



# TREE RESOURCES IN NORTHERN THAILAND

Local Stakeholders and National Policy



NATURAL RESOURCES INSTITUTE  
*Overseas Development Administration*

*Tree Resources in Northern Thailand: Local Stakeholders and National Policy*

is a report of the study that aims to develop stakeholder analysis as a tool for natural resource management. It is an attempt to test a stakeholder approach by applying it to a particular case of forest resource management in the highlands of Northern Thailand. The study therefore focuses on a systematic analysis of the range of forest resource users and managers (stakeholders) and their interests, as well as of the conflicts and the trade-offs in interests that occur. It forms part of a larger research programme on stakeholder and trade-off analysis in natural resource and environmental management.

The report demonstrates that the use of such an approach can be an important aid both to understanding tree resource management issues, and to developing successful management policies. It is believed that the principles of the stakeholder approach used in this study will also be applicable to natural resource management in other parts of the developing world, particularly in situations where conflicts between different stakeholders are paramount.

As such, this report will be of interest to all those in government departments and other institutions responsible for making policies which affect natural resource users and managers.

TREE RESOURCES IN NORTHERN  
THAILAND: LOCAL STAKEHOLDERS  
AND NATIONAL POLICY

Man-Kwun Chan

© Crown copyright 1995

The Natural Resources Institute (NRI) is an internationally recognized centre of expertise on the natural resources sector in developing countries. It forms an integral part of the British Government's overseas aid programme. Its principal aim is to alleviate poverty and hardship in developing countries by increasing the productivity of their renewable natural resources. NRI's main fields of expertise are resource assessment and farming systems, integrated pest management, food science and crop utilization.

NRI carries out research and surveys; develops pilot-scale plant, machinery and processes; identifies, prepares, manages and executes projects; provides advice and training; and publishes scientific and development material.

Short extracts of material from this publication may be reproduced in any non-advertising, non-profit-making context provided that the source is acknowledged as follows:

Chan, M-K. (1995) *Tree Resources in Northern Thailand: Local Stakeholders and National Policy*. Chatham, UK: Natural Resources Institute.

Permission for commercial reproduction should, however, be sought from the Head, Publishing and Publicity Services, Natural Resources Institute, Central Avenue, Chatham Maritime, Kent ME4 4TB, United Kingdom.

Price £5.00

No charge is made for single copies of this publication sent to governmental and educational establishments, research institutions and non-profit-making organizations working in countries eligible for British Government aid. Free copies cannot normally be addressed to individuals by name, but only under their official titles. When ordering please quote **ECN6**.

**Natural Resources Institute**  
ISBN: 0-85954-403-6

Printed in Great Britain by Ebenezer Baylis & Son Ltd, The Trinity Press, Worcester, and London

# CONTENTS

PREFACE	iv
ACKNOWLEDGEMENTS	v
ABSTRACT	vi
1. RESEARCH OBJECTIVES	1
2. PROGRAMME OF WORK	2
3. INTRODUCTION TO NORTHERN THAILAND: NATURAL RESOURCES AND LIVELIHOODS	4
Background information	4
Land, agriculture and farming systems	5
Population and demographic change	9
Tree resources in Northern Thailand	11
4. FOREST MANAGEMENT POLICY: NATIONAL POLICY	16
The emerging policy context: the 1980s onwards	16
Rising to the challenge?: the Thai Forestry Sector Master Plan and the development of 'bottom-up' planning and management approaches	18
Assessing the Master Plan and the future for forest management policy	21
5. INTRODUCTION TO THE COLLABORATING INSTITUTIONS IN NORTHERN THAILAND	26
Introduction to the Royal Project	26
Introduction to the Highland Agricultural Development Division	27
6. MAE PAM — THE NORTHERN THAILAND CASE STUDY	29
Selection of case study area	29
Background to the Mae Pam area	30
Physical characteristics of the area	30
Land use characteristics	31
Socio-economic characteristics	33
Local tree resources	34
Conclusions	39
7. CONCLUSIONS	42
What has been learnt so far	42
Priority topics for future research	46
Concluding remarks	49
8. BIBLIOGRAPHY	50

# PREFACE

This report is part of the research programme on Tree Resources and Environmental Policy: Stakeholders and Trade-offs (TREPST) which was funded under the Agronomy and Cropping Systems Programme for the Natural Resources Research Department of the Overseas Development Administration (ODA). The programme consists of two main phases. In the first phase the literature was reviewed and an analytical framework was developed; in the second phase which has yet to be started, field research will be conducted, and the concepts and ideas developed in Phase 1 will be converted into practical guidelines for policy.

The present report is a product of the intermediate phase of the research which sought to develop contacts with institutions in developing countries and to conduct preliminary investigations with some of these institutions in Northern Thailand. Man-Kwun Chan, the author of this report, was recruited as a researcher in November 1993 to undertake this task.

I believe that this study demonstrates the importance of analysing stakeholders and trade-offs in the development of successful environmental and tree resource policies in Northern Thailand. Although this location was chosen as an example because of our institutional contacts and previous experience in the area, I hope that the principles and approach described here will provide lessons for environmental and forest policies in many parts of the developing world.

Dr Robin Grimble

Director of the TREPST research programme  
Natural Resources Institute (ODA)

September 1994

# ACKNOWLEDGEMENTS

Many people offered me their help in carrying out the research on which this report is based. Among these, Khun Suthat, Khun Ponthip, Khun Arunee and Khun Gitipong from the Highland Agricultural Development Division (HADD) and the Royal Project Foundation with whom we collaborated throughout the research in Thailand, found the time and good will to help our research project and make sure that I was well looked after throughout my stay in Chiang Mai. Without their support, the Northern Thailand case study could not have taken place. Many thanks also go to the other members of staff at the HADD, such as Khun Vijit (Director), Khun Ponsook and Pi Meo, for their general support.

I owe special thanks to many staff at the Royal Project, particularly Ajaan Nuchnart (head of the Highland Plant Protection Programme), Dáeng, Pi Orapin, Wahree, Pi Daeng, Pi Boum, Oi and Miou. Nam Daan gave me invaluable support both professionally and as a friend. My gratitude also goes to Royal Project and other staff at Huai Luk station, particularly to the project leader, Khun Daichopon, who showed great patience in accompanying us on our field visits.

My thanks are also due to the villagers in Mae Pan Nok, Mae Pam Nai and Huai Luk for answering our questions and providing us with material for our case study. Particular thanks go to all the villagers in Huai Luk who let me share in their celebrations of the Meo New Year.

Several staff at Chiang Mai University helped us by providing useful information and comments on our research; they include Dr Banjavan Rerkasem and Dr Benchapun Shinawatra at the Multiple Cropping Centre, Faculty of Agriculture, and Khun Sutee at the Resource Management and Development Centre, Social Science Faculty.

I would like to express my gratitude to the following individuals for giving lengthy and informative interviews at short notice: Khun Sawatdee Boonchee (Chief of the Technical Division at the Office of Land Development, Chiang Mai), Mr Rauno Laitalainen (Team Leader of the Thai Forestry Sector Master Plan, Royal Forest Department, Bangkok), Dr David Thomas (Assistant Representative at the Ford Foundation, Bangkok) and Dr Saovakon Sudsawasd (Faculty of Social Sciences, Kasetsart University, Bangkok). Mr Laitalainen was also kind enough to send detailed and constructive comments on an earlier draft of this report.

Finally, I would like to express my thanks to Dr Robin Grimble, without whom I would not have had the chance to work on this project, for his supervision, encouragement and comments.

## ABSTRACT

This report is the result of four months of research carried out in Northern Thailand and forms the intermediate phase of the Natural Resources Institute (Overseas Development Administration) research programme entitled Tree Resources and Environmental Policy: Stakeholders and Trade-offs. In the first two chapters, the research objectives and programme of work are described in detail. The main aim was to determine the issues involved in formulating fair, workable management policies for forests and forest resources in general, using Northern Thailand as an example. This was to be achieved in collaboration with Thai universities and other institutions, notably the Royal Project Foundation and the Highland Agricultural Development Division (HADD), and by interviews and discussions with local forest dwellers at one end of the spectrum and government officials at the other. In the third chapter, details of the geography, economy, agriculture, population and tree resources of Northern Thailand are given, and in chapter four, past, present and future forest management policies are discussed; particular attention is paid to the Thai Forestry Sector Master Plan which was formulated in 1990. The work of the Royal Project and the HADD is summarized in chapter five and in chapter six, a comprehensive report of a case study undertaken in Mae Pam (Chiang Mai province) is presented; this includes details of the local geography, socio-economy and tree resources, and of the conflicts which arise between different ethnic groups over resource scarcity. Much attention is paid to the ways in which the people who live and work in the forest perceive their environment and the changes which are taking place within it. Recommendations for future management policies and future research are made in the concluding chapter.



# 1. RESEARCH OBJECTIVES

The research on which this report is based forms the intermediate phase of the Natural Resources Institute (NRI) research programme on Tree Resources and Environmental Policy: Stakeholders and Trade-offs (TREPST). The objectives were as follows.

- (a) Familiarization with general issues relevant to the research in North and Northeast Thailand. This would involve gathering information on the status and patterns of change of forest and other tree resources in the region, tree and natural resource management and the institutions involved, the regional economy and population change, and local farming and livelihood systems.
- (b) To gain a greater understanding of issues of tree and natural resource management at the village 'grass-roots' level and in particular, to identify and investigate the interests of local stakeholder groups, conflicts or co-operation arising from tree resource use, and changes in tree resources in recent years. This was to be achieved by selecting representative areas for detailed research in the northern and northeastern regions, and carrying out preliminary but focused research in these case study areas.
- (c) Familiarization with the area of national policy within which tree resource management is taking place. Current and past legislation and policy on forest use and management, land rights and land use, and the emergence of environmental awareness and policies in recent years, were to be reviewed.
- (d) Identification of key policy issues and constraints with regard to tree resource and environmental management, and the associated research and information required to address these issues through policy reform.
- (e) Identification of priority research areas and establishment of a research framework for Phase II in Northern Thailand. This would take into account the further research needs identified from the case study, and the information requirements of policy makers in addressing priority policy issues in the wider context.

The research carried out in the intermediate phase involved case studies in both Northern and Northeast Thailand. However, this report will focus on Northern Thailand as more attention has been given to this case study. Research in the northeast during the intermediate phase was focused mainly on the four-day workshop held in Khon Kaen in January 1994, but the research in the north continued from December 1993 to March 1994. The quantity and depth of information on the northern case study is therefore greater. Also, the main findings of the workshop are presented elsewhere in the workshop proceedings (Chan, Vityakon and Grimbale, 1994).

## 2. PROGRAMME OF WORK

A preliminary visit to Thailand was made during June to July 1993 to investigate the possibility of using Thailand as a case study for the programme. The aims of this initial visit were to gain some familiarity with the issues relevant to research in the northeast and in Thailand as a whole, to make contact with various Thai institutions with the view of future collaboration, and to assess the desirability and feasibility of undertaking future research in Thailand under the TREPST programme. Following discussions with representatives of several institutions, it was concluded that further collaboration with the Farming Systems Group (FSG) at Khon Kaen University (KKU) would be particularly useful, because of their interest in the TREPST issues and approach and their experience in relevant research areas in Northeast Thailand and in research methodologies such as Rapid Rural Appraisal (RRA). Also, it was thought that Thailand would be an interesting case study for future research because of continuing deforestation, problems arising from current forest management practices, and changing national policy.

In October 1993, Dr Robin Grimble (Research Director of the TREPST programme) visited Khon Kaen in the northeast and Chiang Mai in the north of Thailand, to further institutional links and make a preliminary selection of research areas in conjunction with various institutions.

In Khon Kaen, Dr Grimble had discussions and made field visits with members of the FSG at the University. It was concluded that the Phu Wiang Basin would be a suitable research area because of the availability of data, its identity as a small watershed, the presence of forests and tree resources, and the pertinence of various policy and environmental issues relevant to the research, such as the recent establishment of a national park and the ban on logging. It was also decided that a workshop would be held in January 1994 at KKU to provide a forum for familiarizing researchers from NRI, Chiang Mai and Khon Kaen with research concepts and objectives, and to develop a framework and methodology for future research.

In Chiang Mai, similar discussions were held with staff at the Royal Project Foundation, the Highland Agricultural Development Division (HADD), the Northern Agricultural Development Centre (NADC) and Chiang Mai University. The Royal Project, HADD and NADC were all keen to collaborate with NRI during the period of the intermediate phase. Staff contacted at the University's Multiple Cropping Centre also expressed their willingness to act as advisers in future research. Although several potential case study areas were considered in conjunction with the Royal Project and HADD, it was decided to leave the final selection until the next stage of research.

In December 1993, work began at the Royal Project and HADD in Chiang Mai. Preliminary research was carried out, the Khon Kaen workshop was organized and activities between Chiang Mai, KKU and NRI were co-ordinated.

Work initially focused on familiarization with forest and natural resource management, general background information in Northern Thailand, and the selection of a suitable case study area. After discussions with staff at the Royal Project and HADD, a review of available secondary information, and some preliminary interviews with local villagers, the two research areas of Huai Luk and Mae Pam in Chiang Dao district, Chiang Mai province, were selected.

Dr Grimble and Julia Aglionby (research assistant on the TREPST programme based in Indonesia) visited Khon Kaen, Chiang Mai and Bangkok between 16 January and 8 February to assist in preparing and running the Khon Kaen workshop, to help prepare a research programme for the rest of the intermediate phase in Northern Thailand and develop institutional links and to acquaint the South East Asian Development Division (SEADD) in Bangkok with the research aims, programme, and possible linkages with ODA projects in the region.

The workshop was held from 19 to 22 January 1994. As Phu Wiang watershed was to be used as a case study for workshop activities, the workshop was based at the project centre of the Integrated Development of the Phu Wiang Watershed Project (Royal Forest Department).

During February and March 1994, activities were centred on familiarization with national policy with respect to forest, land and environmental management, identification of priority policy issues and dilemmas in relation to tree resource management and associated research and information needs, preliminary research in the Northern Thailand case study areas (Huai Luk and Mae Pam), particularly on use and management of local tree resources and the attitudes and interests of local stakeholders in tree resources and the environment, and preparation of the first draft of the progress report on this intermediate phase of research. A week was also spent in Bangkok interviewing people directly involved in the formulation of forest management policy and associated research.

# 3. INTRODUCTION TO NORTHERN THAILAND: NATURAL RESOURCES AND LIVELIHOODS

## Background information

### *Geography*

Northern Thailand comprises 17 administrative provinces and covers an area of approximately 170 000 km<sup>2</sup>. The region is commonly divided into the 'Upper North' and the 'Lower North' since in terms of geographic and economic characteristics they are fairly distinct. This study is primarily concerned with the Upper North which consists of the nine provinces of Chiang Rai, Chiang Mai, Lampang, Lamphun, Mae Hong Son, Nan, Phayao, Phrae and Tak. More than half of the region is mountainous and despite continuing deforestation, it remains the most heavily forested area of Thailand. The four tributaries of the Chao Phraya River\*, the Ping, Wang, Yom and Nan, originate in this area of small highland valleys; hence the region is important nationally as a watershed area. Most of the Lower North is a flood plain with ecological, social and economic characteristics similar to those of the central region.

In 1987, the population of the whole northern region was approximately 10.5 million (20% of the country's total population), with about 5.3 million in the Upper North and 5.2 million in the Lower North (The Manager Company, 1990). In the mountainous areas, particularly of the Upper North, the population is characterized by the presence of several ethnic minority groups who, over the years, have immigrated to both permanent and temporary settlements.

### *Physical characteristics*

The climate of Northern Thailand is characterized by distinct wet and dry seasons. The period between November and the beginning of April is very dry. In the Upper North, the dry season is divided into the cool season (November to February), when the average minimum temperature is below 20 °C, and the hot season (March and April). The wet season usually begins in May, peaks in August and September, and ends abruptly in October.

Growing seasons in rain-fed areas are primarily determined by the rainfall pattern. In non-irrigated, upland areas the first crop of the year is sown in April before the first rains. The last crop depends on residual moisture after the rains have ended in October. In irrigated areas (accounting for only 21% of agricultural land) the growing season lasts all year.

Soils in the north can be classified into the following three major types related to topography: lowland soils of the alluvial plains and lower terraces; upland soils of higher terraces; and soils associated with slopes greater than 30% in the mountainous highland terrain. Agricultural land consists mainly of the first two soil types. These soils are generally derived from alluvial deposits. Recent alluvials with fresh annual deposits are the most fertile; older soils tend to be more acidic and infertile. Most of the soils in the north are old and hence, of low fertility. A wide range of soils also have very low levels of zinc and boron.

### *Economy*

The average *per capita* income in the north in 1987 was Baht 12 681<sup>†</sup>, slightly more than half the national average of Baht 22 819 and the second lowest after the northeast region (The Manager Company, 1990). During the 1980s, income in the north was growing at a slightly slower rate than that of the country as a whole. Therefore, although the national *per capita* income had risen to Baht 41 300 by 1991 (Royal Forest Department, 1991), *per capita* income for the north had only reached about half that figure. Chiang Mai province,

\*The Chao Phraya River feeds the fertile Central Plain, the 'rice bowl' of Thailand, as well as Bangkok, and is therefore of economic importance nationally.

<sup>†</sup>At the time of writing, £1 sterling = approximately Baht 37.

which has emerged as the economic centre of the north, has by far the highest gross provincial product (GPP) of the region, but its large population means that it does not have the highest *per capita* income.

Although the region is predominantly mountainous, agriculture is the most important sector of the economy. However, although agriculture is a major source of income, its expansion has been significantly slower than that of other economic sectors; between 1981 and 1987, its contribution to gross regional product (GRP) declined from 43.2% to 30.5% (The Manager Company, 1990). After agriculture, the trade and service sectors are the most important economically, accounting for 9.4% and 14.3% of GRP, respectively, in 1987. With the exception of the industrial sector, the economic structure of the northern region is generally similar to that of the country as a whole. At the national level, industry accounts for about 19% of gross domestic product (GDP), whereas in the north, its contribution to GRP is only about 5% (The Manager Company, 1990).

## **Land, agriculture and farming systems**

A large proportion of the population is involved in agriculture in the north with about 80% still living in rural areas in 1980 (The Manager Company, 1990).

### ***Land availability and use***

Land in Northern Thailand can be classified into the following major types which roughly correspond to soil types:

- (a) flat, lowland areas which can be banded to hold water for wet rice cultivation and which are found in river valleys and flood plains;
- (b) upland areas consisting of lower and middle terraces and well rained flat lands suitable for upland crops in the wet season; and
- (c) highland areas with steep slopes considered unsuitable for cultivation.

