

WORKSHOP PROCEEDINGS

REHABILITATION OF DEGRADED FOREST ECOSYSTEMS IN THE LOWER MEKONG BASIN ASSESSMENTS OF REHABILITATION POLICY AND PRACTICE IN THAILAND

November 24-25, 1999
Chiang Mai Thailand

Organized by

**Watershed Management Division,
Royal Forestry Department**

**IUCN
The World Conservation Union**

**MRC/GTZ-SMRP
The Sustainable Management of Resource
in the Lower Mekong Basin Project**

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During this study many people contributed freely of their time and knowledge and this is gratefully acknowledged. People in government and nongovernmental organizations in all countries provided access to documents, particular project documents and other "grey" literature, without which it would have been impossible to carry out the analyses.

In Thailand, Prasong Jantakad from SMRP/GTZ Project carried out the original literature searches and collated much of the materials. M.R. Bhadarajaya Rajani, Deputy Director General of Thai Royal Forestry Department along with his colleagues: Mr. Korkiat Kaysornsiri, Director of Watershed Management Division; Mr. Udhai Thongmee, Chief of Watershed Development and Promotion Sub-Division; Mr. Praphan Phonphanphoa, Chief of 1st Watershed Management Sub-Division; and Mr. Jessada Kaewchote, a SMRP-RFD Field Project Coordinator have given their contributions to a country paper and to the success of the country based workshop. Ms. Nara Kaophong, successor of Prasong Jantakad, organized all support necessary to make the program run and numerous efforts in producing a workshop proceeding.

Financial support to carry out the work came from several sources, including WWF International. The GTZ-MRC Project through its team leader Dr. Hans Helmrich, provided not only significant support, but also logistical backup and encouragement. Various programmes in IUCN also contributed financially and technically, in particular the Global Forest Conservation Programme and the IUCN Commission on Ecosystem

Management. Dr. David Lamb of the University of Queensland, Australia, and a member of IUCN's Commission on Ecosystem Management, was a major contributor to the technical discussions of the national and regional workshops, and provided the text used in the Annex part of this report.

To all of those who contributed, sincere thanks. It is hoped that the materials in this publication and the discussion and dialogue that took place during data collection and at the workshop at AIT in March 1999 will contribute to a better understanding of the process leading to deforestation and forest degradation in the lower Mekong countries. The hope is that all countries in the region can move towards a situation where their remnant forests are being managed sustainably and their degraded forests are rehabilitated to provide a range of goods and services of benefit for the whole of society.

Welcome Address

M.R. Bhadarajaya Rajani

Deputy Director General, the Royal Forest Department

Dr. Andrew Ingles, Regional Representative of the IUCN, Dr. Hans Helmrigh, CTA of the SMRP, Dean Dr. Utit Kutintara, Dr. Somsak Sukawong, RECOFTC Project Director, Mr. Director, distinguished participants, ladies and gentlemen. Dr. Plodprasop Surasawadi, the Director General has an urgent engagement, and he has assigned me to preside over the opening ceremony of this workshop on Forest Rehabilitation Policy and Practice in Thailand. May I touch a little on the reason why the Royal Thai Government really needs to have it. We have set a known target of 40%, which is a figure that we have to work very hard on during this time of the year. What we have here is a possible 40% forest cover for the whole kingdom. What we have at present in existing forest land is 25.28%, which means that there is something around 15% to go in order to attain the goal set by the government. This will be very tough if the Royal Forest Department has to play the role alone without any cooperative assistance from our good friends. Therefore, this workshop will lead to a very good understanding and very fruitful outcome for us as a whole, to play the role together and exchange ideas, experience and expertise, of which, I believe that all of you have plenty. So this is the right moment for this workshop to be held.

The Royal Forest Department has three major strategies to play. Firstly, the Conservation Programme, which will be dealing with public participation, even goes to local communities. This programme means to conserve all forest land that has been available and left behind to nature, which is quite a problem. Secondly, the Rehabilitation Programme, as I have already mentioned, needs another 15% of forest cover, which means quite a hard job, and we have to work very hard, otherwise we will not reach that target. However, this workshop will provide us with a lot of knowledge and experience that will lead to some solutions and create a very good strategic plan for the future. The third programme is called the Research and Development Programme, which we need for some technology transfer. We know that our people need appropriate technology transfer for their living. This programme will help and also provide them with more opportunities to live in our present world.

Also, I would like to touch a little on what forests really mean in another sense besides only biodiversity. I think the natural water cycle is very closely interrelated with forest cover.

We have realized that a lot of people working in watershed areas are running out of water after the depletion of forest resources. This can also cause major floods during the rainy season, and severe drought during the summer time. So, this is not only bad for the people living on the mountains, but also for low-land people.

On behalf of the Royal Forest Department, I would like to thank the IUCN and SMRP for their financial support. Also, many thanks are due to all the organizing committee and staff concerned for arranging this national workshop. Without their contribution, of course, this workshop would not have become a reality. Now I wish this workshop every success. Ladies and gentlemen, may I now declare the workshop on Forest Rehabilitation Policy and Practice in Thailand open. Thank you for your attention.

Welcome Address

Dr. Hans Helmrich

Chief Technical Adviser,
Sustainable Management of Resources Project in the
Lower Mekong Basin

M.R. Bhadarajaya Rajani, the new Deputy Director of the Royal Forest Department, Dr. Andrew Ingles, the Head of South and Southeast Asia IUCN Forest Programme, participants and colleagues. My name is Hans Helmrich. I am the CTA of the Sustainable Management of Resources in the Lower Mekong Basin Project. I would like to take this opportunity to explain why we are here and why we are partners with the IUCN in trying to support this project and this workshop of the Royal Forest Department. The SMRP is a project of the Mekong River Commission and GTZ working in the Lower Countries of the Mekong Basin, such as Vietnam, Thailand, Laos and Cambodia. So, we have run programmes in 4 countries that are very different economically, politically and administratively, and run 4 or 5 offices in them in an effort to move themes and topics which are of interest to our partners, specifically those who are working in the National Department of Forestry in those 4 countries. Basically, our mandate concentrates on watershed issues and management. There are more specific questions of land use, land changes, and the integration of the ethnic minority in the main theme of discussion in policy making. We do this by trying to support the latter's own ongoing programmes and take note of the potential benefits of a common base of natural resources management. So, we focus on national participatory approaches, which could be beneficial for either side in national resources themselves and the policy making process, which is built on participation and the idea of a collaborated forest management. Our programmes vary a lot from country to country and I will not take the time to talk about Vietnam, Laos and Cambodia.

In Thailand, we are pretty new here, we started our activities only half a year ago, and here we try to work in the northern areas of Thailand with our original concentration on land and watersheds being with the Royal Forest Department. Basically, we try to document, analyse and present what has been happening, and what is going on with regards to watershed and forest management in the uplands. The purpose now, is to contribute to the many ongoing discussions between the Royal Forest Department and other departments, the NGOs in this area and perhaps the university.

The IUCN is one of our partners in the region, because their mandate is very close to ours and their expertise, both technically and procedurally, is also very useful for us. We have had a long history and collaboration with the IUCN in all 4 countries, which have been very beneficial not only to us, but also to our partners. The purpose of having this workshop is again similar. It is to provide an opportunity for participants, stakeholders and representations of organizations to exchange their ideas, knowledge and experiences with regard to what should be done in forest rehabilitation in northern Thailand. So, the exchange of ideas and knowledge is of primary concern when it comes to support. We are aware that the workshop will make some difference in a certain scenario, but we believe that it is an important element of communication and exchange. We look at it as one of those elements in exchange of an instrument that we would like to use in supporting the Royal Forest Department, and in continuing the taking up of forest management issues in the northern areas of Thailand.

As a mean for discussion, documentation and internet technology, I would like to welcome you to this workshop. I hope it will be useful and interesting for you and I hope that it will not be an event of presentation and listeners, but one which produces something new with some added value to all the knowledge that already exists here. So, at the end of the second day we will have something which is not here right now. Something new in terms of understanding, commitments and ideas of what to do. So, I hope that this workshop can produce the spirit and environment to do that. I would like to thank the Royal Forest Department for giving us the opportunity to contribute to this process and to be the part of this workshop. Thank you very much.

Welcome Address

Dr. Andrew Ingles

Head of South and Southeast Asia
IUCN Forest Programme

M.R. Bhadarajaya Rajani, Deputy Director General of the Royal Forest Department, Dr. Hans Helmrich, Chief Technical Adviser of Sustainable Management of Resources Project of Lower Mekong Basin, distinguished guests and participants of this workshop. On behalf of the IUCN, World Conservation Union, as one of the supporters of this event, I would like to welcome you to this workshop and wish it a great success. The IUCN is a union of members. Globally, it has more than 900 members worldwide scattered across some 150 countries and organized towards the conservation of nature and natural resources. We have a secretariat and a number of commissions of volunteer specialists as well as our many members. In South and Southeast Asia, the IUCN has a regional office based in Bangkok under the Asian Institute of Technology. We have country programmes, such as those for working with our members in Pakistan, Nepal, Sri Lanka, Bangladesh, Laos and Vietnam, and a liaison office in Cambodia. At present, we do not have a programme of work or a country programme in Thailand. We have 3 members in Thailand. The Royal Forest Department, which has been a member of the IUCN for many years, the WFT (Wildlife Fund Thailand) and of course the RECOFTC (Regional Community Forestry Training Centre). The IUCN is very interested in increasing its activities in Thailand and developing collaboration in a programme of work with its members. We would like to have a Thai country programme of the IUCN. We do not have our own legal status, so we are with the AIT in Thailand, but working so as to establish a full presence here, and I look forward to the future work already started with the Royal Forest Department and discussing collaborative work in particular areas, such as Protected Area System Planning. We are also interested in forestry rehabilitation. This might become an area for collaborative work in the future if the members are interested in becoming involved.

