority, a heavy bureaucracy and lack of coordination and cooperation. Obviously, institutional linkages are weak as objectives too are widely splintered.

In the forest sector there are five institutions: the Forest Department; Wildlife and Conservation Department; State Timber Corporation; Ceylon Plywood Corporation; and National Paper Corporation under two ministries. Similarly, in the agricultural sector eight ministries deal with policy. On the project level, land-use planning is expected to improve this situation of poor cooperation. For example, integrated rural development projects should improve standardization of a comprehensive development plan at the grassroots level integrating most of these institutions.

The Ministry of Lands, Irrigation and Mahaweli Development is responsible for land administration, land-use planning, forestry and environmental development, wildlife management and wood industries. The Forestry Planning Unit of the Ministry is responsible for the preparation of the Forestry Master Plan and monitors and coordinates the activities of the Forestry Department, State Timber Corporation and other institutions. The National Forestry Commission, which remains at its planning stage, is designed to be an inter-ministerial body with statutory power to set policy and coordinate all forestry activities.

Management and development of the forests is the responsibility of the Forest Department (FD) headed by the Conservator of Forests. Administration and control is devolved to 15 territorial divisions with smaller ranges and forest beats. Only a few Forest Department staff have any formal training in forestry. Management efficiency of the Forest Department is low because of the poor level of training and it has consequently been unable to utilize its budget allocations effectively.

The forest area covered under the Department of Wild Life Conservation is about 0.66 million ha and its responsibilities are to preserve flora and fauna, to prosecute offenders, to provide national park services to foreign and local tourists and to carry out research on wild animals and rare plants.

The major functions of the State Timber Corporation (STC) are scientific utilization of forests, sawmilling, seasoning of timber, local and international sales of timber, afforestation, reforestation and scientific management of forests and agricultural production. STC was, until recently, a profit-oriented, government-owned institution with a monopoly in harvesting timber from state-owned lands. The 14 mills are inefficient due to lack of maintenance, poorly trained personnel and inadequate equipment. STC supplies timber to both government-owned and private mills though the supply is limited.

Ceylon Plywood Corporation (CPC) is under the jurisdiction of the Ministry of Industries and Scientific Affairs which generates problems in coordination of timber supply. As STC and CPC-owned forests can no longer meet the timber demand for CPC, it has begun to use rubberwood. At present, CPC is running at an annual loss of as much as Rs 212 million. Old machines and factories, overloading and dwindling supply of logs has contributed to the financial losses. Suggested remedies include strengthening of the processing chain and reducing labour costs.

The National Paper Corporation (NPC) owns two paper mills at Embilipitiya and Valachcheni. Raw materials come from local paddy straw, waste paper and imported long-fibred pulp. They also use local pine and Eucalyptus for pulp when the supply of straw is interrupted. Production is about 35,000 tons of paper annually.

5. AGRICULTURAL SECTOR INSTITUTIONS

Agricultural sector institutions in Sri Lanka include at least 15 agricultural research institutions and departments which function under 8 ministries.

5.1 Ministry of Agricultural Development and Research (M/ADR)

M/ADR consists of four separate units; Department of Agriculture (DA), Department of Export Agriculture (DEA), Agrarian Research and Training Institute (ARTI) and Sugarcane Research Institute (SRI), and is responsible for research and development of all crops except tea, rubber, coconut and cashew.

The Department of Agriculture is responsible for generation of improved technology and dissemination of proven new technology to the small-farm sector. Crops being studied include rice, coarse grains, roots and tubers, grain legumes, condiments, agro-industrial and horticultural crops. Nine regional research centres are supplemented by three centres devoted to crops for special situations.

Promotion and development of the cultivation and processing of perennial export crops (other than tea, rubber, coconut and cashew) are the responsibilities of the Department of Export Agriculture (DEA). Seven crops (cocoa, coffee, clove, nutmeg, pepper, cinnamon and cardamom) which have local and potential export markets have been selected for initial study. DEA is also responsible for promotion of new crops with export potential and implementation of government assistance schemes for the development of this sector. The overall objective is to increase net foreign exchange earnings through the traditional export-crop sector.

The Agrarian Research and Training Institute (ARTI) is the only government organization in the field of research and training in socio-economic and institutional aspects of agriculture. It is governed by a board and the main research divisions cover agricultural planning and evaluation, production economics and extension, irrigation water management and agrarian relations, and market and food policies.

Development of sugar cane production is the main responsibility of the Sugarcane Research Institute (SRI) established in 1982. It collects sugarcane varieties from other countries and tests them under local condition and also breeds new varieties, improves sugarcane management practices and develops milling technology.

5.2 Ministry of Lands and Land Development (M/LLD)

The Ministry is responsible for land-use policy and settlement in large irrigation schemes. Two main departments under the Ministry are the Irrigation and Forest Departments. Supply of irrigation water for agricultural production is the main role of the land-use division of the Irrigation Department. It also assists in land-use planning and establishing rational policies by conducting research in designing water-supply structures and land capability studies. In addition, the land-use division is responsible for conducting national soil surveys of Sri Lanka. The role of the Forest Department has been already described above.

5.3 Ministry of Rural Industrial Development (M/RID)

The Department of Animal Production and Health under the Ministry of Rural Industrial Development is responsible for carrying out research on animal production and health, growth and development of pastures, exploitation of alternative potential livestock feeds such as multi-purpose and forestry tree legumes.

5.4 Ministry of Plantation Industries (M/PI)

The Ministry of Plantation Industries has responsibility for the two main export crops of tea and rubber. Commodity boards (Tea Board, Rubber Board) determine policy for each of the crops while the associated research institutions (Tea Research Institute, Rubber Research Institute) are responsible for production and processing research and providing advisory services.

5.5 Ministry of Coconut Industries (M/CI)

The Ministry of Coconut Industries is responsible for the entire coconut industry in Sri Lanka. The Coconut Development Authority administers development and extension and advisory services through the Coconut Cultivation Board while the Coconut Research Board looks into processing aspects and research on production. The Coconut Research Institute is located in Lunuwila in a major coconut-growing area and has nine out-station units.

5.6 Ministry of Fisheries (M/F)

Under the Ministry of Fisheries, the National Aquatic Resource Agency conducts research and development on marine and freshwater resources. Its current focuses are on fish technology and development of freshwater fisheries.

5.7 Natural Resources, Energy and Science Authority (NARESA)

This institution assists agricultural research by providing grants to individual scientists in the public sector for research of national priority. NARESA coordinates the activities of various departments and other government institutions in relation to research on energy and natural resources.

5.8 Ministry of Higher Education (M/HE)

There are three main units that are closely linked to the agricultural sector with a range of qualified staff. There are the Faculties of Agriculture at Peradeniya, Ruhuna, Eastern Province and Jaffna, Botany Departments of Peradeniya and Sri Jayawardenapura and the Postgraduate Institute of Agriculture, Peradeniya.

6. INTER-SECTORAL COORDINATION - PRESENT STATUS

A lack of inter-sectoral coordination has been fully recognized and this is reflected in government policy to conserve the forest at all costs by encouraging tree planting in non-forest areas. The forestry sector has attempted to develop linkages at several levels such as research, development, extension and training.

6.1 Research

In order to forge linkages at policy and research levels, under the auspices of the Ministry of Lands, Irrigation and Mahaweli Development, several committees have been appointed with members from different sectors. The objective of these committees is to strengthen the direction of policy formulation by inter-sectoral cooperation. Research funds have been allocated by these committees and training has also been provided for different groups of people at all levels of different organizations.

The Forest Sector Research Committee initiates and coordinates the research activities of the forestry sector. It also provides funds to the universities and NGOs to conduct research relating to forestry activities.

Supported by the Winrock International F/FRED, the National MPTS Research Committee is the only committee which is not directly under the jurisdiction of the Forest Department. It helps to meet the needs of small farmers for fuelwood and other non-wood products and centres on research production and the use of multi-purpose tree species.

The Council for Agricultural Research Policy (CARP) was established in 1987 to advise the government on organization, coordination, planning and execution of agricultural research. It also formulates national agricultural policy, recommends manpower and physical resources required by institutions and revises departmental programmes. Other functions are to provide excellence in research, facilitate communications between institutions, inter-institutional funding, provide linkage between research institutions both national and international, provide postgraduate training and to review performances of different institutions. Research relating to the broad definition of agriculture and forestry are directed by CARP. At present many institutions have been funded by CARP for research on priority areas which are based on national development goals. Although still in its infancy, CARP is the umbrella organization for research in the country.

6.2 Development

Another area in which some formal links have been established is in the forest sector development programmes. The Forest Sector Development Project (FSDP) is responsible for overall planning and policy making. Objectives are: to improve the performance of the forestry sector in line with national socio-economic and environmental requirements; intensive management of all plantations and selected natural forests; expansion of the resource base by establishing new plantations; intensification of forestry education and technical training; strengthening the research and information capacity of the forestry sector; and strengthening of forestry-related institutions. Membership of the steering committee is drawn from a wide range of ministries and corporations.

The National Committee of the FAO/Regional Wood Energy Development Programme (RWEDP) has several aims. First is to accelerate the development of appropriate approaches and solutions to improve the supplies of fuelwood and to provide additional energy in rural areas. The exchange of information, materials and expertise is to be undertaken with other countries facing major fuelwood supply problems. Specific aspects to be covered include methodologies for socio-economic studies, extension techniques, species selection, genetic improvement, establishment and management of plantations, management of natural wood vegetation, upgrading of traditional conversion technologies and wood energy development assessment and planning. It will also assist the countries of the region to strengthen research, development and implementation capabilities to establish multi-purpose, wood energy plantations, community woodlots and individual planting. Suitable technical and social-science

skills are required to intensify national programmes through multi-country training and exchange of personnel with other nations with similar problems.

6.3 Extension

Integration of the extension services, mainly of the forestry and agricultural sectors, is another key area for development. Extension in the Department of Agriculture began 1921 and is now the largest extension agency (recently named as the Technology Transfer Division). It uses the training and visit system (T & V). The major constraint for the effective operation of this service are the inadequate technical staff and support staff, residential facilities for field-level workers, lack of mobility for extension field staff, shortage of equipment and funds, difficulties in procurement of equipment and recruitment of staff. After the establishment of Provincial Councils, the front-line extension workers have been removed and extension at the farmer level has been greatly constrained. They must be replaced with another category to play a similar role, even if some changes have to be introduced to the extension service.

The Department of Export Crops is responsible for spice crops (cocoa, cardamom, cinnamon, clove, pepper, nutmeg, citronella, etc.) and operates the unified Agricultural Extension Scheme. The main function of the Department is to administer the subsidy programme, including conversion of mono-crops to mixed-crop models such as forest gardens. This system however has not been properly implemented due to organizational deficiencies and weak research extension links.

Mahaweli Authority of Sri Lanka has a unified extension service at regional and national levels. The coconut industry, under the Ministry of Coconut Industries operates its extension activities under the unified extension system of the Department of Agriculture. The other two major export crops of tea and rubber have separate advisory departments providing extension services to the state plantations.

Compared with other agriculture-based extension services, the forestry extension service is still young and depends on the range and beat forest officers. Personnel are either not trained in extension methodologies or have knowledge of traditional forestry only. The research division does not provide information on proven technologies or agro-forestry models acceptable to the farmers. Except for species recommendations, there is hardly any support for growing agricultural crops in the initial year of forest establishment. The extension activities so far have been limited to the creation of forest awareness, establishment of demonstration centres, pilot projects and participatory forestry projects and have had very little influence on the farming community.

As the T & V system has been well established in other sectors there is no need for its introduction to the Forest Department, except for integration of all extension services. This approach appears to be feasible as many of the extension services have been already placed under a unified system with the modification of the T & V system to contact small farmer groups. Activities could be devolved to provincial level and be based on the whole-farm approach, including forestry, agro-forestry and all existing field crops, horticulture, export crops handled by well-trained extension generalists.

6.4 Training

Forestry education is undertaken by several institutions at different levels from post graduate study to in-service training. A shortage of teaching personnel is again a problem. Existing linkages in this area are very weak. There are no formal links and even at the policy-making level there is little understanding on the content of curriculum and the direction of the training programmes in relation to the needs of the forest sector.

6.5 Trade, commerce and business

The Timber and National Paper Corporations have been under government authority for several decades. With the introduction of new micro-economic policy packages after 1977, these have been or will be privatized. This will reduce linkages in these areas in the future except through market forces. There are thousands of small and medium-scale timber depots and sales centres in every part of the country. It is important, however, to note that only very few timber species can be transported or sold without permits. All the valuable timber species, whether grown in home gardens or jungles, are not allowed to be traded or processed without government permission. The timber market in Sri Lanka is not allowed to operate freely, based on market forces.

6.6 NGOs, interest groups and voluntary organizations

As in many other Asian countries there is a growth in NGOs, interest groups and voluntary organizations. Currently there are about 200 such groups working in Sri Lanka. Their interests are varied, but all of them identify as being involved with development at grass-roots level, both at rural and urban locations. Most of these organizations have expressed their concern about environmental degradation recently. Given their nature, it will not be easy to develop formal links between themselves or with government institutions engaged in forestry activities. However, one should not under-estimate their role in the development of the linkages in the agriculture and forestry sectors in Sri Lanka.

REFERENCES

- Anon., 1991: *Natural Resources of Sri Lanka*. Report published by the Natural Resources, Energy and Science Authority of Sri Lanka.
- Bandarathilaka, H. M., 1991: 'National Forestry Policy strategies for conservation of forest resources of Sri Lanka'. Proceedings of the *Second Regional Workshop on Multipurpose Trees*, Kandy, Sri Lanka. 5 - 7 April.
- FAO, 1989: *Integration of Forestry and Agriculture Extension*. Fo TCP/SRL/8852. FAO Mission Report.
- Nanayakkara, V.R., 1981: 'National Forestry Policy development in Sri Lanka'. *The Sri Lanka Forester*. Vol. 15, 1 & 2.

THAILAND*

1. INTRODUCTION

The forest resource, especially timber, has been known and is still regarded by many as one of the most valuable natural resources because of its ready availability and ease of exploitation. Receipts from exploitation have been used as a means to finance national development in many countries. Timber has been harvested for sale in Thailand since the mid-1800s. Royalty revenues from teak have since funded national development programmes.

Early extraction was mainly of teak from northern Thailand for shipping to Europe. Ownership of the forest was vested in the local chieftains who granted a harvesting licence to loggers. After logging the licensee would pay stumpage to the owner of the forest through the royal inspector who then divided this sum into three portions - one for the forest owner, one for the royal inspector and one for the field officials. The size or number of trees to be harvested was not regulated. The royal treasury received no revenue from the activity.

In 1883, King Rama V appointed a royal high commissioner to supervise logging in the north and collect a portion of the stumpage price for the royal treasury. This action was taken because there were many disputes either between the licensee and the forest owner or among the licensees themselves over the logging areas. The root of the dispute was the unclear boundaries of the forest and the greed of the forest owner. No system of licensing existed. A forest was often licensed to more than one person. Moreover, the revenue collection system was not efficient, leading to the loss of government revenue. The wind of change was rising but at that time no one really knew what to do. Stop-gap measures were introduced on an *ad hoc* basis, e.g. in 1982 loggers were required to plant four teak trees for each one felled.

Forestry policy has been influenced in many ways by systems of government and the forest ownership. Policy development has passed through three distinct periods. The period up to 1932 was under the absolute monarchy system, 1932 until the end of the Second World War and its aftermath in 1956 may be called the crisis period, and after 1956 could be called the modern period.

1.1 The pre-1932 period

During the absolute monarchy period and before the establishment of the RFD, forestry in Thailand was in a period of exploitation. Little was done to form forestry policy except selective logging of certain timber species. Concerns were limited to maintaining revenue for the treasury and settling disputes between Thais and the colonizers.

The first major forestry policy move was in 1895 when Mr. H. Slade recommended that a department be established to handle forestry matters. He also submitted a forest management plan for Thailand and recommended further that logging licences be temporarily suspended and Forest Acts be promulgated. The Royal Forest Department (RFD) was established in 1896. A number of Acts were subsequently formulated, e.g. Forest Protection Act, Teak Tree Protection Act, Illicit Timber Hammer Marking Prevention Act and Revision of Non-teak Timber Royalty Collection Act. These were the first steps toward the control of logging and forest protection. The concession system was introduced thereafter.

* This is the edited version of a paper presented at the meeting by Sathi Chaiyapechara (Royal Forest Department, Thailand).

With the establishment of the RFD in 1896 forest ownership reverted to the King as the central government, as debts owed by local chieftains were exchanged for ownership of the forest. The first minimum girth limit was established along with the system of girdling of teak before felling. Seed trees and reserve trees were retained within an annual coupe for natural regeneration as well as for future growing stock. Students were sent for forestry training and a small-scale, experimental forest plantation set up. A number of policy statements were promulgated in the form of the Royal Act.

1.2 The 1932-56 period

The Forest Reserve Act of 1938 and the Forest Act of 1941 were the major policy statements on forestry in Thailand. Subsequent acts are either supplementary or amendments of these, except for the National Parks Act and the Wildlife Reservation and Protection Act which deal with specific subjects within the forest.

The Forest Reserve Act of 1938 and the Forest Act of 1941 basically duplicated those acts applied in Burma during the British colonial period where policies safeguarded the interest of the colonial power, not the people of the land. Thailand's laws dealt with forestry impassive of the people and provided all for the government. For instance, the procedure for forest reservation was specified in detail, while there was practically no provision for de-gazetting a reserve for the people's use. People occupying land without official title or deed (all the rural poor) had no right to the land. Little area was set aside for any use other than forestry without specific permission from the RFD. In Phrae, a Provincial Chief Executive Officer complained at one time about the lack of farmland for the people as everywhere had been reserved for forestry 30-40 years before.

The problem remains today when people have no means to obtain land for a living and encroach into the Forest Reserve en masse. Control of such large numbers was difficult and most of the reserves have been destroyed from the forestry point of view. Farmland was in a pitiful state as maintenance was lacking due to no security of tenure. Had there been a planned de-gazetting of Forest Reserve land for the people from the start, the problem of encroachment could have been prevented. The welfare of the forest would have been far better than at present.

In the early stages of the implementation of the Forest Reserve Act, the population of the country was a little over 10 million so the problem of demand for land did not occur. The same situation happened with the Forest Act - concession after concession was issued for timber harvesting, mostly to Europeans. Only a few species were harvested so little damage to the forest occurred. Concession terms and conditions were followed.

During the war years exploitation of timber was mainly to support the war effort. This stretched beyond the end of the war as some reparation was made with teak, tin and rice.

1.3 The modern era

The reconstruction, recuperation or even development period began after the Korean war when the new era of RFD started. Many students were trained abroad and the Faculty of Forestry was established. Foreign assistance began and new techniques in forestry were introduced, e.g. the use of aerial photography. The first forestry inventory was initiated.

The First Five-Year National Development Plan was implemented in 1962. Forestry sector policy was included but not emphasized. The only significant policy statement in forestry was the establishment of the minimum permanent area to be kept under forest cover. The target in that Plan was 50 per cent of the land area to be under forest cover, with a provision that, as population reached 30 million, the figure should be reduced to 40 per cent. This may be regarded as the first ever statement of the planned land-use policy.

The Cabinet set up a national land classification committee to supervise the delineation of forest from other types of land use. The entire country was to be classified into forest and non-forest land during the First Plan. However, the job has never been completed. Now re-classification has started to reduce the forest area to the 40 per cent limit while gazetting of the forest has not finished yet. Since the First Plan, the forestry sector has been included in the targets of the National Development Plan. If nothing else, forest protection, annual timber output and exports were specified.

The concession system was suspended during the war and re-introduced in 1965 during the Second Five-Year Plan. First it was re-introduced in the mangrove forest for charcoal production in southern and eastern Thailand, and later in the upland forests. In order to minimize the risk of the forest being squandered, the concession was officially given to a locally established public company in each province comprising the general public (30 per cent), lumber yard and sawpit owners (20 per cent), sawmillers and timber processors (15 per cent), major loggers (15 per cent) and the Forest Industry Organization (FIO) - a parastatal (20 per cent) as shareholders. In fact, private loggers and the FIO held control of proxies of many shareholders and ran the company. Forests became degraded quickly, especially by over-logging and encroachment.

In 1979, access to nearly 75 per cent of the concession forests was limited. Government reasons were for forest regeneration while the military reason was to curb insurgency. Insurgents took refuge in the forests and also pressured concessionaires to provide timber supplies. After five years, some activities were permitted in certain forests, including logging in some cases. When the floods struck southern Thailand in 1988, all concessions were terminated.

2. FORESTRY POLICIES

Past policies related to forestry have basically been formulated on an individual basis. The four major forestry laws are hardly related, with definitions sometimes in conflict. Protection of officials' powers is one reason for the lack of a unified forestry code. Forest protection has been the major policy matter with forest reservation seen as a necessary part of a forest protection system. The ineffectiveness of the policy may be seen from the diminishing forest area due to the expansion of agricultural land during the cash-crop boom in the 1960s. The reservation unit, failing to prevent the forest from being cleared, was used as a patrolling unit to suppress illegal timber cutting instead.

In an attempt to unify the forestry policy in 1982, the RFD established a committee to draft a National Forestry Policy. The aim was to coordinate and consolidate the efforts of all concerned toward protection and utilization of the national forest resource. The first draft was submitted to the Ministry of Agriculture and Conservation (MOAC) for consideration in the same year. The committee was basically an attempt to deal with multiple requests by government and NGOs for exemptions from the 1979 resolution prohibiting activities in parts of the concession. Many of the activities were unrelated to logging such as road and reservoir construction or temple building.

The committee was really a government body consisting of various ministers, advisers and government secretaries. There was only one representative from the private sector - the President of the Forest Industry Association of Thailand. However, even this person was not absolutely free to express his opinion as his organization's survival depended on the decisions of the MOAC and the RFD.

The committee had the following terms of reference:

- Assigning no less than 40 per cent of the area of the country as forest area: 15 per cent for Protected Forest area with appropriate measures under the National Park Act, Wildlife Protection and Conservation Act and the cabinet resolutions on forest conservation; and 25 per cent for Economic Forest area with measures under the Forest Reservation Act and Forest Act and any other laws or cabinet resolutions concerning economic forest development;
- Developing a guideline and target for long-term forest management, forest development and forest resource conservation according to the proposed National Forestry Policy;
- Specifying measures for the conservation of forest environment, soil, water, rare flora and fauna and measures for prevention of natural calamity from flood and landslide and assigning the responsibility to various agencies for implementation;
- Supervising and expediting the operation of law-enforcement officials to deal with offenders and specifying procedures to follow in prosecution;
- Providing recommendations to the cabinet on policy and measures on forest management, forest development and forest resource conservation such as increasing the use of modern technology to increase farm productivity, reduce farm area expansion, and provide a clear forest boundary to prevent forest encroachment, etc.;
- Improving the forest administration system;
- Assigning all lands with slope of more than 35 per cent as forest land and no land deed or title for such land may be issued under the Land Codes;
- Specifying policy and measures to promote private tree farming; and
- Undertaking any other activities assigned by the cabinet.

The specific terms of reference limited the scope for deliberations of the committee. The policy formulation process was detailed, with extensive readings and public hearings for academics, the public, politicians, and village leaders. Cabinet approved the policy in 1985.

2.1 The Policy

The National Forestry Policy covers almost all the areas of concern in forestry. The presentation, though, lacks coordination and clarity. Two or more areas have often been grouped into one item leading to confusion. No area received priority and there are a number of areas missing in the present Policy. These include forestry industrial pollution, lesser-known species research and utilization, and urban forestry.

In the following outline of the Forestry Policy, regrouping of policy elements has been carried out for individual subject clarification.