This classification follows approximately the land capability classification system of the Department of Land Development (Ministry of Agriculture and Co-operatives).

The third category, land which is mountainous and naturally forested, accounts for about 66% of the total land area in the north. Overall, only 27.4% of land is considered to be arable, and in the Upper North, only about 12% is considered suitable for agriculture. However, although actual land utilization roughly follows the pattern of land capability proposed by the Department of Land Development (DLD), there are notable and important exceptions. First, land which is unsuitable for rice because of its poor water-holding capacity may be banded and levelled for growing wetland rice; northern farmers, like most farmers in Thailand, wish to grow at least some of the staple crop. Secondly, at the upland-highland frontier, upland crop farming takes place mainly on steeply sloping land. The DLD classifies land with a slope greater than 12% as unsuitable for cultivation, but maize is often grown on land with considerably steeper slopes in provinces throughout the north. Cultivation on steep slopes is often regarded as a major cause of soil erosion and nutrient leaching; however, with appropriate management, this may not always be the case.

### ***Crop production***

Although the northern region contributes significantly to national rice production, the region's comparative advantage is in the production of upland crops. For example, in the crop year 1987-88, rice grown in the north accounted for 28% of national annual production whereas mungbeans accounted for 80%, soyabeans for 73%, groundnuts for 57% and maize for 43% (The Manager Company, 1990).

There are considerable differences between crop production in the Upper North and the Lower North. About two-thirds of the cultivated rice grown in the region comes from the

Lower North and of the six major rice growing areas, only one is in the Upper North (Chiang Rai province). Maize, which is grown in upland fields in the rainy season, is by far the most important upland crop, and although it is grown in both parts, most is produced in the Lower North. Mungbeans, grown in close association with maize, are limited almost exclusively to the Lower North. Soyabean is a significant crop in both the Upper and Lower region; Chiang Mai is a major production centre. Groundnut is the one major upland crop which is concentrated in the Upper rather than the Lower North. All provinces in the Upper North produce substantial quantities of groundnut, although the main areas are in Lampang, Chiang Mai, Nan and Phrae.

Until the 1980s, there had been no significant increase in the productivity of the major crops. During the period 1952–79 for example, rice yields remained more or less stagnant, while maize yields actually declined (The Manager Company, 1990). The only significant increase in productivity occurred either where irrigation services were improved, or where inorganic fertilizers and pesticides were used for high input crops such as garlic. Although accurate figures are not available, diversification into high input crops and management techniques has increased during recent years. Productivity may therefore have increased in certain areas during this period.

However, unlike some of its neighbours, Thailand has not yet achieved a 'green revolution', and increases in crop production have mainly been a consequence of the expansion of crop land (into forest areas) rather than effective intensification of agriculture.

### **Land tenure**

Issues of land tenure in Northern Thailand can be divided into three main areas: size and distribution of land holdings, tenancy, and the status and security of land rights.

According to the data available, the average farm size in the northern region in 1986 was 22.66 *rai*\* compared to the national average of 26.2 *rai*. However, the average farm in the Upper North was 12.3 *rai*, only about a third of the size of an equivalent farm in the Lower North (34.3 *rai*) (The Manager Company, 1990).

In the Upper North many households have access to only very small areas of land. Complete landlessness affects a smaller proportion of the population, although the number of landless people may have increased significantly in recent years. A survey of 2025 households in 160 villages in the Upper North (The Manager Company, 1990), showed that 13.5% were landless, 31.5% were 'near landless' (owning less than 5 *rai*) and 27.5% were 'marginal' landholders (owning between 5 and 10 *rai*).

Tenancy is probably less widespread in the north, and in Thailand as a whole, than in many other Asian countries. In 1987, 20% of agricultural land was rented. However, in the Upper North in 1984, rent-free tenure accounted for 8% of total agricultural land (The Manager Company, 1990). One reason for this substantial proportion of rent-free tenure might be that northern parents retain ownership of their land until they are old but allow their children to work the land free of charge.

In addition to the small size of land holdings, insecure land rights have been a major area of concern. There are three main types of land certificate in Thailand, *Chanode*, Certificate of Land Utilization (*Nor Sor 3* and *Nor Sor 3 Kor*) and *Bai Jong*. A *Chanode* is thought to represent the greatest security of ownership and is fully acceptable as collateral. However, very few agricultural land owners will have a *Chanode* and are certified with either a *Bai Jong* or a Certificate of Land Utilization instead. *Nor Sor 3 Kor* can also be used as collateral but the ordinary *Nor Sor 3* is much less secure. The *Bai Jong* is merely a piece of paper stating occupancy of the land and confers no ownership status. About 60% of agricultural land in the north is certified with either a *Bai Jong* or a Certificate of Land Utilization, leaving about 40% with no formal land rights at all. This high proportion of non-certified land ownership

---

\**rai* = 0.16 ha.

is normally attributed to the high population growth of the last few decades which has led to clearing and claiming of hill and forest lands. Technically speaking, private ownership is not allowed on forest land. However, while the lack of formal land rights must ultimately limit security of tenure, evidence suggests that many farmers consider that they have fairly secure 'ownership' of the land they farm. As the case study on Mae Pam showed (see chapter 6), informal land rights have a high degree of legitimacy in the eyes of local people, allowing exclusion of other users and renting and sale of land. Such 'rights' to farm land are usually tolerated by local forestry officials and thus 'insecurity of land ownership' is probably not such a serious problem as some have suggested.

### ***Cropping systems***

In the past, farming and cropping systems in Northern Thailand were fairly clearly distinguished by agro-ecological zone (lowland/upland/highland) and ethnic group. Although these distinctions are still valid to some extent, they are becoming increasingly blurred as farmers migrate between zones, and those practising shifting cultivation in the highlands come under strong pressure and are offered incentives to alter their traditional methods of farming. However, it is important to outline the differences between these 'traditional' systems, in order to evaluate the changes in agriculture which are now taking place, particularly with regard to their effects on livelihoods, forest resources, and the environment in general.

#### **Lowland valley agriculture**

This type of agriculture is dominated by the khon Muang (lowland Thai) population and is based on permanent rather than shifting cultivation systems. It is found chiefly in the large river valleys between mountain ranges. The main areas are in Chiang Mai, Chiang Rai, Phayao, Lampang and Lamphun and include the prime land for wet rice cultivation; glutinous rice (the local staple) is therefore the central crop grown. Typically, the system has a long history of agricultural development involving extensive irrigation, specialized management techniques, and cultivation of specialized crops such as vegetables, soybeans, garlic, onions and longans.

In marginal areas where valleys extend into the uplands, the proportion of land suitable for wet rice is more limited so upland crops are more important and upland rice supplements the wet rice crop.

#### **Cyclical swiddening systems**

This is a type of slash-and-burn or shifting agriculture. It is mainly associated with intermediate altitude or upland areas and is practised by the Karen, Lua, Htin and Khama hill tribe groups. This semi-permanent system is based on rotating between several plots of land over a cycle of several years. When crops have been cultivated on a given plot for a certain period of time the bush vegetation is allowed to regenerate. The cropping period and length of fallow vary between tribes. The Karen, for example, have traditionally favoured cycles of approximately 10 years. However, increasing pressure on land has meant that in all groups, most farmers have been forced to shorten their cycles to about 2–4 years.

Under these systems, rice is typically the main crop but it is usually mixed with many other crops such as egg plant, chilli or lemon grass. These are planted in strategic locations rather than in rows so that they can easily be gathered on the way home (Sutthi, 1989). Such mixed cropping systems allow cyclical swidders to eat directly from their fields for up to 8 months a year.

Traditionally, mono-cropping was rare, but in the last few decades, promotion of cash crops by government and NGO agricultural development projects has made it fairly common.

#### **Pioneer swiddening systems**

Pioneer swiddening is typically carried out in high altitude or highland areas. It is 'true' shifting cultivation; each plot of crop land is cleared from primary forest and is cultivated repeatedly until it is 'exhausted'. The actual length of the cultivation period varies greatly,

from one to more than 20 years depending, amongst other things, on soil fertility and structure. Pioneer swiddening is practised by the H'mong (Meo), Yao, Akha, Lisu and Lahu groups. Opium has often been grown as the main cash crop in these systems as it is possibly the crop best suited to the climate and conditions found in high altitude areas (about 1000 m and above).

Many pioneer swiddeners use mixed cropping systems similar to those of the cyclical swiddeners. Those who grow opium, maize and rice may follow a 'sequential' system where opium poppy, inter-sown with vegetables and semi-annuals, is planted in the maize fields after the maize has been harvested. The vegetables and semi-annuals mature and produce after the opium has been harvested (Sutthi, 1989).

As well as the obvious concern about opium cultivation, the government has for a long time been considering reducing, or even eradicating, pioneer swiddening because of its supposed contribution to deforestation and watershed degradation. The cultivated zone covers the main watershed areas of the Ping, Wang, Yom and Nan, the four main tributaries of the Chao Phraya River, and therefore erosion of forest cover in these areas is considered to be a problem at the national level. As a consequence, 'development' efforts in the highlands have concentrated on the replacement of opium with other cash crops and on persuading pioneer swiddeners in particular to change to permanent forms of cultivation.

### ***Changes in farming systems and agriculture in recent years***

In recent years, inter-zonal migration in particular, and the interventions and priorities of development projects, has led to a blurring of the distinction between different farming systems.

Inter-zonal migration has been felt most acutely in the intermediate altitude zone (Tan-Kim-Yong *et al.*, 1988). In the last two decades there has been a high net inflow of population into the zone from the highlands (for example, H'mong families and communities), and from the lowlands (khon Muang).

The migration across zones has meant that the highlanders have needed to adapt their agricultural systems and livelihoods. For those who had depended heavily on opium, alternative cash crops have needed to be found as opium cannot be grown at altitudes much below 1000 m. Also, due to the rapidly expanding population in the intermediate zone, land, especially forest land suitable for shifting cultivation, has become increasingly scarce. Former swiddeners are therefore increasingly needing to change to permanent systems of agriculture.

These changes have been reinforced and influenced by the activities of numerous development projects which have been taking place in the highlands since the 1970s. The activities of many of the organizations involved in these projects originally centred on the eradication of shifting cultivation and opium growing by introducing cash crops to be grown in permanent agricultural systems. That these projects have led to increased production of cash crops, such as temperate vegetables, fruit and flowers, is evident. However, the extent to which they have been effective in reducing shifting cultivation, and their impact on livelihoods and the environment in general, are perhaps more controversial. There is the recurring problem that the profit obtained from the new cash crops cannot generally compare to that previously derived from opium. Also, there is a widespread difficulty in marketing the products. Local demand for many of these temperate crops is very low and costs of transportation to market are often high.

Concern has also been growing about the environmental impact of the new cash crops and their associated management systems. The high level of chemical input needed to grow many of these crops, and the detrimental effect of the chemicals on soil and water quality has been widely criticized. The promotion of mono-cropping as opposed to the traditional mixed cropping systems is thought to be reducing the biodiversity of the highland environment (Sutthi, 1989). There are also criticisms that the development agencies have not given adequate consideration to the need for management systems on sloping land to combat soil



erosion. Many organizations in both the government and non-government sector have begun to respond to these criticisms in the last few years; they have been moving towards activities and methods which have a more positive impact on the natural resource base, for example, the promotion of agroforestry for vegetative soil erosion control by researchers in the DLD, Chiang Mai. However, a large amount of work is still required.

## **Population and demographic change**

### ***Population size, density and growth rates***

The Upper North has the highest proportion (about 10%) of hill tribe population in Thailand (about 1%). The four provinces of Chiang Mai, Chiang Rai, Tak and Mae Hong Son alone account for 70% of the national hill tribe population (Tasanapradit *et al.*, 1986; McKinnon and Vienne, 1989).

The population density of 62/km<sup>2</sup> is low compared to other regions. This largely reflects the high proportion of mountainous and forested terrain (The Manager Company, 1990).

The average population growth rate during the 1980s was about 1.5% per year in the north, which was slightly higher than the national average of 1.2%. However, between 1970 and 1980, the northern rural population growth rate was 1.8%, considerably lower than the national yearly growth rate of 3.0% (The Manager Company, 1990). The northern rate of population growth therefore appears to be falling at a much slower rate than in the rest of the country.

The low regional population density, and the fairly low population growth rate do not appear to suggest any problems of population pressure. However, the population density for the region as a whole masks the fact that a large proportion of the land is unsuitable for human settlement or agriculture. Consequently, in the last few decades, steady population growth has contributed to the significant pressure on available land.

Also, in particular areas and for particular groups, population growth rates not only remain high but are increasing in many cases. This is a result of the sustained high natural growth rates (high fertility rates) among most of the hill tribes, and the patterns of migration which have developed in the region.

### ***Hill tribe population: natural growth rates***

While extensive and accurate information on hill tribe population characteristics are still not easily available, more detailed case studies can provide some indication of demographic characteristics and trends.

There are seven major ethnic groups in the northern highlands and a few smaller groups. The main groups, in descending order of approximate population size, are: Karen, H'mong, Lahu, Yao, Lisu, Akha and Lue. The Karen is by far the largest group, accounting for about half the total hill tribe population (Tasanapradit *et al.*, 1986).

Almost all these non-Thai groups have substantially higher fertility and natural population growth rates than the northern population as a whole. For example, preliminary data from a census carried out by the National Statistical Office showed that in 1985 in Tak province, the average crude birth rate (CBR) for all hill tribe groups was 40.4 per 1000, with a natural population growth rate of 3.1% (compared to an average growth rate of 1.5% during the 1980s for the whole northern region). There was considerable variation in growth rate between groups, ranging from 3.8% for the H'mong to 2.9% for the Karen. These variations, and the high fertility and population growth rate, are generally attributed to intensive labour requirements, cultural characteristics, and inadequate health care.

Intensive labour requirements in highland agriculture result from the steep terrain which severely limits the use of machines, the high cost of obtaining technical inputs where access and transport are difficult, and the relative scarcity of fertile soils which leads to low productivity (Tasanapradit *et al.*, 1986).

Although the socio-cultural characteristics of hill tribe groups are thought by some to explain the higher fertility rates of the non-Thai population as a whole (Tasanapradit *et al.*, 1986), the considerable social and cultural differences between the groups casts doubt on this argument. However, different socio-cultural characteristics may better explain differences in fertility rates between hill tribes. The relatively large numbers of H'mong children, for example, might be explained by their strong preference for male descendants, the strong association between a woman's status and her number of children, and the acceptance of polygamy.

Compared to the lowland population, the hill people have poorer access to, and knowledge of, health services. This may have had the following two effects. First, poorer access to health care may contribute to high infant mortality; this may lead to a high demand for children (although high mortality rates have a negative effect on net population increase). Secondly, poorer access to family planning may limit the extent to which couples can restrict the size of their family.

With regard to likely future trends in fertility and population growth, some of the changes taking place in highland agricultural practices may exert a downward pressure on the demand for labour and hence on the demand for children. For example, increased access to markets has also increased access to modern technology and inputs such as fertilizers, pesticides and herbicides.

Most of the hill tribe groups have, to some extent, adapted their outlook, behaviour and values to the changing socio-economic conditions. However, evidence suggests that for some, for example, the H'mong, the values and traditions related to having large families, such as the preference for male children, have endured in spite of outside influences. For some groups, fertility rates may therefore remain high for some time.

Recognition by government departments of the need to reduce population growth rates of hill tribe groups will probably mean that access to family planning facilities will increase fairly rapidly. However, increased access may not increase uptake because of antagonistic cultural beliefs and practices, and unless the underlying demand for children by both women and men falls, family planning will not depress fertility rates.

### ***Patterns of migration: the 'intermediate zone crisis'***

Population growth in the intermediate altitude zone during the last 20 years was double that in the rest of the highlands (Tan-Kim-Yong *et al.*, 1988). This has resulted in an increasingly serious pressure on land resources, and has contributed to the number of landless households in this area.

This 'intermediate zone crisis' has generally been attributed to the increasing population pressure in both the lowlands and highlands, which has led to the migration of marginal and landless households into the intermediate zone to look for land. While population growth has undoubtedly played its part in the past, other factors are also involved. In the lowlands, intense and widespread land speculation, expansion of infrastructure and markets into upland and highland areas, and small farmer debt have all contributed to landlessness and the influx of khon Muang seeking new land in the intermediate zone. In the highlands, although continued high natural population growth and hill tribe immigration from neighbouring countries are significant factors, government interventions have also had an effect. Efforts to end shifting cultivation and opium growing in the highlands have forced many shifting cultivators, particularly the H'mong, to move to lower areas.

## Population growth and land pressure

The high population growth in the north, especially in the highlands, is frequently blamed for the increasing scarcity of land, landlessness, and degradation of land and forest resources; high fertility rates are seen as a particular threat.

It is important to recognize that environmental degradation may often be attributable to the indirect effects of population growth, rather than to population growth itself. For example, the impact of rapid population growth on degradation of the environment in the intermediate zone has mainly resulted from the pattern of migration, i.e., across agro-ecological zones from the highland and lowland areas. This pattern has been partly responsible for the development of inappropriate farming and management practices in these upland areas. Khon Muang moving to the upland areas have attempted to continue the wet rice farming system on which they depended in the lowlands; terracing land for this purpose presents a serious risk of erosion. Highland pioneer swiddeners have also sought to continue their traditional agricultural methods; forest land whose soil and vegetation conditions can only sustain short periods of cultivation has been cleared and this has necessitated frequent clearing of new land. Future immigrants will need to adapt their farming systems to the new environment; until then, rapid environmental change is likely to continue.

It would therefore appear that the relationship between population growth and pressure on land resources in the north is complex.

## Tree resources in Northern Thailand

When discussing tree resources, trees on farms as well as those in forests should generally be considered. However, in Northern Thailand, forest trees predominate and are therefore considered first.

Northern Thailand is the most heavily forested region of the country, due partly to the mountainous terrain and hence the difficulty of access for farmers and loggers. In 1991, forests covered 45% of the land in the north (60% in the Upper North)\*, but only 26% of the whole country (Royal Forest Department, 1991). The percentage of forest cover varies significantly from province to province, even within the Upper North, from 75% in Chiang Mai and Tak, to about 35% in Chiang Rai.