So we believe that forest rehabilitation is an important area for Thailand and elsewhere. Why do we think like this? The loss and degradation of forests is a global problem and in recent decades has become one of the major conservation concerns in Asia. Somewhere between 50-80% of all the biodiversity on land is probably located in forests. Also, we all know that the livelihood of millions of people is underpinned by forests and forest diversity. They contribute to economic development of course, and more importantly, in the long term, they maintain a very important ecosystem and protective functions of environmental value to society. Many forests have not only been converted into agricultural land, but also large areas have been degraded and left in a low productive state that no longer serves the productive function well. In a recent regional overview that was produced for Southeast Asia, it was estimated that there are many degraded forests in the Lower Mekong Countries of Vietnam, Laos, Cambodia and Thailand. There are some 21 million hectares of bare land, much of which is suitable for rehabilitation.

In fact, in our strategic planning at both global and regional level, it has been clearly revealed that forest rehabilitation is one of the four most important areas for forest conservation work. I would like to introduce the goal that we adopted for forest rehabilitation globally. It is to encourage the development of environmentally sound, economically viable and equitable reforestation and forest ecosystem restoration programmes. Inside that goal are 3 very important aspects: economic viability, and environmentally sound and equitable programmes. That is, the distribution of costs and benefits of rehabilitation should be distributed equally in society. So, these are all interests of the IUCN, which have been adopted in this region, and we aim to support and participate in an expanded programme of work looking into these issues and providing support where we can, for government forest rehabilitation programmes in the Lower Mekong Region. Currently, we have a regional partnership with WWF and MRC/GTZ projects to assist stakeholders in forest rehabilitation in doing a couple of things. One is to update awareness of the issues and the knowledge about rehabilitation. Then, to engage a wide range of policy makers and practitioners in discussions about what sort of rehabilitation is needed, what it will look like, what are the preferred criteria and principles, and what are the best approaches for encouraging rehabilitation. Specifically, this workshop is aimed to further clarify what rehabilitation approaches are appropriate in the context of Thailand, and looking at what sort of future work could be done in order to achieve the objectives. So, we wish this workshop every success, and I would like to thank all the people who worked on the organization of it: the committee that organized the workshop, and thanks to all of you for coming, to give up your time on this important topic. In particular, I would like to thank the Royal Forest Department for their involvement. Thanks also to our partners who have assisted in financial support, such as the WWF and MRC/GTZ Sustainable Management of Resources Project. So, I would like to welcome you to the deliberation of this workshop. Thank you very much.

Expectations to the workshop

Dr. Don Gilmore

Consultant, IUCN

A number of papers in the opening session comment that part of a purpose is to create a forum of discussions in the number of things we want to do, exchange the ideas on different approaches, and the rehabilitation of degraded forest ecosystem. That are very broad purposes. We want to discuss the problems associated with forest degradation and get down to some substances. And then particularly, start to identify some of the key issues we need to address if we want to get the process of forest rehabilitation moving.

We suggest that there are three things that need a particular attention. One is the difficult topic of participatory land use planning and land allocation, which is the common topic throughout the whole region. Inevitably, there will be some discussions on the roles of communities in forest resource management and forest rehabilitation. And then to look also at a question of enterprise between civil society and government what that means in the emerging context within Thailand. Thank you.

National workshop on

FOREST REHABILITATION POLICY AND PRACTICE IN THAILAND

Chiangmai 24-25 November, 1999

Workshop Outline

Day	Time	Activity	input by
1	08.30 to 09.00	Registration of participants	
	09.00 to 10.00	Opening ceremony and introductory session	
		Welcome address by:	
		M.R. Bhadarajaya Rajani, Deputy DG, RFD	
		Dr. Hans Helmrich, on behalf of SMRP, MRC/GTZ	
		Dr. Andrew Ingles, on behalf of the IUCN	
	10.00 to 10.30	Tea break	
	10.30 to 11.00	Purpose of the workshop	Udthai Thongmee
		Introduction of participants	
		Expectations to the workshop	Don Gilmour
	11.00 to 12.00	Technical Presentations:	Prapan Pholpanpoa RFD and Don Gilmour. IUCN
		"Rehabilitation of Degraded Forest Ecosystems in Thailand Assessment of Forest	

		Rehabilitation Policy and Practice.	
		"Emerging Policy and Institutional Settings for Forest Rehabilitation in Thailand"	Somsak Sukawong, RECOFTC
		Discussion and formation of 3 working groups on selected topics	
	12.00 to 13.30	Lunch break	
	13.30 to 15.00	Working group Discussion:	
		3 working groups	
		<ul style="list-style-type: none"> • What are the major factors that have contributed to forest loss and degradation in Thailand? 	
		<ul style="list-style-type: none"> • What are the major policy settings needed to halt deforestation and forest degradation in Thailand, and to encourage forest rehabilitation? 	
		<ul style="list-style-type: none"> • What are the future options for ensuring that the constitutional emphasis on people's rights to access forest resources is translated into realistic actions? 	
	15.00 to 15.30	Tea break	
	15.30 to 17.30	Third technical session Presentation of working group results and discussion	
	18.30 to 19.00	Reception	
	19.00	Dinner	
Day 2	08.30 to 10.30	Technical Presentation: "Trade offs between Bio-diversity conservation and Production in Forest Rehabilitation Programs"	David Lamb, IUCN
		"Forest Restoration of Doi Tung Royal Project"	Riksh Syamananda, Mae Fah Luang Foundation
	10.30 to 11.00	Tea break	
	10.30 to 12.30	Working Group Discussion 3 working groups <ul style="list-style-type: none"> • What is the role of rehabilitated forest in contributing to bio-diversity conservation goals? • What are the conditions needed to encourage bot local communities and the forest industry to become more active in forest rehabilitation? • There are many stakeholder groups interested in forest rehabilitation. What are the options for creating a platform for effective participation of various stakeholder groups in policy formulation 	

		for forest rehabilitation?	
	12.30 to 13.30	Lunch break	
	13.30 to 15.00	Presentation of groupwork results and discussion	
	15.00 to 15.30	Discussion on workshop findings	Don Gilmour, IUCN
	15.30 to 16.00	Tea break	
	16.00 to 17.00	Concluding session Presentation of workshop results Concluding remarks and future action	Helmrich Udhai Thongmee, RFD

Participants List

Workshop "Forest Rehabilitation Policy and Practice in Thailand" 24-25 November, 1999

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Mr. Kovit Panyathong
Mr. Chaloe Kanjan
Mr. Somchai Masathien
Mr. Jessada Kaewchote
Mrs. Napa Sriprasert
Ms. Sasitorn UdhisChawaengsawas
Mr. Thamrong Shinsukjaiprasert
Mr. Manas Teshasatien

B. Watershed Research Division

Mr. Pornchai Preechapanya (PhD)
Mr. Wanchai Viranond

C. Community Forestry Promotion Division

Mr. Nirand Lertlakanawong

D. Private Reforestation Division

Mr. Boonnak Kleejampee

E. State Reforestation Division

Mr. Suthep Laohadeja

F. Nursery Division

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G. Provincial Forestry Office (Chiang Mai)

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TECHNICAL PRESENTATIONS

Forest Rehabilitation Policy and Practice in Thailand

Mr. Prapan Polpanpua

In the past, rich natural resources enabled the balance of nature, since natural disasters occurred mildly and occasionally. Only when environmental and natural resources are scarce, various disasters take place at least once in every 3 years instead of 10. The major cause of such depleted resources has been the people.

The policy under the first to sixth NESD Plans focused on being one of the newly industrialized countries or NICs. As a result, natural resources were carelessly utilized and a tremendous impact occurred. The 7th and 8th NESD Plans have increasingly focused on natural resources, in particular the 8th NESDP. Nevertheless, the target of forest cover during the 1st NESDP was expected to be about 40%, but to date only 25.28% of forest cover remains. It is rather difficult to add another 15% to the remaining forest area.

However, problems of past policies have meanwhile affected some aspects of the environment, while another may be a population growth to 61 million. The NESDB has forecast that by 2020 the population will reach about 70 million, and farmland will, therefore, have to be in harmony with forest cover.

Previous NESD Plans resulted in the depletion of natural resources. The 8th Plan, on the other hand, has begun to focus on natural resources and people participation. In addition, people have also been focused as the center of development.

The second policy is not really a policy, but rather a constitution, a national supreme law which has been formulated and enacted as the peoples' version in 1997. It places an emphasis on the rights and freedom of rural people to preserve the forest and utilize natural resources, regardless of a tripartite partnership or beyond. However, the rights and freedom mentioned should not exceed the provision of law.

The third policy is the decree of Tambon Administration Organisation (TAO) issued in 1994. As a consequence, the local authorities that manage, protect and preserve natural resources have to be devolved to the TAO.