The Royal Thai Government:

- *Desires* to establish an effective, long-term, continuous and well-coordinated management and development of the forest resource vis-a-vis other natural resources;
- *Also desires* that mutual understanding between the public and private sectors on the matter may be achieved;
- *Requests* that this be adopted as a guideline for action so that forestry development may be unencumbered and attained the desired objectives.
- *Declares* that:

Development objectives

- The national forest shall be managed for perpetual direct and indirect benefits to the people.
- A long-term guideline for management and development of the national forest shall be established in order to maximize national social, economic, environmental benefits and ensuring the national security.
- Utilization of the Forest Reserve and various other natural resources shall be coordinated.
- The national Forestry Development Plan shall be an integral part of the National Economic and Social Development Plan to coordinate mutual utilization actions of forest resources and other natural resources such as land, water, mineral and to promote cooperation among as well as between government agencies and the private sector and/or the rural population.

Forest protection

- Forty per cent of the country's land area shall be maintained under forest cover to act as protective and productive forests. The proportion of the two forest categories shall depend on the natural resources and environment situation.
- Any forest land with a slope of 30 per cent or more shall be placed under permanent forest cover. No land use involving land clearing shall be permitted.
- Explicit guidelines shall be established to deal with various causes of forest degradation such as shifting cultivation, forest fires, forest clearing by the hill tribe minorities, etc.
- Measures for law enforcement and penalty shall be specified and appropriate due process shall be established.

Forest administration

- The national forest administration shall be reorganized in line with the changing quality and quantity of the forest resource and environment.
- The establishment of the National Forestry Policy Committee shall be stipulated in the Forest Act.

Regional Law Enforcement Centres shall be established. Ways and means shall be developed to identify and penalize the corrupt government officials and influential persons.

Amendment of forestry-related acts such as the Forest Act, National Park Act, Wildlife Reservation and Protection Act, etc., shall be made to enhance the efficiency of the protection, regeneration and utilization of the forest resource.

Forest resource management

Role and responsibility sharing in joint forest management and development among various government agencies and the private sector shall be promoted. Public and private sectors together shall develop and manage forest lands to achieve the desired objectives and to provide perpetual direct and indirect benefits to the country.

The state shall initiate extension programmes to assist in creating public awareness on the importance of the forest resource to the nation as a whole by instilling a sense of ownership, providing knowledge, creating a positive attitude, skills and appreciation regarding the benefit of the forest resource and the detriment of forest destruction and squandering of timber and forest products.

An incentive system shall be developed to promote reforestation by the private sector.

Reforestation and afforestation

Reforestation and afforestation efforts of government agencies shall be strengthened.

Private forest tree farming shall be promoted.

Community forestry, reforestation of public lands and tree planting on marginal agricultural land by the people, agro-forestry of various types and the establishment of village woodlots for local consumption, domestic markets and even for export shall also be promoted.

Forest-based industry

Efficiency in timber production shall be augmented through appropriate forest management techniques applying both selection and clear-cutting systems of felling. If the clear-cutting system is applied, the cleared area shall be regenerated immediately.

The state shall encourage integrated wood-using industries, including the pulp and paper industry to realize the whole-tree utilization concept.

Research, development and production of wood-substitution materials shall be supported.¹

¹ These items have been inserted by the author.

Measures shall be devised to control the degradation of forest and environment deriving from logging, wood using industries and timber processing.¹

Utilization of minor forest products, lesser-known species and forest and industrial wastes and residues shall be encouraged.¹

Supporting measures

Science and technology shall be enhanced to increase agricultural productivity to lessen the pressure to expand agricultural land into the forest.

To protect the environment and to prevent natural calamity caused by the degradation of the environment, the state shall expedite the city planning process and shall designate specific forest, residential, rural and agricultural areas in each province to prevent the encroachment of the forest land.

Forestry research shall be undertaken by the Royal Forest Department in collaboration with universities and academic institutions.

Human resource and rural settlement planning must conform with the national plan for natural resource management and conservation.

Urban forestry shall be promoted.¹

Wood energy substitution for fossil fuel energy shall be promoted, through energy plantation to reduce petroleum imports.

3. POLICIES OUTSIDE THE FORESTRY SECTOR

The diminishing forest resource and increasing public awareness of environmental problems have led to anti-government sentiment with challenges to many government natural resources projects. Other government sectors have also been forced to take forestry into account when formulating policies.

A major policy conflicting with forest preservation was the promotion of cash crops in the 1960s. This led to rampant forest clearance with expansion of planting area. The MOAC was responsible for this destruction. Cash-crop zoning was introduced, but with little success. Mountains were cleared in northern Thailand. In the south, a landslide that killed hundreds of people has been blamed on logging instead of land clearance for rubber plantations on the steep slopes. The misunderstanding has led to the issuance of a Royal Decree to suspend all logging concessions. This suspension has had many repercussions on many sectors outside forestry.

The reaction of student activist groups, often militant, on forestry issues has led to many confrontations between the groups and the government agencies without any understanding of each other's beliefs and premises. Argument or debate ends up at a stalemate as both sides maintain their own positions. Despite media attention, the public is still not involved to any great extent. However, as the issue affects people more directly such as over-polluted rivers and canals, or drastic change in local climate, stronger pressure will be placed on government.

4. FORESTRY POLICY EFFECTS ON OTHER SECTORS

4.1 Mining

In an attempt to establish a proper land-use system, the government has classified the entire country into various watershed classes. In the highest class, i.e. watershed Class 1, all land uses are prohibited. There have been many communities, in one case an entire district, located in this class long before the classification was undertaken in the 1960s. According to the resolution these communities must be relocated, but nobody, including the author of the classification knows how to do so. This class is divided into 1A, natural forest, and 1B where it has been cleared. In 1B, some uses are permitted, despite steepness and erosion susceptibility.

The other opponent of the watershed classification is the Department of Mineral Resources (DMR) and the mining community. The government has announced a mineral resource development policy to promote mining activities. In the meantime, the construction boom has continued. Both quarrying and mining are in most cases carried out in the mountains, but these have been classified as watershed 1A or 1B where quarrying and mining are not permissible activities. The National Environmental Board is strongly against quarrying in watershed areas. In addition to the watershed classification, all forest lands have been zoned according to various land uses, i.e. protected, economic and agricultural zones. This is to provide a more systematic land-use, permit-issuing procedure. Protected zones are to be preserved as is, including the national parks, wildlife sanctuaries and other reserved areas, and any forest area still under forest cover. All uses are prohibited in the protected zone in addition to those which come under the watershed classification. Economic zones will be set aside for forestry and tree-farming activities while agricultural zones will be alienated from forest land under the land reform system. This is in conformity with the National Forestry Policy on land use.

However, many mining prospect areas are within the protected areas, both those reserved by laws such as national park and wildlife sanctuary, and reserved by policy such as the forested areas. Discussion between the two concerned departments has led to a promise that a vast forested area that has been ear-marked as permissible for mining, may be mined if the existence of a significant mineral lode can be proved, on a case-by-case basis. Cabinet has since instructed the two departments to develop ways and means to undertake environment-safe mining and quarrying. Though miners are willing to pay for the cost of implementing any environmentally safe method of mining, compromise or the second-best solution seems to be unacceptable to other parties. In a conflicting use of a natural resource like, this a clear solution is often impossible. A more detailed discussion of inter-sectoral conflicts between forestry and mining in Thailand occurs in a later paper in this volume.

4.2 Furniture manufacturing

As early as 1975, the government banned exports of logs and larger dimension sawn wood in an attempt to promote downstream processing within the country and export of more value-added products such as furniture, plywood and parquets. The furniture industry was in a poor state at the time. Promotion of the furniture industry was met with much scepticism and criticism by timber exporters and furniture importers. Within 10 years, Thailand has become a leading furniture exporter in the region because of high-quality, local timber species. The suspension of all concessions and the cessation of all logging in 1989 has caused a serious problem to the furniture and other downstream wood-processing industries. Supplies and quality of imported timbers are not reliable but industry

maintains a source somehow - illegal cutting is increasing since the ban. Destructive logging may be promoted by the ban.

4.3 Infrastructure construction

Infrastructure construction (roads, reservoirs and power lines) has at times been restricted in concession forests for conservation reasons (the ban on logging, 1970-91) and for security in some areas. Permission needs to be obtained and this is sometimes delayed. Bureaucratic red tape has often meant a project gets under way without authorization. The Cabinet, who authorizes such construction in restricted areas, is often the authority who initiated the construction project itself.

4.4 Land tenure

Security of land tenure is a key to efficiency in land use and consequently productivity. Though a large percentage of Thai farmers are fortunate enough to own their farmlands, the most recent estimate shows that some 2 million farm families have unlawful landholdings in the Forest Reserves. These people are responsible for forest clearance. Since the integrity of the boundary of the Forest Reserve has been violated intentionally by squatters to lay claim on forest land, thousands of titles or deeds have been issued within the Reserve, which is against the law. The government is in a dilemma as the desire to conserve the forest is still strong but the well-being of the people must also be taken into consideration. No decisive policy has been issued to deal with this problem. With increasing population, the demand for land for food and cash crops will soon destroy all forest unless action is taken. Operations by the military to relocate encroachers from the conservation zone has also led to criticism.

There is conflict between the Land Department (LD) who issued many of the illegal titles and the RFD who is trying to conserve the forest. Titles may have changed hands several times since issuance. Other conflicts lie in some development projects conducted by Public Works Department (PWD) in the watershed areas for hill tribe assistance. The land settlement programme of the same department permits the sale of land received from the department after a certain period has elapsed. This, RFD claims, is one way of encouraging the clearing of forest land. Encroachers would clear a new piece of forest land after they sold off their farmland which they had obtained from the Forest Reserve.

5. RESPONSE TO KEY POLICY ISSUES

The Policy Statement says its intention is to address all the key issues that are relevant to forestry. However, the leaning is still more toward safeguarding the forest area rather than to managing the forest in response to the needs and expectations of society. No direct statements on either food security, malnutrition or poverty alleviation are made. Many policies relevant to sustainable development have been included to preserve biodiversity and reduce climate change. Subjects dealt with include national parks, wildlife sanctuaries and restrictive land use on steep slope land to assist conservation, but much is still needed.

As protection is still the main subject of the Policy and the general feeling of the policy makers is that there is little forest area left, other uses of the forest have not been given much attention. Decentralization of decision making about the use of forest land is a controversial issue. It is difficult for the RFD to devolve responsibility for conservation of the forests to those who are seen to be the

destroyers. Examples of 'community forests' are often surrounded by degraded lands. The RFD is ultimately responsible for the welfare of the forest. The villagers lack the organization to accept such responsibility. Until such a system is set in place, the RFD will remain the body responsible for protection of the national forest. The difference from 20 years ago is there is more cooperation forthcoming from other organizations now than at that time.

6. POLICY IMPACTS

The impacts of the Policy on different groups vary. For those directly in the forestry business it is quite favourably received as it clearly states the intention of the government. However, other groups not directly related to forestry are worse off, as under the guidelines of the Policy, many activities have been banned or restricted. Despite the Policy, insufficient manpower, funding and unclear forest boundaries and land-use classifications have meant many illegal activities continue. Environmentalists consider it too industry-oriented. Particularly targeted is the reforestation project but, without this, the aim of attaining 40 per cent forest cover would be much delayed.

In brief, the Policy is ineffective as many of the policy prescriptions have not been implemented despite support plans in forest protection, forest administration, forest management, private tree farming, community forestry, forest law amendment and forest land-use procedures. Lack of funds and manpower are two key factors. Budget allocation and personnel appointment have not been much different from the period prior to the Policy announcement.

Politically, the institution of the National Forestry Policy occurred at a time when popularity was important to politicians. Decisions were often made in favour of constituencies of politicians rather than for the good of the forests. Policy has been an international show-piece which has won praise but created domestic problems.

The NFP is promulgated at Cabinet level. Decisions can be, and have been, easily changed by a Cabinet decision. The original ratio of protected to productive forest of 15 per cent to 25 per cent has already been changed to 20 to 20 per cent in 1990 and back again by Ministerial decree. At the same time, the Seventh NESDP (1991-95) was submitted for approval where a ratio was specified as 25 to 15 per cent. The Cabinet approved the Plan. Therefore Cabinet policy is now in conflict with Ministerial policy. Also logging has been banned from all forests, so production forest is effectively zero.

7. CONCLUSIONS

From a study of the Thai National Forestry Policy, it can be seen that the policy is too specific, leaving little room for compromise. If the Policy cannot accommodate the situation it will be either disregarded or changed as has happened to the ratio of various types of forests. The Policy is too ambitious leading to unrealistic policy statements. It appears an academic proposal where normative prescription is the rule. The best example is the item where the slope of more than 35 per cent has been assigned as the critical limit whether land may be regarded as forest or not, but the way to make this assessment is not specified. Integrated wood-processing and pulp and paper factory promotion as promoted in the Policy is restricted by a Cabinet resolution prohibiting the establishment of such factories, which is still in effect.

There is no provision in the existing law on land use or land alienation to the people, therefore encroachment is inevitable. With declaration of reserve forests, people need to be compensated with land. Illegal occupation of Forest Reserve land may be seen as a self-service, land allocation programme. But the result is disastrous. Most occupy the wrong place to avoid being arrested and often hold more than is necessary to produce enough to survive on a poor soil. Without any security of tenure, lack of knowledge on soil conservation and improvement and lack of financial assistance, the soil is rapidly deteriorated and abandoned soon after. New forest land will be cleared and the slash-and-burn system will continue. Therefore, land-use provisions should be made clearly in the Policy so that various land-use measures can be implemented properly.

Step-by-step policy should be formulated. The forestry problem in Thailand has become too big to cope with by a single action. Priority should be established and implementation followed strictly according to the stated priority to avoid any unfair application. In this manner it will be easy for the funding agency to plan for fund allocation and assess the achievement. At present no evaluation of progress is possible. Intermediate policy objectives should be set, assessed and modified if necessary.

The most effective policy instrument appears to be one that can accommodate the requirements of the people for farmland, at the same time satisfying the government's national forest conservation objectives. A pragmatic land-use plan could be the answer. A compromise should be made. Both sides must recognize that no-one can have most without encroaching the other's share of the natural resource.

VIET NAM*

1. INTRODUCTION

The development of a National Forestry Policy has been given high priority by the Government of Viet Nam. In 1960, a study entitled 'Orientation of Forestry Sector Development' proposed a forestry policy. Since then there have been a number of studies to propose 'policy' and 'objectives' for forestry in Viet Nam.

In 1985, the Ministry of Forests promulgated forestry policy for the period 1986-2000. The main objectives of this policy were:

- Rational utilization of remaining forest cover for protection and conservation of the environment and for production to meet needs through such a programme of utilization and development in which both functions of protection and production are fulfilled.
- Coordination of forestry and agriculture to supply wood for industry, energy and family use while promoting ecological and economic equilibrium.
- Target investment, mobilize expertise and cooperate with Laos and Cambodia to expand the forestry industry, while increasing the use of waste wood through plywood, panel-board products, etc.
- Intensify the development of the economy in the mountainous areas and resettlement of ethnic groups using land allocated so as to redistribute the population and manpower in various zones.

These objectives were further extended as part of a UNDP/FAO project by defining long-term strategies to pursue these goals:

- Enhancing the effectiveness of forest management activities while ensuring widespread sharing of benefits and participation of all segments of the population;
- Stabilising the environmental contribution of the forest to the land and water base for agriculture and pastoral activities;
- Optimising the contribution of forest products to the economy through the development of appropriate industry and afforestation programmes including fuelwood; and
- Develop institutions and policy at national level.

2. FORESTRY POLICY OF VIET NAM

A forestry policy was proposed in 1989, in cooperation with UNDP/FAO as part of the Tropical Forest Action Plan, and the Ministry of Forestry formulated a 'Forestry Development Strategy Towards 2005' in 1990.

2.1 Purpose

The purpose of the Forestry Policy is to provide direction to the forestry sector in the long-term management and utilization of the nation's forest and legislative directives for economic development, social betterment and environmental protection. Much of the country's once-rich forest resources and

* This is the edited version of a paper presented at the meeting by Professor Hoang Hoe (Director, Department of Science and Technology, Ministry of Forestry, Vietnam).

forest lands are in a badly degraded and depleted condition. Of the nearly 19 million ha of the National Forest Estate, more than 13 million ha have been cleared, burned, cut-over, logged-out or chemically defoliated, and left as bare, eroding hillsides or non-productive forest fallows. Illegal logging, shifting cultivation or man-caused fires, fuelwood harvesting and conversion to other uses have continued to reduce existing forest areas at the rate of 200,500 ha per year, and to destroy government forest plantations. Expected population growth will continue to exert pressure on forest land.

The forest-processing industry is poorly developed, using old and inefficient equipment and producing low-quality lumber unsuitable for export. Pulp and paper production is somewhat better developed, but is threatened by shortages of raw material.

The protection of existing forest areas and the reclamation of degraded forest lands through plantations, agro-forestry and other tree planting programmes is a matter of national urgency to continue economic development and preserve the environment. To this end the Forestry Policy has been adopted whereby the people and the state will share in the right and responsibility of forest production and protection, with each economic sector accorded an opportunity to fully participate in the benefits of an environmentally healthy and economically productive National Forest Estate.

2.2 Goals of the National Forestry Policy

- To protect and manage the country's present and future forest resources and forest lands on a sustainable basis to meet the nation's needs for forest products and environmental protection.
- To increase forest-product yields and improve harvesting, transport, processing and marketing systems to reduce waste, increase social and economic benefits and increase export.
- To increase people's participation and engage all economic sectors (state, cooperatives, households, private investors and individuals) in the protection, production and utilization of needed forest goods and environmental benefits.
- To contribute to improved living conditions and income generation for rural people and in particular for mountain peoples and communities.

2.3 National Forestry Policy objectives and strategies

To achieve the goals of the Forestry Policy, it will be necessary to define a mix of objectives, strategies and implementation actions. Each of these objectives is of equal importance if the forestry sector is to make its full contribution in meeting the nation's needs for environmental protection and economic and social development.

Objective 1: Establish a National Forest Estate comprising the forest and forest lands which are to be maintained and managed in accordance with national, social and environmental goals as specified in the National Forestry Policy and Forest Law.

This will be achieved by a national, inter-sectoral land-use study to identify those areas best suited to forestry and agro-forestry uses, on the basis of soils, slope, socio-economic conditions, environmental protection values and regional circumstances. Land should then be identified as belonging to the National Forest Estate and classified for suitable forestry purposes.

Forest coverage needs to be increased to 10 per cent along the coasts, 5-10 per cent in the deltas, 20-30 per cent in the midlands, 40-50 per cent in the low mountain areas and more than 70 per cent in high mountain areas. Supporting legislation must be passed to designate these lands as Permanent Forest Estate, and classify the lands as protection, production or special-use forest areas.

Mapping of the boundaries of the forest estate and implementation of these boundaries is necessary. Use of appropriate techniques for collecting data on condition of the forests should include satellite imagery, aerial photography and ground surveys. Boundaries of each forest district and various classified forest areas need to be identified, marked and mapped, and then maintained.

Objective 2: Establish forest planning, protection and management systems throughout the National Forest Estate, taking into account the need to tailor planning and management to regional circumstances.

To reach this objective, the protection forest areas will be managed to maximize protective functions while allowing, where appropriate, for the use of agro-forestry practices and supervised production of fuelwood and non-timber products to meet local needs for food, forest produce and income.

The overall objective of production forest management is the long-term, sustainable yield of multi-purpose forest products. Natural production forest areas will be managed to produce high-value timber while providing maximum protection to environmental values, including wildlife and non-timber forest produce. Silvicultural activities, necessary to increase timber yields, will be employed and plantation production forests managed to provide a mix of products (pulpwood, fuelwood, building materials, large timber), according to the needs of the local people, industries and markets. Modern plantation management programmes should be used, including site and species selection, superior seed and tending practices. Research plots will assist planning for growth and yield activities.

Logging in degraded natural production forest is to be prohibited to allow recovery through natural regeneration. Natural forest areas will not be converted into plantations without a clear proposal showing that the total economic, social and environmental values of the area will not be diminished. Special-use forest areas should be established and managed to maximize protection in core zones, coupled with surrounding buffer and support zones.

Working plans for all timber harvesting activities and forest management plans for all forest areas and activities in the National Forest Estate, including those of forest enterprises, communes, households, and private tree farmers, are required. These plans are to cover such matters as selective felling under rotation, retention of selected trees for regeneration, enrichment planting, replanting of logged-over land and afforestation of bare lands. Training for management and research to support these activities are necessary. Also, there should be regular evaluation and revision of plans in response to changing conditions.

Income from logging forest land under a contract or a management plan should be applied first to the payment of expenses for forest protection and reforestation, so that the growing stock is improved and forest yields sustained. Forest fire prevention and control systems should be established over all forest lands.

Objective 3: Engage all elements of society in protection and production activities within the Permanent Forest Estate in

accordance with the National Forestry Policy and Forest Laws and regulations.

Several strategies and actions are needed to ensure the fulfilment of this objective. The new Forestry Policy and Forest Law must be well publicized throughout the country. The distribution of suitable production forest land to cooperatives, households, private investors and individuals should continue to be expanded in conjunction with guidelines from local and national authorities. Forest users must be given security of tenure as an incentive to manage and develop forests with a view to their sustainable use into the future.

Steps should be taken to rehabilitate denuded and degraded areas by mobilising the labour resources of the government, communes and individuals. Organizations, local private companies and foreign investors should also be involved. The rehabilitation may take the form of community forestry, agro-forestry or commercial plantation establishment. Forest tenure certificates should be clear and simple, and issued without undue delay, then recorded in a land registration system. Priority will be given to areas where shifting cultivation is currently being practised.

Areas of short-rotation forest plantations should be reduced and the forest enterprises restructured at all levels to emphasize technical assistance to private sector tree-growers and to households for the gardens and the agro-forestry assistance. Training and advice for management, harvesting and marketing should be provided to the non-government sector.

Natural production forests and forests having major environmental protection values are to be assigned to central forest enterprises under the direct authority of the MOF. Clear definition of forests to be managed centrally or by provincial district administrations is needed. Small-scale wood industries for local processing should be promoted as well as encouragement for private farms, cooperative tree farming, fuelwood and pulpwood plantations by the non-state sector. Priority is to be given to the production of non-timber resources in support of small-scale and family income production.

Training for forest enterprise staff, households and other forest users is necessary to properly achieve objectives. Advice on marketing, harvesting and management will be required. At the same time, the socio-economic impact of the actions need to be assessed

Objective 4: Restructure and modernize the forest products harvesting, transport, processing and marketing sectors in order to reduce waste and increase utilization for domestic requirements, import substitution and exports.

Technical strategies and actions will help to achieve this goal. Overall training of forest and process workers is paramount. Improved timber-harvesting techniques and better road -building equipment need to be used in all commercial logging operations to minimize waste and environmental damage.

New processing facilities will produce high-quality output of timber. Processing and marketing units and programmes for non-wood products should be set up. To compete on world markets, the quality of forest products needs to be up-graded by raising the standard of logging operations, processing plant and technology. Establishment and implementation of standards are important. Possibilities for market extension should be identified locally and overseas with Vietnamese overseas companies considered as possible avenues for market extension.

Integration of the processing sector with the forest production and transport system by locating processing facilities near raw material supplies, with access to market centres or ports would facilitate marketing. Information collection and dissemination on supply, demand and prices should be improved, coupled with establishment of systems of economic forecasting and analysis to assist industrial investment decisions. Research into product development and diversification will also improve these decisions. Efficient use of forest resources can be encouraged by providing economic marketing information and assistance to the non-timber sector of the forest economy and small private producers.

Objective 5: Establish the administrative and institutional mechanisms and structures needed to achieve environmental protection and sustainable forestry sector development.

Reorganization of the Ministry of Forestry will eliminate inefficient duplication of tasks. Appropriate staff training will strengthen its technical capabilities in forest inventory and planning, research, extension and information gathering. Provincial and district forestry authorities should be provided with control over those areas serving provincial and local needs, using rules and regulations established in the Forest Law. The decisions from each level need to be distributed effectively. The proposed new Forest Law needs to be passed and regulations promulgated, then a manual prepared to clearly set out the details.

Forestry training should emphasize community forestry, forest planning and management, plantation management, agro-forestry, economic planning, marketing and forestry extension. Strengthening research programmes in silviculture, plantation management, environmental protection and non-wood forest products will improve management of forest and degraded land. Surveys would establish those areas where skills and personnel are lacking.