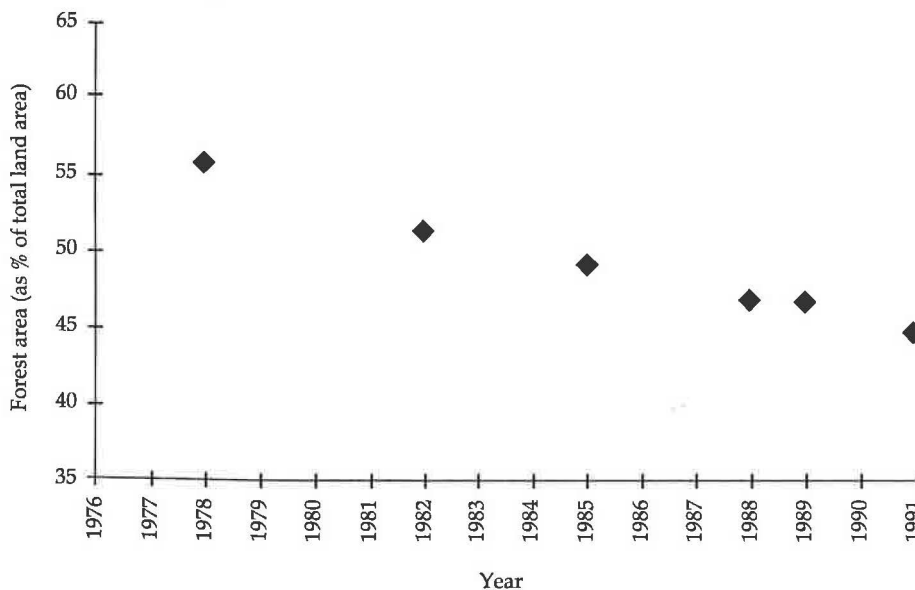


Figure 1 Graph showing change in forest area in Northern Thailand (1976–91)

\*The forest areas quoted here are for all tree cover (including scrub, swamp, bamboo and forest plantation areas) within National Forest Reserves, national parks, wildlife sanctuaries, forest working plan and forest concession areas and detectable by LANDSAT-1M imagery at the scale of 1:250 000. They do not include degraded areas within forest reserves, etc., nor rubber plantations, orchards or other tree cover on private land.

The rate of deforestation has been fairly rapid. Forest cover declined from 60% in 1976 to 45% in 1991 in the north, and from 80% to 60% in the Upper North; the rate of loss has decelerated, however, since the mid 1980s (see Figure 1). While the rate of deforestation in the northern region is not the highest (forest cover halved in the northeast during the same period), the absolute loss of area is the largest at approximately 20 000 km<sup>2</sup> between 1976 and 1991 (Royal Forest Department, 1991).

### ***Types of forest***

The three main types of forest to be found in Northern Thailand, as distinguished by the Royal Forest Department (RFD), are dry dipterocarp (39% of total forest area in 1982), mixed deciduous (28%) and evergreen (31%) (Royal Forest Department, 1991).

Dry dipterocarp forest is found on porous, shallow, well-drained soils, generally formed from lateritic parent material. They grow on both flat lands and hills, but rarely above 1000 m. In appearance they are open, grassy, and often approaching savanna-type forest. Common tree species include the *phluang* (*Dipterocarpus tuberculosis*), *hiang* (*D. obtusifolius*) and *teng* (*Shorea obtusa*). Undergrowth consists of grasses and shrubs.

Mixed deciduous forests contain the richest timber stands in Northern Thailand, and provide suitable conditions for shifting cultivation. Areas containing teak (*Tectona grandis*) have been particularly productive in terms of both timber revenue and swidden agriculture. These forests occur mainly on deep, well-drained soils such as limestone, or on alluvial and colluvial lower slopes, where annual rainfall is between 1000 and 2000 mm. Mixed deciduous forests are generally quite open with the teak either scattered amongst other species or, on alluvial soils, in pure stands. Teak is not found above about 600 m. Common species associated with teak include *pradu* (*Pterocarpus macrocarpus*) and *daeng* (*Xylia kerii*).

According to RFD classification, three sub-types of evergreen forest are found in the north: tropical evergreen, hill evergreen, and pine. Tropical evergreen forests are found at altitudes below 1000 m, mainly in low-lying situations near streams and rivers where soils are deep, well-drained, but with good water retention. Many hardwood species are present in these forests; Dipterocarpaceae are widespread, particularly the *Dipterocarpus* spp. such as *yang khao* (*D. alatus*). Undergrowth includes bamboo, palm, fern and cane.

Hill evergreen forests grow on high mountain ridges above 1000 m and have dense canopies. They are favoured by pioneer swiddeners for growing opium, maize and upland rice because of their soil and climatic conditions. Therefore, except in areas where special protection has been offered, primary forest has been replaced by shifting agriculture and secondary regrowth within the last decade. The commercial value of the trees themselves is insignificant as the few timber species which do exist are scattered and largely inaccessible. These trees are, however, valuable for watershed protection because of their location in the high altitude areas, especially when they grow on steep slopes.

Pine or coniferous forests are found at altitudes of 700–1000 m upwards. The growing stock consists mainly of the two species *Pinus insularis* ('three-leaf pine') and *P. merkusii* ('two-leaf pine'). At the lower and upper altitude limits, pine forest is sometimes mixed with dry dipterocarp and hill evergreen forest, respectively.

### ***Administrative categories of forest***

Over the years, the RFD and other government departments have produced an array of classification systems for differentiating between forest areas according to such issues as intended use, environmental sensitivity or strictness of protection required. As a result, the classifications frequently overlap, so that one area may be classified under more than one type. The current systems are again awaiting review, as the Thai Forestry Sector Master Plan intends to clarify and amend the existing categories and associated management principles (Chapter 4). At present, the most widely recognized classification distinguishes between National Forest Reserves and areas of forest under the Protected Area System (PAS); these are described below.

National Forest Reserves, or reserved forests, cover a large proportion of the country's total land area (45% in 1991); in the north, they constitute 66% of the land area. Between 1986 and 1991, the area of reserved forest in the north increased slightly from 106 000 km<sup>2</sup> to 114 000 km<sup>2</sup> with the designation of seven additional units from 250 to 257 (Royal Forest Department, 1991).

At present, a number of restrictions and regulations on the use of tree and land resources apply to forest reserves, the most important of which include the national ban on commercial logging, the restrictions on private land ownership and use of land for agriculture, and the prohibition of clearing new forest land for agriculture. Many quotas and restrictions apply to the exploitation of tree resources. These are generally intended to limit harvesting to household and 'subsistence' use rather than for commercial ends. Different regulations apply to cutting wood for timber, cutting and collecting wood for fuel and making charcoal. For example, limited tree species may be cut for timber to build a family house, but the timber cannot be sold for cash. Chain saws are not permitted for cutting the timber; only mechanical tools which are also used for household purposes are allowed.

Farmers in reserved forest areas are not permitted full rights to the land they farm although several schemes, such as the Forest Village Programme and the STK Land Certificate Scheme, have allocated limited user rights to selected households throughout the country.

In general, the actual laws and RFD regulations governing the use of resources in reserved forests are less strict than for areas within the PAS system (see below) and the enforcement of regulations in reserved forests is also more relaxed. Many of the restrictions on use of trees are difficult to enforce, and local forestry officials first and foremost seek to avoid conflict with local villagers. Similarly, although few households in reserved forests have any official land rights, government officials usually tolerate their presence and agricultural activities.

The PAS consists of the following categories, each theoretically with specific conservational and/or recreational objectives: national parks, forest parks, wildlife conservation areas, no hunting areas, wildlife parks, botanical gardens and arboreta. National parks and wildlife conservation areas are by far the most important in terms of area covered, and account respectively, for about 8% and 5% of the country's total land area. The number of 'units' of both types has increased substantially in the last few years. National parks increased from 52 in 1986 to 74 in 1991, and wildlife conservation areas increased from 29 to 34. This increase has accompanied rapidly increasing public awareness and concern about environmental issues.

Watershed protection areas are usually included under the PAS, although they are classified by the Office of the National Environment Board rather than by the RFD. Class '1A' watershed areas are the most highly protected because of their critical importance and environmental sensitivity.

All zones under the PAS have been more strictly protected than the reserved forests. Human settlement, and activities such as agriculture and the collection of forest products, are not generally tolerated. There have been many incidences, and several waves of forced expulsion of forest dwellers from these areas. For example, the recent *Kor Jor Kor* programme resulted in many long-established villagers being moved out of national parks. Although cases of violent conflict between park dwellers and local forest officials over forced evictions are still publicized from time to time, the Master Plan states the intention of ending forceful evictions in the future. The Plan also recognizes that the relocation of all the people living in national parks or other PAS areas is not practically feasible, and discussions are now taking place about the removal of inhabitants only from those locations that are particularly sensitive or important for environmental protection.

### ***Other tree resources***

The promotion of tree growing on farms is seldom discussed in relation to forest resources. One reason for this is the division in governmental responsibilities for tree resource

management; whereas forests are the domain of the RFD, on-farm tree resources are the responsibility of other departments such as the DLD.

However, in some of the provinces in the Upper North, the proportion of farm land under tree cultivation is quite significant. In Chiang Mai, Lamphun and Mae Hong Son, for example, the percentage of farm land under fruit trees and tree crops in 1988 was 11%, 12% and 11% respectively (Royal Forest Department, 1991). Orchards, of longan trees for example, have long been kept by the northern Thais, and as the cultivation of many temperate fruit tree species is being promoted by development projects in the highlands, orchards are being kept increasingly by hill tribe communities as well.

Agroforestry has not been a primary feature of traditional farming systems either in the lowlands or in the mountains. However, research, and development of certain agroforestry techniques for highland agriculture, are beginning to develop and certain systems, such as the use of alley cropping to mitigate soil erosion on steeply sloping land, appear to be fairly effective and popular amongst highland farmers. The NGO sector and some sections within government organizations have begun to consider developing and extending these methods. The DLD, for example, in co-operation with other organizations such as the Thai-German and Thai-Norway Highland Development Programmes, and the Royal Project, launched research and development projects in 1987 to identify and implement conservation cropping systems for sustainable agriculture on sloping lands. Although these are small-scale endeavours, more and more groups in the government and non-government sectors are showing interest, so if highland farmers find these methods attractive, agroforestry may spread in future years.

### ***Causes of deforestation and forest degradation in Northern Thailand***

Deforestation and forest degradation result from a complex of factors involving differing human activities, groups of people and sets of interests. One of the ultimate aims of this research is to increase our understanding of this complex. Some of the main causes of deforestation and forest degradation are outlined below.

With regard to forest use and management in Thailand as a whole, it is most important to recognize that since the imposition of a national ban on logging in 1989, large-scale commercial logging concerns, either Thai or foreign, are no longer included among the main stakeholders in forest resources. The rural population living in national parks and reserved forest areas, and those living outside these areas but exploiting the forest for fuel and timber, are therefore the main groups of users and managers. Of these, the most important with regard to the fate of the forest resources is the large and growing group of people living in reserved forest areas; in the north, this includes hill tribe communities and the khon Muang.

The impact of these people on forest resources results from the growing demand for land and tree products. New forest land continues to be cleared by local people mainly for growing crops, but also because the price of land is rising rapidly (as in Chiang Mai province for example); farmers are tempted to sell their cultivated land to non-local land speculators for large sums of money and then clear new forest land for their own use. In principle, the clearing of new land for agriculture is now prohibited, but enforcement of the prohibition does not appear to be particularly effective. Secondly, local people contribute to forest degradation by cutting and collecting a large number of tree products for their own consumption and, increasingly, for sale. These products include fuelwood, foodstuffs for their own use, and timber and charcoal for sale to other villagers or wider markets. Although the ban on logging was relatively easy to enforce by withdrawing concessions from large-scale logging companies, the smaller scale activities of large numbers of local people have proved much more difficult to prevent.

It must be stressed that although local people living in reserved forest areas may constitute the main group of direct forest exploiters, a large number of indirect or secondary stakeholders is also involved (such as the RFD, NGOs, non-residential land owners and

speculators, and urban populations demanding wood products). As much, if not more blame for the deforestation in Northern Thailand can be attributed to these groups. It also needs to be recognized that as well as human activities, there are some natural causes of forest degradation and loss. For example, forest fires, which are frequent towards the end of the dry season, cause damage to large areas of forest land every year; large tracts of forest in the country's oldest national park were burnt in the summer of 1994. Although the vegetation may sometimes recover fairly quickly, the damage may be severe.

## 4. FOREST MANAGEMENT POLICY: NATIONAL POLICY

The policy issues discussed in this chapter provide a background against which the case study described in Chapter 6 can be placed and understood and are also of interest in their own right. The concepts behind the policies, the objectives, and the plans of action, together reflect the interests of one of the most important sets of stakeholders, the macro-level policy makers.

### **The emerging policy context: the 1980s onwards**

Since the early 1980s, important and dynamic changes have been taking place in environmental and forest management throughout Thailand. Changes in the nature and extent of deforestation and environmental problems, and newly emerged problems, have received wide publicity and created new pressures and demands on existing forestry and environmental policy and legislation. In the forestry sector, these pressures have led to discussions about changes in policy goals, strategies and institutional structures; in some cases, such changes have already been initiated. Some of the most important modifications and changes which are occurring in relation to the forestry sector are discussed, and a preliminary assessment of their significance in terms of the future of forest management and related policy is made.

#### ***The problems***

The rate of deforestation slowed from 1.2% per annum in the 1970s to 0.4% per annum during the 1980s (Royal Forest Department, 1991; Pragtong and Thomas, 1990). However, it has remained of primary concern for the government, and the country as a whole, as the effects and causes of deforestation have moved into the public and political limelight.

Some of the problems are old ones which the government has not yet been able to overcome. During the 1980s, until the ban took effect, large-scale illegal logging occurred with the involvement and support of powerful people in all sectors; in spite of the ban, however, small-scale illegal logging is still widespread. Government agencies outside the forestry sector have continued to demand reserved forest land for other purposes, such as land reform and reservoir construction, and the RFD has not been in a position to prevent these developments. In the mountainous areas of the north and northeast, the increasing population of ethnic minority groups living in the highlands and uplands is contributing to 'an ever increasing pressure on land. This has led to more forest land being cleared and to increasing conflicts between different ethnic groups over rights to the scarce land.

However, new problems have also been emerging. Some of the many projects designed to replace opium with alternative crops have encouraged the indiscriminate use of pesticides and the introduction of erosion-prone cropping systems to critical watershed headlands. This has led to concerns about the negative effects of these projects on environmentally critical areas, and to doubts about their long-term sustainability. The scale of land speculation by non-local people has rapidly escalated and this has also taken its toll on forest land; local farmers sell their land to speculators and clear new areas of forest to replace it.

#### ***Forest resources and the environment move to the centre of the public arena***

There was an explosion of publicity and popular concern over environmental issues in the 1980s and during the decade many small NGOs were set up. This expanding network of NGOs gathered strength as a loosely knit environmental movement, and mobilized and supported villagers to oppose various government interventions to the extent that even small farmers began to find a political voice.



The power and influence of this environmental movement was reinforced by media support, and corruption within the ranks of the RFD with respect to the scale of illegal logging became widely publicized. The media has also played a key role in mobilizing the public, particularly in the successful opposition to the construction of the Nam Choan reservoir and hydroelectric facility within Thailand's largest wildlife sanctuary. The catastrophic floods and landslides in the south in 1988, which received extensive media coverage, were linked to encroachment and deforestation of watershed headlands and therefore triggered an unprecedented popular outcry.

The mounting public concern among villagers, NGOs, academics and students gradually spread to political circles and government agencies, including the RFD and led to some important policy initiatives.

### ***Emerging policy changes within the forestry sector***

The catalyst for subsequent debate and initiatives in forestry sector policy has been the realization, from within the RFD, of the need for substantial changes in management strategies, backed by more systematic government policy, to cope with the scale and complexity of current deforestation problems.

The National Forest Policy Committee was set up to address the need for more systematic policy and was made responsible for formulating a detailed forest management plan for the country. The result was the National Forest Policy of 1985 which was innovative in two main respects. First, it established a distinction between the PAS which consists of national parks, watershed headlands and wildlife sanctuaries, and 'economic' forest areas. Emphasis was placed on increasing the percentage of protected areas to 15% of the 40% target for total forest cover, thus emphasizing the environmental objective of forest preservation. Secondly, it encouraged the RFD to foster links with all other sectors of society including local communities, the private sector, universities and other government agencies. This was in recognition of the need for the support and collaboration of other institutions in addressing the country's forest management problems (Pragtong and Thomas, 1990).

Various initiatives were launched in response to these objectives. The RFD expanded the area of national parks and wildlife sanctuaries to about 10% of the country, and a nationwide watershed classification system and mapping exercise was completed. Tree planting programmes were accelerated. The private sector and the military were responsible for initiating large-scale forest plantation programmes, including the military led *Isarn Khieo* ('green northeast') project in the northeast. The offer of help from non-government institutions was also accepted. NGOs have, for example, assisted the government in developing pilot management plans for protected parks. The Forestry Extension Office was set up in 1986, and the Community Forestry Section of the RFD developed 'interest groups desks' in an attempt to elicit the support and participation of local communities.

However, the most dramatic policy change was the announcement in January 1989 of a nationwide emergency ban on commercial logging in reserved forests; later in the year, legislation was passed to revoke all logging concessions. This ban was provoked by mounting public outrage in the wake of the floods and landslides mentioned above which claimed more than 200 lives. In the aftermath of the disaster, environmental groups publicized the extent of forest destruction caused by illegal logging and concession abuse and ultimately goaded the Minister of Agriculture into imposing the ban. As a consequence of this bill, public forest land management policy has been subject to review and reorganization.

### ***Remaining contradictions and challenges***

Despite these promising policy initiatives, some serious challenges remain for the forestry sector. Although the government has taken certain temporary measures to compensate for the commercial logging ban, including opening borders to timber imports and reducing log import tariffs, decisions have yet to be made regarding the future. For example, consideration must be given as to how domestic demand for wood products will be met. The extent

to which commercial tree plantations should be promoted to replace logging of natural forests, and the best economic use to which forest resources might be put without unnecessarily compromising environmental sustainability objectives, are also issues to be addressed.

With the revoking of logging concessions, policy makers and the public have focused their attention on the contradictions and conflicts which result from having over a million households (representing about 10% of the nation's population) living on and farming lands within reserved forest areas. It is impossible to relocate more than a small percentage to sites outside the forest reserves because of the scale of illegal occupation. Those who have been relocated in the past often merely transfer the problem by illegally occupying land in reserved forests in another district or province.