A National Forest Policy initially prescribed to set aside 50% of forest cover, but the target fell to 40% afterwards, of which 15% was planned for conservation forest and 25% for economic forest. On the contrary, the 7th NESDP (1992-1996) set aside 25% of conservation forest and 15% for economic forest. However, in the attempts to reforest, the Forest Plantation Act was passed in 1992 in order that the private individual and public could participate in reforestation.

The fifth policy is the Enhancement and Conservation of Environmental Quality Plan (1997-2016), which places emphasis on conservation. Of these, 30% of the area has been planned for conservation forest and 20% for economic forest. Remaining natural forests should be protected while rehabilitation is achieved later, including the reduction of conflict regarding land and forest use as well as preserving flora and fauna within the conservation area.

The RFD's additional strategies for forest rehabilitation are as follows:

1. Protection plan by strict law enforcement.
2. Protection from fires that are totally caused by human activities.
3. Forest rehabilitation and promotion of reforestation.
4. Institutional arrangements of communities under the forest area only.
5. Administration and research development for biodiversity and the ecosystem.

The RFD carried out forest rehabilitation from 1906-1960, only one year before the implementation of the 1st NESD Plan. Of this, the RFD operated 53,000 rai of replanting (mostly teak) for demonstration purposes and it continually reforested until 1995 with a target of 4 million rai, mostly in the north.

Major plantation establishment programmes are as follows:

- Forestation programme in recognition of the Royal Golden Jubilee. This could be operated by 2 categories, either planting by themselves or financing the reforestation of local communities. Meanwhile, the RFD has been responsible for the seedling supply and technological advice. Such reforestation comprises 3 types:
 - Planted in a watershed area
 - Planted on both sides of the road
 - Planted in government offices and public land.
- The implementation has not yet been able to reach the target set for 1994-1998, the programmes are therefore expanded to 2002 and operated by the RFD.
- The programme to support farmers for planting trees on their own land. This is achieved by providing cash incentives of 3,000 baht/rai for up to five years for farmers to plant and protect trees. However, this programme has been slowed down, due to the economic crisis.
- The programme to plant fast-growing species for replacing some cash crops. This is carried out because over-supplied cash crops are released to the market. Again this has also been slowed down, due to the economic crisis.
- The programme to plant trees in the conservation forest. Since this is the RFD's routine work, it thus comprises 2 types of work, as follows:
 - Reforestation under the Royal Initiated Project
 - Rehabilitation of the watershed ecosystem.

These commenced during 1992-1999 in which time 299,240 rai was accomplished. However, such activities were revoked after 1995 because the ecosystem was not included. The activities were then adjusted in a rehabilitation manner, in that seedlings were planted among big trees of various ages. Degraded forest is in fact fallow land, which seems hardly restorable if it is a large area, while a small area can be supplied with fruit seeds from a patch of forest nearby, even though quite a substantial time will be needed to succeed. Therefore, reforestation needs native species planting by using 25 seedlings/rai to speed up the coverage. Another major activity is forest fire protection, since the cause of fire is apparently the people. Whenever fire broke out in a nearby area, our replanting area definitely felt an impact. As a result, fire breaks must be prepared and surveillance carried out, while at the same time, people participation is the major approach.

During 1998, Mr. Plodprasob Suraswadi, RFD Director General, gave out a policy that the forest was indeed our forest, not my forest. The management of the forest ecosystem has to be carried out and incorporated into various kinds of administration, law, political science and socio-economic aspects. Of these, all living things completely depend upon one another.

Such an approach consists of the following policies:

1. Strict forest law enforcement
2. Administration and management of conservation forest and promotion of eco-tourism
3. Institutional arrangements according to the law and regulations under forest land
4. Forest rehabilitation and promotion concerning
 - Concrete forest plantations should be improved, for example the private individual or TAO can be invited to perform such an activity.
 - Maintenance, preservation and development of forest plantation that provide knowledge of the amount of wood utilized by communities and the country. In 1989, Thailand had to import 20,000 million baht worth of wood per year, while only a small amount of exports took place.
 - The programme to promote planting of economic forest under land reform areas.
 - The promotion for the private sector to establish a plantation within national forest reserves.
 - Planting trees to prevent the greenhouse effect. When planting more trees, they absorb oxygen and reduce carbon dioxide, which is being released by industrialized countries.
 - The Community Forestry Act should be promulgated very soon.
 - The food bank should be promoted for subsistence only.
 - The improvement of seedlings and plant species for the benefit of forest rehabilitation.

Finally, there is the project to honor Her Majesty the Queen, which was approved by the cabinet on 12 October 1999, in response to her initiation in preserving and rehabilitating the forest on her birthday. The purpose of this project is to enhance forest protection in the hope of conserving and restoring critical watershed ecosystems, including the capability to increase forest cover. Since this is quite a large project, there are 3 sub-projects, as follows:

- Forest Surveillance Project covering 65 provinces nationwide
- Watershed Ecosystem Rehabilitation Project covering 20 million rai
- Green Land Project for building awareness of and participation in reforestation in 75 provinces.

These sub-projects will be a cooperation of government agencies and community organisations in order to achieve the target. A work plan and budget are being prepared for implementation by this coming fiscal year.

Rehabilitation of Degraded Forest Ecosystem in Thailand

Dr. Don Gilmore

This presentation is based on the compilation of information by Mr. Prasong Jantakad and myself through a review of literature, and also supported by the discussions with quite a number of people. We can say that it is a derivative study which derived from literature reviews and information collected from various people.

Forest rehabilitation in Thailand covers a number of topics as follows:

1. Some of the trends in forest cover in Thailand.
2. Some of the issues which need to be developed and addressed that we are going to do something about forest rehabilitation.

3. The way that policy has evolved in Thailand.
4. The rapid changes which have apparently taken place.
5. Past experiences in forest rehabilitation in the country.
6. Lessons have come from past experiences, policy and practice.
7. Finally, the future and thoughts about the future.

We have already heard from the previous speakers about what happened to forests in Thailand. In 1961, forest cover was somewhere around 53%, and by 1998 it was said to be only 25%. These figures may be arguable, but the trend is very clear in terms of how much forest has been lost each year. The estimate indicates quite substantially that in the early 1990s, which is the early part of the decade, forest loss per year was somewhere between 160,000 - 300,000 ha, and it is clear that this trend is continuing.

A number of issues materialize from the problems associated with forest management in Thailand. One of the recurrent ones is the difficult dilemma of people living in the reserve forest. Perhaps somewhere around 20% of the population are living inside forests, and in the past they had been considered as illegal encroachers. The real problem, or dilemma, involved how to get them engaged in the question of sustainable forest management. Another major issue has been one of incompatibility between the policies of different sectors.

We know quite a lot about the policy and purpose of the forest sector, which aim to improve and enhance forest cover. But there are other government sector policies which conflict to some extent. One of the reasons is that Thailand's expansion economically is mostly agriculturally based. So the government encourages an increase of cash cropping and agricultural production. Much of these have taken place within the forest cover. So, this conflicting policy comes from the government, which happens in all countries, and almost always, the forests are the losers.

Again, as in many countries whose interests are always bent towards a commercial basis, they want to access forest land for commercial benefit. So these are major issues. Let us look at the way the policy has evolved in Thailand for the last several decades. Before 1999, a lot of policies were concerned with commercial timber exploitation. Again, the partnership between the RFD and concessionaires strongly focused on exploiting forest on a commercial basis along with the development of the country. At the same time, there was substantial expansion going on towards an agricultural base, particularly focusing on cash cropping aimed at improving the agricultural economy of the country, and as indicated previously, there are currently some conflicts between two approaches. As time goes on, there has been a growing conversion in policy, which I believe is a reflection of society's changing interests with an increasing emphasis on conservation. This is increasing with a global emphasis on forest and, of course, other kinds of conservation. This has been played out in Thailand by the development of a degradation area system in 1989, with the ban of logging that has expanded general conservation interests. So in summary, the emphasis on a change from one which focuses on the provision of forest goods, in particular timber, to one which looks on the provision of forest ecosystem services by the diversity of conservation, the watershed protection function has already been heard.

The 8th Plan has already been heard. Nothing read has a very clear indication of the changing policy progress in Thailand. Perhaps the most important thing is the focus on the protection of remaining natural forests. The second emphasis given in this plan is the rehabilitation of forest and promotion of reforestation. The third emphasis is on people participation in the process of forest management in various forms. The number of elements emerging from the Community Forestry Bill, which has been prepared for the last several years, clearly indicates a shift in focus and a broadening of conspicuous advice for involvement in forest management; the reason for constitutional changes. The new constitution emphasizes quite strongly the rights and roles of people in Thailand when participating in natural resources management. The rights and privileges of people should go with responsibilities, and this is an important issue to discuss.

The government has responded to emerging deforestation problems over the years. Basically, a reforestation programme should have been developed to address the following three fundamental needs:

1. On-going economic needs of the country, needs to establish commercial plantations, particularly during the logging ban of the last ten years.
2. Conservation needs.
3. Social needs, needs for rural people who live in and around forests.

Those sort of needs have been addressed in different ways with varied results. Some details, numbers and figures of varied forests, which have been established, and trees planted along the roadside have been mentioned. One publication estimated that the total area of forest planted in Thailand is less than that lost in one year. One might argue with details, however it gives some indications. This is a basic policy of

discussions. The government, which has been acting alone, cannot address deforestation needs. Government has a clear responsibility and important leadership role, but in acting alone without access to enormous financial resources, they cannot address current forestation problems. The areas that have been planted with an initial survival rate are generally low. This derives from government audit figures, and reforestation figures are about 40-60%. The initial seedlings died during the first year or so, and then further encroachment by rural villagers occurred.