State forest enterprises need to be restructured to focus activities on forest management, harvesting, marketing and technical assistance to the private sector. Forest products processing could be turned over to the private sector and additional support provided for small-scale forest enterprises. Planning and management of industrial tree plantations need improvement and revision of programmes made as necessary.

Objective 6: Achieve and maintain a level of funding and investment in the forestry sector from all relevant public and private sources sufficient to accomplish the goals and objectives of the National Forestry Policy.

Sufficient funding is necessary to be able to maintain productive forestry and protect the environment as well. A forest land-use tax, taxes on forest production and forest product processing and on log and forest product exports will generate government revenues of which sufficient funds should be committed to reforestation. Cost sharing with other sectors, which benefit from reforestation, such as tourism, irrigation, fisheries and energy, will increase funding.

The establishment of home gardens, tree gardens and agro-forestry activities by households, individuals and cooperatives will provide increased income from cash crops and special products, some of which could be invested in tree growing. A rural credit system providing loans to these enterprises and to farmers wanting to establish private tree farms and practise agro-forestry should be established by the government.

Appropriate foreign investments for industrial wood plantations, reforestation and modern processing facilities need to be attracted. Inefficient enterprises could receive fewer subsidies. Additional international development assistance through multi-lateral and bilateral agencies should be sought for community, household and agro-forestry activities. Completion of the TFAP sector plan and development of project proposals for funding would assist this. Expansion of the production of special forest products for export would increase foreign exchange receipts.

Objective 7: Give high priority to environmental protection in the management of all forests and forest lands.

Development of a national plan for the identification, protection and rehabilitation of critical mountain watersheds is of key importance. Critical watersheds can be identified by an inter-sectoral survey. Integrated management programmes for the coastal mangrove ecosystems will protect fisheries and forestry values and maintain the protective functions of these areas.

All timber and wood-harvesting and transport operations should be required to follow prescribed practices to minimize damage to soil, water, wildlife and other biological resources within the affected forest areas. Illegal occupation of national parks, nature reserves, and critical and fragile environments must be stopped and these areas expanded where necessary. Environmental protection should receive equal consideration with economic issues in the management of production forests and top priority in the management of protection forests and special-use forests. At the same time, regulated agro-forestry practices to meet local peoples needs in accordance with approved management plans can be allowed.

Regulations should be enforced to control hunting and farming of wildlife and their sale and export. Technical assistance should be provided to encourage deer farming in the private sector. Rare or endangered flora and fauna must be protected and ecological studies to preserve biodiversity carried out. Technical assistance and research in management of forest ecosystems and to identify areas of high ecological, cultural and scientific value for designation as special-use forests (nature reserves, national parks) will be important to conservation. Support for the National Conservation Strategy and assistance in implementation of the law on environmental protection will further these aims.

Objective 8: In cooperation with other state sectors, take steps to improve the living conditions of the people living in or near the permanent forest estate, particularly in the mountainous areas.

Management of forest areas for non-timber as well as timber products in order to provide raw materials for family, households and small-scale, non-timber forest enterprises, needs to be in cooperation with village forestry committees. This will promote people's participation in planning, management and protection. Demonstration plots should be established.

Where shifting cultivation continues, it must be closely regulated and technical assistance provided to stabilize farming practices such as home and tree gardens. Land should be provided to forest-based families for these gardens. Assurance of food and income sources will eliminate the need for shifting cultivation. Extension units could assist with production and marketing of trees and special products as well as advise on agro-forestry, soil conservation and management.

Protection forests and special-use forests need to be managed in such a way as to provide produce to local people within the bounds of the protective laws and regulations. Local people should be given priority in employment opportunities.

Demonstration practices in agro-forestry in mountainous areas should be established and multi-level groups to plan and coordinate rural development in these areas set up. Improved transport and communications networks are necessary in the mountainous regions.

3. POLICIES OUTSIDE THE FORESTRY SECTOR

Forestry plays an important role in the environmental and socio-economic development of the country and the sector has been affected by economic reform. Forestry development must be combined with the solution of social issues (such as food security, employment creation and the improvement of living standards for farmers), with the establishment of a new rural society and with the stabilization of life in mountainous areas. At the same time, economic development must follow principles of resource and environmental protection, with rational utilization of the existing resources and reforestation on bare hills. Farmers' households are seen as the basic economic unit. State enterprises must be improved for service purposes to effectively support and encourage farmers' production.

In implementing these principles, Viet Nam must operate in the context of a severe tropical environment suffering from the consequences of war, backwardness, inexperience in regulating markets, limited scientific and technical knowledge and poverty. Policies must effectively mobilize individual contribution and cooperation and state management needs to be improved, as well as full benefit taken of international assistance.

3.1 Land policy

The Vietnamese government promulgated a policy on Land and Forest Allocation in 1984, a Law on Land in 1988 and a Law on Forest Protection and Development in 1991. It continues to seek policies suitable to local conditions and types of forest. The highland and midland forest areas should receive priority because of poor transport systems and unsustainable farming practices.

The Land Policy confirms state ownership of land but allows for the long-term allocation of land to individual households and producers. Users have the right to grow whatever they want and harvest then sell the produce and legally transfer or inherit the land. They cannot sell the land, so their 'ownership' is conditional. The products of agro-forestry are tax exempt. Tax exemptions also apply to the first cycle of forestry trees (over 10 years or over 30-50 years for some long-rotation, high-value species).

Focus is placed on removing impediments to productive investment of capital and labour in food, forest products, timber and fuelwood, etc., and on improving soil quality and stability, while enhancing the visual quality of the landscape. Over the next 10 years, it is expected that approximately 1 million households will each be allocated 5 ha; 3 ha for forestry and 2 ha for agriculture and agro-forestry for household use and market sale.

Allocation can occur in two ways. First, forest or forest land managed by state enterprises can be partly allocated to enterprises' workers or local people for the purpose of household economic development. Workers and local people can contract for use of land not used by state enterprises as planned. Secondly, apart from the land allocated to state enterprises, local authorities also allocate land to individual households following the state's planning and policy guidelines. The allocation of land and forest should be carried out locally with clear boundaries and certifications to identify the right of land users in accordance with a local land-use plan. A forest user/caretaker can keep a defined part of the produce from his capital and labour investment.

Farmers living in protected forest or watershed regions are allocated a certain area to protect or given contracts to plant timber trees (approximately 600-700 trees/ha). Under the canopy of protected forest farmers can grow rattan, medicinal plants or cash crops from which they can receive full benefits.

Mountain households are not used to these new practices, having relied on shifting cultivation, hunting and the collection of forest products. In order to be able to adapt, these people need guidance and support from extension workers in the technical areas. Demonstration of effective management of land and forest would assist learning and adaptation.

Problems in implementing the Land Policy

Amongst the people being allocated land, only 10 per cent have enough labour for and experience in cultivation and husbandry for well-planned management, and few have any business experience. This inhibits a successful transition from a subsistence-based economy to a commodities-based economy because it depends largely on household abilities in both production and business management. In reality, only a small number of people are able to practise agro-forestry successfully. Others will be employed or look for jobs outside. The Land Policy is not clear enough about the rights to transfer and inherit land. It is expected that most of the land will fall to a small number of able households who will set up small or medium-scale farms.

Differentiation between rich and poor is taking place in mountainous areas partly because of the government's unlimited encouragement for making individual profits. Plans to support the poor are being sought and agricultural and forestry extension programmes are planned to assist landholders. The government also encourages handicrafts in rural areas and promulgates rules for hire of labour or tax relief for the poor under certain conditions. Optimum land use suited to each ecological zone aims not only to produce more but also to protect the environment.

Scientific organizations are widening their activities to review traditional knowledge and experience and to widely spread the results to other farmers.

3.2 Investment policy

Funds for government investment are very limited, causing many difficulties. Taxes raised on forest resources only satisfy 10 per cent of the capital need, the remainder is dependent on the government budget and international aid. Increased financial support for mountainous areas is a priority but the national budget is limited. The Ministry of Forestry invested only 50 billion dong (\$US 5 million) in 1991, and nothing more in 1992.

The national project on planting the Da River Protection Forest is an example. Funding in 1991 was 7 billion dong but only 4 billion dong in 1992. Dam construction forced 50,000 inhabitants to move to higher areas where they now must practise swidden agriculture after their wet rice fields were flooded. They annually destroy 2,000 ha of forest in the area. To have them change their traditional cultivation practices to agro-forestry and livestock raising requires capital and technical support and extension.

Capital is essential for all production development. A policy on capital loans to farmers must be worked out. Recent surveys in rural areas show that most households need capital to hire labour or buy inputs such as tools, seedlings and fertilizers. Many dare not borrow capital for fear that they cannot pay their debts.

Mountain residents are also short of capital and unfamiliar with market economics. They are in real need of government support. Government capital loans (not grants) with low interest repayments will be an incentive to promote economic efficiency and autonomy.

Direction of the investment policy for forestry

In watershed and protected forests, the government will provide 500 kg rice for replanting 1 ha of forest and 300 kg rice for maintaining and protecting 1 ha of regenerated forest. Soil quality and climate conditions are very important in selecting long-term trees that can provide shade. Under mature trees, local people can grow food crops, cash crops (rattan) or medicinal plants. The government's limited budget allows funding for only the most important protection forests.

Capital loans with low interest are available in production forests. To date, however, the National Bank has extended only a limited amount for forestry loans with an interest rate of 19 per cent per year. It is hoped that this interest rate will be lowered to less than 5 per cent.

In the area of forestry production, cash crops are very often long-term crops and the loan conditions should be set to take account of different species and regions. Timber-using factories could act as intermediaries to help farmers borrow capital from the banks and let them pay it back in terms of product.

It is hoped that forestry development projects will attract the international banks as a source of financing. Capital mobilization could come from local or overseas Vietnamese businessmen or in terms of labour input.

3.3 Scientific and technological policy

Viet Nam has to assess its own traditional experiences and also the available international technology, then carry out research to select appropriate methods for each ecological zone. New technologies should be applied to small-scale production to preserve resources and promote intensive cultivation. Labour needs to be encouraged in mountainous areas in order to create more employment. Priorities should be given to biological pesticides and the new technologies that stimulate growth and increase resistance to insects and diseases to produce more agro-forestry products for domestic consumption and export.

Agro-forestry institutions are responsible for establishing pilot projects and socio-economic and technical models for each region and passing them on to local people. Therefore, training local technicians is an urgent task to introduce applications of new technologies, to decide on a forest model and to control the quality of nursery trees and seeds. Appropriate technology for use in mountainous areas needs to be developed and encouraged. Establishment of a network and involvement with forestry extension and technology transfer activities should be encouraged for all interested farmers.

4. FORESTRY POLICY RESPONSES TO KEY DEVELOPMENT ISSUES

4.1 Development of the mountainous regions and ethnic minorities

The 1992 Constitution guarantees equal rights to all nationalities and forbids discrimination based on ethnicity. Each group maintains its right to use its own language and observe its own customs. The government is charged with developing policies to improve all aspects of the lives of minority peoples.

A mountain area, socio-economic development strategy has been established by the government, in which specific programmes have been established to meet the demands of each region, such as the northeast mountainous area, the high plateaus, upland area and sedentary cultivation and settlement. These programmes are hoped to improve the living conditions of ethnic people and also create a basic level of subsistence, thereby ensuring equal rights among the ethnic people and development of the mountainous region to the level of the delta area. Overall economic development of the mountainous areas should integrate appropriate activities with a dominant role for forestry. Various forestry programmes have already been implemented to make a strong and active contribution to the socio-economic development of the ethnic minority people.

The sedentary cultivation and settlement programme, assisting 3 million shifting cultivators, was adopted by the government in 1968. This programme has only had limited success mainly because of the lack of available capital and also because the traditions of ethnic people are not easy to change. Only two-thirds of shifting cultivators have been resettled. Some have improved their living conditions with new agro-silvo-pastoral cultivation systems.

In line with the new economic reforms, the programme has been reaffirmed and strengthened in order to solve problems of food deficits and production of commodities for exchange with rice in the mountainous area. The policy on allocating land and forest to households will be implemented in the region for ethnic minority people. Extension activities in this area will be strengthened.

4.2 Forestry for environmental protection and sustainable development

Little action was taken by the government in relation to the environment until 1985. Since then two basic principles have been followed. First, development has been promoted based on the two basic strengths of the country; its natural resources and its labour force. Secondly, socio-economic development should be in harmony with the existing natural resources and the environment in general.

A draft National Environment Protection Strategy was compiled in 1985 and the following Acts promulgated since then: Land Law (1988); Decree on Mineral Resources (1989); Law on Protection of Health of the People (1989); Decree on Protection of Water Resources (1989); Legislation of Dam and Dyke Protection (1989); Law on Oceanic Shipping (1990); and Law on Forest Protection and Development (1991).

In June 1992, the National Programme on Environment and Sustainable Development was adopted. This programme was designed to create appropriate policy for all sectors, branches, and localities for the utilization of natural resources and for environmental protection. Sustainable development of forest resources is one of eight important programmes adopted.

4.3 Forestry and agricultural development

Each of the seven agricultural ecological regions has characteristics which influence the type of agriculture and forestry practised based on natural resources and vegetation. In the delta and coastal areas, the protection-forest system is of extreme importance in reducing the intensity of storms and winds and cold winds in winter and preventing sand blowing and sand encroachment into the rice fields.

Large forest areas serve as water catchment areas, influence climate affecting agricultural production and living conditions, prevent erosion and reduce the intensity of floods and other disasters. The

natural, plantation and protection forests are also shelters for animals which are beneficial to agriculture, such as insects, birds and frogs which help to control pests.

In many agricultural areas of the country, different combinations of agriculture-forestry-irrigation and agriculture-forestry-hydrology-fisheries can be seen. Forest trees are often intercropped with long-rotation industrial trees or the shelter belts planted with tree plantations. Many agro-forestry models can be suggested to enhance and protect the environment. In the mountainous areas, tree plantations can be established on the mountain tops, long-rotation industrial species can be planted in the midlands and annual crops can be planted on the mountain base. Mixed plantations of forest trees and industrial trees could also be established. Annual crops may be agricultural ones of short rotation such as sesame or peanut, food crops such as rice, maize, sweet potato or cassava, and lowland hill fruit trees can be citrus or other suitable types.

Where mountains and hilly areas are combined with plains, the above models could be used in the uplands with forest plantations on all barren hills, e.g. timber trees, industrial trees or fruit trees. On the delta areas, a protection forest could protect agricultural production with a selection of suitable species for different ecological regions. In the coastal areas, there is a need to establish a protection forest to improve climatic conditions.

Environmental protection is the key to socio-economic development. Agricultural production needs an unpolluted environment. Improper over-use of fertilizers and insecticides can cause contamination in food, air and water. Over-spraying of insecticides and not following the correct dose can result in premature harvesting.

5. CONCLUSIONS

Successful implementation of the National Forestry Policy will require the active participation of all people in the protection of existing forest resources and the rebuilding of the nation's forest resources. Past actions under forestry policies have not always been successful. About 5 million ha of forest land and barren land has been allocated to about 786,000 households, but only 30 per cent of this should be used for production. The government has plans to continue to allocate barren land for household use.

Integrated land-use planning with guidance on suitable plant species for different sites will be provided by local forest services. Some areas have had success in using allocated land for production because suitable species for home gardens have been selected, e.g. cashew at Song Be, Dong Nai Province and *Cinamomum cassia* at Yen Bai, Quang Ninh Province. Other factors in success are that households have received financial support from government they have adequate labour and knowledge on production and marketing and communications and marketing systems have been improved.

Rapid population growth continues to threaten the environment in the upland regions, but the needs of these people must be met. A national land-use plan must be put in place to concentrate on providing protection of soil, catchments and biodiversity, at the same time promoting a free market economy which allows choices for the land user. Cooperation between personnel from different sectors (agriculture, forestry, husbandry) needs to be expanded.

The transmigration of people from lowland areas into the barren land areas of the midlands and uplands must be controlled and supported by the government, but it is unlikely that adequate levels of technology and investment will be available.

A long-term policy and planning horizon is recommended as the only realistic way of achieving sustainability of natural forest resources and social and economic goals for communities who, directly and indirectly, are largely dependent on forests for employment, food production and marketable forest products.

Management practices are, in general, appropriate to the nature of the forests, related to objectives and include technically realistic operations which are consistent with requirements of silvicultural regulations for both establishment/regeneration and tending. Careful application of poly-cyclic selection cutting supported by enrichment and other post-logging tending operations is necessary, and attention must be directed towards economic and business considerations. Research priorities should be placed on growth studies in natural forests, development of a more reliable method for forecasting wood yields on a sustainable basis, land-use capability studies and on the economics of forestry.

PART II

INTER-SECTORAL LINKAGES IN FORESTRY

CASE STUDIES

**Indonesia
Pakistan
Thailand**

INTER-SECTORAL LINKAGES IN INDONESIA*

1. INTRODUCTION

In Indonesia, a National Development Guideline provides broad directions for a period of 25 years, and is revised every 5 years in a Five-Year National Development Plan. Parliament determines a yearly budget allocation for implementation of the Plan. Strategies have recognized the importance of balancing economic development with protection of the natural environment (Anon., 1989a). Protection of environmental quality is basic to sustainable development linking production, protection and participation.

During the First Five-Year Development Plan (1969/70-1973/74), all effort was directed towards rehabilitation of previously neglected economic infrastructure. Guidelines for sustainable development were included in the Second Five-Year Development Plan (1974/75-1978/79) and further expanded in subsequent Plans. In the Third Plan (1979/80-1983/84), a Sector of Natural Resources and the Environment was developed. In the Fourth and Fifth Plans (1984/85-1993/94), sustainable development was defined as development that provides opportunities: (i) for sustainable life-support systems by sustaining functions and capacity of the ecosystem; (ii) to utilize natural resources as much as sustainably possible by applied technology; (iii) for many sectors to grow more complementary to each other; (iv) for improvement of capacity of the ecosystem to provide goods and environmental services sustainably; and (v) to choose development processes for continuous improvement and maintenance of environmental quality (Anon., 1989b).

In the early stages of sustainable development, priority is on exploitation and utilization of water, land and forests. Later, more attention is paid to energy uses, marine resources, hazardous materials, urban areas and socio-cultural aspects. Improving production and welfare in a country with high population growth will involve exploitation of natural resources, changing landscapes, increased technological application and changing social value systems. Risks to be addressed by development include: damage to the environment which reduces the capacity of life-support systems; emergence of new hazards created by man; transfer of environmental risks and burdens to future generations; and replacement of social organizations by institutions.

These risks are a product of interaction between population size and growth, expanded production to satisfy needs, technology development and use to increase production, and natural ecosystems' capacity to withstand pressure. To avoid the risks, development must ensure that: (i) sustained yield only is extracted from natural resources; (ii) profit or rent from depletion of non-renewable resources are invested in human and man-made capital and technology; (iii) capacity of the environment to assimilate waste is not exceeded; and (iv) improved management capacity to implement sustainability is present in all sectors. Policy development and implementation for sustainable development must take socio-economic and political factors into account.

2. OVERVIEW OF POLICY AND IMPLEMENTATION OF DEVELOPMENT

The main issues for sustainable development in Indonesia are linked to population growth, management of natural resources and the environment, institutional capacity and community participation. Population has increased from over 97 million in 1961 to 179 million in 1990, although the population growth rate has decreased slightly. There are variations in the growth rate between regions, with the highest rates in Kalimantan. Population pressure leads to increased demands for food and raw materials, a need for more space for settlement and infrastructure and increased

* This is the edited version of a paper presented at the meeting by Herman Haeruman Js (National Development Planning Agency, Indonesia).

pollution of the environment. Many activities are required to provide jobs and export earnings, and incentives are used to boost investment in agriculture, forestry and industry.

Programmes to expand agriculture, new settlements, industries and infrastructure have direct impact on natural ecosystems by reducing the quantity and quality of these areas. In regions such as Sumatra, Kalimantan and Sulawesi, impacts of settlement and agricultural expansion are felt on natural lowland forest ecosystems, coastal environments and mangroves. In Java, rivers and coastal ecosystems are affected. Pollution of rivers is appearing in many highly developed areas such as northern Java, eastern Sumatra and southwestern and eastern East Kalimantan.

To reduce the negative impacts of population growth in the agricultural sector, a resettlement programme was established to move people from areas of high population density (Java, Bali and Nusa Tenggara Barat) to less-populated regions (Sumatra, Kalimantan, Sulawesi and Irian Jaya). There are also local solutions by moving marginal shifting cultivators from degraded forest land to newly developed agricultural areas. However, the policy poses risks to natural lowland tropical forest ecosystems. So only areas dominated by *imperata* grass or low-quality forest may be converted to agriculture and new settlements. A soil and land inventory project has been launched to support the programme, generating new information on forest cover and land suitability (RePPProT, 1990).

Another problem in implementation of the planned transmigration is related to interaction between new migrants with the local indigenous population. New settlers are provided with 2 ha of free land for each family complete with agricultural inputs and free food for 6 months. Tensions arise because local farmers feel they are discriminated against. A scheme to assist local dryland and shifting agriculture and reduce socio-economic discrepancies is also incorporated into the programme with about 10 per cent of lands cleared in new settlements reserved for local farmers. Programmes to alleviate local poverty exist in the areas of agriculture, forestry, trade and rural small-scale industrial developments.

Population increase creates pollution problems on many major rivers by the dumping of domestic and industrial wastes. The value of rivers as natural support systems for inland fisheries, drinking water supply, industrial water supply and recreation is reduced. River quality is further worsened by soil erosion from dryland agriculture and careless logging practices upstream. The Clean River Programme (PROKASIH) has been launched to reduce pollution of rivers.

Improved management of natural and modified ecosystems is the only answer to the growing needs. The main issues are degradation of soil and forest productivity, environmental pollution, marine resources management, allocation of natural resources and conservation of nature.

Degradation of soil and forest productivity are mainly caused by poverty and greed. Poor farmers have little choice but to over-exploit their lands if they are to produce subsistence foods and income. Fertility is reduced quickly on agricultural land and then it is abandoned, new forest lands are cleared and more wastelands created. Some logging companies harvest the forests carelessly, creating damage to residual trees and reducing the social, financial and ecological values of the forest. A programme of forest, water and land rehabilitation has been launched to help farmers improve the productivity of land, reduce soil erosion and degradation, increase reforestation and reduce forest degradation, and improve watershed quality. During the Fifth Five-Year Plan, the programme is to rehabilitate about 4.9 million ha of marginal agricultural drylands, 1.9 million ha of deforested protection forests and 4 million ha of degraded production forests (Anon., 1989b). Relocation of about 500,000 families of shifting cultivators around forest lands is also planned to relieve pressure on watershed areas.

A pollution control programme has been implemented for almost 10 years in Java, especially in major watershed areas. Forestry is a key part of this programme related to watershed protection, development of urban forests to alleviate air pollution and mangrove management. International attention to global warming and ozone depletion has highlighted Indonesia's efforts on pollution abatement and forestry development.

Action has been taken to conserve natural ecosystems such as coral reefs, mangroves, sea-grass beds, lowland tropical forests, swamp and peatlands, savannas and prairies, freshwater lakes and montane forests. Nature reserves, wildlife sanctuaries and protection forests are developed to preserve ecosystems and biodiversity. An integrated development of such reserves with economic utilization has also been developed in the form of a national parks system. Plantation establishment can also conserve biodiversity in forest marine and agricultural environments. An integrated conservation and development approach is necessary between agriculture, forestry, rural and community development and environmental protection.

Organization and procedures are the key to efficient and effective management of natural resources and environment. Laws and regulations on environmental management, conservation of nature and spatial planning provide policy guidelines.

2.1 Participation

To improve the welfare of the people, their full participation is essential. It will also help to guarantee sustainability. 'Farmers' in and around the forests see no alternative ways to improve their standards of living but by agriculture at the expense of forest. There are about 5-6 million people on 12 million ha of forest lands currently practising some form of shifting cultivation (Haeruman, 1992). So far, those 'farmers' and 'forest-products gatherers' are considered as outsiders and a menace to the forest by many foresters and concessionaires. The attitude and practices of some concessionaires has created a negative reaction by the farmers in the form of destruction of forests by forest fires, poaching of wood and encroachment.