Finally, the new policies which were initiated in the early 1980s to promote community participation and elicit the support of various institutions have been implemented only slowly.

Thus, at the end of the 1980s, the RFD faced several challenges with regard to deforestation arising from occupation of reserved forest lands. The following issues are of particular importance:

- the large scale of the problem, and the pressures on resources and management which it implies
- the political unacceptability and logistical difficulty of enforcing strict regulations on forest use
- the history of conflict between government forestry officials and local villagers living on or near forest land, and between national and local interests in the use of forest resources.

## **Rising to the challenge?: the Thai Forestry Sector Master Plan and the development of 'bottom-up' planning and management approaches**

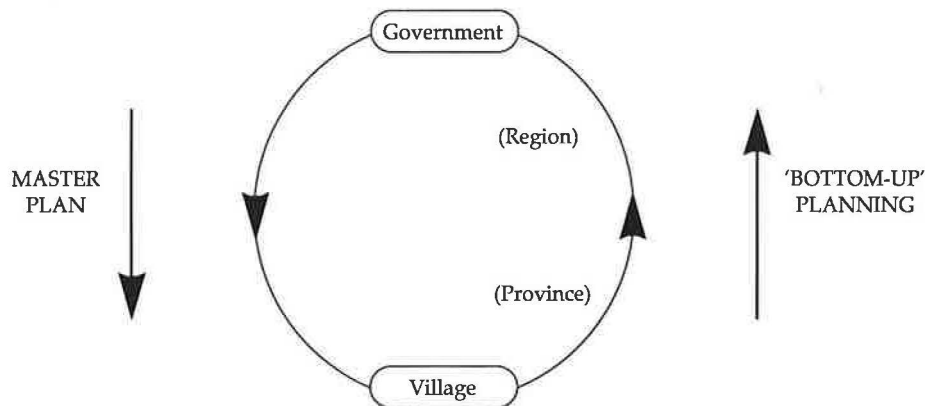
During the late 1980s and early 1990s, two levels of initiatives were launched in response to these challenges. On the macro level, work began on the Thai Forestry Sector Master Plan in 1990. The Master Plan is a comprehensive national plan which was approved in principle by the Project Steering Committee (a committee appointed by the Cabinet) at the beginning of 1994. On the micro level, during the 1980s the RFD in collaboration with universities and support from the Ford Foundation, initiated a series of studies and pilot projects aimed at developing practical field methods for joint RFD-community land use management planning. The intention was to develop land use management plans and activities which would meet local needs on the one hand and satisfy national natural resource management policies on the other.

The 'top-down' Master Plan and 'bottom-up' community level projects are pictured by the policy makers as two sides of the same coin. Eventually, as the two processes develop, they are expected to be incorporated into a 'policy cycle' whereby lessons learnt at the micro level will be continuously fed back into the macro level plan. This is depicted diagrammatically in Figure 2.

### ***The Thai Forestry Sector Master Plan***

In many ways, the Master Plan is a direct progression from the 1985 National Forest Policy. It seeks to develop, articulate and put into practice the policy objectives and measures introduced in 1985 rather than provide new policy initiatives. However, the significance of the Plan should not be underestimated. To begin with, it is the first attempt to formulate an integrated and comprehensive plan for the whole forest sector since the RFD was founded in 1896 (Vorapien, 1990). Also, the fact that it has been formulated within the RFD and been approved by the Cabinet is in itself an achievement; not long ago, the concept and

acceptance of such a plan within central government would have been unimaginable. Finally, the actual process of formulating the Master Plan was significant. It was characterized by discussion between different interests and involved different government departments and sections, and some external agencies and NGOs. Although some NGOs feel that their inclusion was nominal, most would agree that it was a positive gesture.



**Figure 2** The policy cycle  
 (Source: Laitainen, personal communication)

The Master Plan is ambitious and detailed. It describes many objectives and proposes a number of measures with which to address them; at this stage, it is still uncertain which aspects will take priority. However, several key strands run throughout the Plan, and these are outlined below.

- (a) A comprehensive forest management plan will be created to deal with the different aspects and objectives of managing forest resources in an integrated way. To support this overall aim, emphasis is placed on rationalizing policy and management, by attempting, for example, to articulate specific policy objectives and by delineating different categories of forests according to their primary purposes and associated management principles.
- (b) For the first time, environmental conservation will be placed at the forefront of policy objectives while recognizing the opportunities for harnessing the economic value of forest resources in a sustainable way, and the need to take social justice and equity into account.
- (c) The scale and depth of management activities will be increased in recognition of the extent and complexity of forest resource management problems today. This will largely be achieved by enlisting the co-operation and support of other sectors of government and society, including universities, NGOs, and the local forest communities themselves.
- (d) Institutional reform will be introduced, particularly in terms of forging both vertical and horizontal links. The Plan will seek to link 'upwards' by incorporating the forestry sectoral plan into the National Economic and Social Development Plan (NESDP). As the NESDP is updated every five years the forestry sectoral plan, for which the Master Plan will be the prototype, will be updated accordingly to co-ordinate with the NESDP cycle. 'Horizontal' links are being developed with institutions with specific expertise and interests, such as other government departments, university faculties, and relevant NGOs. 'Downward' links are currently being sought and developed with local villagers by collaborative learning and planning efforts at village or community level.
- (e) Approaches to forest management and policy implementation which rely more on 'positive reinforcement' (Pragton and Thomas, 1990) will be developed and applied in recognition of the difficulties encountered in the past associated with 'negative reinforcement'. This is represented implicitly by the emphasis on working in partnership with local people, for example, rather than in opposition to them. By planning in conjunction with local people at the village level, the implementation of policy at the micro level will try to take the needs of local stakeholders into account and hence establish a compromise between local and macro policy interests.

## *The development of 'bottom-up' planning approaches*

A programme of pilot projects based on a series of studies initiated in the 1980s on deforestation problems in reserved forests in the north and northeast and aimed at developing 'bottom-up' planning methods, was launched in 1987. The programme, known as the Thailand Upland Social Forestry Project, was initiated by the RFD in collaboration with the Kasetsart University Faculty of Forestry (Bangkok), the Faculty of Humanities and Social Science at KKU, and the Social Science Faculty of Chiang Mai University. Its ultimate aim was to develop practical methods by which RFD officials can collaborate with local communities to formulate mutually acceptable land use plans for local reserved forest resources, and thereby meet both local needs and the objectives of national resource management policies.

Using the programme's approach, the RFD would collaborate at the macro level with policy advisers and university staff (with some support from NGOs) and at the local level, with local communities. In practice, this strategy is carried out by using resident village community organizers (COs) who mediate between villagers and the RFD, and by informal monthly working group sessions which bring together COs, RFD staff at local, regional and central levels, and university staff. The employment of simple research and planning techniques by village COs enables all groups to contribute to the analysis of problems and the planning of activities. The university staff analyse progress and problems in pilot villages supported by supplementary research; these analyses are presented at the monthly workshops which result in a rolling plan for the following month.

The following three types of pilot villages were initially selected in the northeast: those under Forest Village Programmes, those participating in the STK Land Certificate Programme\*, and those located in reserved forests where no RFD programmes were operational. In the first two cases, the aim was to improve the effectiveness of the programmes by collaborative management. In the third village type, the potential for CO-initiated programmes was explored and developed.

In the north, pilot villages were selected primarily in first class watershed headlands in order to seek ways of minimizing the need for resettlement by developing local catchment management plans acceptable to local people and in line with national policy. The opening exists even though, in principle, settlement and agricultural activities are prohibited in all first class areas. This is because it is now recognized that rather coarse resolutions were used when drawing the national watershed classification maps and within many designated first class areas, zones exist where more intensive land uses would be ecologically acceptable (Sudsawasd, personal communication; Thomas, personal communication).

Since 1987, considerable development has taken place. Within the programme, activities have expanded considerably to incorporate villages within several river basins of the northern region. However, in view of the uncertainty of the future of the project because of the need to secure further funding, the most important aspect may have been the development and formalization of techniques and methodologies for collaborative management of local resources. In the north for example, the research staff from Chiang Mai University have used their seven years' of experience in the field to develop the following three analytical and operational frameworks: Situation-Specific Analysis (SSA), Operation Process Analysis (OPA) and Participatory Land-Use Planning (PLP). SSA focuses on pre-operational research using a variety of participatory information gathering techniques such as RRA. OPA is concerned with the gathering, processing and communication of data which are then channelled into the planning process. PLP is an operational process for strengthening local institutions and creating the conditions for frequent discussion and joint analysis of local forest resource management problems (Tan-Kim-Yong, 1992). The principles and techniques used in PLP are discussed in detail elsewhere (Tan-Kim-Yong, 1992).

---

\*The Forest Village Programme and STK Land Certificate Programme were previous attempts at addressing the problems of continuing encroachment of forest reserves by farmers looking for agricultural land. Both programmes intended to contain the extent of land clearance by giving user rights to forest dwellers over a fixed area of land, and providing a variety of other services. However, in many cases, these efforts were not successful for various reasons including the allocation of inadequate plots of land and failure to deliver promised services.

This operational framework has been generally successful and popular. Some aspects have been adopted by NGOs and government organizations such as the Community Forestry Section of the RFD in the north. The Chiang Mai research team is now endeavouring to adapt the framework for neighbouring countries (Boonto, personal communication).

## **Assessing the Master Plan and the future for forest management policy**

Although the Master Plan has been approved in principle by the Project Steering Committee, it awaits official parliamentary approval; meanwhile, views are being expressed about the real significance of the Plan and what it represents.

The Plan is officially presented as a revolutionary watershed in forest policy, providing the mechanism for solving long-standing problems of forest management and deforestation by adopting an innovative approach based on partnership with local people in the planning and management of forest resources. A more cautious viewpoint recognizes the symbolic importance of the Master Plan, but regards it as the formalization of a process already underway. Many moderates acknowledge the good intentions of the Plan but are more sceptical about the chances of its effective implementation. There are also groups, such as some environmental NGOs, who view the Plan as a sham, simply an attractive re-packaging of a continued drive to promote the commercial exploitation of forest resources.

In the following section, the specific strengths and weaknesses of the Plan are considered, and directions for future efforts are suggested. Certain recommendations are also made on the application of stakeholder analysis where appropriate.

### ***Strengths of the Master Plan***

- (a) The serious need for participatory planning and management in all types of forest has been addressed. Not only has involvement of local communities been accepted by policy makers as a principle, but equally importantly, explicit steps have been taken to develop practical methods for collaborative planning under a variety of conditions. By accepting the need for community participation, policy makers are also recognizing the potential of using positive rather than negative reinforcement strategies in policy implementation.
- (b) The Plan also recognizes the cyclical nature of policy formulation. Policy makers have envisaged it as a prototype for a regularly updated, 'rolling' forestry sector policy plan. Planning is thus seen as a flexible process, where policy goals and methods of implementation can be periodically refined to better address the interests of both policy makers and local people. At the same time, any changes in the interests of local people, and any developments in planning methods, etc., can be systematically incorporated into the cycle.
- (c) In spite of NGO criticism, the intentions of the policy makers behind the Master Plan appear to be sincere. Attempts have been made to respond to current problems and conflicts in forest management, and past mistakes of the RFD have been acknowledged. The policy makers appear to be alert and receptive towards new ideas and approaches, and towards collaboration with universities, NGOs and other institutions.

### ***What remains to be done? What is the potential role for stakeholder analysis in these respects?***

The Master Plan is only the initial stage of a process which will take several years at least to develop. The further processes of policy development which are intended to lead on from the Master Plan are outlined below.

- (a) The Master Plan represents a fairly comprehensive national forestry policy but the gap between the policy in theory and its implementation in practice in diverse situations

on the ground now needs to be bridged. However, in order for the policies to be implemented, the development and passing of new and appropriate legislation is required. A draft Forest Act is now being drawn up, but this will only be a base for the further development of legislative structures to support the Master Plan. Making the policies work under different field conditions requires further research. This process is already underway using experience from the Upland Social Forestry Project and by the development of approaches such as PLP. The scope of these approaches, however, needs to be expanded or modified to operate under diverse conditions and in relation to the different management priorities in the various categories of forest. In situations where there is potential for a high level of conflict between distinct local groups over the use of forest resources, the development of a flexible but formalized framework to help resolve disputes is envisaged. A stakeholder analysis of interactions between groups at the micro level may also be useful.

- (b) As well as finding ways of implementing the Master Plan on the ground (the 'top-down' half of the policy cycle), the 'bottom-up' planning part of the process also needs to be developed. The experience and methodologies resulting from the Upland Social Forestry Project again form a sound basis on which to build. Ultimately, however, the interests of different stakeholders, particularly local people, will need to be systematically assimilated into macro policy-making, given the variability of these interests over space and time. This may necessitate rational trade-offs between local and macro objectives if these are incompatible. The application of some type of stakeholder analysis would be particularly appropriate for this purpose. Such an analysis could provide policy makers with an explicit understanding of the overlaps and/or conflicts which exist between the interests of local and macro level stakeholders; it could also provide frameworks and guidelines for formulating mutually acceptable management policies and strategies, and for making considered trade-offs where micro and macro interests conflict.

***What questions and criticisms of the Master Plan remain? What room is there for further progress, and how might stakeholder analysis be of use?***

- (a) Drawing up the Master Plan: is the participation of stakeholders enough?

When drafting the Master Plan, the policy makers noted previous forestry sector experience which indicated that policies made without at least some consideration of the interests of different stakeholder groups, particularly local forest users and managers, rarely achieved their intended objectives. As a consequence, representatives of a wide range of interested groups and institutions, from different government departments to villagers (represented by active village leaders and NGOs), were regularly consulted. Over 6000 working days were spent in workshops and seminars during the three years, and involved 3150 diverse participants (Laitalainen, personal communication).

However, the increased participation of stakeholders by itself may not have guaranteed that all their interests were properly taken into account in the Master Plan, partly because the selected participants may not have adequately represented the whole range of relevant stakeholders. Fundamental conflicts of interest will inevitably arise between different stakeholders and these cannot be resolved without cost to one or more interests. It is therefore essential to incorporate the means of addressing and resolving such conflicts, and of making reasoned trade-offs between different interests, during the initial policy formulation process. The application of stakeholder analyses could be useful in this respect.

- (b) Multiple objectives and trade-offs in forest management

It has already been noted that one of the particular characteristics of the Master Plan was the attempt to categorize different types of forest according to purpose and management strategies, and to outline explicitly how the different objectives would be represented for the various forest types (see Table 1). Although the plan succeeded in giving more rational detailed consideration to the objectives behind forest management, it may not have gone far enough; two significant consequences of this inadequate depth of analysis are discussed below.

**Table 1** Forest Land Categories and Policy Objectives (Thai Forestry Sector Master Plan)

<b>Land Category</b>	Biodiversity conservation	Watershed rehabilitation	Social justice and equity	Production of forest-based commodities	Economic development	The control of global warming
<b>State lands</b>						
Protected Area System (PAS)	Demarcated as national parks or wildlife sanctuaries. Disturbed areas rehabilitated. No logging. Conversion of natural forests restricted.	Demarcated as Watershed Class 1 (erosion-prone). Disturbed areas rehabilitated. No logging. Conversion of natural forests restricted.	Settlers may stay but activities to be consistent with PAS objectives. No forced resettlements. Managed by the State.	Activities of settlers guided to be consistent with PAS objectives.	Ecotourism	Carbon assimilation. No logging. Disturbed areas rehabilitated. Conversion of natural forests restricted.
Community forests	May be in buffer zone or conservation <i>in situ</i> . Disturbed areas rehabilitated. No logging. Conversion of natural forests restricted.	May be in buffer zone. Disturbed areas rehabilitated. No logging. Conversion of natural forest restricted.	Priority in allocation and lease. Community managed.	Multiple products. Agroforestry encouraged.	Develop local economy.	Carbon assimilation. No logging. Disturbed areas rehabilitated. Conversion of natural forests restricted. Replanting.
Man-made forests for multiple purposes leased to local people	May be in buffer zone. One or mix of species. Remnant forest retained. Replanting.	May be in buffer zone. One or mix of species. Remnant forest retained. Replanting.	Priority to forest land dwellers and landless farmers. Individually managed.	One/multiple products. Agroforestry encouraged.	Develop local economy.	Carbon assimilation. Remnant forests retained. Replanting.
Man-made forests for wood production leased to the wood-based industry	May be in buffer zone. One or few species. Remnant forest retained. Replanting.	May be in buffer zone. One or few species. Remnant forests retained. Replanting.	Least priority in allocation and lease. Corporate managed.	Mainly for wood. Agroforestry encouraged. Raw materials secured. Self-sufficiency in competitive products.	Wood import controlled. Deregulated. Export round-wood banned. Develop local and national economies.	Carbon assimilation. Remnant forests retained. Replanting.
Other state lands	<i>In situ</i> conservation in urban forests.		Equitable access.	Urban forest and greenery.	Not to be commercialized, but support tourism.	Carbon assimilation.
<b>Private lands</b>	May be in buffer zone. One or mix of species. Replanted.	May be in buffer zone. One or mix of species. Replanted.	Owner managed.	One/multiple products. Agroforestry. Urban forestry and greenery.	Deregulated.	Carbon assimilation.

First, the Plan is unclear about how the multiple objectives for managing a particular area will be addressed when they are found to represent competing actions. For example, in areas demarcated as Class 1 watersheds, the objective of maintaining forest cover for watershed protection appears unequivocal, but it becomes more complex when the beneficiaries of such protection are considered. At least two groups should be represented: local people who live within the area or immediately adjacent to it, and the Thai nation as a whole. The interests of the two groups differ substantially. The interests of the local population lie in preserving the catchment areas for their crop land; therefore, the specific siting and species of trees grown for protective cover is of crucial importance. National concern for watershed protection is on a much larger scale. For example, if protecting the critical catchment areas of the Chao Phraya River is in the national interest, the overall area of tree cover in the highlands of Northern Thailand is of primary concern.

Secondly, although the Plan is clear about the policy objectives which should guide the management of the various kinds of forest, the more basic question of whether or not the most appropriate use of the land has not been adequately addressed. This may apply particularly to the 'economic' forests outside the PAS. In land set aside for 'man-made forests for wood production' for example, the main benefits would be economic rather than environmental, so the question would need to be asked whether trees are the most economically productive form of land use in the given area. The Master Plan does, however, recognize the importance of allowing flexibility in the interpretation and implementation of national policy. The policy makers are well aware that zoning of forest lands can only be indicative, and that if, for example, a specific site is more suitable for sustainable agriculture than for forest, declaration of the site as a protected forest area would be counter-productive. It is suggested, however, that any consideration of alternative land use for meeting primary policy objectives (such as economic development) needs to take place when the policies are being formulated.