Lessons learned from all of this are the major constraints of successful rehabilitation related to the lack of secured access and utilization by people living in and around forests. If local people are going to have some role in forest management, they must have some security of access and utilization, which does not necessarily mean being an owner per se. The Watershed Management Division has refocused intervention strategies based on past experiences. I think this indicates the direction of the future quite well. The intervention has been articulated and emphasized by the following points:

- The RFD should acknowledge and endorse traditional rules and regulations to conserve watersheds.
- A strong emphasis on working in partnership with local people should be formed.
- Emphasis should be placed on strengthening local capacities to manage natural resources.
- RFD officers should change their attitude towards forest conservation and encourage the participation of local people.

To look inside the internal culture within the RFD, and identify cultural changes, which need to take place, they are interestingly the sort that forestry departments throughout the world have identified as being essential to take to the future. In Australia, forest departments throughout the country are undergoing these cultural changes. It is traumatic, very difficult and very tough for foresters to shift from past cultures of technical orientation to a new one of participation and collaboration. As a forester, I have been through this experience and I can speak with some feeling. This is not common to the RFD, but it is to the forest department and forest culture throughout the world.

The Director General of the RFD (Dr. Plodprasob Surasawadee) gave an interview in the Bangkok Post earlier this month, and he said, "the challenge is to find a way to mingle the two (people and forests) with minimum impact on the forest". This makes clear that the RFD intends to make a cultural shift.

The future is blank. There is common sense in many countries in the region, but beyond that the future looks uncertain. However, it could be said that things are going to be different. How different and how the transition from the past through the present and to the future will be managed is open to substantial discussions. In the next few days there will be discussions on how the future looks.

In reading around the topic, one could articulate the vision of Thailand's forests. Many of the elements of that vision could be seen in speeches at the workshop. In logical sequence, Thailand could have 25% forest cover, most of which would be within some sort of protected area system. To ensure that degraded areas be rehabilitated for both commercial and environmental purposes, one could expect to have areas of community forest under the community's control. Again, providing economic goods, services and environmental services, one can look to have effective industrial plantations, providing primarily industrial products. In a range of areas of private control to communities and farms, one can look to having a great deal of management in partnership with local communities, and with an equitable share of costs and benefits.

One can look at the integration of trees into the farming system, so agroforestry can contribute more effectively for both economic and environmental goods and services. Finally, one could look at integrating trees into urban areas. Thailand is developing large cities, many of which are not environmentally friendly and the question of urban forestry is one that can provide a challenge for the future.

I would like to finish by quoting directly from an interview given by a former Thai Prime Minister earlier this month in the Bangkok Post. He said "We need to invest in agency renewal that will look at different ways of doing things...the scale and pace of change will need to be far greater than anything that has ever been considered before. The challenge now is to find appropriate ways of re-weaving the people into the fabric of societal decision-making".

Forest Rehabilitation in Thailand

Dr. Somsak Sukawong

Director of RECOFTC

How the new internal policy leads to the implementation of forest rehabilitation by various institutes is a question that I consider irrelevant, because Thailand has long been familiar with the technical basis and is already equipped with nationwide forestry stations. In addition, this project has a 30 year old Teak Research Center and a Wild Seed Research Center that was financed by Canada 20 years ago. Nonetheless, the new public rudiment is in fact a social process, which has been fundamental for national forest rehabilitation. Any clauses under the Constitution, which have mentioned the people, communities and the roles of the state are all social processes and key principles for forest rehabilitation. Forestry problems are global and one cannot solve them alone. This project has friends from the IUCN, MRC and other nations. Also, the RECOFTC has tried to link technical problems with actions through social processes.

- The 1st -2nd National Economic and Social Development Plan (NESDP) encouraged the exploitation of forest resources in order to bring in foreign currency.
- The 4th NESDP realized the loss of forests, therefore, their conservation was initiated and their destruction banned until the 6th NESDP. (Good policy, but no fruitful actions since the government sector worked alone without success. Meanwhile, forest cover was constantly reduced.)
- During 7th NESDP, forest cover continued to reduce by about 1 million rai per year.
- The 8th NESDP encouraged the people to participate in the process, initiated community organizations, strengthened the community, campaigned for the understanding of government officials towards the community's roles, and promoted people's participation.
- The 9th NESDP states more clearly that provinces will be aimed at local planning.

Now, some clauses in the Constitution can be looked at, as follows:

Clause No.46: Communities shall have the right to preserve and restore the traditional culture, knowledge and fine arts of the local community and the nation, and participate in the management, maintenance, preservation and utilization of natural resources and the environment in a balanced way, as provided by law.

Clause No.56: The human right to participate with the state and community for maintenance and utilization of natural resources and biodiversity, and protect and promote the quality of the environment for a better quality of life. This right must be covered by law.

Clause No.78: The state authority shall be devolved to local communities, so that they can depend upon themselves, can decide their own activities, develop a local economy and basic service system as intended by the provincial people.

Clause No.79: The state shall promote and encourage public participation in the preservation, maintenance and balanced exploitation of natural resources and biological diversity, and in the promotion, maintenance and protection of the quality of the environment in accordance with development principles.

Clause No.89: The state shall establish the National Economic and Social Development Advisory Council for providing advice and recommendations in various problems, particularly economic and social aspects, to the cabinet. Such council before the promulgation shall approve the NESDP and other plans specified by law.

Clause No.290: Roles of the local government include the responsibilities to protect and maintain the natural resources and environment within their responsible areas, as well as those outside, provided that the impact from environmental degradation occurred.

Roles of the government

1. To accommodate the roles of the government with the participation of the public and communities by:

- Adjusting attitude and capabilities of government agencies towards the cooperation with and support

for local communities.

- Campaigning and publicising to initiate the awareness of communities towards the cooperation, protection and solution for natural resource management.

2. To allow the community and public to participate in management, such as participation in planning, decision making and the evaluating process that can be achieved by a public hearing, including support for the rights of the local community, which is recognised by law, and the backing for the NGOs' budget to launch the Community Forestry Bill.

3. To develop the network on information technology, natural resources and disseminate data to the public.

Roles of the Local Community

1. The Tambon Administration Organization (TAO) has clear responsibilities, as specified by the TAO Law in Clause 67, in which the TAO shall protect, maintain and preserve natural resources and the environment within the area it is responsible for.
2. To initiate the awareness of local people towards the impact from resources and environmental degradation.
3. To render support for the public learning process towards the protection and preservation of natural resources and the environment.

Roles of Non-Governmental Organizations (NGOs)

1. NGOs will provide the budget and activities to maintain natural resources and the environment, for example, PTT, Bangchak Refinery and Cement Thai Co. have implemented private reforestation projects.
2. To publicize and transfer knowledge and skills for the preservation of natural resources and the environment.
3. To support the establishment of a development fund for natural resources and the community's environment.

Roles of Community Organizations

1. To participate in the planning process and management of natural resources and the community's environment.
2. To cooperate and support the government sector in the preservation, restoration and management of natural resources. As a result, the Community Development Volunteers Association of Thailand has been established. While comprising two members in each village, and a total number across the country of 120,000, 7,000,000 trees have already been planted.
3. To establish the learning network among local organizations.

As mentioned above, regardless of the policy guidelines in the Constitution, the roles of the government, TAO, NGOs and communities all form the social processes leading to preservation, for example:

In the case of Kao Paeng Ma in Wang Nam Khieo District, almost all the Buddhist monks fled the monastery ten years ago, since nobody put food in their bowls, due to the difficulties the villagers faced themselves. Consequently, the Wildlife and Flora Protection Foundation of Thailand put in an effort to restore and help the people by starting to look into their debts and bring in fruit trees. Afterwards, their living conditions gradually improved when PTT financed 5,000 rai of reforestation. They participated in forest rehabilitation by planting indigenous species and types suitable for wildlife. They believed that fire protection was beneficial, and the forestry staff, therefore, provided fire protection training. After 2-3 years without fire, the forest changed from weed cover to native banana, etc. In addition, wildlife returned, as the villagers no longer hunted them down. Wild pigs started digging and wild seed dispersed. The forest rehabilitation of 5,000 rai has nearly been accomplished and the ecosystem has been restored by the support of social processes.

Another case occurred in Trad province, close to the Cambodian border. The Buddhist monk visited the truth savings group in the southern region, where one village alone managed to save up to 60 million Baht. That monk replicated such activity in the eastern region and the communities then became strengthened. The Women and Conservation Groups were set up, resulting in forest resource management. Nevertheless, they struggled for a long time before the logging concession was banned about 7-8 years ago, because the concessionaires disobeyed the contracts by cutting timber outside their own jurisdiction. Those

concessionaires were in fact local politicians who excavated fish ponds in 7,000 rai of forest reserve, while no one could stop them from this encroachment of national forests. However, the villagers united in protesting and protecting the forest until they finally won. They then began to rehabilitate the forest and strengthen their own communities by requesting social funding in order to buy a surveillance boat to survey their 10,000 rai of mangrove forest. All activities, already achieved, have made the villagers very proud of themselves.