Efforts have been launched to provide national recognition to individuals and communities of their participation in protection of the environment. This has received positive reaction from the international community, NGOs and governments and has encouraged initiatives in environmental protection and rehabilitation. A programme to rehabilitate critical watersheds was begun in the Second Plan and expanded later to cover about 36 watersheds. Reforestation of degraded forest lands needs extensive community support to be successful.

Protecting the quality of the environment is best achieved by recognition and understanding of common objectives of many communities, risks and costs of development, and fairness in sharing the benefits of a better environment. The forest resources of Indonesia (74 per cent of the land area) are also land resources, an ecosystem and a business opportunity. Forest management needs to recognize all these aspects to improve cooperation in sharing the costs and benefits of forestry development.

3. FORESTRY-RELATED SECTORS

The agriculture and natural resources sectors are closely linked to forestry. Objectives of agricultural development are increased production and diversity of products, improved income and welfare of farmers, a more equitable distribution of business opportunities, job opportunities, and improved value-added of agricultural products. The most important strategies to achieve these goals is food self-sufficiency and greater exports of processed agricultural products. In the past 5 years, production of food crops such as rice, corn, cassava, soybeans, rubber, palm oils, coconuts, sugarcane, cotton,

and shrimps has increased substantially. Export of agricultural products such as rubber, palm oils, coffee and shrimps have also risen.

Agricultural expansion has occurred in Sumatra, Kalimantan and Sulawesi where land is still available, and in Java intensification takes place on existing agricultural lands (Haeruman, 1992a). Land-use policy impacts on commodity policy. Food crop agriculture is restricted to lands with less than 12 per cent slope, estate crops to lands between 12 and 30 per cent slope and forest to lands with slopes more than 30 per cent. All agricultural development should take place in areas below 1000 metres altitude. As 80 per cent of the poor in Indonesia are rural people, agricultural development can best alleviate poverty by expansion of smallholder agriculture. This effort relates directly to forestry since poverty is an important factor in forest degradation.

Another sector linked very closely with forestry is Natural Resources and the Environment. Objectives of this sector are improved environmental quality, increased biodiversity and enhanced sustainable development. Important issues involved are population increase, management of the ecosystem, institutional development and community participation. Again, alleviation of poverty is an important part of improving environmental quality management. Sustainability is impossible without management to ensure continuity of renewable resources, reinvestment of human capital and technology and preservation of the capacity of the environment to assimilate waste.

Recognition of the issues of resource depletion and degradation has been widespread among policy makers. However, improvement of available instruments to mitigate the problems is still in the very early stages. Practical instruments for policy implementation, such as government regulation, a market mechanism and social value systems, have not been fully developed. Sustainability is hindered by the failure of the available instruments to recognize and remedy the problems of resource depletion and degradation. While policy and market failures are acknowledged factors in unsustainability, they are the products of an institutional framework.

The sector of Natural Resources and Environment tried to address environmental management by management of the economy, but specific actions are needed to alleviate environmental degradation and renewable resource depletion. A series of programmes have been developed, including inventory and evaluation of natural resources and environmental quality, management of natural resources and environmental quality, conservation of nature, pollution control, rehabilitation of degraded forest, waters and lands and coastal-zone management.

Several important policies have been instituted by this sector. Spatial planning, delineating a protection zone to support sustainable development, has been implemented covering aquifer recharge areas, high biodiversity and unique habitat of wildlife, deep peatlands, coral reefs and marine coastal areas, swamps and natural lakes, natural river-banks, cultural heritage and archaeological sites. Environmental impacts assessments to minimize damage to the environment and improve the social benefit of development are to be used. Emission and effluent standards to guide the selection of technology for development and institutions to manage the environment will be set in place. In the pollution control programme, priority has been given to natural rivers, coastal areas and hazardous urban waste. Effort will also be directed at abating natural forest depletion and global warming, improving public participation and institutional development.

4. INTERACTIONS WITH FORESTRY

In the First Plan, the forestry sector was assigned to produce better standing forests, improve quality and sustainability of material, increase diversity of products, improve environmental services from the forest, enhance employment opportunities, support forest-based industry and export development,

and increase public participation in forest management. These objectives are theoretically consistent with the environmental policy objective of sustainable development. Guidelines for sustained yield management are impaired by poor knowledge of characteristics of the natural forest. Effective field interpretation of the guidelines for local conditions is lacking, both technically and administratively. Consequently, forestry field practices in logging operations have hindered pursuit of sustainability of natural production forests.

Central government control of forestry institutions creates problems in management of the forests, especially production and protection forests. As a result, protection forests are not well maintained or protected from encroachment, thereby reducing forestry's value in providing environmental services to other regions or sectors. Interaction between environment and forestry in institutional development will focus local capability (government, local community and business community) on addressing forest degradation. Forestry development at the local level will be influenced by increased awareness of environmental issues by the public and local communities.

The log export ban and high export taxes on semi-processed wood have increased Indonesia's role in the world market for tropical forest products. Initially the policy led to wasteful use of forest resources, and provided no incentive to improve efficiency in forest-based industries.

In promoting forest plantations linked to industries, especially pulp and paper, incentives have been provided ranging from low land taxes to the right to clear cut 'secondary' forests in concession areas. To obtain an early return on investments, concessionaires over-cut forests with little regard for biodiversity conservation and protection of the soil from erosion. This behaviour is directly contrary to environmental policy.

Interaction between forestry, environmental and agricultural development will focus on efficient uses of forest lands, community participation, nature and biodiversity conservation, integrated management of natural resources and environmental quality requirements imposed on forest-based industries, including logging and timber plantations. Forestry and environmental cooperation is vital in fragile ecosystems such as mangroves and deep peatland forest with high biodiversity, such as lowland tropical forests currently managed by concessionaires as production forests.

Another important policy interaction related to forestry is between the environment and industrial sectors. Environmental policies will force forest-based industries to take account of waste minimization, high efficiency in raw materials use and higher values of natural resources.

4.1 Expectations from Forestry

National development policy relates to equitable distribution, economic growth and political/socio-economic stability. Forestry development is expected to encompass this national policy objective.

Equity in forestry development has been implemented by improving Indonesian participation in industrial and business activities, improving training and employment in forestry activities, satisfying basic needs of communities in and around the forest areas, and introducing forestry activities to all regions. Implementation of this policy of equity in concession management, reforestation, national park development and community forestry will greatly increase community participation.

Economic growth in forestry development will be achieved by increasing productivity and utilization of forest lands, improving value added in forest products, maintaining a major share in world tropical forest markets, and increasing diversity in forest products. The key to this is maintaining the capacity

and improving the quality of natural forests. Forest product diversity, in the form of material products and environmental service, is also important.

Political and economic stability in forestry development will be enhanced by the establishment of permanent forest boundaries, social forestry practices, consistency in implementation of policies on forest concessions, and better environmental activities such as protection forest management and nature reserve improvement. Public awareness of the role of forestry in development will increase political recognition and hence stability of forestry's existence.

Expectation is high that forestry can support the economic take-off policy of the Second Plan by providing sustainable and diversified input to industrial sectors, continuous protection to watershed development and many options for future growth. Forestry is expected to improve its capacity to address all the major issues of development with an integrated approach. These include issues of institutional framework, implementation of policies, environmental protection, economic well-being and local participation.

The 1966 policy of investment incentives and concessions in productive forests brought rapid exploitation of less accessible forests in Sumatra, Kalimantan, Sulawesi and Maluku-Irian Jaya. Indonesia became a major exporter of tropical logs and forestry became an important economic sector. The profit accumulated was reinvested in non-forestry sectors and many log importers (Singapore, Hong Kong, Taiwan and South Korea) became major wood product exporters. However, there was little improvement in forest management, availability of trained personnel or forestry technology. Government revenue from log production was minimal. Receipts from forest activities, especially from forest concessions, could have been increased from around \$US 15 to almost \$US 45 per m³ of logs without detrimental effects on the capacity of concessionaires to effectively manage the forest.

To capture more benefit from forestry and develop forest-based industries, the Indonesian government imposed a log export ban in 1980. This policy has reduced substantially the role of logs as an export commodity, but has quickly made Indonesia the major producer and exporter of tropical plywood and sawn timber. Export revenue has increased steadily, employment has improved and forest industries have gained a momentum for growth. Log production declined substantially in 1981, but by 1984 it had returned to its original level.

Despite substantial growth in forest industries, the improvement in forest management and protection is still minimal, forest boundaries are almost non-existent and forest depletion remains unchecked. Forest-based industries were still developing during early REPELITA V (1989/90-1993/94). The shortage of better quality logs as raw materials for plywood and sawmill industries is one indication of resource depletion. The need to improve management of natural forests is clear as forest industries require a continuous supply of wood to survive.

A policy on sustainable development was implemented in early REPELITA V in the form of limiting log production to 31.4 million m³ per year, imposing and increasing reforestation taxes, and raising taxes on sawn timber exports. The first impact of these policies was a decline in sawn timber exports and industries, especially small export-oriented factories, causing a temporary decline in log production. However, there are indications of growth of wood-manufacturing industries, such as moulding, furniture, and finger-jointing in anticipation of export opportunities for finished products. Pulp and paper industries increasingly utilized low quality wood. Introduction of a high tax on semi-processed timber and rattan in early 1989 has slowed down production and reduced exports of sawn timber by more than 50 per cent. Sawn timber industries have continued to decline.

However, there were few impacts on improved utilization of forests and enhanced development of industrial forest plantations. A projected 1.5 million ha of new forest plantations may not be able to be achieved by the end of REPELITA V. Constraints include site identification, species selection, certified seed and seedling production, and shortage of skilled workers and contractors as well as problems of alleviating negative environmental impacts.

REPELITA V allocated 113.5 million ha as permanent forests, consisting of 18.8 million ha as nature reserves, 30.3 million ha as protection forests, and 64.4 million ha as production forests. In addition, there are 30.5 million ha of conversion forest managed as production forests, convertible to other uses if necessary. However, not all forest lands are forested. A recent study indicated that only 109 million ha of lands are forested, and 57.3 million ha have management potential.

Forest land is often yielded to agriculture for food security and poverty alleviation or industry for economic development and employment. Forestry should address these issues with new approaches to forestry development and hence maintain forest lands. Forest conservation and environmental protection has focused on national parks development, nature reserves and management of protection forest. Management has been inconsistent because of institutional problems related to unclear division of responsibility between central and provincial governments, under-developed organization, lack of trained and skilled manpower, and unclear forest boundaries. These issues need to be addressed as major objectives of forestry policy. Local communities benefit from conservation areas. Buffer zones and community participation in development of protection forests, national parks and recreation grounds would help.

Rehabilitation of degraded forest and critical lands has a more ambitious target of 4.9 million ha of logged forest areas (TPTI), 1.9 million ha of degraded protection forests and 5 million ha of critical agricultural lands. Only reforestation of the latter two has involved cooperation between local government and village communities. During the first year of REPELITA V only 400,000 ha of critical agricultural lands and 40,000 ha of degraded protection forests were rehabilitated. Rehabilitation of logged forest areas is meant to be implemented by concessionaires, but poor supervision and site identification, lack of skilled and trained manpower and weak organization has slowed the progress.

Over the next 25 years, issues of permanent forest land delineation of 113 million ha will dominate the activities of forestry in relation to agriculture and transmigration, industrial development, human settlement and infrastructure development. Changing demand for wood products, as well as environmental concerns about forest depletion, will affect management practices. Regional development and equitable distribution of income will become issues in management of forests for local and regional benefit, especially shifting cultivation, cooperative and social forestry, remote area infrastructure development and increased employment. Diversification of products will change the pattern of managing the forest for multiple yields.

Continuing major constraints in forestry development will include organizational and institutional weaknesses especially in relation to local and central government, poor managerial capabilities in private sectors, lack of skilled and trained personnel especially in management of natural forests, and low community participation in maintaining the existence of forests. Population increases and employment needs will present a big challenge to forest existence.

The development process must generate about 12 million new employment opportunities in 5 years. The undeveloped forestry sector, especially in forest management and regeneration, offers ample opportunities for such employment. Population increase means increasing production in all sectors to meet the objectives of improving welfare and the creation of economic growth. This growth is

mostly in manufacturing industries and agriculture. With diminishing production capability of natural forests, growth of forest industries is becoming a serious concern.

During the last 25 years, forestry development has been basically private sector and export oriented. Revenue from forestry has been re-invested in forest industries such as plywood, pulp and paper, and sawn wood industries, and in non-forestry activities such as real estate, hotel and banking businesses. Very little of the revenue was put into maintaining and developing the natural forest. Private sector activities seem to neglect the national development goals of sustainability, equitable income distribution and participation of the local population in benefit sharing. However, the private sector is very important to the future of Indonesian forestry development and should move from logging-oriented enterprises to sustainable forest management activities.

The low re-investment of forestry revenue into natural forest management and development was due to a lack of private sector knowledge and technology, more profitable non-forestry opportunities, poor quality and quantity of labour in remote areas, weak government supervision and little interest of international communities in better terms for natural resources management in developing countries. Emphasis on logging instead of natural forest management reduced the potential opportunities for employment, skill development, local participation and links with other sectors. The image of forestry development in national as well as international communities has also been harmed by these private sector policies.

4.2 Impact of other sectors on forestry

Policies in the natural resources and environment sector influence forestry, mainly in relation to allocation of forest lands in planning, conversion to agriculture, promotion of sustained yield principles, protection of biodiversity, acceptance of the multiple functions of forests, improved public awareness and participation in forest protection, and reorientation of forest-based industries based towards sustainable forestry. A planning law has recognized the importance of protection regions for hydrological protection, wildlife habitat conservation, national heritage sites, etc. These regions include protection forests, wildlife sanctuaries, nature reserves, coral reefs and mangroves and extend beyond the existing protection forest to cover areas such as deep peatlands, coastal strip zones, natural lakes, riverbanks and aquifer recharge areas (Anon., 1991). Almost all natural forests are meant to be managed with biodiversity conservation as a factor.

Required environmental impact assessments further protect the conversion of natural forests to other uses whenever negative environmental impacts exceed positive. A concerted environmental awareness programme helps to control the rate of degradation of natural forest for settlement, agriculture and industry. It will also increase acceptance of single species plantations and promote sustainable management of natural forests by ecologically sound practices.

The increasing importance of environmental quality management and protection has given a new recognition to forestry. Budget allocations for forestry development have been increased substantially, especially for soil conservation, nature reserves and national parks, reforestation and human resources development. Many projects in water resources development include forestry development in the upper watersheds. Large mining and infrastructure proposals using forest lands improve political recognition of forestry. Such integrated development approaches also improve skills of forestry agencies and personnel.

5. POLICY FORMULATION AND DEVELOPMENT

5.1 Role of forestry

Within national development, the roles of forestry are to increase sustainable production of forest products, support forest-based industries and exports, and increase nature conservation. Forestry has undergone substantial change from a small traditional role. A separate Ministry of Forestry has been established with the economic importance of the forest sector expanding. It is now the second biggest export earner and forest industries are large and modern with Indonesian plywood dominating world markets.

Policy on forest land use has been developed and practised although improvement of boundary delineation is urgently needed. An area of 113.4 million ha of permanent forests and 30 million ha of conversion forests were accepted in principle. It became an important guide in many provinces for allocating land for development. Until early 1989, 60,000 km of forest boundary had been delineated in the field.

Early investment policies increased log production from 5.2 million m³ in 1968 to 27.7 million m³ in 1988, plywood from 0.4 million m³ in 1978 to 8.9 million m³ in 1989, and sawn timber production from 0.17 million m³ in 1968 to 7.9 million m³ in 1983. Export bans on logs were instrumental in increasing production and export of plywood. Export of sawn timber has increased substantially from 0.3 million m³ in 1973 to 3.1 million m³ in 1988, and export of plywood has also increased from 0.07 million m³ in 1978 to 7.9 million m³ in 1989. Policies outside of forestry, such as incentives for investment, have a significant role in the increased production and export of forest products.

However, there has been no substantial improvement in production and export of non-timber forest products. In fact export of some traditional products, for example *tengkawang* and *damar*, have ceased.

Production and export of wood pulp has increased substantially with new pulp mills developing rapidly in Sumatra and Kalimantan. But timber plantations are still undeveloped, and all pulp mills are using logs from natural forests.

Development of conservation areas and national parks has been impressive. In 1989 there were nearly 15 million ha of gazetted conservation areas. Policy on species protection has led to improvements in the number of species and in the introduction of habitat protection. (Anon., 1990). There has been no improvement in the preservation of protection and production forests and the natural forest has been degraded at the rate of about 1.2 per cent a year or about 1.3 million ha due to conversion for agriculture, shifting cultivation, fire damage, poor logging practices and infrastructural development.

Rehabilitation of critical forest and agricultural land has been carried out consistently since 1968 with 1.4 million ha of forest land successfully reforested, and 3.5 million ha of critical agricultural land rehabilitated by 1989. However, the rate of rehabilitation was slower than the deforestation rate. Production forest is managed under the HPH system. Concession management is undeveloped, and natural production forest is almost unmanaged.

Institutionally, forestry has evolved substantially with establishment of a large Ministry of Forestry. However, development of regional forestry offices lagged both in number and skill of personnel and in working facilities. Recruitment of new personnel, especially at technical levels, needs to be carried

out as soon as possible. Facilities for forestry training is also improving at all levels. Forestry research institutions are located in Bogor, North Sumatra, East Kalimantan, South Sulawesi and Irian Jaya.

A most important goal in forestry development is the emergence of a strong private sector to further improve the role of forestry in long-term national development by improving Indonesian forest resource uses and tropical forest product share in the world market. Substantial development of forest-based industries has been at the cost of natural production forest. Poor logging practices followed by shifting agriculture has led to deterioration of the forest. In some areas, concessionaires have given little attention to local community traditional rights and created social tension leading to further degradation by both communities and concessionaires. Production forests in several provinces are no longer operational because of poor management degradation.

The role of forestry in protecting and maintaining environmental quality is quite important, especially for nature reserves and national parks establishment. Quality of rivers has been improved through reforestation and soil conservation measures. Greater public awareness of the importance of protection of nature reserves and soil conservation has been instrumental in watershed improvement.

A new policy in spatial planning for the protection and development zones will increase protection forest areas and confirm nature reserves and wildlife sanctuaries, but reduce production forest areas. Some current production forests will have strong environmental quality objectives and others will be converted to more beneficial land uses such as agriculture and settlement expansion. Forestry policy on production forests with its annual allowable cuts and land allocations to concessionaires has a strong influence in development of industrial and land policy, and nature conservation activities support planning and maintenance of biodiversity and tourism development.

5.2 Facilitation of dialogue

Policy conflicts need to be resolved for effective implementation. Improved dialogue within and between sectors is needed to obtain consensus and participation in attaining all objectives. In developing policy, joint committees have been convened in watershed management, energy policy and resource allocations for development. Each committee has members from different sectors and different levels of administration. They establish priority concerns such as renewability, pollution and efficiency for energy policy, and space, land, water, forest and marine resources for development policy.

A biodiversity conservation working group and environmental impacts assessment committee have members from many agencies, the scientific community and NGOs to consider negative impacts of development projects and promote integrated efforts to mitigate the impacts. Bilateral decrees can be developed by two or more agencies, e.g. a joint decree between forestry and mining for mining procedures in forest areas; forestry and transmigration on determination of forests for settlements; forestry and environment on nature reserves and natural forest management; and forestry and industry on coordinating wood-based industries development and with forest regeneration capacity.

National or regional development planning agencies coordinate periodic development consultations to integrate policies of different sectors, as well as conducting routine activities of setting project priorities and allocating resources. Project planning meetings can resolve these issues.

6. POLICY IMPLEMENTATION

6.1 Policy competition and complementation

An important policy competition arises in forestry and environment about production forests and timber plantation establishment. Environmental policy places priority on the continuous maintenance of quality and quantity of natural forests for purposes of biodiversity conservation, traditional community rights and improved diversity of sustainable forest production. Forestry policy emphasizes material production of timber of fewer species, conversion to more 'profitable' plantations, and rights to harvest for concessionaires instead of the traditional community. In contrast, environmental policy sees the plantation as a cost to environmental quality.

Almost 93 million ha of natural forest have been allocated as production forest and 50 million ha as protection and conservation forest. Allocation of large areas to 'production forests' creates direct competition with other land uses which may produce better and faster returns. Already 30 million ha have been designated as conversion forests to be converted any time to other uses. Of the remaining permanent production forests, about 11 million ha have no forest, and are very easily subject to conversion by any economic criteria. (Haeruman, 1991b). Environmental policy would designate about half of the production forest as protection zones.

There is no stated forestry policy on participation of traditional communities in concession management, while national environmental policy suggests that security of the forests' existence depends on this participation. Institutional and personnel shortcomings mean there is no consideration of including community in the concept of managing the forests. Community forest development contributes to community welfare by positive participation to protect the natural forests and develop appreciation of the forest. But forestry agencies have no way of extending their knowledge and skill to assist the community to manage their forest.

Expansion of agricultural land is in direct conflict with protection of the forests, while some intensification of existing agricultural practices and agro-industrial development are complementary to policy on forest management. Early policies of administrations to grant land to local businesses had detrimental effects on forest lands.

Since 1989, a 'reforestation tax' of \$US 10 per m³ of log production has been levied on concessionaires, and those willing to establish plantations in unproductive forest lands are eligible for an interest-free loan from the 'reforestation fund'. The objective is to establish 6 million ha of plantations in unproductive forest lands. Many big concessionaires have started to respond, but the policy has some negative impacts on good natural forests scattered in vast areas of unproductive forests.

Complementary policies exist in the environment and forestry sectors for development of protection forests, nature reserves and national parks, although community participation is still to be developed further within forestry to match the environmental policy objective.

Environmental policies of many donor and creditor countries and international financing institutions are often in conflict with that in the receiving country because of differences in value systems. Reforestation activities have been supported by donors with expectations that recipient countries conserve their natural forests. Plans to convert degraded forests to better uses, economically, socially and environmentally, receive no financial support from donors nor does protection and management of natural forests.

6.2 Policy instruments: uses and effectiveness

Three kinds of instruments have been used to implement forestry-related policy; they are regulatory measures, financial and market mechanisms and social value systems. Regulatory measures are government instruments, while the market directs behaviour of the private sector. The traditional community is governed by socio-cultural value systems. Effectiveness of any of these instruments in implementation will depend on support from the others.

Opening forest lands for traditional agriculture is governed by tradition and the community works and moves together in their shifting agriculture scheme. Into this system has been introduced some agricultural commodities such as rubber. In some areas the farmers planted tree species before abandonment as a means of claiming lands in the future. Unwritten traditional regulations are very effective in regulating land-related activities among many traditional forest dwellers.

Financial policy and market mechanisms have influenced both traditional and business communities. Financial incentives with low-interest credit for coffee, for example, have attracted traditional as well as migrant farmers to open new forest land. Incentives for timber plantations, again with low-interest rates and no or small reforestation fees for pulpwoods, have boosted plantations and conversion of low-grade natural forests. Very low land tax has encouraged concessionaires to hold large tracts of forests without any activities. Profit is an effective instrument to regulate the private sector and individuals.

Regulatory instruments, especially when they increase costs, need enforcement and many developing countries have limited capability to enforce regulations. Policy on the selective cutting system for natural forests has not been adopted by concessionaires because of cost. For concessionaires, the only benefit from adoption is extension of their concession in the future. Large fines for non-compliance would probably be more effective. The government regulation also needs support from financial and social policy instruments. Local forestry offices should be given full responsibility and power to implement the instruments.

6.3 Need to coordinate policy implementation

To avoid detrimental effects of conflicting policies the instruments need to be coordinated before implementation by discussion among government agencies, especially between Finance, Trade, Environment, Interior and Forestry.

Policies on natural forest management, especially selective cutting and concession management systems, should be linked with traditional community practices and the market mechanism. Regulatory control, market-based incentives, government spending and socio-cultural regulatory measures require special attention.