The above two issues suggest a need to reconsider the proposed strategy which seeks to pursue, simultaneously, a range of policy objectives, in each forest land category, without adequate emphasis on the need to prioritize. The successful implementation of a range of objectives as diverse as watershed conservation, production of forest-based commodities and promotion of social justice and equity, without encountering serious incompatibilities between these objectives and the need to make considerable trade-offs between them is implausible. The prioritization of specific objectives in each location of forest land category is therefore likely to be a more practical and efficient management strategy. Prioritization should take into account the potential of the area(s) for watershed protection, forest-based production, etc., and the interests of existing stakeholders in the forest area. For this, stakeholder analysis may prove useful by helping to analyse policy trade-offs and different interests, and ultimately producing a rational set of policy priorities based on this analysis.

### (c) Intersectoral co-ordination, policy-making and planning

In recent years it has been recognized that forestry policy is interdependent with other sectoral policies. Recognition of the need for intersectoral co-ordination and policy-making has therefore emerged, as indicated by the involvement of a wide range of government departments and divisions during formulation of the Master Plan. However, the long history of sectoral autonomy means that entrenched sectoralism is a fundamental obstacle to the implementation of reform at central level.

There are two questions relevant to this issue. First, the Master Plan policy makers are hoping that the introduction of participatory planning at the micro level, which brings together local government officials from different departments working in conjunction with local communities to solve problems in an integrated way, will act as a catalyst for the gradual development of more integrated planning at higher levels. Integrated planning initiatives at the local level are represented not only by pilot projects initiated within the forestry sector, but also by the current effort to test and develop natural resource management plans. These plans are to be drawn up at the level of each tambon (sub-district) and integrated into district,



regional and, ultimately, national resource management policy. They are currently most developed in the northeast of the country. The main question is whether the hopes of these policy makers will be realized, or whether the attitudes and working methods based on sectoralism will be so entrenched that they will eventually prevent the growth of integrated policy-making and planning, even at the current, micro level.

The second question concerns the potential for development from the top level of the hierarchy. At present, within the permanent bureaucratic structure, a number of 'strategic alliances' already exist between high-ranking officials representing different departments and sections suggesting that there are people at the top of the hierarchy who recognize the need for intersectoral co-operation. However, it is not possible to anticipate how this situation will develop. These informal alliances may either lead ultimately to an institutionalization of collaborative links represented by appropriate changes to the formal organizational structures, or they may develop into the familiar corrupt clientelistic networks.

The solution to these problems depend on whether the current fight against the existing clientelistic structure will be more successful than previous attempts. Answers may be found by investigating the present level of familiarity with and acceptance of the Master Plan's principles of participation and inter-institutional co-ordination by middle-ranking government officials. This is considered in more detail in Chapter 7.

(d) The 'social justice and equity' issue

At this stage, the issue of how social justice and equity will be promoted in practice remains under consideration. Certain social dimensions for inclusion in the draft Forest Act, which is being prepared for public consultation before the end of 1994 are currently being discussed. However, the scope of these dimensions is not yet clear. Among the more important issues which need to be clarified, is the allocation of leases to non-PAS state forest land. The stated criteria give the local community priority, followed by individual forest land dwellers and landless farmers; non-local commercial corporations are given lowest priority. However, there are currently no mechanisms for ensuring that these priorities are adhered to, and prioritization by itself does not ensure a fair allocation. Disadvantaged groups, particularly landless households, may not benefit from community-managed forestry as it is difficult to prevent existing inequalities and hierarchies from being repeated. Also, the idea of giving local people priority over outsiders by giving current land users, or *de facto* owners, first choice over the lease inherently excludes the landless.

Two particular issues need to be addressed. First, in order to ensure that local communities and/or local households are able to stake claims for the leases, explicit weighting measures for selecting between different types of leaseholders are required; if left to market forces, large commercial interests would probably take over. It is partly on these grounds that the NGO movement has criticized the commercial bias of the Master Plan. Weighting means deciding on a set of rules which are enforceable by law. It is hoped that this will be addressed in the draft Forest Act under preparation.

Secondly, the selection of leaseholders should ensure that leases are given to holders who will comply with (and benefit from) the lease contract. In order to do this, the perception and response of different stakeholders to leases and accompanying conditions of land use need to be understood. This understanding could be provided by stakeholder analysis (see page 46). For example, *de facto* local land owners in reserved forests may find the offer of a lease on land they are already farming unattractive. They would previously have had no restrictions on the use of their land and yet been reasonably secure with their informal rights. The formal lease offered by the RFD would not increase their perceived security of ownership, but would impose greater land use restrictions. Conversely, local people who, for whatever reason, have been unable to obtain land for cropping, would find the lease more attractive; access to land, even with use restrictions, would be perceived as a better option than no land at all. From the RFD's point of view, giving the lease to local landless households would therefore be most effective as it would be in the interest of these households to adhere to the conditions of the contract. In this case, such a strategy would also satisfy equity or social justice objectives.

## 5. INTRODUCTION TO THE COLLABORATING INSTITUTIONS IN NORTHERN THAILAND

The choice of case study area for focused research was based on the need to gain an understanding of the issues involved in tree resource and environmental management typical of Northern Thailand as a whole. Finding an area representative of such a wide and diverse region was difficult, but the area of Mae Pam was thought to suitably reflect the problems of natural resource management faced by many villages in the land-pressured intermediate altitude zone.

However, other criteria for the selection of the case study area were also important. As the research was carried out in conjunction with staff at several local institutions, their interests, expertise, and areas of activity had to be taken into account. This applied not only to area selection but also to the approach, methodologies and practice of the research.

The closest associations were with the Royal Project Foundation and the Highland Agricultural Development Division (HADD) of the Ministry of Agriculture and Cooperatives. The case study area of Mae Pam is an area where the Royal Project is itself just beginning to set up activities. Due to the important role of the research carried out at both institutions, their aims and activities are briefly described.

### **Introduction to the Royal Project**

The Royal Project was established by His Majesty, the King of Thailand, in 1969 as a non-government organization and began work in 1970. It was at the forefront of a wave of development and research activities, involving both government and non-government sectors, which arose out of concern over opium production and the effects of shifting cultivation on the forests and environment of the highlands of North Thailand. Working in parallel with state agencies, the core objectives of the Royal Project were therefore the reduction of shifting agriculture and eradication of opium growing. These were to be achieved by the replacement of opium with other cash crops and the promotion of permanent agriculture and settlement.

The Royal Project was the first agency to experiment with different crops. Work immediately concentrated on the production of new and improved varieties, only a few of which had traditionally been grown by hill tribes. The Project has collaborated with personnel from academic institutions including Kasetsart University (Bangkok), the Agriculture Faculty of Chiang Mai University and the Mae Jo Institute of Technology and Agriculture (Chiang Mai), and with government agencies including the Ministries of Agriculture and Cooperatives, Ministry of Science and Technology and Ministry of Interior. The Project has also worked with various foreign governments, international organizations and the private sector.

Today, the work of the Royal Project has evolved into four major areas of activity: research, agricultural extension, community development and marketing.

#### ***Research***

Research has concentrated mainly on the testing of temperate fruits (including fruit trees), vegetables and cut flowers. By 1986/87, up to 70 different cash crops had already been tested in the highlands. Experiments on these crops are conducted at six research stations located in different highland areas in Chiang Mai province. At these stations, the testing of technologies, such as soil conservation, and alternatives to chemical pesticides, is also increasingly being carried out.

## ***Extension***

Extension is currently the main activity of the Royal Project. There are 28 extension stations in the six northern provinces of Chiang Mai, Chiang Rai, Mae Hong Son, Lamphun, Phayao and Nan. Extension agents based at these stations cover about 280 villages.

Farmers are given seed of new crops free of charge to encourage them to try to grow them. Subsequently, they either have to pay cash on delivery for the inputs, or the money is deducted from the proceeds after the Project has marketed the produce.

## ***Community development***

With the assistance of other line agencies, the Royal Project initiates and implements community development and infrastructure programmes such as road construction, provision of electricity and irrigation, and health and education services, and assists with the setting up of various self-help organizations.

## ***Marketing***

Most of the crops promoted through extension are also marketed by the Royal Project. Therefore marketing has become one of its most important activities. It provides grading, packaging, transportation and marketing services for which the farmer is charged a standard 20% of the proceeds to cover costs. The balance is paid to the farmer within a guaranteed 15 days of delivery.

However, selling produce through the Project is less attractive than selling to the private sector as the money is returned slowly rather than as cash-in-hand. Another significant problem is crop wastage. At present most of the markets for the produce are in Bangkok, and crop wastage between Chiang Mai and Bangkok can often be high. Therefore, although the market price in Bangkok may be high, the price for the farmer may be low.

In 1992, the King decided to change the Project's status from pilot project to the Royal Project Foundation. Its programmes and activities are outside the responsibility of the government as the Royal Project is registered as a private organization. The government, however, recognizes its contribution and potential, and this recognition was formalized in March 1992 by a cabinet decision to institutionalize the Project's objectives and create a committee to support its work. The main role of this committee is to oversee the work of government agencies which collaborate with the Project.

To facilitate the implementation of the committee's policy and decisions, the government established the HADD to act as the secretariat for the committee by a Royal Decree in June 1993; the HADD was incorporated into the Office of the Permanent Secretary of the Ministry of Agriculture and Co-operatives (MOAC).

## **Introduction to the Highland Agricultural Development Division**

The main responsibilities of the HADD are:

- to suggest programmes and work plans, and to co-ordinate and implement the objectives of the Royal Project
- to act as the secretarial unit for the Committee
- to co-ordinate with other relevant agencies for highland agricultural development
- to liaise with other relevant agencies whenever necessary and carry out other activities assigned by MOAC.

In order to realize these responsibilities, the major activities of the HADD are currently the planning and collection of baseline data, research on highland agricultural technology, and support of the Royal Project development centres.

### ***Planning and collection of baseline data***

In addition to the role of co-ordinating the activities of relevant agencies, the HADD is actively involved in the collection and analysis of data which will be disseminated to the relevant agencies in order to facilitate programme planning and implementation.

### ***Research on highland agricultural technology***

The HADD intends to provide mechanisms and resources for sustaining and expanding the research programmes of the Royal Project. This will be complemented by building and strengthening networks with relevant research organizations. Current research projects focus on research and development of linseed and Arabica coffee, improving extension and training for temperate fruit crop cultivation, and co-ordinating the detection and study of chemical pesticide residues. Projects planned for future implementation include the use of vegetative techniques for soil and water conservation, and research and development of farming systems.

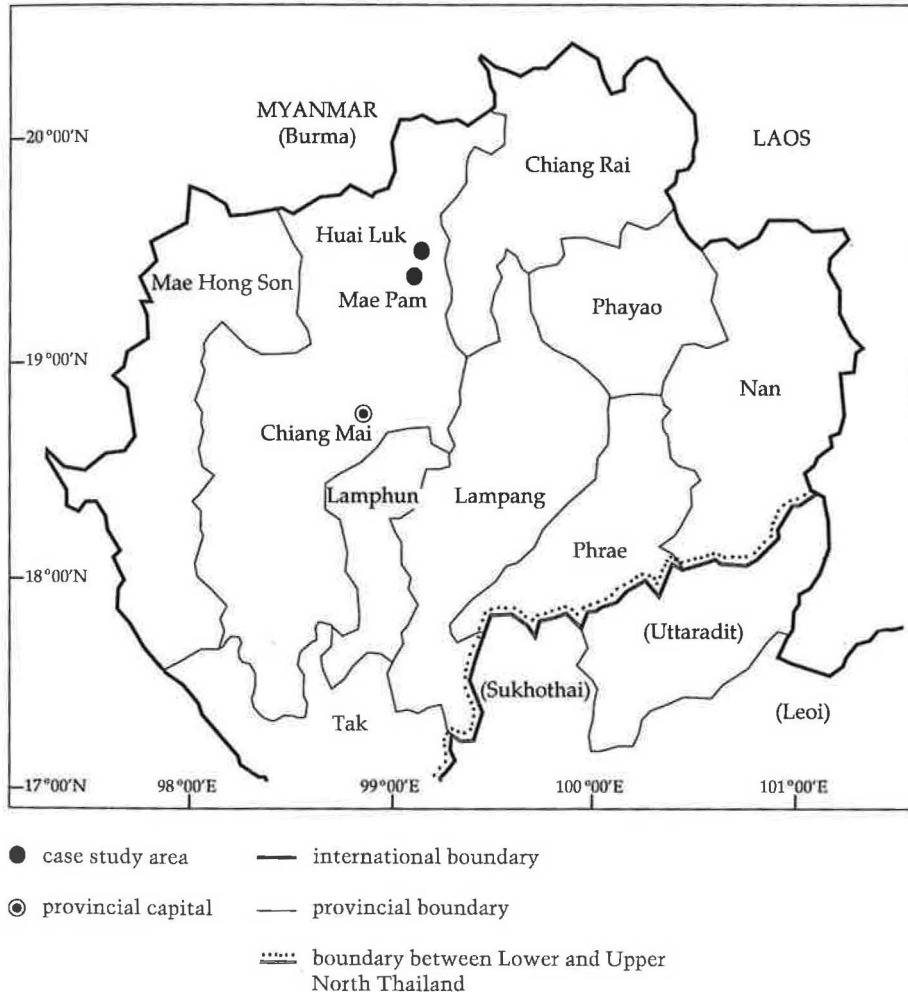
### ***Support of Royal Project development centres***

The committee has delegated full responsibility to the HADD for co-ordinating the programmes and activities of the various government agencies supporting the Royal Project in 12 stations in Chiang Mai, Chiang Rai, Lamphun and Phayao provinces.

## 6. MAE PAM—THE NORTHERN THAILAND CASE STUDY

### Selection of case study area

Mae Pam is situated in the north of Chiang Dao district within the northern Thai province of Chiang Mai, and covers an area of approximately 15 km<sup>2</sup> (see Figure 3). It was selected as a suitable area for focused research, after considering several other sites in Chiang Mai



**Figure 3** Political map of Upper North Thailand showing locations of case study areas

province, for several reasons. First and foremost, Mae Pam is of particular relevance to this research because of the relatively acute and increasing pressure on land coupled with high levels of exploitation of local tree resources. The existence of several distinct local and external stakeholder groups with competing interests, and evidence of growing conflicts between these groups over local tree and land resources, also make Mae Pam a potentially interesting area for study. With respect to the Royal Project and HADD, information gathering and research in Mae Pam was of particular use as their activities have only just started here. Both the gathering of information and building of rapport with the villagers are only in the early stages, so hopefully the process and results of this preliminary research have given timely support for the work of the Project in the area.

Access to Mae Pam was also convenient. The drive from Chiang Mai City where the research team was based takes about 1.5 h, so field visits are possible in one day. The two villages within the research area are also located near a main road. Although their proximity to an asphalt road may not be representative of the more remote villages in terms of favourable

access to markets for example, good road access for villages is becoming more and more the norm rather than the exception, even in the highlands. A further practical advantage of Mae Pam is its location near the Royal Project field station of Huai Luk where overnight accommodation and meals, etc., can be provided for the research team.

As the Royal Project had been working with the villagers for over 10 years, Huai Luk was originally selected as an additional site for research to provide a contrast to Mae Pam. Some information on Huai Luk was gathered by the researchers but it was decided as the work progressed to focus specifically on Mae Pam for two main reasons. As most villagers in Huai Luk had access to some crop land, dependence on forest resources for income, if not for fuelwood gathering, was comparatively low and therefore of less interest to the research. Also, issues surrounding the use and management of tree resources where this was significant were similar to those found in Mae Pam and therefore of little value as a contrast. The situation and research findings reported here therefore relate to Mae Pam.

## **Background to the Mae Pam area**

Two villages lie within the Mae Pam case study area, Mae Pam Nok and Mae Pam Nai. Mae Pam Nai is populated by khon Muang (so-called lowland Thai or 'local' people) and was settled over 40 years ago. Mae Pam Nok consists of a larger community of H'mong (Meo) and two smaller communities of Lahu (Mooseu) and khon Muang. Mae Pam Nok was settled more recently; the first H'mong families moved there 15 years ago and the first group of Lahu, only three years ago.

The majority of the khon Muang and some of the Lahu either own informally, or have access to, some land for growing rice and/or field crops. However, none of the H'mong have any agricultural land so they depend solely on off-farm income earning opportunities.

The Royal Project is only just beginning to plan its work and activities in Mae Pam. Its involvement is based on a recent decision by the RFD to allow an area of land of about 160 *rai* in an old teak plantation located between the two villages (and technically owned by the government) to be allocated to selected local households for growing crops. A special government committee is presently in the process of deciding the criteria for allocation. The responsibilities of the Project will begin only after the allocation has been settled, and will concentrate on crop extension and associated support for the villagers who will receive land under this programme.

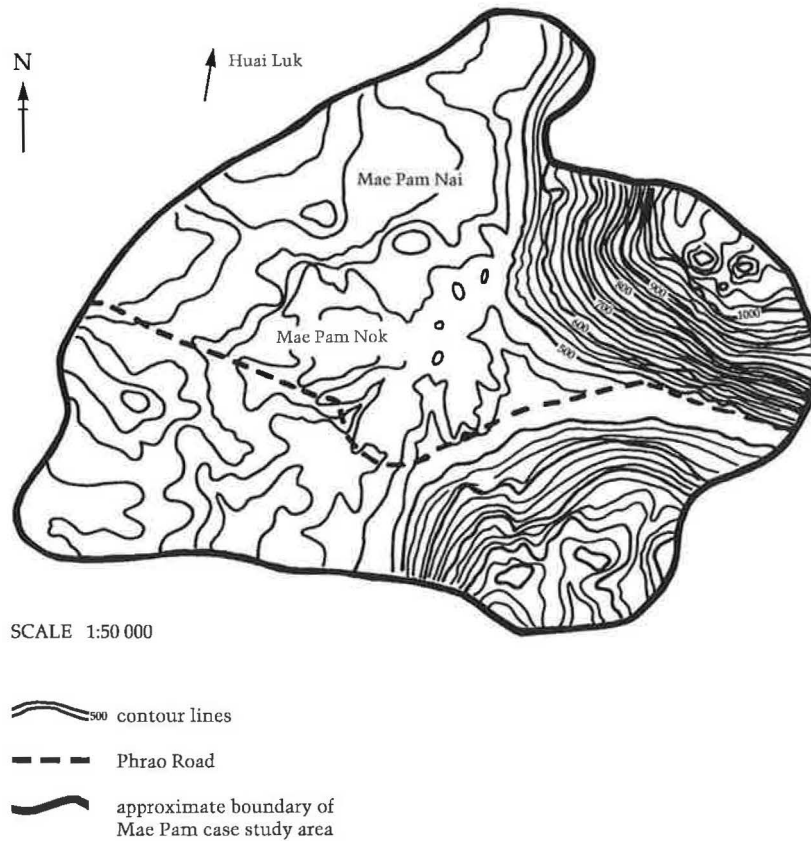
As the distribution process is still being decided, several groups are competing for the land. These are the H'mong villagers in Mae Pam Nok who have been campaigning through their head man for rights to this land for at least 10 years, and H'mong and Lahu households who have only recently moved to the village. Some khon Muang from Mae Pam Nai have also applied for land supposedly on behalf of the approximate third of their villagers who do not at present possess any land at all. Some of the land in the plantation area has already been sold to non-resident land-owners and is being used for orchards, etc.