The future

- The roles of the people will be increased, and much more in terms of communities, since there will be groups of people and a forum for the exchange of ideas.
- People will have already created the patterns for the project.
- Up until now, the government has set up everything, but in future the people will initiate any activity by themselves, since they are more aware of the Constitution.
- Government officials should accept whatever happens in the future. Meanwhile, they should not rely totally upon the law, as that does not provide a solution.

Trade-offs between Biodiversity Conservation and Production in Forest Rehabilitation Programs

Dr. David Lamb

The original forest was not degraded and had a certain biodiversity of plants and animals, including a certain level of production. When it becomes degraded by some process and nature takes its course, it might slowly return to the original forest if no more further degradation or disturbance occurs. But on the other hand, if there are more disturbances such as fire, it might get even worse or degrade even more. So our choices are to accelerate a process to try to deal with ways of going back to its original point, start again completely or put in a plantation. That means we simplify biological diversity and the production increases at a higher level than the original system has. That is because we put in fertilizer or we have carried out a course of changes to increase productivity.

In terms of reforestation possibilities in an area we might reforest, the first filter is the SITE. If the site is very infertile, very rocky or there is low rainfall, then degradation is taking place. Next to the site is the LANDSCAPE, which might limit the number of possibilities that we are perhaps able to adopt. The landscape condition will affect the choice we make, for instance, if there is a patch of intact forest nearby the area we are going to rehabilitate, the task might be quite easy compared with the area without any nearby intact forests. Also, the process of colonization of plants and animals is going to be very different, depending upon a landscape with no remnant forest and high degradation or one that still has patches of original forest. The SOCIAL indicates what sort of the land use, what to do, and what the objectives and needs are. The ECONOMIC issue is how much money you have to play with, and lots of OTHER things, both practical and legal.

When talking about rehabilitation, two sets of choices have to be made. One is high or low density planting, which should be considered. By high density, the planting exceeds 1,000 trees/ha, meanwhile, low density will be less than 100 trees/ha. Another choice is about how many species we are going to use. If we are trying to establish the original biodiversity, a large number of species might do. But if we use a low number we are going to establish plantation mono-cultures. Therefore, there are 3 possibilities. Option 1, where we have a large number of species and high density planting. Option 2, where we have a low number of species, perhaps only one, and planting is at a very high density. Option 3 is that we have a small or large number of species, but planting is in a very low density. All of these have their place in a particular circumstance.

Option 1 Dense planting of many species

1. High rainfall areas In the case of high density planting with many species, we do that in order to restore the biodiversity to a particular part of landscape, or perhaps we might try to restore the biodiversity in an area that had been degraded inside a national park. That is the primary land use for the objective of managers who have to restore the biodiversity by:

- Weed control
- Use of as many species as possible
- Include particular species e.g. figs, life forms - trees, shrubs, etc., and poorly dispersed species which do not arrive in that area by themselves, because the fruit maybe too big or wind dispersed species do not normally spread very far.
- Plant seedlings at 1-3 m spacing, which is very dense
- Plant at one time, which is then a one job operation.

2. *Restoration after mining.* This is a very special situation different from the ones we have been talking about up until now. But one of importance nonetheless because the level or intensity of degradation is very severe. Good ways of dealing with this are as follows:

- Respread topsoil (seed + mycorrhiza)
- Good site preparation (rip)
- Fertilizers
- Use as many species as possible
- Particular species may include N-fixers (mostly Acacia) and exotics. The area might be so degraded that native species cannot grow
- Re-introduced by seedlings and direct seeding. These can be done by hand, etc.
- Plant at one time.

Option 2 High density planting by using few species

There are 2 ways to consider, as follows:

1. *Dense planting of a few short-lived secondary species.* This is to plant a dense plantation with a few short-lived species to exclude grasses and weeds, and allow a natural colonization process to take place from a patch of intact forest nearby. This is a slow development of biodiversity, but cheaper and it covers much larger areas. Trees might be introduced as seedlings or direct sowing (after weedicide) to:

- eradicate shade in tolerant weeds
- facilitate colonization from nearby forest
- facilitate seedling establishment.

However, some problems might be expected because biodiversity accumulation is dependent on forest being present nearby. Also, one particular problem is large fruited species, which are poorly dispersed and might be treated as a special case.

2. *Commercial tree plantations.* The question is, can we modify the traditional silviculture to provide some degree of biodiversity as well as production? The motives are an increased variety in the ways to plant, not the intention to get some commercial value from that.

Ways this might be achieved

- *Increase buffer strips around mono-cultures (indigenous species).* This is very common in many plantations that have buffer strips along the riverbanks and uphill sub-ridges, which are perpendicular to the river.
- *Mosaics of species mono-cultures.* This is not having one species planted across the whole landscape, but rather having species A here, species B there and species C here. Each species has been fitted where it grows best in each part of the landscape.
- *Mixed species plantations.* This is not having a single species, but two or more.
- *Encourage under-storey development.* Under-storey development, which often occurs in the mono-culture plantation, should not be regarded as a nuisance or irrelevant, but rather deliberate encouragement for the development of biodiversity, or commercial or social purposes.

However, one should bear in mind that *likely biodiversity outcomes probably range from limited to modest.* That is to say, none of these approaches have very much biodiversity, but biodiversity will be significant to the extent of its usefulness or dependence on ecological and economic circumstances. It is not suggested that these methods be applied everywhere. Foresters should be thinking, which of these might be appropriate in particular circumstances.

Problems and issues arising

- Species-site relations. In most parts of the world the approach is not to fit species to the landscape, but rather to choose the species and modify a suitable landscape for them.
- Designing multi-species plantations that might be used.

How many species? Mixture approach.

Species forming stable mixes? What species will mix together?

Incompatible species. One species might go farther than the others.

- *Designing plantation layout*

Spacing. What is the appropriate spacing?

Temporary or permanent. Are there temporary mixtures where we have cover crop or a nursed crop?

Systematic or random. Is there a systematic plantation or completely random mix?

Alternative rows or trees.

- *Managing multi-species plantations Thinning regimes. What are the appropriate thinning regimes?*
- *Consequences for productivity (What is trade-off?). Do we lose in terms of production by doing this?*

Option 3 Low density planting using few species

Minimal contribution to accelerating natural succession.

What should we do to make a trade-off between a low cost operation to plant seedlings or trees that are very widely spaced, and which might cover a large area? A much smaller rate of biodiversity than in option one starts to come back to that landscape and what we are going to talk about is based on observations often found underneath isolated trees on all farmland. That is to say that a large number of seedlings have been brought in by birds perching on trees and shedding seeds down to the ground. Therefore, a gradual springing out happens in a whole range of species to the extent that dependence on whether the seed is protected occurs, e.g. from grazing animals, which come in and chew the seed. This is based on the well-known perch tree effect.

If we consider how many seedlings can be found in each situation, Situation 1 is an ordinary abandoned grassland or farmland, where usually not too many seedlings are present because the weed competition is too severe. If shrubs grow, then little seedlings start to appear, but not in a high density. Once a tree grows to about 6 m, many more things materialize in the area. One reason for this could be that birds feel safer in a tree than in low shrubs where they are more vulnerable. Another reason is a variety of trees that are with and without fruit. However, there is no difference as far as the bird is concerned, provided it has somewhere to perch. A further point is whether there is any difference between a single tree and groups of 2-3 trees. Are there more seedlings under a single tree than under more trees? The answer is a slight increase under a clump of trees per m² over the single tree.

So, this information tells us to grow a little clump of trees across the landscape, at a distance of maybe 100 or 200 m, which would not cost as much as in option 1 or as much as a plantation that would potentially cover a large area. Also, provided there are patches of intact forest in the region or district, birds will start to bring items into that site.

Which method provides greatest landscape cover and greatest rate of biodiversity accumulation?

Option 1 is expensive.

Option 2A uses a small number of short-lived species, but takes a lot longer for biodiversity to arrive. This method does not cost much money.

Option 2B is a plantation system that might cover a large area, but the rate of biodiversity could be small or large depending on how the plantation is planned, e.g. with buffer strips, under-storey development, etc. Each case has the opportunity to cover large areas.

Option 3 has a small number of species and costs less. It can also cover a large area, but the rate of biodiversity is pretty small.

Which method is the least risky?

Degradation occurs from either human or natural causes. This may or may not have been removed, as with logging or grazing being stopped. Are we absolutely sure that this action was successful?

Option 1 costs a lot of money and a large number of species have been used. Risk is pretty low in this case.

Option 2 is a plantation system where the risk is somewhere in the middle. Production also plays its part.

Option 3 does not cost much money, but sparse planting is high risk.

Which method provides greatest benefit in ecological services?

Biodiversity and function (watershed protection). The function increases when a number of species do, which may be 4 or 5 species of any kind.

Why not rely on nation parks for biodiversity and restore only production on degraded land?

The reasons are:

- National parks will always be a small percentage of area. Most countries have only 5% landscape in national parks.
- Parks are too isolated. They are too remote with no trace of animals between them.
- Multiple objectives are possible:
 - production alone is insufficient, since there are other purposes for timber, recreation, etc.

CONCLUSIONS

Should seek to restore more than just productivity, but choice depends on:

- degree of degradation
- social factors
- funds available
- legal constraints

There is no single method

- landscape may require various approaches
- seek heterogeneity/mosaic

Even small improvements are useful.