6.4 Main constraints

Major constraints on forestry policy development in the last 10 years have been organizational and institutional especially in areas of local and central government, communication with private sectors, community needs, and information on the forests, forest products market and community participation. Availability of skilled and trained personnel in forestry and other sectors, especially in management of natural forests, is a big issue.

Population and employment, land-use policy, skilled personnel and environmental quality objectives will all become significant factors influencing the attainment of forestry policy objectives. Creation

of employment for a growing labour force represents a challenge to conservation of natural forests. The forestry sector offers possible job opportunities, especially in management and regeneration. Population growth will affect demands for conversion of forest lands, improved welfare and economic growth.

At present, constraints on forest-policy development are related to inadequacy of land uses and boundary delineation, management of natural production forests and concessions, inefficient forest-based industries, inadequacy of research and technological development to support sustainability, poor inter-sectoral communication, inability to respond to growing concerns on global environmental issues related to tropical forests, biodiversity and climate changes. The main concern of forestry institutions and foresters is the welfare of forests. Community welfare can also be supported if policies benefit the local community.

Public perceptions of forestry inhibit policy implementation. Functions of forests are poorly understood by government personnel and the public. A large contribution from forestry to the region is no guarantee of a better acknowledgement of the importance of forestry. More than 60 per cent of Indonesian forest product exports come from East Kalimantan, and yet the main programme of the region is agricultural expansion at the expense of forests despite infertile soils.

7. POLICY REFORM AND POLICY INSTRUMENTS

7.1 Major lesson learned

Major policies in forestry development need to relate to the national policy of equitable income distribution, economic growth and political/socio-economic stability. Equitable distribution policy has improved participation of Indonesians in forestry activities, training and employment opportunities, as well as meeting the basic needs of forest area communities, and spreading forestry activities to all regions. Economic growth has increased production and utilization of forest lands, improved value added, maintained a major share in world markets, and increased diversity in forest products. Political and economic stability has been assisted by delineation of permanent forest boundaries, social forestry and improvement of conditions for the poor, consistent policies on forest concessions and improved environmental activities.

Yet all these efforts have not been able to reduce the pace of forest degradation. Many policies outside the forestry sector greatly affect its activities. Despite increased production and export of tropical wood, forest management, personnel training and forestry technology have not improved. Government revenue from log production has been minimal, and managed forest enterprises have not been encouraged. Improvements in forest management and protection are minimal and forest boundaries are almost nonexistent.

A projected 1.5 million ha of new forest plantation in REPELITA V has not been achieved. The policy on permanent forest lands lacks support from outside forestry. However, allocation of conversion forest was hailed as an important understanding by forestry institutions of other sectoral objectives, but very little support has been offered to maintain treed areas.

Nature reserves and national parks have benefited from strong environmental awareness, creating public and international pressure, despite no returns to government. On the other hand, maintaining production forests receives little attention from local government, the private sector or the general public. This is probably due to the fact that the beneficiaries are companies alien to the local community and public. A poor image of concessionaires in the past has had negative impacts on public support for sustainable management of production forests.

7.2 Expectations of forestry and environment

The tropical forest is very important to global, national and local communities. It has become a major topic for forums at all levels of discussion from local to international, scientific to political. Tropical forests provide local community needs for forest products such as firewood, logs, rattan, and food to sustain livelihoods. For some, it offers fertile soils to till and produces foods and other commercial crops. Nationally, they provide sources of income and lands for agricultural expansion. To global communities, tropical forests are important for environmental protection. These conflicting objectives must be addressed in developing sustainable management strategies for tropical forests. Current policy formulation only addresses sectoral objectives in many forest management plans.

Policy should be developed within forestry agencies to provide a mechanism in integrated forestry development planning in relation to the many common and conflicting objectives. This will require a new kind of open-minded 'foresters' and revised institutions at all levels of government, private sector and communities. A Forestry Development Council with members from related fields and institutions could direct forestry policy development.

Policy instruments in the future will need to be directed at issues of delineation, management and training, degradation, conservation and biodiversity as well as regional development and equitable income distribution. Diversified production is also a key to employment opportunities. Cooperation with other sectors will help to achieve these objectives, as well as improve the public and institutional image of forestry development. Management of natural forest rather than logging will help ensure local participation and benefit. Employment creation has to be addressed by forestry through major changes in concession management, and improving access for community participation.

Together with the objective of improving welfare of the people, forestry development must create economic growth, increased production and values, and expanded forward and backward linkages. Revenue from forestry needs to be reinvested in natural forest management while conditions should assist private sector forestry by providing healthy business opportunities in forestry consulting, management and technical training, forestry college education and a fair basis for competition among concessionaires.

Private sector forestry in the past has neglected the basic objectives of national development but its role will still be very important to Indonesian forestry development in the future. A new kind of forestry private sector is needed to improve sustainability of natural forests, community welfare, employment opportunity, and new business opportunities.

7.3 Improving linkages and major policy issues

The correlation between population density in rural areas and forest degradation needs to be addressed to ensure sustainable management of tropical forests. Multiple products from natural forests could cater for the growing needs of the people. The majority of Indonesia's population is rural and when forests cannot provide enough employment and income, forest degradation follows (BPS, 1990). Forestry must be linked with population distribution to effectively satisfy present and future community needs. Industrialization could attract migration from forest lands to urban and industrial towns, including forest-based industries. The main issue is effective training of forest dwellers for productive employment in the industries. Planning for economic growth needs to consider both short and long-term objectives of all sectors. Multiple use of forest land should be directed at the best combination of these goals, between present and future output, and local and national benefits.

Environmental objectives can be met through forestry development. Agencies need to agree on a value system and a procedure to attain objectives, as has happened with nature reserves and wildlife conservation. Community and local government objectives which emphasize direct revenue and employment are more in conflict with environmental goals. National parks policy, which stresses integrated development of conservation areas protection, buffer zone establishment and management, and village or community development linked to tourism, will benefit many people and so would be supported by community and local government. Problems include coordination of inputs from many agencies and institutions at the right time and in the right amounts, and institutional support for community participation.

While, in Indonesia, environmental issues have been considered important since 1968, only recently has the developed world shown concern and started to assist with mitigation of environmental degradation in Indonesia. This attention will benefit conservation of natural tropical forests only if local population and developing country needs can be fulfilled. The two very different social and economic conditions of the donors and recipients need to be reconciled for effective implementation of policies.

Within forestry institutions, changes have to be made so that all development aspects linked to sustainable and multiple objective forest management, community participation, distribution of benefits, environmental quality and tropical-forest management for export are fully addressed.

7.4 Instruments most effective for implementing policy

Regulatory control of forests began in most parts of Indonesia when concessionaires were given forest lands by central government to promote investment and export in forestry. Backed by the investment policy, forest concessions developed quickly, producing and exporting logs in large quantities. These instruments were very effective in propelling forestry development in Indonesia, but forests were only seen as another resource to be exploited.

To increase value added and reduce logging, the ban on log exports was instituted. The ban was very effective in reducing export of logs and increasing development of forest-based industry, especially plywood and sawn timber industries. However, a resulting low price of logs led to low efficiency of industry and there was little effect on forest protection.

A market-based instrument was introduced to increase value added in sawn timber in 1989 with an export tax on semi-processed sawn timber and rattan. To date high technology, sawn timber industries have not grown but production of raw rattan has declined.

Where there are strong forestry management practices, as in Java, regulatory control is more effective. Good relations between concessionaires and local people also enhance forest sustainability. Government funding is needed to control activities. Reliance on private sector financing for forestry management has been proven inadequate. In many areas (Siberut, West Sumatra and Arfak Mountain, Irian Jaya) with strong traditional communities, unwritten socio-cultural regulation is very effective in protecting environmental quality.

REFERENCES

- Anon., 1989a: *Garis-Garis Besar Haluan Negara Republik Indonesia* (National Guidelines for Development). Republic of Indonesia, Jakarta.
- Anon., 1989b: *Rencana Pembangunan Lima Tahun Ke Lima 1989/90-1993/94* (The Fifth Five-Year Development Plan 1989/90-1993/94). Republic of Indonesia
- Anon., 1990: *Situation and Outlook of the Forestry Sector in Indonesia*. Ministry of Forestry and FAO, Jakarta.
- Anon., 1991: *Keputusan Presiden RI No 32 Tahun 1991 Tentang Pengelolaan Kawasan Lindung* (Presidential Regulation No.32 Year 1991 on Management of Protection Regions. Government of Indonesia, Jakarta.
- Anon., 1992: *Undang-Undang Pengelolaan Ruang Tahun 1992* (Law of Spatial Management Year 1992), Government of Indonesia.
- BPS, 1990 : *Population of Indonesia: Results of the 1990 Population Census*. Biro Pusat Statistik, Jakarta, Indonesia
- Haeruman, Herman Js, 1991a: 'Sustainable development in Indonesia: theory and practices.' paper presented in the *Workshop on Alternative Strategies for Sustainable Development and Environmentally Sound Regional Development*. UNCED, November 11-13, 1991. Nagoya, Japan.
- Haeruman, Herman Js, 1991b: 'Evidence and causes of unsustainable development'. Invited paper presented at the *Seminar on Economy and Ecology*, SPES, 6-7 May 1991. Jakarta, Indonesia.
- Haeruman, Herman Js, 1992: 'Masalah sosial dalam pembangunan kehutanan' (Social problems in forestry development). Paper presented in a *Seminar on Social Issues of Forestry Development*, University of Indonesia, 4-5 March 1992. Jakarta, Indonesia.
- Haeruman, Herman Js, 1992: 'Pembangunan dan keadaan sumberdaya alam hutan di Sumatra' (Development and condition of forest resources in Sumatra). Paper presented in a *Workshop on Conservation of Biological Resources for Sumatra Development*. BIOTROP, 16-18 September 1992. Bogor, Indonesia.
- RePPProT, 1990: *The Land Resources of Indonesia: A National Overview*. Ministry of Transmigration, Jakarta
- WCED, 1987: *Our Common Future*. Oxford University Press. Oxford and New York.

INTER-SECTORAL LINKAGES IN PAKISTAN

THE INTERACTION BETWEEN LAND SETTLEMENT, TENURE, PROPERTY RIGHTS AND FOREST MANAGEMENT AND DEVELOPMENT*

1. Overview

A critical issue of concern to Pakistan is the interaction between the forestry sector and land settlement, tenure and property rights in the North West Frontier Province (NWFP). The biggest challenge to forestry today does not stem from technical factors (the improvement of harvesting and planting management), but from institutional factors such as property and utilization rights over forests. Concern with these institutional issues has dominated the formulation and implementation of forestry policy in Pakistan. Inability to effectively manage these issues is leading to deforestation, over-grazing of rangelands and deterioration in the natural resource base of the country.

2. The forestry sector in Pakistan

Pakistan's forest cover is only 5.4 per cent of the country's area and only 3 per cent is considered commercially productive. Compared to other provinces, NWFP has a rich endowment of forests which comprise 14 per cent (or 3.59 million ha) of its total area. Most are natural and occur at high elevation in fragile mountains in the north. About 18 per cent of these are young plantations recently raised under different development programmes. The remaining are natural forests, 90 per cent of which grow in Hazara and Malakand. Only 52 per cent of the forests in NWFP are considered commercially productive. While the country's best forests grow in NWFP, its share of the wood-based industries and associated employment is about 5 per cent. Most of the lumber is exported unprocessed to other provinces. Forestry employs about 70,000 people in the Province.

Firewood is the main source of domestic energy supplemented by animal wastes and crop residues. About 90 per cent of the rural population uses these traditional fuels. The existing forests supply less than one-fifth of the timber and only one-fourth of the firewood needs of the country. The majority of the production comes from scattered trees privately grown on farms and rangelands. It is estimated that farm forests supply more than one-half of the timber and three-fourths of the firewood demand of the nation. The remaining timber demand is met through imports.

Based on official figures alone, it is difficult to say with certainty whether Pakistan's forest area has been increasing or decreasing (barring the additions due to the incorporation of the former princely states). Widespread anecdotal evidence (including some quoted in the National Conservation Strategy of 1991) is, however, ambiguous: there has been a significant reduction in natural forests over the last 30-40 years, a process which many feel is still continuing. The lower parts of the mountain ranges are denuded. Some slopes may have lost their vegetation recently, but many have been devoid of trees for more than a century. Conversion from rain-fed and grazing land to irrigated agriculture has been a dominant trend in the natural resource base over the last 100 years. Together with improvement in agricultural technology, it has resulted in large increases in agricultural production that have enabled the country to just keep pace with the growing population. The consequences of this trend include a certain loss of biodiversity and the displacement of traditional (nomadic or transhumant) populations by sedentary populations (including settlers into the newly irrigated regions).

Official data on the area of rangelands is not available, however some are being converted to irrigated agriculture, while other areas may have been degraded significantly in the recent past. Rangelands, forests and cultivated areas have come under substantial pressure in recent years from large increases

* This is the edited version of a paper presented at the meeting by Maliha H. Hussein (EDC Pvt. Limited, Pakistan).

in human and livestock populations. The human population has doubled to 110 million in the 25 years since the mid-1960s. In the last 20 years, the numbers of sheep and goats have more than doubled, thus adding to the pressure on forests and rangelands.

The most important function of the forests is the protection of watersheds to prolong the useful lives of the Tarbela Dam, Mangla Dam and other water reservoirs. The need for watershed protection is reflected in all intents and plans of the Forest Department. However, the local people see the forests more as a perpetual source of wood and fodder for domestic consumption. The forests are also a major source of revenue for the state and the local people. Thus local and commercial uses take precedence over long-term conservation needs.

At 1 per cent of the growing stock, the annual yield from the commercial forests is assessed to be 18.87 million cubic feet (0.5 m³). Currently about 10 million cubic feet (0.28 m³) of the potential yield is harvested. The remainder is lost due to the inaccessibility of the forests, disputes among people and removal of trees for domestic use. In 1990-91, commercial harvests from the forests generated a revenue of Rs 298 million for the state. The forest owners and concessionaires are estimated to have received more than three times as much of the royalty from forest harvesting. Since 1977, timber harvesting has been assigned to a state-run Forest Development Corporation (FDC).

Commercial harvesting is not the biggest consumer of the forests. The major demand comes from firewood and grazing of animals. The transhumant livelihood system of the nomadic people hampers natural regeneration of forests and affects their long-term stability. The increase in population, a narrow economic base and lack of alternative means of living is forcing people to draw on the forests more heavily than before. Consequently, the capacity of forests is increasingly constrained. The problem is acute in communal forests and state forests heavily encumbered with local rights and concessions. The influx of Afghan refugees has added another dimension to forestry in NWFP. They have brought along millions of livestock and are mostly camped near the forests and use them intensively.

Pakistan faces many of the environmental problems of a third world country. These include resource degradation due to lack of protection and enforceable ownership rights, and pressures on natural resources due to increases in population and incomes. As a result, the natural resources have been undergoing rapid and extensive deterioration in terms of quantity and quality, with adverse effects on the environment, the economy, and particularly the well-being of the poorest segments of society. These trends can be observed in forests, water and land.

3. Forms of property and forest classification

There are several types of ownership of the forest resources in Pakistan. Within the two principal categories of state and private ownership, there exists a variety of arrangements governing ownership, management and use of trees. Reserved Forests are state-owned and very few private rights are admitted on them. In contrast, the Protected Forests are heavily burdened with private and communal rights and concessions. On communal or individual forests rights are determined by communities or individuals. Communal (*shamilaat*) forests are managed under community rules enforced by village institutions (if they exist) such as the *numberdar* or the *jirga*. Such institutions may also exercise some control over trees on individually owned land, so that the interests of neighbouring farmers are protected.

Guzara Forests, which are also classified as private, are owned by individuals or communities, but are managed by the state. In recent years, forest cooperatives have been established in Hazara to share in the sale proceeds from these forests.

Table 1: Ownership of Pakistan's Forest

	Forest Area (per cent)
State Forests	61.5
State*	22.7
Reserved	13.9
Protected	21.8
Unclassed	0.9
Resumed	2.2
Private Forests	34.0
<i>Guzara</i>	13.6
Communal	19.2
Section 38	1.1
<i>Chas Act</i>	0.1
Mixed Forests	4.5
Total	100.0

Source: Abeeaddullah Jan (1992)

* No further explanation provided in source.

Under state-owned forests, community rights and concessions are available for protected forests. The various rights and 'concessions' (as they are called in the Forest Act of 1927) given to dependent communities include: the rights of firewood collection, free grant of timber, grazing, grass cutting and other customary rights and concessions recorded in the *wajib-ul-arz*. In some areas (such as Malakand Division), local people also have 60-80 per cent share in the proceeds of sales of timber. The distribution of forest area by type of ownership is shown in Table 1

Table 2: Classification of Forests in NWFP

Category	Area (000 acres)	Share (%)
Reserved Forests	239	7
Protected Forests	1,266	35
<i>Guzara</i> Forests	1,358	38
Special Areas	62	2
Afforestation Areas	665	18
Total	3,590	100

In addition to the categories already discussed, the NWFP classification includes special areas and afforested areas (Table 2). Special areas are those which are afforded special legal treatment under forest laws. These are mostly areas voluntarily surrendered by the people to the protection and management of the Forest Department for a specified period. The areas afforested under various development programmes are classed as afforestation areas. These are mostly private and communal lands with an unclear arrangement for their protection and management.

4. Interactions between the sectors

Adding the areas of protected forests and private forests indicates that about 56 per cent of the forest area of the country has some legally acknowledged community (ownership or use) rights over it. In NWFP, the same rights extend to more than 73 per cent of the forest area. In addition, about 53 per cent of the total NWFP area is classified as rangeland/wasteland, thereby indicating the uncertainty of ownership in this area. These figures highlight the importance of institutional issues to forest management and development in Pakistan.

Land settlement has not been completed in and around most of the forest area in NWFP. Settlement simply formalizes land claims and establishes legal title. The Reserved Forests are those where land settlement has been formalized in the sense that the government has established title for itself. The Protected Forests, on the other hand, are those in which legal title has not been established and land settlement has not taken place. In the absence of *de jure* title, there is a tendency to establish *de facto* title. Often the legitimacy of claims is established through long-term investments such as land development, plantation of trees or construction of irrigation channels. This is understandably opposed by those with competing claims. Afforestation programmes in Dir and Malakand Agency have particularly suffered as a result of competing claims.

The NWFP economy is agriculture based with about 23 per cent of its total land area under agriculture. However, 42 per cent of that area is farmed by tenant farmers (Pakistan Agriculture Census, 1980). This is significant because tenant farmers generally have a different cropping pattern from owner farmers. Farmers who own their land usually prefer to plant perennial crops which are less labour intensive like woodlots, fruit orchards or trees for fodder. Tenants prefer annual cash crops. However, the total area farmed by tenant farmers is gradually decreasing in NWFP and Pakistan as a whole. This could have positive implications for the total supply of fuelwood and timber in the country and on deforestation rates in the future.

Livestock farming forms an important aspect of the local integrated farming systems. Tenant families who enjoy grazing rights are generally not mindful of the long-term negative consequences of free-grazing animals on hillsides or rangelands. Free-grazing by the *Gujjars* or the landless livestock owners, who follow a transhumant livelihood system, and tenants has been a principal reason for the rapid deforestation, over-grazing and lack of natural regeneration of forests in NWFP.

Property and use rights over the natural resource base are generally regulated by custom rather than dictated by state policy. Thus traditional institutions have enforced these rights rather than state law-enforcing bodies. Common property regimes, grazing rights, collection of fuelwood, rules governing allowances of timber for construction were all determined by the traditional system. However, once the forest resources were put under strain by the increase in human and livestock populations and outside economic forces, local traditional institutions for the protection of natural resources were weakened. Official agencies have not been able to fill this institutional vacuum at the local level.

There is no legitimate mechanism for collective decision making through which a community can protect a resource, allocate rights and responsibilities over it and plan investments and improvement in its quality and quantity. Almost every contemporary environmental problem in Pakistan is confronted by the absence of legitimate mechanisms for collective decision making, e.g. vanishing forests, falling water tables in semi-arid areas, and co-existence of wildlife and traditional grazing rights.

The system of forest classification stems from a need to define the institutional arrangements under which they will be managed. Thus the forest classification in Pakistan does not spring from technical

considerations but from those of resource ownership. The major emphasis of the Forest Department is on this system of ownership. While systematic evidence is lacking, anecdotal evidence suggests that a ranking of property regimes (from least to most destructive) would be:

- Private individual ownership (not to be confused with temporary leases, whether of one or 99 years).
- *Shamilaat* with effective common property regimes - where there is no interference from the state.
- Forests owned and managed by the state - these have limited opportunities for 'leakages'.
- *Guzara*-type forests nominally owned by the community but managed by the state - here one would see the worst consequences of the combination of centralized managerial control with an approach that gives power to the representatives of a community without holding them accountable to the community at large.
- *Shamilaat*-type situations where traditional systems have broken down, but there is not even a nominal state role.

Without effective ownership, there continues to be an institutional vacuum at the local level for internalising the benefits and costs of forestry. In other words, the key issue is not technical or staffing problems, but the question of who owns the forest. As long as the forest remains alienated from the community, the harvesting of forest resources will continue on its present unsustainable course.

There is very little documentation on traditional management of pastures and rangelands in Pakistan, but there is a general view that traditional systems are unproductive and may lead to over-grazing. There is also a belief that these systems, dominated by *sardars* or tribal chiefs are highly inequitable. As in the case of forestry, it is important to distinguish between functioning traditional institutions and open access (the latter resulting from the disappearance of traditional institutions or mixed government-community control).

The picture of resource management that emerges from empirical studies on rangeland and pastures represents a complex set of issues in productivity, equitableness and sustainability. Effective traditional institutions tend to represent lower but more sustainable levels of productivity than non-traditional systems. Traditional systems often depend on the seasonal mobility of people and livestock to balance fodder and forage needs with the carrying capacity of ranges and pastures. They may also regulate the type and number of livestock, the periods of opening and closure, and the rights of different communities sharing a pasture or range.

Major changes affecting traditional management systems in recent years include restrictions on the movement of livestock and people across international boundaries; notwithstanding these restrictions, the influx of Afghan refugees; and introduction of legislation that has converted some traditional pastures and ranges into protected wildlife areas. When exposed to rapid change, traditional common property systems have tended to become less sustainable. They may also have degenerated from effective community institutions to individualized private property in some cases. Future institution-building for pasture and resource management would require attention to both sustainability and equitableness issues, in addition to productivity enhancing measures.

5. Policy formulation and implementation

Pakistan's policy for the protection of resources continues the colonial tradition of focus on resources extraction and financial gain for the institutions of the state rather than resource development for society. Most of the existing forest laws are the legacy of the colonial rule, are restrictive and are not responsive to today's challenges to forest management and development. The stated forestry policy objectives are aimed at expanding the forest resources of the country to make it self-sufficient in wood, to afford protective cover for important watersheds and to increase economic returns from trees. The relative emphasis on different goals vary among the four provinces. Generally, forest protection and revenue generation receive more emphasis but watershed management, social forestry, wildlife conservation and recreation are also gaining importance.

The centralized, colonial approach of government agencies also has another manifestation: investment in natural resources has been technique-oriented, rather than directed towards people and resources. Considerable investment has been made in recent years in the techniques of watershed development, social forestry, on-farm water management and soil conservation. Large government departments, often donor-supported, promote these activities. Most, if not all, of these techniques are based on a standard package of inputs, dominated by civil works and machinery, that appear to change very little over time and across regions. The needs of local communities living in diverse social and environmental conditions are seldom incorporated into this type of planning and investment for resources.

Plans and policies are formulated and enforced from the top, rather than discussed with and implemented by local people and their institutions. One consequence of this approach is that indigenous knowledge and local patterns of resource use are seldom reflected in official plans and policies. Another consequence is that traditional institutions for resource management are by-passed and undermined, while more expensive and less effective administrative systems are created. Yet another consequence is that local communities have little stake in the agenda, plans and projects that are devised and implemented by distant planners. All these consequences are serious threats to sustainable development.