The area to be distributed is very limited, and resentment between the competing groups over allocation is already substantial.

## **Physical characteristics of the area**

### ***Topography***

The altitude of the western part of the study site where the two villages and virtually all the crop land is located on ranges from 440 to 500 m above mean sea level; slopes range from 2% to 8%. To the east the slopes are much steeper and the land rises to well above 1000 m at the eastern edge (Figure 4).



**Figure 4** Topographic map of the Mae Pam case study area

### ***Climate***

Average annual rainfall is 1210 mm and the average temperature is 23 °C with a diurnal range of about 20 °C.

### ***Soils***

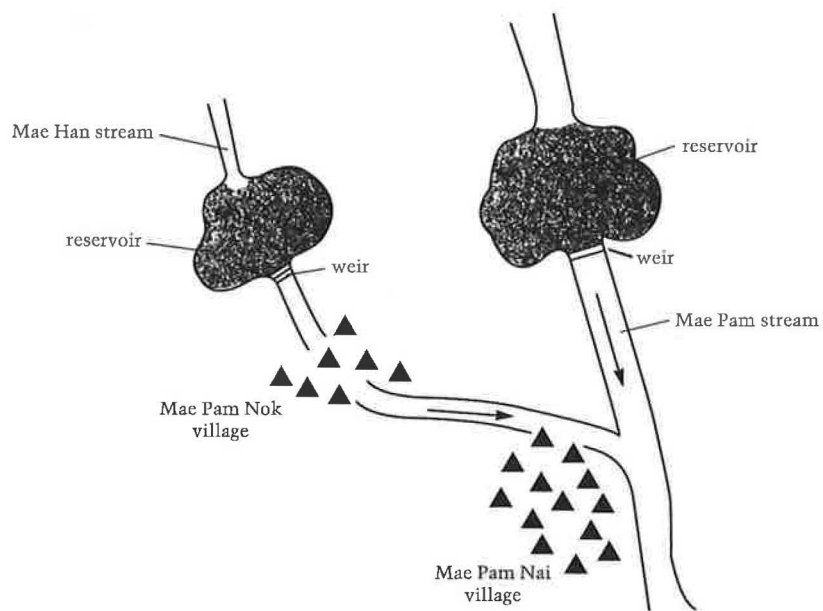
Soils in the lower areas are mainly clay loam, brown in colour, with medium fertility and moderate drainage; the pH is typically 6.5–7.0.

### ***Water resources***

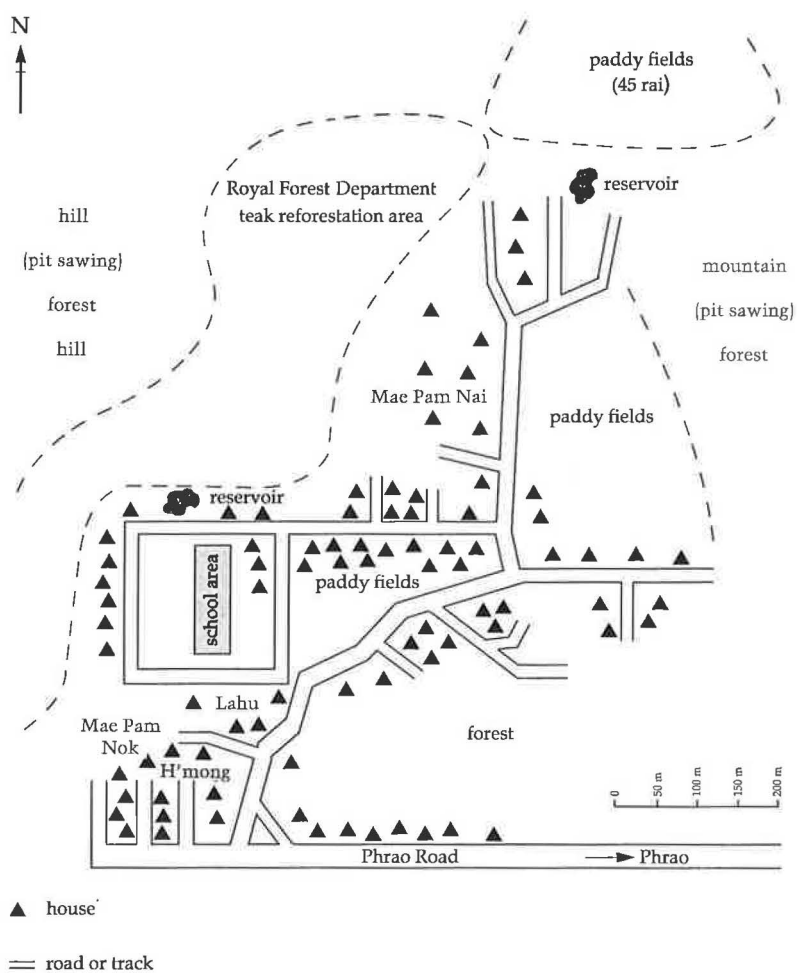
The Mae Han stream supplemented by the upstream reservoir supplies most of the water for everyday use in Mae Pam Nok. The water supply in Mae Pam Nai is relatively good as a small (concrete) weir on the Mae Pam River allows irrigation of crop land (Figure 5). However, the recent successive years of drought have led to a water shortage in Mae Pam Nai; often there is now not enough water to grow second crops.

### ***Land use characteristics***

The main type of forest in the Mai Pam area is mixed deciduous with teak. The main agricultural crops are upland rice, maize and soyabean in the rainy season, followed by field crops such as red kidney bean, black bean, onion and garlic in the dry season. Increasingly, there are also scattered areas of orchard. The main fruit is mango, with some orange, lychee and other fruits (Figure 6).



**Figure 5** Water resources of Mae Pam Nok and Mae Pam Nai



**Figure 6** Land use around Mae Pam Nai and Mae Pam Nok



## Socio-economic characteristics

### Population

The data on Mae Pam Nok in this section are derived from a survey of the village conducted in December 1993 by the Government Working Group on Mae Pam.

The total populations of Mae Pam Nai and Mai Pam Nok are approximately 350 (70 households) and 300 (62 households), respectively. Mae Pam Nai, populated only by khon Muang, has an average household size of five.

Mae Pam Nok is divided into H'mong, Lahu and khon Muang communities. The khon Muang community consists of 52 people in 15 households with an average of 3.5/household. This group was not included in the case study research but it may be worth noting that, apart from the significant difference in average household size and age (the khon Muang in Mae Pam Nok are mostly older), many of its socio-economic characteristics are similar to those of the khon Muang in Mae Pam Nai.

The H'mong population consists of about 210 people or 34 households with an average of six; the three smallest households have two people and the largest two have nine.

The Lahu community consists of 72 people, or 13 households, with an average of 5.5/household; household size in this group ranges from two to 11.

Contrary to trends in Northern Thailand as a whole which indicate a much larger family size for tribal as opposed to Thai populations, the average size of household in Mae Pam is similar for all ethnic groups. Whether this pattern is representative of recent changes in the population dynamics of the intermediate zone is unclear.

### History

Villagers in Mae Pam Nai moved there from a variety of districts, but the vast majority came from within Chiang Mai province. The first families arrived over 40 years ago; since then, individual or small groups of households have moved into the village continuously. The original settlers came as hired labour when a large logging company was granted a concession to the teak forest which used to cover the village area. The owner of the logging company encouraged the villagers to grow tobacco on the lowland areas of cleared forest land, so most of the land now 'owned' by these villagers was obtained by clearing the forest themselves. However, during this time, a significant number of households was forced out of the area when their crop land was flooded by continuous storms which broke the wooden weir on Mae Pam stream. The wooden weir has now been replaced by concrete.

Virtually all of the H'mong moved in to Mae Pam Nok from outside Chiang Mai province; most came from Chiang Rai province and the rest from Mae Hong Son, Phayao and Sukothai provinces. The villagers immigrated in three discrete flows; the first group arrived in 1979, the second in 1983, and the most recent in 1990. The village head man, since his arrival in Mae Pam Nok in 1983, has continuously petitioned the government and King for rights to the 160 *rai* of old teak plantation land adjacent to the village. At the moment the more established residents have limited permission to use some of the plantation land for growing flowers whose seeds are sold for cash. However, the most recent immigrants (who arrived in 1990) do not have access to any land.

Most of the Lahu households moved to Mae Pam Nok in 1991 from Fang district (Chiang Mai province). They had been forced out of their previous area because the land was flooded when a new reservoir was constructed. Originally, they worked as agricultural labourers on the khon Muang land. Most of the households now seem to have been able to rent (or buy) small pieces of land from the khon Muang to grow some crops.

## ***Income and economic status***

The data on Mae Pam Nok discussed in this section are derived from the 1993 Government Working Group Survey on Mae Pam.

Most of the families in Mae Pam Nai own paddy land but about 30 still have little or none. The average holding is about 3 *rai* per land-owning household\*. The main crops grown are upland and paddy rice, followed by soyabean, onion and garlic. A significant number of farmers also grow fruit trees such as mango, passion fruit and orange. Important non-farm income sources include pit sawing (two-thirds of the households rely to some extent on this source of income) and agricultural labour. Data for the average income of households in Mae Pam Nai were not directly available but data on average incomes for the khon Muang in Mae Pam Nok were obtained from the 1993 Government Working Group Survey on Mae Pam. As land ownership and income-earning activities are similar for the khon Muang in both villages, the average income of Baht 12 000 per household<sup>†</sup> in Mae Pam Nok is likely to be similar in Mae Pam Nai.

The average monthly household income for the Lahu community in Mae Pam Nok is 2300 Baht, with a *per caput* income of only 420 Baht. Income differentials between households appear to be small. Most households have access to an average land-holding of about 1.5 *rai*. The main crops grown include upland rice, maize and various beans. It is not yet clear whether the villagers have supplementary sources of income, but charcoal-making provides some income for young people.

The average monthly household income for the H'mong in Mae Pam Nok is about 5400 Baht, or 900 Baht *per caput*. Income differentials between households are larger than for the Lahu community; at least one household has an income of 10 000 Baht or more, and at least one, less than 2000 Baht. A substantial part of this discrepancy may be attributable to the considerable variation in household size. None of the H'mong own any crop land and their main source of income comes from being hired as agricultural labour outside the village. Charcoal-making and flower seed selling (from flowers grown on the adjacent reforestation land) are also very important.

## **Local tree resources**

Most of the information in this section was obtained from semi-structured interviews with key informants from the two villages. Interviews and group discussions to gather general information about the village, and to build up some rapport with the villagers, had already taken place. Information about the use of tree resources by the Lahu community is unfortunately very limited because of practical restrictions during field visits.

### ***Uses of tree resources (direct and indirect)***

The H'mong in Mae Pam Nok rely heavily on trees and forests for cash income, probably because they own no land and have to depend solely on off-farm income. They also depend on tree resources for direct goods and services but to a lesser extent.

---

\*As Mae Pam falls within a designated reserved forest area, no-one is permitted official rights to land. However, the extent of recognition of informal rights is such that the *de facto* owners can generally exclude others from using their land, and transactions for sale and rental of land frequently take place. 'Ownership' is usually tolerated by local forestry and other government officials, but the legitimacy of these land rights are based solely on common and mutual acceptance and not on any legal status.

<sup>†</sup>This figure, and the following figures for average incomes, were calculated from data on the incomes of individual households contained in the Government Working Group Survey on Mae Pam. The information made available did not indicate how these data were measured, but they were probably obtained by direct questioning of the heads of households.

A large proportion of the income of the H'mong comes from the sale of forest products. The sale of charcoal, made from wood from nearby forest areas, is second only in importance to agricultural wage labour. All but three of the H'mong families make charcoal, and it becomes particularly important during the dry season when few other income-earning opportunities are available. The reliance on charcoal also varies from year to year, increasing during difficult years. Charcoal-making therefore acts as an important reserve during times of scarcity; one household will make and sell an average of 40–50 bags of charcoal every year.

Various other types of forest products are also collected and sold for cash. For example, villagers sometimes collect teak seeds and sell them to RFD nurseries; teak seeds are currently worth about 100 Baht per *tung* (1 *tung* = approximately 20 litres). Although villagers in Mae Pam Nai suggested that the H'mong also cut timber for sale, it is unclear to what extent this takes place, and the allegation was not supported by information given to the researchers by the H'mong themselves.

The main forest/tree product used directly by the villagers is fuelwood. Few food stuffs are gathered from the forest as most food is bought from the nearby markets. Bamboo is the main house-building material and none of the H'mong houses are made of wood.

Although the majority of the villagers in Mae Pam Nai own crop land, forest and tree resources still provide an important source of income for a large number of households. Pit sawing is the main source of income for the landless and for others it is a supplementary activity; two-thirds of the population rely on pit sawing. Teak (*Tectona grandis*) is the main species cut although other species such as *mai daeng* (*Xylia xylocarpa*), and possibly *mae teng* (*Shorea obtusa*) and *mai rang* (*S. siamensis*), are also felled for timber. Demand for cut timber appears to be consistent and high. The villagers are able to sell it either in their own village or nearby. About 10 villagers also work as carpenters, using wood bought from other villagers as raw material. Charcoal-making is a supplementary income source for some villagers.

Unfortunately, comprehensive information on direct uses of forest products by villagers in Mae Pam Nai was not obtained, but some indication can be derived from the following findings and observations. Most villagers use charcoal rather than wood for fuel (the charcoal is made or bought locally), although several households now also use gas. Unlike those in Mae Pam Nok, virtually all the houses are made from timber, many of them from teak; several large, new, wooden houses are currently being built, presumably as a result of increasing wealth. It should also be noted that the villagers still rely on the local forest for new agricultural land, and every year, during the dry season, more land is cleared to satisfy demand.

### ***Changes in tree resources over time; causes and consequences***

Detailed information on the forest area, density, species diversity, etc., and how these are changing is not available at this stage because of a lack of relevant secondary data and the 'social' focus of this fieldwork. The information on changes in tree resources presented in this section was obtained by questioning villagers directly. It concentrates on how the villagers themselves assess the nature, causes and consequences of change.

Information was gathered largely from the H'mong and the khon Muang, and the considerable differences in the way they described changes in forest resources are worthy of note. Whereas the H'mong declared that little change had taken place in the quantity and quality of tree resources in the vicinity during the last two decades, the khon Muang reported serious deforestation and a decline in the quality of tree resources. However, the H'mong respondents appeared to be less open than the khon Muang in offering to discuss and analyse the problem. The discrepancy in opinion about changes in tree resources may therefore reflect a degree of suspicion towards the research team and hence an unwillingness to give

accurate or detailed information. It must be recognized that deforestation and use of tree resources are very sensitive issues because of the many legal restrictions on forest exploitation in reserved forest areas (see below); evidence of uncontrolled exploitation may threaten the villagers' future residence in the area. The caution shown by the H'mong, in particular, when responding to questions may be due to one or more of several factors. In the first place, most of the H'mong settled in the area much more recently than the villagers of Mae Pam Nai, and they own no land. Consequently, their residence and livelihoods in Mae Pam are much less secure. Also, the research suggests that other groups, such as some khon Muang in Mae Pam Nai, blame the H'mong for having an irresponsible attitude towards the use of the local natural resource base; they are seen as the main culprits in the destruction and unsustainable use of local tree resources.

By contrast, the khon Muang respondents strongly emphasized the extent of the decline in forest area and quality, and the negative consequences for the villagers. According to the khon Muang, when the first families moved to Mae Pam Nai 40 years ago, there were dense stands of teak in the lowland areas which have now been completely converted to paddy land. Although concessionary logging in the earlier years had a noticeable effect, other changes in the last 20 years have been considerable. A villager who relies on pit sawing as his main source of income reported that two decades ago there was, on average, at least one large teak tree/m<sup>2</sup>; he was also able to find teak of sufficient quality near the village. Today, however, there are no large teak trees left, and he has to travel several kilometres from the village to cut wood. As recently as five years ago, the villagers were able to select only high quality trees for felling. Now only the low quality trees that were left to grow remain. The consequences for income opportunities have also been considerable. It was reported that whereas virtually everyone in the village used to rely on cutting timber for sale as a significant source of income, only two-thirds of households now continue the trade; for many, it has become only a side activity. Returns for labour also appear to have declined. Whereas the income from one tree would previously have lasted four or five days, the lower quality timber has meant that income generated from one tree now lasts only one day.

Although both these negative impacts may indeed have occurred, other factors also need to be considered. The fact that pit sawing has become a less widespread and less significant source of income may be due to changing circumstances as well as to forest degradation. In recent years a rapidly diversifying economy, increasing availability of transport, and changing socio-economic expectations, have meant that the range of available income-earning opportunities has increased considerably. Also, the substantial rise in market prices for timber (especially teak) following the sudden fall in supply when commercial logging was banned, should have offset the effect of decreasing quality on income.

### ***Restrictions on use of forest resources***

In this section, the ways in which various restrictions on the use of forest resources are perceived by, and affect, local stakeholders are considered. At this stage in the research, although some idea of how the combination of forest policies and regulations over the years has affected local people in Mae Pam has been gained, the different impacts of specific policies, and the different ways in which policies may have affected the various stakeholder groups, remains unclear. More focused research into both these issues should be a priority for future investigation because of their importance to the general research programme.