Forest Restoration of Doi Tung Royal Project

Dr. Riksh Syamananda

Mae Fah Luang Foundation

I am here today on behalf of the people working for forest rehabilitation at Doi Tung. However, I would like to say that what Dr. David Lamb mentioned would have made a reforestation plan more difficult if carried out 11 years ago. I mean there would have been forests with biodiversity or no forests at all accordingly, and we would have had to think hard whether the implementation had been recognised technically.

Doi Tung Royal Project was initiated in 1988, the same year that the King's Mother reached 88 years of age. Project areas of 150 sq.km. or 93,515 rai were originally 3 plots of forest reserves, while another 2 plots were state forests. The project, therefore, contacted the army regarding their 30 year permission from the Royal Forest Department (RFD), Ministry of Agriculture and Cooperatives (MOAC) in order to develop the areas from 1988 onwards. A borderline of about 25 km lays north between Doi Tung and Myanmar, while Doi Mae Salong is situated in the southeast, and the River Kham runs into the Mekong River in Chiang Saen District. The minimum elevation of Doi Tung is 460 m and the maximum is 1,509 m.

Before the project, about 54% of the site consisted of degraded forests and poppy fields, while natural forest comprised 28% of rocky landscape and 17% of the RFD's original reforestation programme. At present, we are able to maintain all the original forest land, although fire has broken out occasionally. However, since the fire protection plan was well organized, not much damage has recurred as a consequence. The site, where the RFD and project have reforested with funds from the government, is a rather dense planting forest with 4x4 m spacing (100 trees/rai). Teak has been planted at an elevation of less than 700 m, while pine trees are at an elevation of over 700m. Besides these, there are economic forests where Macadamia(spell check???), chestnut, arabica coffee, etc. are grown. Another 10,000 rai reforestation was carried out in 1990 to honour the King's Mother. Mixed fruit trees were planted and the site was divided into 2-4 rai plots to be looked after by local people. These local people were granted 5,000 baht/rai for the first 3 years, and afterwards they had to manage by themselves for the remaining 2 years, until yields could be harvested after 6 years. However, the local people had to rent such land at a rate of 1 Baht/rai/year, which implied that this was state land that anybody could cultivate for a living, but could not sell. As a result, the original 45% of forest land has been increased to 85%, and the shifting cultivation areas have been reduced from 50,000 rai to only 7,000 rai.

In the case of forest fire, which broke out as many as 196 times in 1989 resulting in damage to a 3,632 rai area, the number of fires and amount of damage have currently been reduced. In addition, the figures of relative humidity have changed positively, and that means more humidity. Such figures have been collected from 1992-1998. Another aspect is the climate. While previously coldness occurred during the cold season and intense heat prevailed in the summer, now, extremely cold weather becomes mild and intense heat also decreases.

Annual rainfall has also been affected positively since the data collection began in 1988, when the annual rainfall lowered to 1,200mm. Afterwards, the annual rainfall increased in more forests to 2,200 mm instead of the normal 1,800mm. The number of rainy days in Doi Tung now exceeds 100 days/year, which indicates that the humidity is in a favourable condition, due to more trees.

Reforestation results in better living conditions for local people, since they now earn 3,772 baht/household/year compared to only 10 Baht per day from their poppy fields and shifting cultivation in the past. With the project, they were employed for reforesting, applying fertilizer and mulching with a maintenance budget of 1,000 baht/rai/year for about 3-5 years, depending on the site. This resulted in an increase of income for the household and they no longer had to cut trees.

The population of Doi Tung is 10,800 with 2,520 households and 39 houses. At first, the birth rate was rather high at 2.65%, but now that family planning has been introduced, it has decreased to only 1.2% in the year 2000, as planned. In the past, the number of elderly people were few, due to health problems and scarce food. Now, their number has increased as a consequence of better public health and an increasing income obtained by employment.

Reforestation cannot be carried out unless local people pay attention. If reforestation occurs while they are poor, they will definitely not cooperate. They believe that they can depend on the forest while no damage has been done. We have to seek a compromise with regard to methods of how they can live with the forest and what kind of products they would make for a living. All this has to be managed and distributed for them and the project has its own Sa Paper Factory to encouragement income generation.

In the early days, local people were not educated and, therefore, any kind of training did not seem worth the effort. Afterwards, they were trained and then began to understand what they had been taught. In the past, they used to earn 28.4 million baht in a total population of 10,000, while 13 million baht of this came from poppy fields and 50,000 rai of shifting cultivation. Now, their income has increased to 243 million baht. Also, the land used can be reduced to only 7,000 rai, due to their employment and the appropriate cultivation learned during the employment period. Public utilities such as electricity are also being provided, as well as a 118 km road for 26 villages.

Before 1988, the project areas were all degraded mountains and trees were cut down. At present, the whole area is green covered, since the project has applied only 1, 2 or 3 species with very dense planting. There are

some species that can compete with pine trees. When viewing from the hilltops, the indigenous species from seed dispersing birds can survive as well as compete with high pine trees. The success of the project is indeed due to the development of the people in line with the forest, otherwise the project could not accomplish anything. Quite a number of patterns are still to be selected, for example, if reforestation requires the migration of people from the forest, nobody will take care of it and extinguish the fires. The people will no doubt love their own forest if their living conditions have improved.

Summary Paper of PaChowBan: Forest Rehabilitation Program of the Royal Project

Pichart Wattanaprteep, RFD

Forests are the vital natural resources in the human's way of life. Nevertheless, it is currently found that Thailand's forest cover, especially watershed area in the north, has mainly diminished as a result of the encroachment for agricultural purpose and wood fuel. A consequence of forest decrease is the need for various agencies to draw up the solution guidelines.

The Royal Project is another agency attempting to find the solution to such problem, since its scope of work has been implementing on the upland area, particularly in the case of wood fuel shortage. The Royal Project has consequently introduced the PaChowBan Royal Project to the farmers in accordance with the King's Initiative of 3 categories of forest plantation with 4 types of benefit obtained, namely an edible forest, wood fuel forest, utility forest, and the last type has been defined as the soil and watershed conservation forest. Such forest plantation has to be carried out only in a suitable area, and its harvest should be free of any environmental disturbances. Farmers can grow trees on their cultivated land whether on individual or household basis, and they can cut the trees down for own use at their own will. Even though farmers under the project can grow their own trees and make use of them, the area management is however subjected to be advised and controlled by the identification of tree varieties and area utilization. These are defined into 3 types as: 1) a conservation area where any tree cutting is not permitted at all; 2) a proposed economic area where trees can be cut down for use; 3) an area suitable for any agricultural activities, such as the plantation of fruit trees, field crops, flower crops and vegetables, depending upon area and climate suitability. Farmers are due to follow the area classification in order to comply with the use and to be friendly with the environment. Suitable varieties of tree should be fast growing and can be used as wood fuel as well as building house purpose, including providing the economic benefits, for instance Taiwan Acacia (*Acacia confusa*), Fragrant maple (*Liquidambar formosana*), Griffith's Ash (*Fraxinus griffithii*), Camphor Tree (*Cinnamomum camphora*), Paulownia (*Paulownia taiwaniana*), Taiwan giant bamboo (*Dendrocalamus latiflorus*), and Oldhamii bamboo (*Bambusa oldhamii*).

The implementation of PaChowBan Royal Project will be the most beneficial if farmers are involved, since the illegal logging from natural forests can be reduced, and degraded forests can be rehabilitate subsequently. PaChowBan Royal Project is therefore one of the key methods to conserve and restore the watershed area.

Attitude towards the PaChowBan Royal Project

PaChowBan Royal Project can help to reduce forest loss and support watershed restoration, since its objectives, concepts and implementation principles have perfectly integrated into the conservation and socioeconomic aspects. Additional viewpoints can be arranged into 3 parts as follows:

1. Project Objectives

PaChowBan Royal Project has defined its objectives by promoting the farmers to grow, maintain and make use of the trees, which are appropriate. But the clear target about farmers and their number has not been mentioned in the objectives. Project duration is also missing, which makes the evaluation of project success not possible.

2. Implementation Principles

2.1 The implementation concepts of PaChowBan Royal Project have been complied with the Royal Remark of

His Majesty the King as concerned the 3 categories of forest planting with 4 types of benefit obtained. Such implementation is an integrated forest plantation suitable for the watershed area predicament, since farmers have yet depended upon the wood for fuel and building houses. If there are trees at their disposal without destroying any natural forests, problems will diminish. In addition, farmers will be convenient to obtain some forest benefits without travelling to the remote forest lands.

2.2 Permission for freely cutting down their own trees is such an incentive for the involvement of farmers. Nevertheless, tree replacement should be carried out instantly to prevent the lack of wood supply, which may cause the old pattern of encroachment that such implementation will be fruitless and the farmers' involvement may be inactive. These often give rise to the withdrawal from other Royal Project's activities as well.

2.3 Public relations planning has not been mentioned. Good understanding with farmers is therefore not possible, since the successful promotion has to depend on the effective communication and public relations. As a consequence, a pilot group should be recruited through publicity before the beginning of the project.

2.4 Implementation procedure should be established as a manual for operating staff and other interesting agencies, so that it may serve as some guidelines for them to work properly in the area.