A major problem area is the failure to use economic mechanisms for prudent resource use and the exclusive reliance on administrative (often colonial) mechanisms for control, policing and enforcement. Examples of desirable economic mechanisms include competition in the provision of municipal services, pricing for resource conservation and security of tenure over forest areas. That official policy has failed to use such mechanisms in furtherance of sustainable development is due, in large part, to three factors: (i) a tradition of distant and centralized bureaucratic management inherited from colonial times that confers extraordinary and discretionary powers on officials; (ii) the rights of local communities are considered to be of little or secondary importance relative to the rights of official agencies, as interpreted by the current national context; and (iii) perhaps most importantly in the current national context, the absence of legitimate mechanisms through which individual, corporate and community rights can be enforced.

6. Inter-sectoral linkages: policy reform and policy instruments

Key issues which arise from an analysis of the inter-sectoral linkages between the forestry sector and land settlement, tenure and property rights in Pakistan, point to the need for reform in the formulation and implementation of forestry policy and that of related sectors. Policy instruments which are likely to be most effective in achieving the desired reform have been identified.

The principal issue which arises as a result of the existing land settlement practices, tenancy and the lack of clear definition of property rights is the low level of investment in forest management and development. This level of investment is due to the uncertainty about who owns the forests, the nature of rights and the long-term pay-off to invest in the forestry sector. The government does not have the resources to invest in the forestry sector and so far has adopted a primarily administrative approach to forest management and development. Pakistan's forestry policy needs to adopt a broader social forestry approach in order to involve the owners and users of forest resources to invest in their development.

The overall development of the forest resources is linked to policies of agricultural development, irrigation management, livestock and livelihood systems. Policy formulation is not generally a well-coordinated exercise on specific issues. A farming systems perspective which recognizes that a host of problems in the forestry sector originate in other sectors is critical to this coordination. In Pakistan, these issues include the free grazing of animals, livestock management practices, lack of alternate sources of fuel and the high rate of population growth.

Sectoral policy planning in Pakistan is fairly fragmented and the true incidence of individual sectoral policies is on the household decision making and resource management matrix. Sectoral policies lack a household focus which is invaluable in studying and analyzing such multi-sectoral issues as crop-livestock interactions, livestock and forest management, land tenure and forest development, labour markets and use of forest resources.

There are few policy instruments available to the government to effect the desired changes in behaviour. Leverage over existing land settlement practices or the definition of property rights is limited, so the government has basically tried an administrative approach to the enforcement of property rights and forest management. It is suggested that an economic approach to behavioral change is likely to be more effective and sustainable in managing and developing Pakistan's forest resources. The economic approach embodies the following aspects:

- Incentives to change cropping patterns (annual to perennial crops), livestock management systems (free grazing to stall feeding) and farming systems (diversification to specialization).

- Build into development strategies the incentives which enable the transfer of benefits from long-term investment in forest development into short-term gains for the immediate losers from such investments.

The Forest Department needs to experiment with outreach mechanisms that devolve financial and managerial responsibility for communication and extension to local communities of farmers. The need for community involvement that emerges in the context of extensions for forestry appears even more pressing when it is recognized that there is, at present, no extension mechanism for community forests. Additional measures which can assist in changing the orientation of forest officials are training programmes in inter-sectoral linkages and inter-departmental transfers to understand and appreciate these linkages in practice.

REFERENCES

- M. Rafiq, 1992: *Forestry in NWFP*. NWFP Forest Department, Pakistan.
- Tariq Husain, 1991: Contributions to the UNCED '92 Report.
- Abeedullah Jan, 1992: 'Review and analysis of forestry policies of Pakistan'. Paper presented at the Regional Expert Consultation on Forestry Policy Developments and Research Implications in Asia and the Pacific. FAO Regional Office for Asia and the Pacific, 5-9 October 1992. Bangkok, Thailand.

INTER-SECTORAL LINKAGES IN THAILAND

FOREST CONSERVATION AND MINERAL RESOURCE DEVELOPMENT CAN THEY CO-EXIST?*

1. Introduction

In Thailand, development guidelines are articulated in the 5-year National Economic and Social Development Plan (NESDP). The present Plan, the seventh of its kind, covers the period from 1992 to 1996. The chapter on 'Management of Natural Resources' clearly describes specific programmes to manage forest and mineral resources.

In forest management, the Seventh Plan calls for effective protection of 'conservation forest' - national parks, wildlife sanctuaries and watersheds - maintaining at least 25 per cent of the country (12.8 million ha) under natural forest. This will be done through implementation of forest protection plans, with regular assessment of the outcome in order to arrest forest encroachment activities. Demarcation of clear forest boundaries will also ensure that encroachment can be effectively controlled.

To manage 'economic forest' - forest reserves which have been encroached by landless farmers covering a total area of 7.68 million ha (15 per cent of land area) - the government will rely upon participation of farmers at the village level through social forestry, proclamation of an Act giving legal status to community forest within the Seventh Plan period, and the use of modern technologies - remote sensing and geographic information systems in monitoring changes in forest land use.

The national target is to protect existing forest lands, while attempting to reforest through small-scale community actions. At the same time, the Seventh Plan specifies programmes for mineral resource development as follows:

- Promote value-added in mineral resource consumption, by facilitating domestic mineral processing rather than the export of raw minerals.
- Designate mineral resource development zones to support future demands in mineral resources. Private sector will be encouraged to participate in mineral exploration activities.
- Speed up reliable estimation of mineral reserves and encourage exploration of mineral deposits by the private sector.
- Reduce adverse impact to the environment through strict enforcement of regulatory measures and the establishment of a mining rehabilitation fund.

While Thailand produces 23 different minerals, not all production is consumed domestically. At the same time, with increasing industrialization, a number of key minerals need to be imported to satisfy development demands. Mineral production and consumption in Thailand have steadily increased since 1984. Major exports are gypsum, feldspar and dolomite while coal is the major import. Mineral reserves are extensive but these deposits often lie within the forest boundaries, thereby causing a major conflict between environmental concerns and development needs. Based on Bank of Thailand figures, the mining and quarrying sector contributed 2.6 per cent of the Gross Domestic Product in 1991 and this has remained fairly constant over the past five years.

* This is the edited version of a paper presented at the meeting by Dhira Phantumvanit (Director, Natural Resources and Environment Program, Thailand Development Research Institute) and Duangjai Intarapavich (Research Fellow, Natural Resources and Environment Program, Thailand Development Research Institute).

2. Potential conflict

The potential area of conflict lies in the protection of the remaining primary forests of Thailand. Latest statistics from the Royal Forestry Department (September 1992) verify that only 26 per cent of Thailand is under natural forest, causing great public concern. In January 1989, a national ban on logging was promulgated, revoking all forest concessions. Since the logging ban, there have been more publicized cases of arrest and prosecution of illegal poachers and unscrupulous land speculators attempting to acquire forest lands by illegal means such as title deed forgery. Such conscientious efforts have succeeded in slowing the deforestation rate.

There is a consensus among the media and concerned citizens that the remaining natural forests should be protected at all cost. However, this runs counter to the needs for mineral resources development in Thailand's industrialization. There is an increasing demand for raw minerals to feed industries - limestone for cement production and lignite for energy generation, to name just two. This has led to a growing pressure to explore for additional reserves of these vital minerals, many of which may be found in the designated 'conservation forest' areas.

Aside from the falling prices for raw minerals, environment has emerged as the single most important factor standing in the way of more mineral exploration. When government designates an area as a national park, a wildlife sanctuary or a prime watershed area (Class 1 according to the official definition), it becomes off-limits to mineral exploration. Furthermore, the mining industry is often criticized as the destroyer of the forest, keen to plunder the remaining virgin lands only to satisfy its own commercial interest.

The key question, therefore, is whether the conflicting interests between forest conservation and mineral resource development can be reconciled.

3. Environmental impacts of mining activities

Mineral extraction has left unhealed scars on many natural landscapes. One major environmental problem generated by mining activity is land degradation. Most surface mines in Thailand use both wet (hydraulic) and dry mining methods that involve the removal of top soil and overburden. The inevitable changes in topography can be visually abhorrent. In such cases, land reclamation is necessary. In the exceptional case of underground mining, the physical degradation of the surface land is considered minimal. If underground openings or tunnels are plugged after mine closure, acid or alkaline mine leachate can be prevented.

A major problem of mining operations affecting the communities that are located downstream is the pollution of water bodies by slime discharged from hydraulic mining operations. Most hydraulic mines (especially tin mines) produce slime water which, if not properly contained, will be a source of water pollution. Effective tailing ponds should consist of at least two stages. The first stage retains soil and gravel tailings, while the second stage is for slime settling, after which only relatively clear water is discharged. Problems arise when the ponds are too small to retain all the tailings, too small to allow sufficient time for slime to settle, or have been filled up with mine tailings due to improper maintenance.

4. Current measures for environmental protection

The Department of Mineral Resources (DMR) regulates pollution control measures by requiring that tailing ponds be constructed commensurate with estimated tailings. This is done on a case-by-case basis since the size of a tailing pond varies with the type of mining, the depth of ore deposits and the

ratio of overburden (soil and gravel) to ore. At the operational level, according to the Mineral Act, regulations and standards have been established to protect the environment. For example: mining is allowed at a distance of not less than 50 metres from public sources of water supply; discharged water should not contain more than 6 grams per litre of particulates; and a set of conditions is officially stipulated for occupational safety and health.

According to the National Environmental Quality Act a proposed mining project, regardless of its size, must submit an environmental impact assessment (EIA) report to the Office of Environmental Policy and Planning (OEPP) of the Ministry of Science, Technology and Environment (MOSTE) for approval. In addition, the applicant must also state clearly how he plans to protect or rehabilitate the environment in the mining area. Although the EIA requirement has resulted in the submission of hundreds of environmental impact reports related to mining, it has not proved to be an effective instrument for environmental control. Monitoring and compliance with follow-up activities as proposed in the EIAs has been less than adequate. Environmental rehabilitation activities are often shown only on paper but not executed in the field.

5. Land rehabilitation

Most minerals in Thailand are mined by the open-pit method which results in surface land degradation. The solution lies in establishing a new ground contour which will maintain the quality of the top soil and, at the same time where applicable, create new water reservoirs to serve local needs. The least expensive way in reclaiming the mined area is by in-pit dumping of overburden. Dumping into an adjacent mined-out pit is the most effective method of mine rehabilitation. Once in-pit dumping is completed, the last pit can be converted into a water reservoir or a recreational lake. The overburden, when returned into the pits, lacks nutrients necessary for agriculture. Thus, top soil is required to fertilize the overburden. It is thus important that top soil be removed and stored in the very first stage of mining to be returned to the overburden later. This practice requires planning in advance.

In 1981 the Thai government promulgated a ministerial regulation to collect a special fee from tin mining equivalent to 5 per cent of the tin royalty paid to DMR at that time. Half of the fee was awarded to the province where mining was located, one-fourth was set aside for the suppression of mineral smuggling, and the remainder was used for environmental rehabilitation. The collection of this special fee was suspended in late 1985 after the collapse of the international tin market resulted in economic depression of the local tin-mining industry, and it has not been resumed since.

Another example of rehabilitation has been carried out by the Electricity Generating Authority of Thailand (EGAT) for lignite mine reclamation at both its Mae Moh mine in Lampang Province and the Krabi mine in Krabi Province. Experimental rehabilitation projects to study soil conditions were performed as part of the programme and field projects identified the species of trees and plants suitable for rehabilitation. A mine reclamation plan was prepared for both the Mae Moh and Krabi mines, relying on a fund collected as a percentage of lignite sold. Unfortunately, such examples are still exceptions rather than the norm. This has led to the public perception that mining, particularly in forest land, creates adverse effects on the environment.

6. Conflicts over land use

The development of mineral resources causes environmental damages such as soil erosion, waste water discharge, air pollution and loss of aesthetics. These adverse environmental impacts can be modified if there is proper planning and management. However, in practice, miners often pay little attention to environmental problems and ignore post-mining rehabilitation and reforestation. The

accumulated damage resulting from reckless mining operations and inadequate reclamation of mined-out areas in the past has led to strong criticism from environmental advocates and the general public concerning the mineral industry's genuine interest in safeguarding the environment.

Two different government agencies issue mining permits and land-use rights. The former is under the mandate of the Department of Mineral Resources (DMR), while the Royal Forestry Department (RFD) oversees land use in forest reserves.

While DMR is promoting exploration and assessment of new reserves for mineral resource development, the RFD is currently expanding forest reserves in its programme to conserve wild fauna and flora. Such dual objectives often lead to conflicting viewpoints. To reconcile the differences, intra-governmental agency working groups have been established to consider the issue, with the national interest as the ultimate objective. The problem becomes how to decide which objective serves the national interest in the long run.

A third dimension to this conflict is the objective to safeguard Thailand's watersheds. This comes under the mandate of the Ministry of Science, Technology and Environment. MOSTE has been instrumental in the physical classification of watersheds throughout the country. Static parameters including slope, elevation and land form are used to identify protected areas which are off-limits to development activities. One criterion is that any area with a slope of 35 per cent or over is classified as 'conservation' area. However, mineral deposits, such as limestone, are normally located on sloped lands. Such a criterion may inadvertently create conflicts in implementation.

Regulatory measures may also become obstacles. For example, permission to use forest land is issued by the RFD for a 10-year period, while a mining licence issued by the DMR can be granted for up to a period of 25 years. Conflict occurs when permission to use forest land expires and RFD may refuse to renew it based on environmental grounds. This implies that the miner cannot use the land for mining activities though his licence is still valid!

As noted earlier, forest areas in Thailand are broadly classified as conservation forests and economic forests. The term *conservation forest* refers to forests that are protected for the purposes of preserving the country's biological diversity and consists of national parks, wildlife sanctuaries, Class 1 watershed areas and protected mangrove areas. The term *economic forest* refers to areas which were earlier classified as forest reserves but have already been encroached by farmers and in fact are being utilized as agricultural land or left fallow.

In May 1985, the Thai Cabinet endorsed the watershed classification scheme proposed by the Ministry of Science, Technology and Environment. Watershed areas are classified into 5 categories, Watershed Class 1 refers to conservation forest and headwater areas, and is divided into Classes 1A and 1B. The distinction within Class 1 is that natural vegetation in Class 1A still remains intact, while those in class 1B have already been cleared for agricultural use or are occupied by villagers. Watershed Class 2 refers to commercial forest; Watershed Class 3 refers to fruit orchards; Watershed Class 4 refers to upland farming; and Watershed Class 5 refers to lowland farming area.

At present, the total forest area in Thailand is around 26 per cent of the total area of the country. Under the Seventh NESDP, it is proposed that 40 per cent of the country's total area will be targeted for forest reserves, of which 25 per cent is set for conservation forest in which all developmental activities are prohibited. Fifteen per cent is designated as economic forest in which permission for mining activities will be considered on a case-by-case basis.

7. Land utilization for mineral resource development

Under the above proposal, part of the country is already excluded from mineral resource development. The total land area in Thailand is about 513,120 km². In 1978 the areas allocated for mining activities was 629 km² or approximately 0.12 per cent of the total land area. As a comparison, the granted areas for mining activities in 1990 was 478 km² or approximately 0.09 per cent of the total land area, of which the actual operating areas were much less than the granted areas.

The actual land requirement for mineral resource development is therefore minimal relative to the size of the country. The issue is not the total size of land required for mining activities, but rather the adverse environmental impact that mining might induce.

8. Viable solutions

Is it then possible to protect the remaining forests in Thailand while at the same time ensuring that minerals which are essential raw materials to many basic industries will continue to be available? Mineral deposits can only be found in specific geological locations and some inevitably are located in the conservation lands that cannot be developed. National parks and wildlife sanctuaries are legally protected by special laws which prohibit mining activities. With public opinion in the country tilted heavily towards the protection of the remaining forest, it is unlikely that any part of land falling under this category can be exempted for mineral exploration. In the conservation areas, over-riding value is assigned to the protection of biological diversity and the survival of the endangered fauna and flora for the benefits of future generations.

The mandate for protection of Watershed Class 1A lies in cabinet resolutions which, theoretically, can be modified with changing needs. However policies of governments in the past decade have been consistent, giving priority to watershed protection ahead of mineral resource development. Hence, to acquire new land for mineral extraction, emphasis should be given first to private land where the transfer of ownership rights is open to free market practices. Next in line is encroached forest reserves, which have already been turned into agricultural fields. These lands correspond to Watershed Classes 2, 3, 4 and 5.

9. Potential for future mineral resource development

The Department of Mineral Resources has just completed an air-borne geological survey (partially financed by ADB) which identifies 356 potential areas for mineral resource development, covering roughly 95,792 km² nation-wide. Most of the deposits are found among several types of ores. The combinations of zinc-lead, kaolin-pyrophyllite-ball clay-bentonite, feldspar-quartz, chromate-magnesite-talc-asbestos are commonly found in the same deposits. The potential deposits are found in varying sizes - from the largest deposits of lignite and oil shale of 47,078 km² to the smallest deposits of potash of 43 km².

However, not all of the potential areas can be developed. The ability to develop a mineral deposit depends on several factors, including grade of ores, the available mining technologies and existing infrastructure. In addition, institutional constraints such as existing laws and regulations on the use of forest land are key factors. Existing domestic mineral reserves could be enough for domestic consumption and export for several decades but may be located in the conservation areas where exploration and extraction activities are prohibited. The identified deposits can be classified as:

Mineral deposits wholly located in conservation forest, such as zinc deposits at Pai Wildlife Sanctuary, Pai District in Mae Hong Son Province and those at the Oob Luang National Park, Chom Thong District in Chiang Mai.

Mineral deposits only partially overlapping with conservation forests, such as lignite deposits at Mae Sareuy and Vieng Pa Pao Districts in Chiang Mai Province, and at Vieng Naou District in Lam Pang Province, where portions of the reserves overlap with the Doy Luang National Park.

Mineral deposits located around the border of conservation forests, such as marble deposits at Ban Tak District in Tak Province where the deposits are located close to the Mae Tuen Wildlife Sanctuary.

Mineral deposits located in Class 1A watershed areas.

Accessibility to the mineral deposits is prohibited in the first case because mining runs counter to the national interest to protect forest. Where minerals are located only partially within the reserves, those portions outside the conservation forest or watershed areas can still be developed.

The Mineral Resources Master Plan prepared by the Thailand Development Research Institute (April 1992) has predicted a growing domestic demand for minerals during the Seventh NESDP. Annual consumption of minerals is forecasted to rise at the following rates: kaolin 21.1 per cent, feldspar 19.4 per cent, limestones (for cement industry only) 13.3 per cent, gypsum (for domestic consumption only) 11.7 per cent, glass sand 12.6 per cent, marble 11.7 per cent, tin 10.6 per cent, granite 8.9 per cent and zinc 8.7 per cent. Even with such high growth, the development of mineral deposits, while avoiding land-use conflicts, is still possible since the actual size of land required is not great. The study indicates that a number of mineral reserve deposits are found outside conservation forests and others only partially overlap with conservation forests. This means those portions of the reserves outside the conservation forests can still be developed. Therefore, land-use conflicts can be reconciled by aiming first to develop the reserves outside the conservation forests. The study's conclusion shows that only some minerals will encounter problems of accessibility. These include glass sand, where several deposits are located in the areas considered as natural heritage, and lignite, where most of the deposits are located in the areas gazetted as national parks and wildlife sanctuaries.

10. Valuation of mineral resources

In Thailand, it is the forest sector that is gaining the upper hand by widespread public support to preserve forests. The mining sector needs to inform the public of the economic values of its activities to give a balanced viewpoint. A systematic mineral resource survey is vital to estimate net benefits from mining and obtain more geological data leading to better estimates of mineral reserves is vital. Reliable estimates of reserves is a pre-requisite to assessing comparative economic costs of different land uses.

The economic costs of mineral resources development should be fully assessed and compared with benefits from mining. In addition to production costs, there are opportunity costs in terms of foregone benefits from alternative uses of the land and future unavailability, environmental damages protection and rehabilitation costs, and the costs from loss of forest and biological diversity. The net benefits should then be compared with competing resource uses. Where the usage of land for mineral resource development offers the greater benefit, the land should be allocated to mining.

11. Designation of economic mining zone

After thorough benefit-cost analyses have been completed, if mineral resource development is finally considered to be the best possible use of the land, it is important that the government designate such

areas as economic mining zones. In these areas, mining activities should be given priority over other uses of the land, and applications for mining activities should be assessed and approved promptly and only by the DMR according to its rules and regulations, without further referral to various government agencies for final approval.

Two areas currently holding economic mining zone status in Thailand are an area of 10 km² around Had Sompan District in Ranong Province, and an area of 6,870 km² in Loei Province and the vicinity. Additional areas are in the process of approval as new economic mineral zones, including gemstone reserves in Chantaburi and Trad, limestone reserves for cement industry in Saraburi and Lopburi and other reserves in Kanchanaburi and Rajchaburi provinces. Such an approach will effectively reduce conflict in land use.

12. Conclusions

The inter-sectoral linkages between forestry and mineral resource development are unarguable, one cannot be sustainably managed without due consideration to the other. To date, the conflict of land use between the two sectors has been rhetoric, with conservationists blaming the mining industry for plundering virgin forests, and miners citing the imminent shortage of raw materials, and hence the collapse of Thailand's industrial bases unless more land becomes accessible to mineral exploration and extraction.

What is needed is more factual analysis of the highlighted conflicts. With the actual size required for mining of only about 0.1 per cent of the total land area of Thailand, there is room both for mineral resource development and forest conservation.

PART III

SYNTHESIS OF RESULTS OF THE EXPERT CONSULTATION ON FORESTRY POLICY DEVELOPMENTS AND RESEARCH IMPLICATIONS IN ASIA AND THE PACIFIC

The Expert Consultation on Forestry Policy Developments and Research Implications in Asia and the Pacific¹

I. INTRODUCTION

The Regional Expert Consultation on Forestry Policy Developments and Research Implications in Asia and the Pacific was organized by FAO, with joint sponsorship from the International Food Policy Research Institute (IFPRI) and the Centre for International Forestry Research (CIFOR) with the support of the FAO/ADB/UNDP Regional Project, "Forestry Research Support Programme for Asia and the Pacific (FORSPA)".

The Expert Consultation was held at the FAO Regional Office for Asia and the Pacific (FAO/RAPA) in Bangkok, Thailand, from 5 to 9 October 1992. The programme of the Expert Consultation and the list of participants are provided in Annexes 1 and 2.

The reports on national forestry policies and on intersectoral aspects of forestry policies from seventeen countries of the Region as reproduced in Parts I and II constituted the main basis for the discussion of the Expert Consultation.

In the course of the Expert Consultation the participants organized themselves into four working groups to deal with the main steps of the logical process of policy development:

- Main issues and processes related to national forestry policy formulation;
- Exogenous forces and intersectoral linkages affecting forestry policies;
- Main issues and constraints affecting forestry policy implementation; and
- Policy research issues and priorities.

On each topic the working groups focused their attention on major problems and opportunities influencing forestry policies in the Asia-Pacific Region, on the main experiences and constraints affecting the development of those policies, and on priorities for action and means of implementation.

A concise synthesis of the results of discussions that took place at the Expert Consultation is presented here. At the same time, since it incorporates the conclusions of the groups' work under the relevant sections, there may be some repetition. Such overlapping of treatment is, however, indicative of the genuine importance that participants were attaching to some particular aspects of forestry policies in the Region.

¹ The report of the Consultation was published by the FAO Regional Office for Asia and the Pacific under the reference RAPA Publication: 1993/16. June 1993

2. THE FRAMEWORK FOR CONSIDERATION OF FORESTRY POLICIES

It should be recognized from the outset that sound forestry policies cannot be developed in isolation, but must be considered within the broader framework of national goals for economic and social development, especially those related to sustainable natural resource management, equity and poverty alleviation, employment creation, reducing population pressures, and people's participation in development. If forestry policies do not contribute to those goals, or conversely, if policies in other sectors run counter to them, the problems identified by the working groups will become even more difficult to solve. International policies, such as those arising from the UNCED meeting in Rio de Janeiro in June 1992, or those promoted by the IMF and the World Bank, also have to be taken into consideration.