As the case study area lies within a reserved forest area, the prohibitions and restrictions affecting the people in Mae Pam relate to the use of trees and land in reserve areas. Theoretically, the reserve land is owned by the government and its use for agricultural purposes is not permitted. Therefore, those who are already farming land in the reserves cannot apply for official land ownership rights. In principle newcomers cannot buy land as no formal land rights are permitted and the clearing of new forest land for agriculture is prohibited. However, the general experience in the rest of the country would suggest that none of these restrictions are particularly effective. In Mae Pam, as elsewhere, although no formal land rights exist, the continued use of agricultural land is tolerated by local forestry officials, and informal rights carry sufficient legitimacy to allow frequent sale and rental of land

between villagers. Therefore the high levels of landlessness in Mae Pam must be due to factors other than reserved forest legislation alone. It is interesting to note that although the H'mong community have been living in the area much longer than any of the Lahu, they own no land while many of the Lahu do. A possible explanation might be that local officials are enforcing policies and legislation selectively so that laws and restrictions are affecting various ethnic groups differently. Although this is conjecture, it suggests an important area for future research.

Various restrictions on the use of tree resources in reserved forests also exist, although again their effectiveness is limited. For example, the RFD have regulations governing the amount of charcoal each person can sell but quotas are frequently exceeded by exploiting loopholes. For example, although the quota is only three bags of charcoal per person, the merchant may visit several times and buy three bags on each occasion.

Although the banning of commercial logging and the revoking of logging concessions curbed the activities of concessionaires, the impact on small-scale illegal logging by local people was more marginal. In Mae Pam, wood cutting (mainly teak) is still an important source of income for a large proportion of households in both villages, but as some concession to the law, pit sawers take the precaution of using only small household hand saws so that if checked, forestry officials will not be able to accuse them directly of logging activities. The risk of arrest is minimal as they must be caught in the act before a formal accusation can be made. If the villagers know that there is a forestry official nearby, they will postpone their activities until he has gone.

The proportion of villagers in Mae Pam Nai depending on the sale of timber has declined in recent years, and the potential has probably fallen. However, villagers attribute this to a rapid decline in the quantity and quality of trees rather than to the enforcement or fear of restrictive laws.

### ***Interactions and conflicts between local stakeholder groups over tree (and land) resources***

There is evidence of considerable ill-feeling and conflict between the khon Muang, Lahu and H'mong groups over the use of local tree resources. There are at least two reasons for this.

To begin with, conflicts between the three groups have simply resulted from competition for scarce tree resources. For example, all three groups collect wood for charcoal-making from the same areas near the villages. Access to this wood is governed by an informal hierarchy which depends on how long a group has been living in Mae Pam. The khon Muang, therefore, have first priority, followed by the H'mong; the Lahu have least access. Not surprisingly, the Lahu resent this hierarchy, claiming that it gives them little opportunity to make charcoal. The khon Muang instruct the Lahu not to cut wood from areas upstream from their paddy fields as these forested areas are important for watershed protection. The H'mong, who want a monopoly in making and selling charcoal therefore resent competition from the Lahu, so the Lahu feel forced to make only enough for their own use in order to avoid conflict with the other two groups. The sanctions, if any, which exist to police this hierarchy, and the consequences for the H'mong or Lahu if these rules of access were ignored, are not yet known.

Secondly, ill-feeling between the groups may also have a cultural or ideological origin. For example, some khon Muang contrast their own concern for sustainable management of the environment with the carelessness of the other two groups. They suggested that the hill tribe villagers, especially the H'mong, do not use local resources in a sustainable manner because of their migrant characteristics; they lack a sense of responsibility towards the environment in Mae Pam because they do not own any land there and are therefore not concerned about the preservation of the local resource base in the long term. By contrast, the khon Muang felt that they themselves try hard to manage the forests and natural resources in a sustainable way since they have owned and farmed permanent fields for a long time in spite of having no formal land rights.

Similarly, some of the Lahu accuse the H'mong of pursuing a culture based on profit-making which supports the large-scale sale of timber and charcoal for example. The Lahu, on the other hand, are said to be subsistence-orientated and only concerned about generating enough income to secure their livelihoods.

Interactions between the local people and residents of nearby villages over the use of tree resources have not yet been investigated in detail. A substantial number of villagers from outside Mae Pam do come and collect wood, etc., from the forest areas within Mae Pam. While preliminary questions suggested that conflicts between locals and outsiders were insignificant, further enquiry may be helpful.

### ***Perceptions of environmental change and of the environmental roles of trees***

Villagers in all three communities were generally aware and concerned about the environmental changes, in terms of the decline in quantity and quality of the natural resources available for their use, which have taken place in recent years. However, the emphasis of the concern varied between the ethnic groups. For the H'mong, for example, the primary issue was the increasing scarcity of land available for agriculture. During conversation, their awareness of land scarcity was also indicated by the fact that they did not consider emigration in search of new land to be a feasible option any more, even if life became difficult in Mae Pam. Members of the Lahu community also expressed this view.

The khon Muang in Mae Pam Nai, however, were more concerned about scarce tree and water resources than scarce land. They were concerned about the rapid decline during the last 5–10 years in the quantity and quality of trees, particularly teak; they attributed the decline partly to the rapidly increasing population from continued immigration into the area. Their main worry at the moment, however, is the current shortage of water for their crops; this area, as in many parts of Thailand, has suffered from successive years of drought. It is uncertain whether the drought conditions are due to short-term climatic fluctuations or to more long-term trends, but the khon Muang place part of the blame on the deforestation of watershed areas. When asked how they would respond if this drought were to continue for the next few years, they said that they would be forced to move out of the region to somewhere where there was more forest; they did not regard land scarcity in the highlands in general as a barrier to finding new land.

The villagers of Mae Pam Nai and the Lahu in Mae Pam Nok were generally well aware of the effects of continued deforestation on their livelihoods and the environmental role of trees. Although the H'mong did not express concern over dwindling forest resources, it was thought that suspicion of the research team influenced their response to the questions.

The villagers were concerned more with the effects of deforestation on their incomes than its effects on the environment. However, there were some hints of concern about the negative impacts on the local environment. For example, the khon Muang from Mae Pam Nai try to prevent the Lahu from collecting wood for charcoal from areas upstream from their paddy fields in order to ensure a stable water supply, but it is not clear whether they themselves also refrain from exploiting these watershed areas. However, the khon Muang suspected a connection between deforestation and increasing water scarcity (see above).

At the present stage of the research, the exact extent and nature of stakeholders' perceptions and interests towards the environmental roles of tree resources remains unclear. It was felt that because of the difficulty of discussing these sensitive issues with villagers, more basic questions about direct uses of tree resources, etc., should precede the more involved questions. It is a vitally important area, both for future research and for project planners and policy makers, because the answers to these questions can help to ascertain whether or not sustainable management or conservation of local tree resources is ultimately in the interests of the local stakeholders (see pages 40 and 46 for a further discussion of this point).

## Conclusions

### *The Project level: policy recommendations for future Royal Project activities in Mae Pam and in other project areas*

#### Tree resource management/community forestry

The following recommendations are made to satisfy two objectives. First, the appropriate conservation and planting of trees is in line with the Royal Project's stated major objective to 'encourage a wise and proper balance in utilizing and conserving land and forest resources' (The Royal Project, 1990). Second, it is hoped that they will be of use to the Project's recent community forestry efforts at various project sites, particularly in the cases where the conditions are similar to those at Mae Pam.

- (a) When designing, planning and implementing tree resource management strategies in North Thailand, it is extremely important to recognize the obstacles and limits to inter-group co-operation which result from lack of integration, and a tendency for conflicts between the different ethnic groups. The population in many areas of the intermediate altitude zone, such as Mae Pam, consists of relatively recent immigrants, so there is a lack of established institutions and systems for the management of local resources. Therefore any efforts to establish communal management systems will have no existing institutions on which to build.
- (b) Although villagers perceive the increasing scarcity of good quality timber as detrimental to their income, they do not yet consider the local availability of wood for general purposes such as fuel and charcoal-making to be a major problem. If villagers are to be persuaded to grow trees, the tree types chosen may therefore have to produce specific, high-value benefits before they will be seriously considered. Tree species which provide only fuelwood and other minor subsistence products are unlikely to be accepted or grown.
- (c) Trees yielding products of high income and subsistence value will be particularly useful because of the high degree of market dependence shown by Mae Pam Nai and Mae Pam Nok villagers. A significant number of villagers are already growing fruit trees such as mango; this may be a promising area for development (see page 40).
- (d) It is suggested that a community forestry effort either in Mae Pam or in a similar situation, should include two components: planting trees such as fruit trees on private land and under household or small group management; and establishing conservation areas within existing forest areas of critical importance for watershed protection and other, wider environmental functions. Maintenance of these conservation areas would require communal management and regulations.

It should be stressed at this point that the success of conservation efforts will depend, critically, on a good understanding of the extent to which the various local stakeholder groups perceive the importance of forest resource preservation for environmental protection. It needs to be recognized that from the point of view of local people driven by increasing land scarcity, clearing new forest land for agriculture may outweigh the benefits to be derived from protecting watershed areas. If this is the case, preserving watershed areas may not be in the interests of local people. If, however, it is decided that these reserved forest areas should be conserved in the regional or national interest, external incentives will need to be given to local villagers, and in order for such incentives to work, an accurate understanding of their valuation of environmental protection, and their anti-conservation interests (such as felling trees for new agricultural land) is essential.

#### General recommendations not specifically related to tree resource management

In addition to the above tree management issues, the following general suggestions can be made relating to the planning and implementing of Project activities in Mae Pam.

- (a) If alternative activities for generating income, such as the growing of cash crops, are to be introduced and encouraged by the Royal Project, they should compare favourably with those based on the sale of forest (wood) products, particularly timber and charcoal, which is currently widespread and important in both villages. The cost of marketing timber and charcoal is relatively low as both can usually be sold in the village or its vicinity. Alternative activities would therefore have to compete in terms of marketing, profit margins, reliability of income and labour demands, for example. Competitiveness is important if the alternative activities are to succeed, and if the villagers' contribution to the destruction and encroachment of forest areas is to be stemmed.
- (b) When deciding on land allocation, management responsibilities and access to water for irrigating crops, etc., the interests of the different local groups should be carefully and sensitively considered as misunderstandings and resentments already exist. Initially, it may be helpful to encourage negotiation between the H'mong, Lahu, khon Muang and non-resident land-owners. Discussion and joint decisions may serve to clarify rights and responsibilities over access to water, for example. Distribution of rights and responsibilities should be based on multiple criteria in order to accommodate the interests of the different stakeholder groups and ensure their co-operation. For example, whereas the H'mong in Mae Pam Nok think they have a priority claim to the plantation land because of their landless status and their leading role in the campaign for land rights, the khon Muang feel they have an equal right as they have lived in Mae Pam the longest.

### ***Key questions for future research in Mae Pam***

- (a) A key area for future research in Mae Pam is a deeper investigation of how each stakeholder group perceives and understands the environmental role, particularly for watershed protection of local tree resources. How important these roles are, what costs would have to be borne in the conservation of trees and forest areas, and how the need to balance the competing objectives of environmental protection, expanding agricultural land, supplementing income from the sale of wood products, etc., can be resolved, are all questions which need to be addressed. A decision tree indicating the trade-offs made when deciding whether or not to conserve a particular forest area would be useful.

Research has shown that there are significant differences between the khon Muang, Lahu and H'mong in their perception of and perhaps behaviour towards, management and use of the local environment. Future researchers should be aware of such differences and should ascertain whether differences in perception or stated attitude are reflected in behaviour.

- (b) With respect to the relevance of policy, a more detailed investigation of the impact of forestry policies, legislation and RFD regulations on local stakeholders, and how the stakeholders perceive and respond to these restrictions, is also required. There is evidence to suggest that some policies or laws have affected the three ethnic groups differently, both in terms of the way local government officials implement the regulations and the way in which the different groups view and respond to such regulations. This is another area worthy of investigation.
- (c) Many local people, particularly Mae Pam Nai villagers, are now growing fruit trees. It may be of use to community forestry projects to find out why, and what conditions are required. Such information could indicate ways of encouraging further planting of fruit trees and suggest the characteristics and conditions required for growing other types of trees. Another decision tree showing the kinds of trade-offs made by villagers when choosing whether or not to plant trees could result.
- (d) During this preliminary stage of research, some insight has been gained into the interests in tree resources of village-based stakeholders and the interests of policy makers at the macro level. However, the 'stakes' and perceptions of various other groups have not yet been fully investigated. The interests and attitudes of local forestry officials in Mae Pam towards forest management and the use of forest resources by the villagers, are of particular relevance to this study. The roles and concerns of the increasing number of non-resident land owners in terms of their perceived responsibility and stakes in managing the local environment, may also be of interest.



- (e) The ultimate aim of this research is to bring together the interests of all pertinent stakeholder groups at the micro and macro level in order to assess and negotiate appropriate tree resource management goals and strategies. The case study of Mae Pam has been used in this chapter to investigate some of the issues and interests at the micro level. However, before the findings can be used to analyse the interaction between interests at the micro and macro level, it is necessary to reconsider whether this case study is representative of conditions in the rest of the northern highlands.

***How representative is the Mae Pam case study area with regard to tree and natural resource management issues in the uplands (and highlands) of Northern Thailand as a whole? What general lessons can be learnt from the specific case study?***

- (a) The existence of growing land pressure in Mae Pam, the high population growth rate including the high rate of immigration into the area, and the potentially serious conflicts between different local groups (H'mong, Lahu, khon Muang) over very limited land for crops, represent key natural resource management problems of the intermediate zone crisis. All these factors have contributed to the continued clearance of forest land, and the exploitation of other forest resources for income and direct use, by local villagers.
- (b) Current RFD regulations and policies restricting the use of forest resources in Mae Pam appear to be largely ineffective and typical. The need to reconsider both the methods of implementation and the policies themselves provides a solid basis and rationale for research in this area.
- (c) The conflict over natural resource use which exists at different levels between ethnic groups in Mae Pam, is representative of many other situations in the northern highlands. It is crucial to the success of environmental management in Mae Pam and elsewhere to understand the dynamics and bases of these conflicts.
- (d) As the villages in Mae Pam are populated mainly by recent immigrants, traditional and established intermediate zone farming methods, such as the Karen rotating-fallow systems, do not exist. As a consequence, the establishment of 'community forestry' in Mae Pam may prove difficult because of the lack of appropriate communal institutions and established management systems on which to build. However, due to the high rates of immigration from the highlands and lowlands, Mae Pam is becoming more typical of many areas in the intermediate zone. The problems and issues presented in the case study area are therefore by no means unique, so the lessons learnt are likely to be applicable elsewhere.
- (e) At the moment, environmental degradation such as soil erosion does not appear to be at a serious level in Mae Pam and this situation is not typical of many areas in the uplands of Northern Thailand. This is partly due to the fact that the vast majority of crop fields are on slightly, or at most moderately sloping land. Although this means that the case study may provide little help in the handling of these more critical environmental situations, it does provide a useful example of how the wishes of the wider society to conserve forest areas might best be 'traded-off' against the opposing interests of local stakeholders.

## 7. CONCLUSIONS

### What has been learnt so far

#### *Main stakeholders in tree resources in Northern Thailand*

##### Royal Forest Department

The RFD is the most important government department involved in tree resource management and exploitation. At the national level, it is primarily responsible for formulating the policies and regulations relating to forest management and restrictions on forest use, and until recently, it was the major beneficiary of profits from the exploitation of forest resources (notably timber). At the local level, RFD officers are responsible for implementing these policies and regulations.

##### Other government departments

Some other government departments also have influence over and interests in, forest management. The DLD for example has the mandate for formulating and enforcing land rights systems and programmes, including those relating to forest land. The Office of the National Environment Board was responsible for the watershed classification system which emphasizes the protection of forest cover in critical watershed areas (Class 1A watersheds).

##### Non-government organizations

The strength and influence of the NGO network, which includes international as well as local groups, has grown rapidly during the last 5–10 years. Most NGOs are concerned with environmental protection, the promotion of sustainable development, etc., and they have been instrumental in promoting public concern.

##### The commercial sector: the wood-based industry

Until the ban in 1989, logging concessionaires were major stakeholders in forest resources, especially in the north. Now that the concessions have been revoked they have to depend on other sources of raw timber, such as trees on private land and logs imported from neighbouring countries. Although the interests of the wood and wood-based industry in Thai forest resources are therefore currently of little significance, they may be partially reinstated with the adoption of the Master Plan which aims to boost domestic wood production by promoting commercial wood plantations on degraded forest land.

##### Non-resident land owners

In recent years, non-resident owners of land in reserved forest areas have increased in significance. As land became more scarce in both urban and rural areas, prices have risen sharply and land speculation has taken place on a substantial scale. The supply of land to outside buyers exists because local farmers find it lucrative to sell the land they are currently farming for a considerable sum of money; they then clear a new piece of nearby forest land for their own use.

##### Local resident communities

Local people living in reserved forest areas are probably the most important stakeholders in forest resources, both in terms of the impact they have on forest resource quality and quantity, and their direct interaction with the forest. They depend on the forest for tree resources and related products, and for land. In the north, the most important sub-divisions of this stakeholder group relate to ethnic origin; individuals and communities are clearly distinguished according to ethnic group (H'mong, Lahu and khon Muang in Mae Pam) and have varying attitudes and interests in forest resource use and management.

## ***Stakeholder interests in tree resources, and how they are changing***

### Royal Forest Department

Important changes have been taking place in the formal objectives of the RFD, represented by policy initiatives such as the ban on commercial logging and the development of the Forestry Sector Master Plan. In the past, the predominant concern of the RFD was to maximize the economic productivity of forests, mainly by harvesting timber. This level of production was intended to benefit the national economy and increase government revenues. The emphasis of Forestry Sector policy is changing, although to what extent it is changing in practice remains to be seen. The trend is towards the promotion of the maximization of forest conservation and environmental objectives and away from maximum short-term production. This is reflected in recent changes to the Forest Sector's stated policy priorities, and by plans to give more of the responsibility for production to farmers and the private sector.

It is also intended that more attention will be paid to the interests of the local rural population when deciding on and implementing policy objectives. Although some developments have already taken place in this direction, it is unclear at this stage whether or not local interests will be extensively and consistently represented in the future.

Although environmental and local interests are receiving more attention, the Master Plan will continue to promote commercial production by the forestry sector. Logging in natural forests will be replaced by commercial wood plantations on degraded forest land. Thus the proposed activities of the Forestry Sector are designed to improve efficiency as well as equity and environmental quality. Although these are laudable aims, it would appear that inevitable trade-offs which are not being explicitly recognized or evaluated would need to be made between these objectives. In particular, increasing the power of local people in the name of equity and efficiency may frustrate the environmental goals unless careful consideration is given to the trade-offs. Preliminary research suggests that the preservation of trees for environmental reasons would be considered of low priority to local people.