3. Participating farmers

Participating farmers should have their cultivated land on the upland area. To take part in the project, they have to grow and maintain the trees themselves. By doing this, it is possible to build up the responsibility's habits towards forest resources, since they have experienced a long duration of growing trees step until utilization. This is thus an awareness building process for farmers and their families to be deeply care for the forest. In the long term, it will serve as a mechanism to develop a young generation to appreciate the value of the forest, as well as lessening the burdening task of foresters.

After all, it can be concluded that PaChowBan Royal Project is highly beneficial to reduce the problem of forest encroachment, and may eventually be an approach to increase forest cover in Thailand.

WORKING GROUP DISCUSSION

Nov 24, 1999 Group 1

Factors to forest losses

Human factor

1. The use of timber has long been in demand.
2. Needs for income increase
3. Lack of knowledge and understanding towards the role and importance of natural resources
4. Needs for land rights
5. Taking advantage of the legal and regulations gap for one's own interest.

Administrative and management factor

1. Lack of coordination among agencies in terms of policy and practice.
2. Soil fertility under government's allocation lands is not suitable for cultivation.
3. Lack of practical and constant establishment on conservation and natural resource management for the youths.

Nov24, 1999 Group 2

Policy settings to halt deforestation

Statements:

There are people living in forests, making their living on forest resources, who have no alternative for survival in the given situation.

There is a need to raise consciousness for the need of forests at national level.

Recommended policy settings

Policies for creation of forest reserves

- Needs programs for forest plantations.
- Promotion of the establishment of factories to use forest products.

Policies for re-classification of forest land

- Present classification is not sufficiently detailed
- Different categories of forest are required
- A new classification has to cover the spectrum from forest for conservation down to forests for pure commercial use.
 - There should be provisions for different regions
 - for cooperation between local people and foresters
 - for commercial use and for protection
 - Participatory Land Use Planning required for development of appropriate management practices

Policies addressing the Tambon Councils

- Creation of budgets on Tambon Council level for expenses on environment, meant for different environmental investments or projects
- Origin of funding could be taxation of energy and other sectors
- Build programs for environment-supportive activities at Tambon Council level

Policies supporting alternative income through specific investments

2 million people living in and from forests, need to be supported with programs

- providing alternative employment possibilities
- supporting local investment in job creation outside forest use
- programs for protection of forests and dissemination of

information

Nov 24, 1999 Group 3

Constitution: people's right to access forest resources and realistic action

Problems identified

- There are discrepancies and sometimes contradictions between policy objectives among government

institutions (forestry and agriculture)

- There is lack of transparency about agendas of institutions and individuals working in institutions
- There is lack of transparency about what is going on as practicalities of Government and NGO intervention with local communities.

Suggested action

1. Culture and TOR

- There is a need for a culture in government organizations, which is supportive of direct interaction between government officers and local communities.
- There is a need to review the present TOR and evaluation systems of government officers, who supposedly directly work with local communities. The revision should look at possibilities to change to a more facilitating and less controlling role.
- Policies, which support these changes, have to be in place before, since any large organization like government tends to resist changes, which do not apparently benefit individual members.

2. Tambon Council

- Tambon Councils should be strengthened and supported with technical advice, community development agents, and workable approaches and programs addressing community development.
- Support to Tambon Councils has to come from government organizations, which work country wide for initiation of a movement, which covers larger areas.
- Development agents may come from NGO-based programs, temples, communities and projects.
- The role of projects is important for development of approaches, packages, but is usually limited to micro-areas.
- During the process there is a strong need for interdisciplinary technical support for GIS, PLUP, Info-management.
- The facilitation and empowerment process may take a generation. During the process those government organizations involved would transfer power to Tambon Council level decision making.
- Tambon Councils need to be further supported with guidelines as well as sanctions for proper functioning or violation of regulations
- There needs to be sufficient financial means for programming at Tambon Council level. Funding may come from environmental accounts.

3. Security of living

- any program addressing involvement of people in technical activities has to start with securing basic needs of people.
- formation of village based institutions, which would then be mobilized for technical programs have to consider the economic status and possibilities for income generation at the same time.

Nov 25, 1999 Group 3

Role of rehabilitated forests in contributing to Biodiversity conservation goals

Past rehabilitation efforts in Thailand may not contributed significantly to biodiversity conservation because of:

1. There is a limited number of species used in plantations at the moment, following government regulations (about 10 years ago, only 6 species were planted by RFD).
2. The budget provisions do not cover all necessary activities and leave constraints for the implementers.
3. There is not sufficient overview in Thailand regarding best utilization of land. Land Use Planning is not done systematically
4. Work plans are being made at highest level, who do not understand problems at the local level. A result of this is that implementation often in conflicts.
5. There is a great deal of misunderstanding of the term biodiversity, since it is not clearly defined.
6. Focus on commercial plantations with little emphasis on biodiversity.

Recommendations

1. There is need for a larger budget to take care of all operations to be performed for creating forests with higher biodiversity.
2. There should be programs to better inform private sector and villagers to help them better understand the issue of rehabilitating forests and biodiversity.
3. Needs to be a clear priority of objectives for land use and identification of areas for raising biodiversity.
4. There should be studies underway to find out about the optimum number of species appropriate for a specific piece of land and for the purpose given to the land.
5. Establish a base line for better planning of biodiversity for the future by surveying existing plantations.
6. Survey existing rehabilitated areas to evaluate the levels of biodiversity present and the reasons, to prepare guidelines for future rehabilitation (commercial plantations and others).

Nov 25, 1999 Group 5

Conditions for encouragement of local communities and industry

Recommendations

1. To zone land into
 - land for protective functions and
 - land for economic functions, which involves participation of people through appropriate channels
2. To encourage local communities involvement with
 - rights to use land
 - collect NTFP
 - compensation for upland people from down land people through
 - being hired for work
 - getting better knowledge about the importance of reforestation and preservation of forests
3. To encourage private sector to be more involved
 - redraw regulations for higher flexibility. Present regulations are too many and too cumbersome.
 - application of the monitoring environmental program (MEP)
 - setting standards for using land in an appropriate manner and establish sanctions for using land not in appropriate manner.
 - providing benefits to the industry and to people through incentives for investment
 - provision of effective benefits for the private sector will have to be thought through very carefully. One should take Japan as a good example which has 60% to 70% forest coverage, most of it being created by the private sector.
 - only tax reduction would not be sufficient, since benefits from investment in reforestation would come after many years and carry high risks.

Nov 25, 1999 Group 6

Effective participation of stakeholder groups in policy formation

Options for creating a platform for effective participation in policy formulation for forest rehabilitation

AMBITION

There should be regulations and mechanisms, which enable stakeholders at various levels and stakeholders from different groups and organizations at a level to participate in a decision making process which addresses

natural resource management. This ambition describes communication processes trying to integrate different interests vertically and horizontally.

POTENTIAL

Special potential

- There is a Canada-supported project operating in 6 provinces Natural Resources and Environmental Management (NREM). Here, provincial offices work through an interdisciplinary team on provincial planning using
 - Participatory processes, involving TAO, local groupings, federations, etc
 - Facilitation skills
 - Technical aid like GIS, mapping
 This initiative should be carefully studied and learnt from. It might develop processes of a regular and systematic consultative process between recognized institutions, taking account of local peoples' interests.
- The former water user groups and their foundations could become a very effective organizational structure, taking care of upstream-downstream relationship in watersheds. They have the potential to provide a platform for conflict resolution in consultation with the government, if dealt with in a form, which is not politicized or instrumentalized.

Problems identified

- At the Tambon level, which is the lowest administrative level of decision making and resource allocation, apart from elected people there is a number of organizations represented. There is no representation of the Forest Sector.
- It is not clear to anybody, who from the RFD (from what level with what authority) would systematically be connected with the Tambon Administrative Organization (TAO) for professional discussions.
- There is a great variation in quality of leadership and in terms of economic resources among TAO, which makes it difficult to consider the TAO as a functioning body generally at the moment.
- There is a number of other organizations, which are not clearly connected with or attached to the TAO, like projects of donors, NGOs, foundations and networks. Some of them have created their own mechanisms for voicing peoples' interests, or even voice opinions beyond peoples' interests.
- There is no apparent platform for a meeting point between bottom up planning and top down decision making in natural resource management at the moment. The mechanisms of National level planning (e.g. National Park boundaries) do not meet with representatives of locally affected people for negotiations in a systematic way.
- Particularly, issues beyond the administrative size of a Tambon Council have no platform to be dealt with, which would have recognized peoples representation.
- Negotiations today between government decision making and local peoples' interests do not follow institutionalized ways, but happen in an unsystematic way, often being instrumentalized by outsiders.

General potential

- Reforestation in future will be organized (and financed) through the TAO as per Cabinet decision. This shows the commitment of the government towards decentralization and providing leverage to the TAO.
- Mechanisms for community based natural resource management have been in place since long informally. The traditional water user groups (downstream) are well known and there are examples of extended concerns of these former groups over upstream water production as well.
- There is a great deal of willingness on either side to introduce conflict resolving mechanisms. Consulting processes are taking place, but seem more to follow outspoken voices than regular channels.
- Coordination of policies and planning at the top level is not always in place as well. This may contribute to a greater room at local level to take the initiative for a consultative process.



RESULTS

Summary of group discussions and results during the Workshop on Forest Rehabilitation Policy and Practice in Thailand

Factors related to forest losses (Result of Group)

These involve human, administrative and management factors.

The human factor includes the use of timber, which has long been in demand; the need for increased income; the lack of knowledge and understanding towards the role and importance of natural resources; the need for land rights, and the advantageous taking of the legal and regulation gap for one's own interest.