A further important reason for developing forestry policies in a flexible and systemic framework is that there are considerable areas of overlap, inter-connections, and interaction among the main issues affecting the formation of policy within and outside the forestry sector. Thus, it may not be practicable to find solutions to one issue without ameliorating linked problems; or, if those inter-relationships are not recognized or are ignored, an apparent solution to one problem may exacerbate others, even within the forestry sector itself.

Both national policies and sectoral policies are affected by exogenous factors. In the first case those factors may be due to policies of neighbouring countries, or of regional groupings; or they may be the result of international factors, especially trade relations, and in recent years environmental policies. In policies affecting natural resource management, especially forestry, environmental issues have become paramount.

In the case of the individual sectors of a national economy, such as forestry, the exogenous pressures affecting policy may be exerted directly on the sector or indirectly by events outside the country through their influence on national policy. On the other hand they may also be due to internal policy decisions of the government affecting the economy as a whole, other sectors that impinge on forestry, (particularly agricultural land use, and forest related industrial policies), or the forestry sector specifically. In such cases, they may be seen as exogenous to that sector, but endogenous to the country. Both types of external influence on the forestry sector are included as 'exogenous' in Section 5.

In countries with diminishing or scarce forest resources, the supply of forest products originates mostly from trees and small woodlots grown in combination with other crops in non-forest land uses. Those countries are focusing their attention on agroforestry systems and on forestry activities outside forest lands. The interaction between forestry and agricultural policies influences the development of agroforestry as a component of forestry policies that may be more important in some countries than traditional forestry activities. Thus, reference is often made to policies for forestry and agroforestry.

3. CROSS-CUTTING ISSUES OF MAJOR SIGNIFICANCE TO COUNTRIES OF THE REGION

Nine main 'cross-cutting' issues have been identified, each representing a synthesis of the discussions of all four working groups and the subsequent plenary session. Those issues are listed below:

1. Macro-economic and inter-sectoral effects of national policies on forestry and agroforestry;
2. External influences and their impact on national forestry and land use policies;
3. Issues related to sustainable land use in forests and forest fringes;
4. Alternative forms of land use to forests, and their potential;
5. Decentralization and transfer of responsibilities for forest management from government agencies to local communities, user groups, and private enterprise;
6. Shifting the emphasis from industrial to non-timber forest products;
7. Policy issues related to accelerated industrialization policies, and increased emphasis on domestic processing of timber;
8. Ameliorating institutional obstacles to sustainable forestry and agroforestry management; and
9. Action related to implementation of the recommendations of the expert consultation.

3.1 Macro-economic and Inter-sectoral effects of national policies on forestry and agroforestry

These may affect forestry or agroforestry, either as a result of policies affecting the economy as a whole, or through the impact of policies applied in other sectors of the economy, especially agriculture and industry.

National policies include economic decisions such as exchange rates, taxes, subsidies, prices, and credit policies; investments in equipment, inputs, and infrastructure, which may have powerful effects on logging, timber extraction, and processing, (also facilitating access to the forests by squatters); social policies, particularly those affecting population growth, employment, land, tenure, and food security; and environmental decisions concerning protection of forests and wildlife, timber extraction, and 'ecotourism'. Reductions in public expenditure due to structural adjustment may affect resource allocations for education, training, research, extension and other services at the sectoral level, which are also set initially by the central government; as are many bureaucratic rules, legal standards, and civil service pay scales and allowances.

Most of these influences were discussed in several contexts, usually as constraints to progress rather than as opportunities. However it was recognized that forestry policy has often been planned in isolation, and that closer relations need to be forged between the forestry administrators and national planners. This would enable the problems and the potential contribution of forestry to the national economy to be better understood by the policy-makers, and could lead to a 'more level-playing field' for the forest sector in terms of resource allocations, compared to other sectors. In order to assist policy formation, a particular need was seen for the establishment of national land use policies, which several countries currently lack. Another imperative is to bring outdated effective legislation and regulations affecting forestry and land use, into line with the modern realities reflected in current national policies.

In the case of land use planning it was recognized that this was an area requiring cooperation between sectors and multi-disciplinary expertise. In this context the constraint imposed by national shortages of people trained in the necessary disciplines was raised frequently.

3.2 External influences and their impact on national forestry policies

These mainly take three forms: i) indirect pressures through structural adjustment and other macro-economic interventions; ii) environment-related pressures exerted through trade relations, logging embargoes, debt for nature exchanges etc.; and iii) influences either by international or bilateral aid agencies, or by NGOs.

Increasing concern was expressed concerning the effects of these various pressures on their freedom to develop and use their forest resources as they see fit. A need was seen for action to try and dispel concerns of developed countries and NGO's over forest resource use and management. Research to provide objective information (for example on the value of tree plantations as a sustainable alternative to natural forests), could defuse current misunderstandings e.g. over CO₂ absorption by trees, and global warming. There was a feeling that developing countries are being expected to bear an unfair share of the burden of mitigating global warming.

There is a perceived contradiction between the international call for agreements imposing controls on land use, which imply 'top-down' national planning and central control; and parallel calls for more decentralized and participatory decision-making (especially at the project level), and for privatization of land use. While it was recognized that developing countries should do all they can to formulate and implement sound and sustainable forestry and land use policies, and to fulfil their commitments to Agenda 21, there is also a need for sympathetic understanding of their needs for economic development of forest resources from the industrialized nations. Improved information on their goals and actions with respect to sustainable forest management, and dialogue with those countries and NGO's in international fora, as well as at the national level, should be accorded higher priority in follow up to the UNCED meeting. Effective national land use policies, supported by environment impact analyses, would provide valuable support to these efforts. For the short term, however, resource assessment is likely to be hampered by a shortage of national staff trained in the necessary disciplines, both for carrying out the work of geographic information systems (GIS), and for monitoring its accuracy.

Countries with relatively abundant forest resources are likely to pay more attention to international issues and to those affecting the sustainable management and harvesting of national forests, e.g. i) impacts of proposed international forestry initiatives, including effects of logging bans, import/export bans, eco-labelling etc., ii) exploration of options for compliance with international agreements, iii) participation in international research efforts related to sustainable natural resource management, and iv) global warming, especially concerning the role of forest plantations and other forms of tree culture in carbon sequestration and environmental conservation.

3.3 Issues related to sustainable land use in forests and forest fringes

A clear distinction must be made between encroachment on forests by migrants from other areas, and traditional shifting cultivation and movements of people, especially tribal people, within forested areas.

Migration to forested areas is generated by the external pressures of rapid population growth, poverty, and lack of employment opportunities in other areas, and is therefore an inter-sectoral issue. The movements of existing (mainly tribal) people within the forests are related to unsustainable

shifting cultivation, and sometimes to pressures to move exerted by forestry staff or by settlement policies. Overall, the consultation recognized this as an over-riding issue.

In general, much remains to be understood concerning the dynamics of migration and its driving forces, but there is a great urgency to find solutions, since encroachment on forests is leading to loss of economic opportunity, to environmental degradation and loss of biodiversity, which threaten the future productive capacity of the resource.

While several countries of the region are collaborating in attempts to find solutions to these problems, it is clear that it will not be easy, since it involves other difficult issues of policy, all of which were raised frequently in the working groups and country papers. These relate to: i) population growth, ii) the effects of structural adjustment policies on employment outside forestry, iii) lack of access to land and rights to common property resources, iv) land settlement issues, v) the impact of infrastructural development (including that accompanying log extraction) on providing access to forest lands, and vi) the possibilities of raising the productivity of agricultural land.

3.4 Alternative forms of land use to natural forests, and their role

Regardless of the fixed quotas set by some governments for the share of forests in land use, the area under natural forests is likely to contract progressively as population pressures increase, despite efforts to protect forests, establish buffer zones, enter into 'debt-for-nature' swaps, and other policy measures.

Options for sustainable alternative forms of land management include: i) plantations either of 'forest' trees or of fruit or other tropical commercial species (rubber, coconuts, cocoa, etc.), ii) agroforestry and trees on farms (with or without livestock), iii) grazing land improvement, and iv) arable agriculture.

The choice may be determined by a number of factors including the local ecology, land tenure patterns, traditional skills of local people, availability of capital and markets for products, external know-how, etc. In particular, a need to look in more depth at the potential of farm forestry.

In addition to reduced forest lands, attention should also be focused on the issue of the large areas of unproductive land that have already been stripped of trees and whether such land could be reclaimed economically, and for what future purposes. While the causes and remedies differ among wet and dry environments, the overall problem is considered to be a major policy issue.

3.5 Decentralization and transfer of responsibilities for forest management from government agencies to local communities, user groups, and private enterprises of various kinds

Related to this are issues of ownership, tenure, access and usufruct, especially concerning common property resources.

Clearly this issue is seen as one of importance, since most countries assign significance to it in their national forestry policies, as well as promoting people's participation in the implementation of those policies, though less commonly in their formulation.

In some Asian countries, measures to transfer greater responsibility for forest management and afforestation from government agencies to local authorities, communities, and individual stakeholders are already in hand, although much remains to be learnt about the risks, benefits, and successful mechanisms for implementing them.

A further extension of such measures is privatization of land, or alternatively, rights to plant trees on land leased from the state; this option is being exercised with respect to plantations in several countries, some of which have market economies, e.g. New Zealand and others with centrally planned economies, e.g. China.

While there are elements of doubt concerning the risks of misuse and degradation of land once it is out of the direct control of the government forest services, most countries see the need to move towards community and private forestry as a possible means of alleviating the free-for-all problems of common access described under 3.3 above and also to relieve some of the pressures on the limited resources of the government services.

The latter emerges as a constraint to efficient professional forest management in several countries, because of a shortage of trained staff and an excess of regulatory and service duties, including the provision of technical assistance to farmers. However, forestry professionals will still have an important technical and advisory role to play in oversight, research, supervision of nursery stock production and hygiene standards. Some traditional service tasks might be decentralized and some services privatized, such as nursery management.

3.6 Shifting the emphasis from industrial to non-timber forest products.

Most countries are placing some priority on broadening the product base of forestry beyond traditional timber products. The nature of the products vary between those countries with a basically wet tropical economy, and the drier countries especially in South Asia and most of China. Much needs to be learnt about the supply and the demand for such products, and their importance for family nutrition, food security, livestock, energy, commercial sale or processing.

Issues on protection of rights for products or processes also arise. These may affect not only national policies on royalties, patents, and intellectual property rights, but those of the international agricultural research centres of the CGIAR, regional research institutions, and development assistance agencies such as FAO.

The role of forestry in rural employment and income also involves more general consideration of the potential of trees in land use, including plantation crops, agroforestry systems, and homestead lots. In some countries the value of such products exceeds that from the natural forests.

However, there are also areas of uncertainty, including the nature and scope of market demand and potential for commercialization of such products, which cover a wide range of wood, food, fuel, medicinal, fodder, and other end uses including service benefits such as shelter, windbreaks, nitrogen fixation, and soil conservation, which are difficult to assess and to value.

In some cases, there are already markets for non-timber products from plantations, agroforestry systems, and trees and shrubs in degraded forests for fodder and fuelwood. While the latter have often been regarded as free goods, they are being commercialized by entrepreneurs in some countries, mainly for sale to urban areas. This particularly applies to fuelwood. It also relates to questions of transfer of resource use to local people discussed under issue 3.5 above, and whether rights or concessions to fuelwood resources, or to manage or protect national parks and wildlife reserves, could be given to local communities rather than to outsiders, in the hope that they would manage them in a less exploitative fashion.

3.7 Issues related to timber harvesting, the effects of accelerated industrialization policies, and increased emphasis on domestic processing of timber

The importance of the industrial component of forestry has in no way diminished and issues requiring renewed attention relate to the valuation of forest resources and fair market pricing of timber. Furthermore, government interventions should be structured to achieve sustainable management of forests and an equitable share of revenues under concessionary arrangements, as well as to recapture any losses due to improper harvesting of logs. The socio-economic and environmental impacts of bans on logging need to be better documented. Fiscal policies and taxes influence the economic efficiency of resource utilization and the real economic or other benefits of accelerated domestic processing of timber and manufacture of wood products. Relatively simple regulations need to be promulgated, the application of which can be easily monitored, together with the establishment of safe minimum harvesting standards.

Although these issues would seem to be predominantly related to the countries with abundant forests, this distinction is becoming somewhat blurred by log export bans by some of those countries, and by related decisions on log imports. Concern was expressed by participants that these measures might be accelerating deforestation in some of the countries that are still exporters of logs in order to supply those imports.

There is a need for empirical evidence to shed light on many of these issues; not least to promote better understanding between north and south on changing tropical timber harvesting practices and other ongoing efforts of developing countries to achieve sustained yield management of natural forests.

3.8 Ameliorating institutional obstacles to sustainable and efficient forest management

The rigidity and resistance to change of public forestry administrations was seen to be an important constraint to the development of more flexible and outward looking forestry policies. Isolation of senior forestry staff from national policy makers is also a matter of concern, leading to low priority for the forestry sector in national plans and financial allocations. These difficulties are being compounded by the apportioning of responsibility for forestry and agriculture among different Ministries, including Ministries of environment and/or natural resources, with the location of forestry in the government structure varying from country to country.

Lack of sufficient manpower with modern management skills, as well as a serious shortage of personnel in the forestry sector with training in natural resource management and social sciences, and experience of working with other disciplines in an interdisciplinary manner, acts as a further constraint, especially as existing forestry professionals are over-loaded with regulatory and service duties.

While there was widespread concern about this problem, it was recognized that reform of the forestry agencies to alleviate bureaucratic constraints, improve conditions of service, and institute modern management procedures would not be easy. The radical restructuring of a single service could still not succeed without a parallel reorganization of government procedures, ministerial responsibilities, and civil service regulations and conditions of service -- probably involving new legislation. Nevertheless this was considered to be an urgent issue for review by national governments.

Training to strengthen national forest cadres, especially with respect to the disciplines required for sound natural resource management, socio-economic, and policy research, was seen as an area that should receive immediate attention and support, both nationally and internationally. Priority should be given to updating existing curricula in the universities to provide appropriate training, integrating forestry into the larger university context, and encouraging interdisciplinary perspectives. Planning a comprehensive programme of human resource development requires an understanding of what the principal tasks, skill requirements, and overall demand for future forestry professionals will be; thus, it should be closely linked to long-term policies for the sector as a whole.

4. ISSUES, OPPORTUNITIES AND PROCESSES RELATED TO NATIONAL FORESTRY POLICY FORMULATION

The premise is that the national forestry policy should deal with "forest lands" including all biomass resources, the utilization of wastelands and degraded lands, and tree growing in other "non forest" land uses. The issues discussed were linked to forestry policy formulation, i.e. impacts of land use policies and practices, population and settlement policies, transfer of control and management to local groups, privatization and transfer of responsibilities to different actors (rural people, NGOs, local governments, private sector), the intersectoral relationships in forestry, the consultation process in policy formation and formulation.

4.1 Problems and Opportunities

Problems that must be considered when formulating national forestry policies include:

- Exploitation of forests beyond their carrying capacity has led to land degradation, soil erosion and related problems.
- In many countries of the region, forestry is treated as a residual land use with low priority in development programmes, resulting in inadequate allocation of financial resources for forestry development.
- The production capacity of forest land is finite but the demand is high and growing rapidly, exacerbated by a burgeoning population. The existing gap between demand and supply, even to meet minimum needs, has not diminished due to the recurrent deforestation process. Scientific management norms have been difficult to implement on a practical basis.
- The role of foresters, forest dwellers and the wider public in the formulation of forestry policies in some countries has been minimal, due to an unfavourable political environment and rigidity in bureaucratic procedures. Effective policy formulation has also been hampered by the lack of a consultative process involving user groups and other related players in forestry, as well as limited use and knowledge of mechanisms of conflict resolution.
- The long-term forestry gestation period must be reconciled with the immediate needs of the population, and requires improved understanding of the role of the forests and support for forest protection and development.
- Similarly, the environmental and ecological requirements are confronted with resistance and antagonism as they are seen to restrict free access to the resources.

The increasing awareness of the important role of forestry and a better understanding in terms of its contribution to rural and national economic development, should contribute to overcoming the

above-mentioned problems and lead to a concerted effort towards forest conservation and development. This is also evident from the political awareness generated during the UNCED meeting.

4.2 Experiences and Constraints

Forestry policy formulation is constrained by:

- The lack of comprehensive and updated information on the forest resource base and on socio-economic and demographic features, as well as with the traditions of the people;
- Inadequate capabilities to undertake analysis related to policy formulation, impact assessment, and policy implementation;
- Lack of or inappropriate land use policies and guidelines;
- Lack of established procedures within most Forest Departments and Ministries to undertake work relating to policy formulation;
- Fiscal and financial government policies that on many occasions are at cross purposes with the development needs of the forestry sector; and the fact that
- Forestry by its economic importance in many countries of the region is considered mainly as a source of revenue, its ecological and environmental aspects receiving inadequate attention.

4.3 Priorities for Action

The following actions are important to overcome the above-mentioned constraints:

- a) Analyze the real economic value of the forest and tree resource base to support allocation of the most appropriate level of resources for forest management; and to influence decision makers to accord a priority to the sector commensurate with its real value.
- b) Develop an appropriate land use policy that will support a comprehensive forestry policy oriented to contribute to rural and national development in the face of burgeoning population and conflicting demands for land.
- c) The forestry legislation should fully match with forestry policies and should be amended or up-dated where needed, to give credibility and consistency to policy goals and objectives, and to help their implementation.
- d) National capacity in the fields of forestry policy formulation, analysis, impact assessment and planning should be developed and/or strengthened.
- e) To ease the identification of policy options and decision making, an information management system must be established to provide qualitative and quantitative socio-economic, demographic and resource data and to facilitate the identification of policy options and decision making.

- f) Each country should determine the importance and value of the social and economic goals of forestry, to define the responsibilities and contribution of every institution directly or indirectly concerned with forestry.
- g) To ensure inter-sectoral linkages and to minimize negative ex-sector spill-overs, an advisory board should be established at the appropriate level in the government to express opinions and make recommendations on issues of government policies.
- h) Depending on the country's political environment, a consultative mechanism should be established to ensure a bottom-up policy formulation process. Research to identify performance indicators of the adequacy of the consultative process should also be developed.
- i) The establishment of parameters for decisions on optimal forest land use can help solve the sometimes conflicting socio-economic goals of forestry development.

4.4 Suggestions for Implementation

Three fundamental questions relating to policy formulation were raised and it was recommended that the topics be subject to more substantial research. These were:

- 1) *Should the forestry policies be general or specific and should they be formulated on a short, medium or long-term basis?*

As forestry is a long-term activity, agreement was reached that specific forestry policies should be formulated on a long-term basis with provision for an appropriate monitoring, evaluation and modification process.

- 2) *Which of the main forestry policy goals -- social, environmental, economic -- should receive priority?*

The consensus was that for countries rich in forest resources, without environmental degradation and with ample production capacity, economic considerations should receive preference and priority. In such cases privatization can be promoted accompanied by safeguards to ensure respect for equity and sustainability.

Countries poor in forest resources should give preference to social and environmental considerations but still need to ensure that their policies encourage the most efficient use of their scarce resources.

However, it was also agreed that in most cases a mixed approach to these goals is more desirable.

- 3) *Is the present consultation process for policy formulation appropriate to include people from the policy making establishment and people involved in the implementation of policy (international, government and local)?*

All groups (from up-stream to down-stream) who will be affected by the forestry policy should be consulted in the policy formulation process. However, it was recognized that this type of consultative process at the national level is rarely found in the Region, even among neighbouring countries despite the fact that national policies can have regional and sub-regional impacts.

5. EXOGENOUS FORCES AND INTERSECTORAL LINKAGES AFFECTING NATIONAL FORESTRY POLICIES

Attention was concentrated on four key factors influencing forestry policy: i) external economic and environmental pressures; ii) national economic policies; iii) land use policies; and iv) over-dependence on external policy expertise.

5.1 External economic and environmental pressures

Problems and Opportunities, Experiences and Constraints

The Asian and the Pacific countries, especially those with abundant forest resources, are experiencing considerable pressures, from developed countries and consumers, on their forestry sectors with mixed effects. One positive effect is the strengthening environmental concerns in policy formulation. Agenda 21 approved by the UNCED meeting and the different Protocols signed (Biodiversity, Climate Change) together with existing regional and sub-regional Conventions, Agreements, Treaties, etc., create favourable opportunities to reorient environmental policies leading to more appropriate and sustainable development involving efficient utilization of natural resources and improvement in related policies.

However, other pressures can be misdirected, due to poor understanding of tropical forestry issues, e.g. calls for tropical log import bans or for "sustainable" forest management to be achieved within this decade; demands that, through forestry policy, tropical countries absorb the major costs of the battle against global warming.

There is also a fundamental contradiction between the international calls for agreements imposing controls on tropical land use, which necessarily imply "top-down" national planning and central control, and the parallel calls (both nationally and internationally) for more decentralized and participatory policy decision making, and conditions of private control over land use.

International trade policies of developed countries are usually more influential than their aid policies on forestry, but this reality is merely understood.

Priorities for Action, Suggestions for Implementation

- Initiate regular consultation and discussion between countries (especially neighbouring ones), international organizations and agencies, NGOs and national forestry sectors; and seek mechanisms for partnership.
- Include temperate forest management in all international discussions and agreements regarding forest management in relation to global concerns.
- In strategies to control global warming, use multi-sector analysis, and include tropical forest management as one of the components. Options should be explored for balancing carbon emissions by industry with sequestration of carbon through investment in afforestation and improved forest management.
- Become more pro-active in identifying and pursuing environmental policy objectives and implementation strategies, in response to local, as well as international concerns, e.g. three north shelterbelt programmes in China, meeting local, national and international objectives.

- Improve information in developed countries about tropical forestry constraints and opportunities.
- Analyze socio-economic and environmental impacts of proposed international forestry initiatives such as the effects of logging bans, import/export bans, eco-labelling.
- Explore implications and options for compliance with international agreements, where they influence lands under private or indigenous control.
- Continue to develop and make practical definitions of sustainable forest management for different objectives.

5.2 National Economic Policies

Problems, Opportunities, Experiences and Constraints

National economic policies often shape forestry policies more than forestry sector policies do. In countries with relatively abundant forest resources (e.g. Malaysia, Indonesia, Papua New Guinea, Myanmar), forests are a critical resource for development of rural livelihoods and growth in other sectors, and forestry policy influences the direction of national development and public investment. In countries with scarce forest resources (e.g. China, India, Pakistan, Sri Lanka), economic policies in other sectors are little influenced by forestry considerations, while agricultural, land use, population and settlement policies have a major influence on forests and other tree resources.

In both cases, private incentives to invest in forest management (by farmers, industrialists and others) are influenced by macro-economic policies, such as exchange rate policy, structural adjustment, credit policy and interest rates, and trade policy. It is not clear, however, how forestry policy takes these factors into account to respond or plan more effectively. Basic information is not available about economic linkages between the forestry and other sectors of the economy. More policy dialogue among these sectors, and integrated policy research, is needed if there is to be a coherent and consistent national policy for forest resources.

These macro-economic policies can be an opportunity to analyze forestry's contribution and linkages and to introduce permanent consultative mechanisms into which the forestry sector will be integrated.

Priorities for Action and Suggestions for Implementation

- Analyze economic multiplier effects of forestry activities (public, private industrial, and farm forestry), to better inform national economic planners and influence decision makers.
- Identify the linkages between macro-economic policy and performance and forestry variables such as deforestation, industrial investment, etc. Focus efforts on forest-abundant countries or regions and explore implications of different rates and patterns of forest conversion.
- Identify critical policy factors in other sectors that indirectly influence farmers and communities to conserve and invest in farm or community forestry, e.g. rural energy pricing policies affecting incentives for investment in woodfuel; settlement policies affecting construction wood demand. Focus efforts on forest-scarce countries or regions and assess costs of institutional development in the forestry sector vs. returns, and vs. alternative mechanisms for promoting forestry activities.