### Environmental NGOs

NGOs gained public and political attention by their concern over the negative effects of deforestation on the environment and society. They blame the corrupt practices of government officials such as their support for illegal logging and the activities of large corporate interests for causing deforestation. The socio-economically disadvantaged groups (the poor, the landless, and the hill tribes in the north and northeast) are seen by the NGOs as the victims of deforestation. Therefore, the NGOs generally attempt to represent the interests of small farmers, landless labourers, etc., and defend them against the environmentally and socially destructive interests of the government and commercial interests. Many also express their environmental concerns through the promotion of sustainable agricultural systems and practices.

### Wood-based industry

The interests of this group will be extrapolated from general information and some research carried out in the northeast. The group is only interested in wood, usually for timber or pulp/paper. Therefore if the quantity and quality of supply of one or more non-wood product falls as a consequence of maximizing wood extraction, this is not seen as a private cost to the industry (although the enforcement of certain government regulations on logging techniques for example, may mean that the industry has to bear these costs to some extent). The northeastern case study also showed that other wood sources, such as trees on private farm land, commercial wood plantations and forests in neighbouring countries, can be used for raw material instead of local forests.

### Non-resident land owners

The interests of this group were not studied in detail during this research, but it seems that they regard the purchase of land mainly as an economic investment and/or profit-making

enterprise (land speculation). The land itself, rather than its potential use, is often seen as the main asset. Therefore the establishment of orchards may become popular because it requires relatively little labour but produces a considerable income with time. Land may also be bought for reasons of social status. In either case, non-resident land-owners are unlikely to be concerned about the impacts of their activities on the local environment and forest resources, and they are unlikely to exploit other (non-land) forest resources.

### Local resident communities

This stakeholder group exploits, manages and depends on a very wide range of forest products and services. Local people rely on timber as a building material and for cash; non-timber forest products also provide cash and subsistence benefits such as charcoal for domestic use and for sale, teak seeds for sale to tree nurseries, and bamboo for houses and furniture. Forest land may be more valuable than the forest itself as it provides the means for growing crops; litterfall from forest vegetation helps to restore the fertility of the soil after cultivation. However, changes in the relative importance of the wide range of different interests/products have taken place in response to changing socio-economic conditions. The commercially valuable tree resources have become much more important as the exploitation of forest products for direct subsistence has declined, and the value of forest land in relation to other forest products has risen substantially.

### ***Complementarities, conflicts and co-operation between stakeholders***

It is useful to present and summarize the conflicts and complementarities of interest, and the co-operative action between stakeholder groups, in a simple matrix (Figure 7).

Government departments	◆☎				
NGOs	◆☎				
Wood-based industry	◆☎	◆			
Non-resident land owners		◆			
Local people	◆☎	■☎	◆■	◆	◆
	Government departments	NGOs	Wood-based industry	Non-resident land owners	Local people

Conflicts of interest are represented by ◆, complementarities of interest by ■, and co-operative action by ☎. The size of the symbol represents the extent of the conflict, complementarity or co-operative action.

**Figure 7** Matrix showing the occurrence and extent of conflicts, complementarities and co-operative action between stakeholders

The following three areas of major conflict can be identified from the matrix.

- (1) *Conflicts of interest between different government departments (macro-macro conflict).* The fact that a fairly wide range of government departments collaborated to some extent over the production of the Forestry Sector Master Plan indicates a move towards greater interdepartmental collaboration. However, the sector-based attitudes and interests will take time to change.
- (2) *Conflicts between government departments (national policy objectives) and local people (macro-micro conflicts).* The fundamental differences in interest which exist between national policy makers and the local people who depend directly on forest resources,

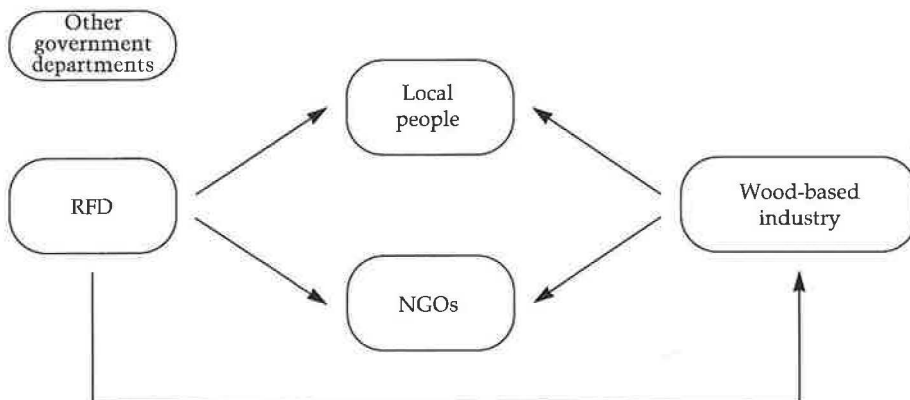
should not be underestimated. The nature and the scale of their interests differ widely. The concerns of policy makers are likely to relate to the achievement of general policy objectives such as national self-sufficiency in forest products, the designation of a certain percentage of land as national parks, and the conservation of specific areas of national significance such as the Chao Phraya watershed. By contrast, local people will be more concerned about the management of specific resources in fixed areas, and whether their village will fall within, or remain outside, the boundary of a proposed national park than about the number of national parks to be created. These differences in interest may not be incompatible, but a shared interest cannot be assumed.

The development and implementation of co-operative planning and management between forestry officials and local people has been taking place since the mid 1980s, but it requires further development, reinforcement and dissemination. The trade-offs which have to be made between national and local interests also require further investigation and greater understanding.

- (3) *Conflicts and competition between different groups of local people.* Competition for increasingly scarce land and forest resources has intensified in the intermediate zone largely because of immigration from lowland and highland areas. This may be a result or a reflection of socio-cultural differences as well as of increased population density *per se*. The problem in the intermediate zone is exacerbated by the mixture of ethnic groups, the relatively recent arrival of many of the residents, and the consequent lack of rules or institutions for co-operative intergroup management of forest resources. With the exception of the land cultivated by individual households, reserved forest areas are considered to be public land; if no formal or informal institutions exist to regulate the use of forest resources, the risk of their continued inefficient and unsustainable use is high. In the highlands, the Thailand Upland Social Forestry Project has been helping to develop such inter-community institutions, but their existence cannot be assumed.

### ***The changing balance of power between different stakeholder groups***

The balance of power or influence between different stakeholder groups appears to be changing under current socio-economic policies. The more noticeable changes are represented in Figure 8. The arrows represent the directions in which power over tree resource management is being transferred between groups.



**Figure 8** Diagram showing the directions of power shifts between stakeholder groups

The RFD is transferring some of its forest management responsibilities to other institutions and groups, partly because the manpower necessary for the widespread implementation of its policies can no longer be met by RFD resources alone. Also, by enlisting their participation and incorporating their interests, local people will have more incentive to abide by regulations so the efficiency of policy implementation may be improved.

The ban on logging and the provisions of the Master Plan have transferred power from the wood-based corporate interests to the local rural population, NGOs etc. However, many of these industries have made use of other sources of raw material, and may therefore regain a stake in tree resource management by obtaining leases to establish commercial wood plantations through the Master Plan scheme.

## **Priority topics for future research**

The following areas of research have been identified according to two main criteria. One was to identify those areas of interest which are felt to be relevant to the analysis of tree resources and stakeholder interests in Northern Thailand, but which have not yet been fully investigated because of practical limitations during this interim phase of research. The other was to address the priority (information) needs of policy makers with a stake in tree resource management. The research areas discussed below were therefore selected following the analysis of national policy and in response to the identification of the main issues and dilemmas presently confronting policy makers.

### ***Policy analysis***

How have different policies relating to forest management differentially affected the various stakeholder groups?

An investigation into the ways in which the ban on commercial logging has affected different stakeholders would be of particular interest. Preliminary evidence has suggested that there are differences in the way small farmers and entrepreneurs, and large concessionaires, have been affected. It has proved much more difficult to stop small-scale logging activities and they therefore continue on a significant scale. However, the response of both groups to the ban merits further investigation.

The impact of the ban on the various ethnic groups in the highlands is also of particular interest. Research in the Mae Pam area showed that the attitude of the khon Muang when questioned about logging activities was very different to that of the Lahu or H'mong. It is important to determine whether this difference reflects differential implementation of logging regulations by forestry officials.

An understanding of the differential impacts of policy on different stakeholder groups could also be useful when assessing the policy options proposed in the Master Plan. An analysis of the ways in which different local stakeholders, such as landless households, small land owners and large land owners, would be likely to respond to contracts for leases to forest land, and the benefits and costs which the stakeholders would incur, would be invaluable for determining priority groups in the allocation of leases.

How well do RFD (and other) government officials at the regional and local levels understand and accept the Master Plan and the principles it represents?

Although the Master Plan, which was initiated and endorsed by the Forestry Department, has gained the support and collaboration of a number of other government departments and bodies, the extent to which regional and local offices and staff have been involved in its formulation, and the extent to which the principles and attitudes proposed in it are known and understood, is unclear. This situation requires investigation as the extent to which policy changes have filtered down to regional and local levels will directly affect the pace at which they can be expected to take place in the future.

What policy trade-offs need to be made?

The first of two related issues recognizes a need for further analysis of the necessary trade-offs between the various policy objectives in the Master Plan, particularly trade-offs between the promotion of environmental conservation, the promotion of equitable local development in forest areas, and the need to satisfy the national requirement for forest products. The

analysis of those trade-offs — or the assessment of the costs of pursuing one objective on other objectives — allows rational compromises to be made.

The second issue concerns the extent to which proposed policy objectives are realistic within the existing power structure. The extent to which the promotion of forest conservation is compatible with the intention of increasing the powers of local people is one example of this. Whereas strengthening the rights and management roles of local people is probably necessary to ensure the success of government policies and regulations, the cost of this may have to be a reduction in forest conservation efforts. Forest land is becoming increasingly valuable to local people relative to the value of forest resources themselves, and therefore the effects of changing the balance of power merits further investigation.

### ***Environmental roles of tree resources (focusing on case study area)***

Although an understanding of the environmental roles of tree resources, and of the ways in which different stakeholders view these roles, has been of central interest to this research, work was postponed until an understanding of livelihoods, tree resource use, etc., in the case study area had been achieved. However, a framework for investigating the environmental role of trees is presented below.

Determination of the environmental roles of tree resources, based on a physical analysis

The first stage would consist of a general description of the ecological/environmental resources in the case study area and their relation to tree resources. Useful tools might include Geographic Information Systems (GIS) maps and aerial photographs and/or sketch maps showing tree/forest types and locations, topography, water courses, vegetation types and soils.

A more detailed description of forests or other areas with trees, showing tree species, other vegetation, wildlife and biodiversity measurements, could then be undertaken. Plots or transects could be used as appropriate.

Using these descriptions, the (likely) environmental or ecological roles of trees could be determined and categorized.

Determination of stakeholders' perceptions and understanding of the environmental roles of tree resources

Stakeholder perceptions could be assessed by semi-structured interviews with micro-level stakeholders in the case study area including villagers, local forestry officials, development project staff, non-resident land-owners, etc. The interviews could be based on the following general questions.

- (1) How important are the environmental roles of (local) tree resources to the stakeholder and which role is most important?
- (2) Do the stakeholders need to make trade-offs between environmental and non-environmental roles of trees when deciding on management strategies? If so, what influences the trade-offs they make?
- (3) How far do different stakeholders understand the physical relationships between tree resources and the environment, for example, the relationship between the presence of trees/forests and ground/water quality and quantity, soil structure and soil erosion/sedimentation?

An assessment of the clarity and accuracy of the ways in which stakeholders understand the environmental roles of tree resources could be made on the basis of the answers. Fundamental differences between the perceptions of stakeholders might also be recognized. Of particular strategic importance would be an assessment of the commitment of users/managers and powerful stakeholder groups to conserving trees for environmental benefits.

### ***Changes in tree resources in recent years (case study focus)***

A physical analysis of change in the Mae Pam study area is still required, and as stakeholder perceptions of physical change are of central interest to this research, it merits more detailed investigation.

#### Identifying physical indicators of change

It is first necessary to identify how the different tree and forest types have changed in the area with time (during the last 10 years for example). Comparisons can be made between satellite remote sensing data, such as LANDSAT images, for different years and seasons.

Secondly, the status and structure of tree/forest areas, whether the species structure is stable or dynamic and whether the forest is primary or secondary for example, needs to be determined. The age or size distribution of selected tree species indicates whether existing species are regenerating, and to assess whether the forest is primary or secondary, the presence and abundance of indicator species can be measured.

Using the above data, predictions can be made about the physical consequences of changes in tree resources, and any further changes which are likely to occur in the near future.

#### Discussion of stakeholders' perceptions of change

The following questions can be used as the basis for interviews and discussions with local stakeholders.

- (1) What are the perceived changes in forest area, abundance of species, and abundance and quality of forest products for example which have occurred in the last 10 years?
- (2) What are regarded as the main causes of change (both physical and human)?
- (3) What are thought to be the main consequences of change (economic and environmental), and how important are they?
- (4) How have the different stakeholders adapted to change, and/or how will they adapt in the future?

Any significant differences in the ways in which stakeholders perceive change can be determined from the answers to these questions. The accuracy of their perceptions and predictions can also be compared with the results of the physical analysis.

### ***NGOs, the wood-based industry, and non-resident land owners: their interests in tree resources***

This research has focused on the interests of stakeholders at the extremes of the macro-micro continuum (national policy makers and government departments, and local, direct stakeholders). However, the stakeholders in the middle of this continuum should be considered during the next phase of research as the interests and actions of this group affect, and are affected by, those of both policy makers and local stakeholders.

#### Non-government organizations

There is an increasing number of small NGOs working on a range of development and environmental projects in Northern Thailand. Some information relating to their activities would be of relevance to this research. This would include the proportion of groups working directly with tree resources on farms or in forests, the ways in which they deal with trade-offs between conservation and socio-economic objectives, the ways in which their objectives and activities differ across their range of organizations, and the relationships between their interests and those of other stakeholders.



## The wood-based industry

The future stake of the wood-based industry in forest resources is uncertain and will depend on the directions which government policy reform will take. Relevant questions which could be asked of this group would include the ways in which they have been affected by, and have responded to, the ban on logging, and the extent to which they have been able to adapt by seeking alternative sources of raw material. Their perception and expectations of the recent policy initiative to encourage commercial tree plantations, particularly on degraded forest lands, would also be of interest.

## Non-resident owners

The main concern regarding the interests of this stakeholder group is the extent to which they feel they have a stake in, or a responsibility towards, the local environment. This includes the extent to which they are concerned about maintaining the medium- and long-term productivity of the land they own, and the extent to which they feel any responsibility towards the surrounding farmland and forest. This would affect, and be affected by, their relations with local people.

## Concluding remarks

These conclusions have been divided into two main sections, which describe what has been learnt by the research so far and what remains to be investigated. The report provides no definitive results of a finalized project because of the preliminary nature of the research. The aims have been two-fold: to find out more about tree resources, stakeholder interests and policy; and to identify, clarify and develop directions for further research.

## 8. BIBLIOGRAPHY

- BOONCHEE, S. and SRIKHAJON, M. (1991) Farming systems development on the upland areas of Thailand. In: *Regional Expert Consultation on Farming Systems Development in Upland Areas, Chiang Mai, September 1991*. Bangkok: Department of Land Development.
- CHAN, M.-K., VITYAKON, P. and GRIMBLE, R. J. (1994) *Proceedings of a Workshop on Tree Resources and the Environment* held in Phu Wiang Watershed, Khon Kaen, Thailand. Chatham, UK: Natural Resources Institute.
- CHIANG MAI UNIVERSITY (1988) *Vegetable Cash Crop Data Base for Opium Replacement in the Highlands of Northern Thailand*. Project No. TCP/THA/6653. Final Report.
- GOVERNMENT WORKING GROUP (1993) *Report of Working Group Survey on Mae Pam, December 1993*.
- HIGHLAND AGRICULTURAL DEVELOPMENT DIVISION (1993) *Highland Agricultural Development Division Leaflet*.
- KUNSTADTER, P. (1987) *H'mong and Karen Health and Family Planning*.
- McKINNON, J. and VIENNE, B. (1989) *Hill Tribes Today: Problems and Change*. Bangkok: White Lotus. Paris: ORSTOM.
- PRAGTONG, K. and THOMAS, D. E. (1990) Evolving management systems in Thailand. pp. 167–186. In: *Keepers of the Forest: Land Management Alternatives in Southeast Asia*. POFFENBERGER (ed.). Connecticut: Kumarian Press.
- ROYAL FOREST DEPARTMENT (1991) *Forestry Statistics of Thailand 1991*. Bangkok: Royal Forest Department.
- ROYAL FOREST DEPARTMENT (1993) *Thai Forestry Sector Master Plan (TFSP) Vol. 2, Executive Summary and proposed Forestry Sector Policy*. Bangkok: Royal Forest Department.
- SUKIN, K. (1994) Waiting for the green revolution. In: *The Nation*.
- SUTTHI, C. (1989) Highland agriculture: from better to worse. In: *Hill Tribes Today: Problems and Change*. Bangkok: White Lotus. Paris: ORSTOM.
- TAN-KIM-YONG, U. (1992) *Participatory Land-Use Planning for Natural Resource Management in Northern Thailand*. Rural Development Forestry Network Paper 14b. London: Overseas Development Institute.
- TAN-KIM-YONG, U., GANJANAPAN, A., RAMITANONDH, S. and YANASARN, S. (1988) *Natural Resource Utilization and Management in Mae Khan Basin: Intermediate Zone Crisis*. Chiang Mai: Resource Management and Development Programme, Chiang Mai University.
- TASANAPRADIT, P., PERNGPARN, U. and POSHYACHINDA, V. (1986) *Hill Tribal Population and Family Planning*. Bangkok: Institute of Health Research, Chulalongkorn University.
- THE MANAGER COMPANY (1990) *Profile of Northern Thailand*. Chiang Mai University: Siam Studies Institute and Department of Economics, Chiang Mai University.
- THE ROYAL PROJECT (1990) *The Royal Project*.
- VAN DER MEER, C. L. J. (1981) *Rural Development in Northern Thailand*.
- VORAPIEN, P. (1990) Government should reconsider its reforestation plan. In: *Bangkok Post*.