- Explore actual economic benefits from down stream wood processing, particularly where industrial inputs need to be imported.
- Keep abreast with evolving market conditions for domestic timber and non-timber forest/tree products from other sectors, e.g. fodder, industrial raw materials, etc.
- Establish institutional mechanisms of coordination to facilitate intersectoral dialogue and integrated action programmes between forestry and other economic sectors.

5.3 Land Use Policy

Problems, Opportunities, Experiences and Constraints

Decisions about use of forested or potentially forested lands take place largely outside the forestry sector. Yet, this is not recognized in current planning processes. Forestry Departments have little effective influence over population shifts into forested areas, shifting cultivation, commercial agriculture through large-scale forest conversion, etc. New models that integrate forestry considerations into land use planning and policy are needed at all levels. This may involve increasing reliance on more economic incentives than direct regulation.

Priorities for Action and Suggestions for Implementation

- Expand use of environmental impact assessments where large-scale changes in land use are being planned, and utilize technical forestry expertise to identify land use options that maintain essential forest resources.
- Identify regulations that constrain private forestry investment, e.g. transport, and assess the impact of possible modifications.
- Identify and analyze: i) actual economic costs and benefits of conversion of forest land to alternative uses, under different socio-economic and agro-ecological conditions; ii) whether sustainable farming or agroforestry systems can effectively replace forests for upper watershed protection; iii) whether tree crop plantations can effectively sequester carbon or provide habitat to critical wildlife species.
- Develop alternative mechanisms by which the economic (as opposed to financial) costs and benefits of forest management or conversion can be incorporated into private land use decisions.
- Analyze environmental effects of deforestation on irrigation, crop yields, etc., under different production and agro-ecological conditions.
- Establish mechanisms for joint land use planning and policy for agriculture, livestock and forestry, including private land users and industrial forestry interests as well as the public sector.
- Carry out studies jointly with land users (forest concessionaires, user groups of communal forest lands, farmers practising agroforestry and farm forestry) to understand their management and investment decisions, and their response to different sectoral policy options.

5.4 Overdependence on External Policy Expertise

Problems and Opportunities, Experiences and Constraints

Current policy debates regarding all the above issues rely on a very weak base of empirical research and policy analysis. The bulk of policy research upon which both internal and external policies are being formulated has been drawn from institutions in the developed countries. The policy agenda has been influenced by priorities and interest groups of developed countries and by major financing institutions.

National forest sectors themselves are now recognizing the need to incorporate policy research and analysis in national institutions, but the institutions need to be strengthened, and a cadre of trained and experienced forestry policy specialists and researchers be developed. Development of national capacity as promoted by UNCED Agenda 21 will contribute to reversing this situation.

Priorities for Action, Suggestions for Implementation

- Increase national and international support for training of forest economics and policy researchers.
- Strengthen existing university forestry curricula in forestry economics and policy analysis and encourage interdisciplinary perspectives.
- Establish or strengthen centres of excellence in forestry economics and policy analysis in the Asian region. Special attempts should be made to stimulate existing specialized centres in the region to develop economic and policy studies on forestry.
- Concentrate policy research efforts on pilot field projects, testing and comparing the effectiveness of different policies and strategies, rather than on academic studies, e.g. ASEAN and Fiji pilot projects evaluating technology and management jointly with concessionaires.
- Ensure that a high proportion of CIFOR and other regional research efforts are directed at socio-economic and policy research, collaborating with regional centres of excellence.
- Synthesize the analysis and discussion of forestry issues in all the regional and sub-regional intergovernmental fora to promote a better understanding on the socio-economic and environmental importance of forestry.
- Strengthen the national capacity to analyze, understand, and develop national forestry policies integrated with national development policies.

6. POLICY IMPLEMENTATION

Independently of the country's political and economic system, availability of forest resources, level of population pressure, forestry institutional set up, and official support being given to forestry development, the most common recurrent issues in forestry policies in the Region are:

- a) Maintenance of environmental stability and biodiversity by preserving suitable amounts of natural forests;

- b) Substantially increasing (and/or maintaining) the forest cover through major forestation programmes on both public and private lands;
- c) Meeting local and national needs for fuel, poles, timber, non-wood forest products (NWFP), fodder, etc. on a sustainable basis;
- d) Promotion of sustainable resource utilization and domestic processing industries, to create employment, economic growth and foreign exchange earnings; and
- e) Checking soil erosion, especially in watersheds and catchment areas.

6.1 Opportunities and constraints

Opportunities

- i) The increasing awareness of the role forests play, and intense public interest and support for forestry matters are due to:
 - ⊗ Heightened environmental awareness;
 - ⊗ Recognition of the potential for employment creation, processing and valorization, forest products exports, etc.;
 - ⊗ Contribution to the basic needs of rural and forest-dependent communities, e.g. fuel, NWFP;
 - ⊗ Renewability; and
 - ⊗ New benefit-sharing arrangements.
- ii) The increasing scarcity of natural forests has led to a **greater appreciation** of them, resulting in a very favourable global supply-demand outlook for ecotourism, biodiversity and conservation measures, as well as for timber and NWFP.
- iii) Concurrently, **substantially increased financial flows** and technical assistance are available from international agencies, for innovative activities and capacity building, including research, education, and training.
- iv) **Many new institutional arrangements, models and structures** are emerging including contract reforestation and research; privatization; transfer of management responsibility and control to local communities, etc.
- v) **The exchange of positive and negative experiences and information** throughout the region is contributing to greater understanding of potentials and opportunities.

Constraints

- i) In spite of increasing national and international commitments to environmental aspects, forestry still suffers from **insufficient political will, support, commitment and conviction**.

- ii) Policies are often **too ambitious**, unspecific, unmeasurable and unmonitorable and without adequate resources. Financial aspects include: amount of funds; complexity of the allocational and disbursal system, and delays in release of funds.
- iii) There are **difficulties in quantifying the benefits** from forests, which lead to a lack of recognition of their role and importance. Sometimes the data simply does not exist, but even where it does, assessment of the socio-economic values can be very difficult.
- iv) There are **conflicts within the government Forestry Agency**, between its rôle as a producer and its service, administrative and regulatory functions.
- v) There is **insufficient co-ordination and cooperation** between the forestry sector and other sectors and even within the forestry sector, between government and private industries, and between Forest Departments and NGOs. This is particularly important if there are complex or confused jurisdictions with many agencies involved (public and private) at national, state, and local levels.
- vi) There are many **institutional weaknesses in forestry administrations** such as:
 - Ineffective or archaic management systems, especially for personnel and finances;
 - Unclear or inappropriate administrative structures and chains of command unsuited to the modern rôles and functions of a government forestry agency;
 - The lack of clear lines of responsibility and accountability, and appropriate incentive and performance structures, hamper effective programme implementation;
 - Limited availability of trained personnel with appropriate skills and expertise, partially due to poor payment, status and conditions; and
 - Inadequate independent monitoring and feedback upwards through the administrative system.
- vii) Other constraints mentioned as affecting policy implementation include:
 - Land tenure problems;
 - Poor communications and public relations ability by forestry personnel;
 - Excessive proscriptive, regulatory, and negative forestry legislation instead of a more permissive, pro-active, and incentivised one;
 - Interference from cooperating international agencies; and
 - Absence of clear national policies in related sectors (agriculture, energy, transport, environment).

6.2 Needs

- i) Stronger political support for the forestry sector should be built up by:

- Improving the performance of the sector;
 - Quantifying its benefits and contributions; and
 - More aggressive public relations and lobbying.
- ii) Resource allocations must be adequate to achieve plausible objectives within a specified and reasonable timeframe through a more realistic assessment of the economic contribution of the forestry sector (both priced and non-priced).
 - iii) Improved cooperation between and within government agencies, with the private sector; and between countries, should be facilitated to improve implementation performance.
 - iv) A more efficient administration of the management of forests could be achieved by addressing the institutional weaknesses listed above.
 - v) Increased people's participation (especially women) right from the planning stage, in the management and protection of forests for all the potential benefits is needed.

Some of the above requirements also have implications for land tenure systems, agrarian reform, and conservation of biodiversity, both in forest reserves and outside.

6.3 Recommendations

To countries:

- i) Policies should be consistent with, and support, higher-level national development policies and other sectoral policies.
- ii) Policies should be attainable, realistic, specific, logically consistent, measurable and monitorable. Since the implementation of forestry policies is a dynamic and evolving process it needs to be periodically reviewed and regularly monitored.
- iii) Policy statements should indicate priorities, and provide quantified targets for operational strategies, to facilitate monitoring. Responsibility for implementation, when, how, in what timeframe, and with what resources should also be specified.
- iv) Establish a system for the rigorous, independent and transparent monitoring of progress towards achievement of the policy goals and the strategic objectives.
- v) Promote training in policy analysis and related case-studies to assist in the formulation of forestry policy and its implementation.

To International Agencies and Institutions:

- vi) Investment policies should be harmonized by consultation between international agencies, and recipient governments, in accordance with country needs and policy goals, to avoid counter-productive results.

- vii) International technical assistance should be sought and could be provided by a "neutral agency" such as FAO, for the coordination and exchange of information between countries in the Region, regarding:
 - a) Formulation, analysis and implementation of policy; particularly a review of case studies on monitoring systems applied for policy implementation in forestry and other sectors around the Region;
 - b) Issues such as: logging bans; log pricing; markets for non-wood forest products; and
 - c) Administrative innovations.
- viii) Recommendations concerning policy research needs should be proposed by a regional advisory body, with representatives from selected institutions such as CIFOR, the FAO Asia Pacific Forestry Commission, SPARSO, IUFRO, FORSPA, ASEAN, etc. on priority topics identified by the Expert Consultation.

7. POLICY RESEARCH ISSUES AND PRIORITIES

Policy research should provide information that can guide policy makers or analyze the impact and effectiveness of policy. A key role of policy research is to influence perspectives of decision makers. Processes may include literature or data search and review, case studies, field work for empirical analysis, the development of methodology for problem-solving or priority setting, research on research, etc. While policy research is often thought of as predominantly the realm of economists, it is becoming increasingly necessary to involve a broader spectrum of disciplines, both in the social sciences and in technical fields, especially with respect to issues related to environmental policy.

It was recognized that certain research areas are of greater significance to some countries than others, depending on their ecology, the nature of their forest resource, economy and demographic situation.

There are considerable areas of overlap among the priority areas identified for policy research. Although those areas may constitute discrete research topics, their inter-connections should not be overlooked, since inappropriate policies in one area may exacerbate problems in other areas. Conversely, the reverse may be the case with successful policies.

Seven priorities for policy-oriented research were identified as listed below without ranking them:

- A. Priorities for policy research on population distribution, growth, deforestation and sustainable land use: inter-sectoral issues.
- B. Policies affecting trees in land use outside main forest areas.
- C. Transfer of responsibility to local communities, private individuals or enterprises for natural resource management.
- D. Shifting the emphasis from industrial forest products to multi-purpose land use forest management.

- E. Government forest revenue collection and concession policies and its influence on tropical forest management.
 - F. Impact of accelerated industrialization policies.
 - G. Institutional problems and related policy research needs for effective implementation.
- A. Priorities for policy research on population distribution, growth, deforestation and sustainable land use: inter-sectoral issues.**

This was recognized as a very broad area for research, involving several important issues, both within the forestry sector and in relation to inter-sectoral policies. There is a particular need to reduce migratory pressures on forest lands; to develop sustainable land use systems; to foster complementarities rather than conflicts in land use, for example between forestry, and livestock grazing; and to provide stable income and employment. However, since the roots of the problem of encroachment of people on forested areas probably lie outside those areas, attempting to tackle them solely by 'upstream' measures is unlikely to be adequate. Important issues for research include:

- Improved knowledge of the dynamics of planned and spontaneous migration. Because such research is likely to be information intensive and not amenable to standard demographic techniques, a case-study approach may be the most appropriate analytical paradigm.
- Improved understanding of the socio-cultural systems that govern the management of forest resources, especially among tribal people, (property relations, traditional practises of resource use including grazing, and the roles of women).
- Improved characterization of the natural resource base for developing sound land use policies, which are described in several country reports as currently lacking. This requires multi-disciplinary cooperation among the main users of the resource, including forestry, agriculture, irrigation and mining.
- Identification of the policy measures that could be most effective in reducing the pressures to move to the forests from other areas - linkages to government infrastructure; industrial, rural development, and land reform policies; and how these are affected by structural adjustment and other external influences.
- What policy measures would be most effective in promoting sustainable land use within forest areas, (for example agro-forestry systems), which might provide better income and employment opportunities from a diversified range of wood and non-wood products. Should tax relief, subsidy, land rights, or other incentives to agro-forestry be considered?
- What causes the collapse of traditional land use systems and means of managing common property or other communal resources? Can measures be taken that will facilitate the adaptation of those systems, incorporating their strengths but better suited to modern needs? How relevant are government policies to such issues as they affect different ecologies or ethnic groups?

B. Policies affecting trees in land use outside main forest areas.

Increasing population pressures indicated by demographic trends are likely to lead to progressive reduction in the total area of natural forest, requiring advanced thinking on means of transition to other sustainable tree-based land use systems, as an alternative to degradation through loss of forest cover. Agroforestry deserved more prominence in the Consultation compared to forest related issues, since in some countries tree-based land use systems outside forests are the main concern. Research has so far been principally oriented to technology; links are needed between foresters, agriculturalists, and social scientists to harmonize land use techniques and maximize income and employment. An integrated approach is essential. Research issues include:

- Evaluation of economic returns to land and labour in agroforestry and related systems including trees, crops and livestock; income generation capacity of various components; contribution to family employment and nutrition, compared to other alternative forms of land use (annual crops, pastoral systems, plantations).
- What incentive measures are appropriate to stimulate trees in land use or to remove disincentives (taxes on trees, or tree products, bans on cutting trees etc.)? How to help the shift from a subsistence to a market-based economy?
- What is the scope for rehabilitation of degraded or barren lands such as the vast area of Imperata grassland (Lalang) in South East Asia, and the saline areas of South Asia, through trees? What would be the costs, economic returns and technological requirements? Who has ownership or other rights of use? What is the most appropriate end use? How can damaging fires be contained? There is a need to inventory land degradation, to identify unproductive land or land under threat, and assess the validity of restorative measures, including the potential externalities arising from their neglect.

C. Transfer of responsibility to local communities, private individuals or enterprises for natural resource management.

Devolution, privatization, and participatory management of local people in forests, woodlands, and tree resources are embedded in national land use and forestry policies, but information on the associated problems and benefits is scarce. Researchable issues related to policy include:

- Problems of tenure and access, especially with respect to common property resources. How do people view rights to use land? How can customary practices best be built on? What are the continuities and complementarities? What are successes and failures in devolution of management, for example in the adoption of soil conservation measures or other sustainable practices?
- What is the impact of people from outside the community on land use and extraction of wood and other products, for example settlers, middlemen, contractors? Does this remove the traditional incentives to good management and checks and balances respected by local people? Can such concessions be given to local people, and what happens then? Who is the ultimate beneficiary - the community, the family, or individual profiteers? How sustainable are such practices?
- What measures can be taken to improve accountability for resource use and management by communities or private individuals? How can government structures be improved so that

devolution succeeds and does not lead to inequities among people or regions of a country? What is the role of government extension and of NGO's in sustainable participation of local people? Should advisory services, plant nursery stocks, etc. be privatized? Would local communities be willing or able to pay for them? What is the role of government in this context?

D. Shifting the emphasis from industrial forest products to multi-purpose land use forest management.

Research issues include:

- How successful are multiple land use systems? Do they promote sustainable development? How can they be planned most effectively (for example in watersheds) where they may cut across villages and individual holdings? Multiple land use planning may be necessary to develop suitable systems; this requires inter-disciplinary research. How can inter-disciplinary collaboration be instilled into research institutes and universities when research and teaching are segmented among single disciplines?
- More information is needed on value, market demand, and beneficiaries from non-forest products. They may also provide services and goods. What is their economic and nutritional significance?
- What policies or changes in policies are needed to protect forest products and technologies? Should international centres and agencies, such as FAO, rethink their policies on intellectual property rights? Can the special knowledge of local people relating to traditional products and processes be protected? If so, by what measures?
- What has been the role of tourism in sustainable natural resource management? How does it help local people? Can it be privatized?

E. Government forest revenue collection and concession policies and its influence on tropical forest management

This is another question of wide applicability and topical importance. Issues for policy research include:

- Is the role of forests adequately recognized and valued by governments? How can government intervention be structured to achieve sustainable management of forests under concessionary systems? How can authority best be separated from enterprise?
- What legal and fiscal instruments are most appropriate to different forest ecologies, economies, and end-users? How can the costs of damage by migrants to logged-over areas be recaptured? How can damage to drainage patterns of a region after logging be avoided? How can simple laws that enable easy monitoring of the effectiveness be devised and enforced? What are safe minimum standards?

F. Impact of accelerated industrialization policies

The impact of policies to accelerate domestic processing of timber and to prevent excessive harvesting of higher valued species, on efficient resource utilization, government revenues, and

employment, is a controversial issue on which more research is urgently needed. Particular problems include:

- What has been the economy-wide impact of policies to accelerate industrialization, particularly with respect to employment, and the income, welfare, and rights of access to land of poor people? Are the social costs of adding value greater than the benefits?
- What has been the effect of decisions made by log importing countries on forestry policies, logging practises, and sustainable forest management of exporting countries?
- What has been the socio-economic impact of export taxes on logs on local sawmills, and has this led to efficient local processing industries?
- What are the alternatives to present patterns of scale and location of wood industries, relative to the markets (e.g. small-scale high technology portable sawmills, non-road loggings, etc.)? Will those or other alternatives (decentralized local cooperatives and small industries) lead to increased efficiency in production and/or reduction in waste? How do these alternatives compare economically to present technologies, particularly those of state-run industries?

G. Institutional problems and related policy research needs for effective implementation.

Discussions revealed numerous institutional and related human resource problems impeding effective implementation of forest and land use policies. Many require research to develop more efficient alternatives. Such issues include:

- Forest officers are so busy with regulatory and service duties that they cannot spend more time in the field. Is there a case for a separate forest agency, which can take over service duties? Should outside consultants be hired by governments to recommend effective alternatives to current bureaucratic structure?
- A related issue impeding desired changes is the seniority problem. Senior officials are sometimes resistant to inter-disciplinary collaboration because of their lack of expertise. However, persons who have been trained in new methodologies and technologies usually do not have the seniority to occupy key positions. This makes it difficult to allocate the trained manpower in the right position. Thus, the situation of a general lack of trained manpower is further exacerbated.
- Some countries have no research and training cadres to foster trained managers in business management and information science. Can reforms begin in one government service, without wholesale reform of the bureaucratic system? What are the costs of continuing existing government bureaucracies, and what are the alternatives? Do effective models exist that could be applied to finding solutions to this systemic problem?
- Is there a role for private services in research, nursery stock production, and extension? What incentives could be devised to encourage private sector involvement? Would privatization of such services improve feedback from producers on their research needs, advisory needs, and the impact of government policies on the forestry sector, or would it impede it? What are the legitimate roles of government vis-a-vis the private sector?

- What are the most appropriate methodologies for valuation of natural resources, and assessing economic costs and returns of existing and alternative land use systems? What data is necessary to answer such questions?
- Among these areas of research, which are suited to being carried out by CIFOR; by other international centres with "global mandates" such as IFPRI; by "eco-regional" centres such as CIAT, IICA, or CATIE; by other regional institutions such as FORSPA or national institutions?
- What are the most effective instruments for collaborative research between international, regional, and national institutions, on forestry and agroforestry?

8. ACTION RELATED TO IMPLEMENTATION OF THE CONSULTATION'S RECOMMENDATIONS

Many issues discussed at the Expert Consultation can only be implemented through action at the national level, sometimes over the long term. However, actions that could be initiated in the short term on the priorities identified by the working groups include:

- Enhance research on strategic issues related to forestry policy (especially where they affect several countries), by CIFOR, ICRAF and IFPRI, either through individual or collaborative efforts, working with appropriate regional bodies such as FORSPA and national institutions. Special attention must be given to the active role to be played by institutions in countries with special competence in policy research and to continued support to strengthening their capacities.
- Strengthen certain of those national institutions to serve as centres of excellence in economics, social sciences, and policy research.
- Initiate action with international support to reinforce national forestry cadres, both for research and for professional and advisory duties in forestry policy analysis and development and assessment of policy impacts.
- Expand field work on case studies of the issues identified by the Expert Consultation, to provide better information to policy makers, especially on controversial questions.
- Institute periodic inter-sectoral policy consultations at the national level, involving national planners, senior staff from line ministries responsible for natural resource management, relevant national research institutions, non-government agencies and the private sector, to develop and sustain integrated national policies related to land use, reconcile potential conflicts of interest, and allocate resources to perceived needs according to agreed priorities. Determine whether there is a role for international support to such consultancy.

International assistance for strengthening national capacities in policy analysis and development and for enhancing the exchange of information among countries of the region should be sought from a competent and objective agency such as FAO. It is important to promote knowledge and understanding within the region, especially concerning progress with ongoing efforts to find solutions to the problems identified by the expert consultation. Another important objective of such assistance should be to inform international and bilateral development assistance agencies and NGOs, of the progress being made towards sustainable forest management, conservation, and land use through the evolution of policies by countries of Asia and the Pacific region.

**Expert Consultation on Forestry Policy Developments
and Research Implications in Asia and the Pacific
FAO Regional Office
Bangkok, 5 to 9 October 1992**

Agenda/Timetable

5 October 1992 (Monday)

0830-0900 hrs	Registration
0900-1000	Opening Ceremony
	Statements by:
	- Mr. A.Z.M. Obaidullah Khan, ADG/RR, FAO Regional Office
	- Mr. Peter A. Oram, Research Fellow Emeritus, International Food Policy Research Institute
	- Mr. M.R. de Montalembert, Director, Forestry Policy and Planning Division, FAO, Rome
1000-1030 hrs	Coffee Break
1030-1045 hrs	Procedures of the Consultation by the Secretariat
1045-1200 hrs	Presentation of Country Papers on Forest policy Development
	- Authors present outlines of papers focusing on recent forest policy developments
	- Discussions
1200-1330 hrs	Lunch
1330-1500 hrs	Country Paper Presentation: (Continuation)
1500-1530 hrs	Coffee Break
1530-1700 hrs	Country Paper Presentation: (Continuation)

6 October 1992 (Tuesday)

0900-1030 hrs	Country Paper Presentation: (Continued)
1030-1045 hrs	Coffee Break

6 October 1992 (Tuesday) (Continued)

1045-1200 hrs	Presentation of Three Special Papers on Inter-sectoral Linkages of Forestry Policies
	- Authors present their findings
	- Discussion
1200-1330 hrs	Lunch
1330-1500 hrs	Overview papers
1500-1515 hrs	Coffee Break
1515-1630 hrs	Presentation and Discussion on Forest Policy Research
	- Consultative Group on International Agricultural Research (CGIAR)
	- Centre for International Forestry Research (CIFOR)
	- International Food Policy Research Institute (IFPRI)
	- Forestry Research Support Programme for the Asia-Pacific Region (FORSPA)

7 October 1992 (Wednesday) &
8 October 1992 (Thursday)

Both days devoted to working group meetings whose discussions would be articulated around the main steps of the **policy development process**. Five working groups are tentatively proposed:

- * Main issues and processes related to national forestry policy formation
- * Exogenous forces and intersectoral linkages affecting national forest policies
- * Policy research issues/priorities
- * Problems and experiences related to effective policy implementation
- * The role of national governments and international organizations in forest policy development and research

9 October 1992 (Friday)

Whole day:

- Presentation of conclusions and recommendations by working groups' rapporteurs;
- Discussion and finalization of conclusions and recommendations of the Consultation.
- Closing ceremony

(Coffee break at appropriate time)

Expert Consultation on Forestry Policy Developments
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FAO Regional Office
Bangkok, 5 to 9 October 1992

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- 66 Forestry extension organization, 1986 (C E S)
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91 Design manual on basic wood harvesting technology, 1989 (E F S)
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92 Forestry policies in Europe - An analysis, 1989 (E)
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