The administrative and management factor includes the lack of coordination among agencies in terms of policy and practice; soil fertility under the government's allocation of land that is insufficient for cultivation, and a lack of practical and constant establishment on conservation and natural resources management for youths.

Policy settings to halt deforestation (Result of Group)

There are people who have no alternative ways to survive in the given situation. As a result, they have to live in the forest and earn their living off its resources. It is, therefore, indispensable to raise consciousness for the need of the forest at national level.

Recommended policy settings are for the policies that create the forest reserves, which include programmes for forest plantations as well as the promotion of factory establishments aimed at making use of forest products.

Meanwhile, the policies for the re-classification of forest land show that the present classification is not sufficiently detailed, while different categories of forest are required. Also, a new classification has to cover the spectrum from the conservation forest down to the economic ones in different regions, either for cooperation between local people and foresters or commercial use and protective purposes. At the same time, Participatory Land Use Planning will be required for the development of appropriate management practices

In addition, policies addressing the Tambon Council should include the budget request for environmental expenses such as various environmental investments or projects. However, sources of funding could be obtained from energy taxation and other sectors. At the same time, programmes for environment-supportive activities at Tambon Council level will also be established.

However, the policies supporting alternative income through specific investments for about 2 million people living in and around forests, need to be supported with various programmes aiming to provide alternative employment possibilities, support for local investment in job creation outside forest use, protection of the forests and the dissemination of information.

Constitution: people's right to access forest resources and realistic action (Result of Group 3)

Problems can be identified in terms of discrepancies and sometimes contradictions between policy objectives among government institutions (forestry and agriculture). Also, there is a lack of transparency on the agenda of both government agencies and the individual, as well as a lack of transparency on the practices of Government and NGO intervention with local communities.

However, suggested actions are as follows:

Culture and TOR

There is a need for a culture in government organizations, which is supportive of direct interaction between government officials and local communities. There is also a need to review the present TOR and evaluate systems of government agencies, who supposedly work with local communities. The revision should consider possibilities to change to a more facilitating and less controlling role. However, policies, which support these changes, have to be in place very soon, since any large organizations like government agencies tend to resist changes that do not apparently benefit individual members.

Tambon Council

The Tambon Council should be strengthened and supported with technical advice, community development agents, and workable approaches and programs addressing community development. It has to be supported from nation-wide government agencies, while the facilitation and empowerment process may take a generation. During the process, such government agencies would transfer the decision making authority to Tambon Council level.

The development of agents may come from NGO-based programmes, temples, communities and projects. Although the role of projects is rather important for the development of approaches and packages, it is usually limited to micro-areas. However, during the process there is a strong need for interdisciplinary technical support from interested GIS or Info-management, etc.

Moreover, the Tambon Council needs to be supported further with guidelines as well as sanctions for proper functioning or violation of regulations. Also, sufficient financial means for programming at Tambon Council level are needed, although funding may come from some environmental accounts.

Security of Living

Any program addressing an involvement of people in technical activities has to begin with securing the basic needs of the people. In addition, a formation of village based institutions, which would then be mobilized for technical programs, have to be concerned with the economic status and possibilities for income generation simultaneously.

Role of rehabilitated forests in contributing to biodiversity conservation goals (Result of Group 4)

Past rehabilitation efforts in Thailand may not contribute significantly to biodiversity conservation as a result of various instances, such as a limited number of species used in plantations according to government regulations (about 10 years ago, only 6 species were planted by the RFD); budget provisions do not cover all necessary activities and leave constraints for the implementers; an overview in Thailand regarding the best utilization of land and Land Use Planning is insufficient because it has not been done systematically; work-plans are being made at a high level, as a consequence, problems at local level are always misleading and often result in implementation conflicts; a great deal of misunderstanding of the term biodiversity occur, through lack of clarification; and finally, commercial plantations are focused with little emphasis on biodiversity.

Recommendations regarding the above-mentioned problems have been put forward, such as a larger budget is needed to take care of all operations to be performed for creating forests with higher biodiversity; programmes should be set up to inform the private sector and villagers better in helping them to increase their understanding on the issue of rehabilitating forests and biodiversity; a clear priority of objectives for land use and identification of areas for increasing biodiversity are needed.

In addition, there should be studies underway to find out about the optimum number of species appropriate for a specific piece of land and for the purpose given to the land. These can be achieved by the establishment of a baseline for better planning of biodiversity for the future by surveying existing plantations. However, a survey of existing rehabilitated areas should be conducted to evaluate the levels of present biodiversity, and to prepare guidelines for future rehabilitation (commercial plantations and others).

Conditions for encouragement of local communities and industry (Result of Group 3)

Recommendations have been made to zone the land for both conservation and economic functions, which involve the participation of people through appropriate channels; encouraging local community involvement with the rights to use land, compensating upland people who are hired for work, and receiving better knowledge about the importance of reforestation and preservation of forests. Moreover, the private sector should be encouraging more involvement in redrawing regulations for higher flexibility, since there are too

many present regulations that are too cumbersome. Also, the monitoring environmental programme (MEP) should be applied and standards for using land in an appropriate manner should be set up. Meanwhile, sanctions against inappropriate land use must be established.

In addition, the benefits to industry and the people through incentives for investment will be provided, since the provision of effective benefits for the private sector will have to be thought through very carefully. One should take Japan as a good example, which has about 60% to 70% forest coverage, most of it being created by the private sector. However, tax reduction alone would not be sufficient, since benefits from investments in reforestation would come after many years of carrying high risks.

Effective participation of stakeholder groups in policy formation (Result of Group 6)

Options for creating a platform for effective participation in policy formulation for forest rehabilitation may be identified as follows:

Ambition

There should be regulations and mechanisms, which enable stakeholders at various levels and from different groups and organizations to participate in a decision making process that addresses natural resources management. This ambition describes communication processes as trying to integrate different interests vertically and horizontally.

Specific Potentials

There is a Canada-supported project operating in 6 provinces, Natural Resources and Environmental Management (NREM), where the provincial offices cooperate through an interdisciplinary team on provincial planning by using participatory processes, involving the TAO, local groupings, federations, etc; facilitation skills; and technical aid like GIS and mapping techniques.

This initiative should be carefully studied and learnt from. It might develop processes of a regular and systematic consultative procedure between recognized institutions, while taking local peoples' interests into account.

However, the former water user groups and their foundations could become a very effective organizational structure in taking care of upstream-downstream relationships in watersheds. They have the potential to provide a platform for conflict resolution in consultation with the government, if dealt with in a form that is not politicized or instrumentalized.

Problems Identified

At Tambon level, which is the lowest administrative level of decision making and resource allocation, there is a number of organizations represented apart from elected people. However, there is no representation of the Forest Sector at all. It is not clear to anybody, who from the RFD (from what level and with what authority) would be connected systematically with the Tambon Administrative Organization (TAO) for professional discussions.

There is a great variation in quality of leadership and in terms of economic resources among the TAO, which makes it difficult to consider the TAO as a general functioning body at the moment. There is a number of other organizations, which are not clearly connected with or attached to the TAO, like project donors, NGOs, foundations and networks. Some of them have created their own mechanisms for voicing peoples' interests, or opinions beyond the peoples' interests.

There is no apparent platform for a meeting point between bottom up planning and top down decision making in natural resources management at the moment. The mechanisms of National level planning (e.g. National Park boundaries) do not meet with representatives of locally effected people for negotiations in a systematic way. Particularly, issues beyond the administrative size of a Tambon Council have no platform to deal with, which would have recognized the peoples' representation. Negotiations today between government decision making and local peoples' interests do not follow institutionalized ways, but happen in an unsystematic way, often being instrumentalized by outsiders.

General Potential

Reforestation in the future will be organized (and financed) through the TAO as per Cabinet decision. This shows the commitment of the government towards decentralization and providing leverage to the TAO.

Mechanisms for community based natural resources management have long been in place informally. The traditional water user groups (downstream) are well known and there are also examples of extended concerns of these former groups over upstream water production.

There is a great deal of willingness on either side to introduce conflict to resolve mechanisms. Consulting processes are taking place, but they seem to be more outspoken than regular channels.

Also, the coordination of policies and planning at top level is not always in place. This may contribute to greater room at local level, which can provide the initiative for a consultative process.

Closing address

Mr. Udthai Thongmee

The conclusions of the past two day workshop has offered us some useful recommendations and presentations, which lead to 6 group discussions kindly summarised by Dr. Hans Helmrich. I believe this workshop will be successful according to the objectives.

First, there have been an exchange of knowledge, experience and ideas among people involved, technocrats and specialists from various agencies, which result in the diverse ideas for further resolution and improvement of implementation. Moreover, several practical suggestions have been obtained and adopted, meanwhile, a number of participants may feel disturbed that no policy makers have attended the workshop. However, the proceedings of the workshop are yet to be made and submitted to the decision makers concerned. In fact, although many of us are not the ones who formulate the plans, but our technocrats or practitioners have still to prepare them. Therefore, if they are equipped with diverse knowledge and understanding derived from an exchange of ideas, they can influence the decision makers at a certain level, though not all. I believe that this is what we can do and we should cooperate as much as possible, since it will be useful in the future. Second, the contents of the workshop can be disseminated to interested persons, who are able to perceive the correct concept as well as the diversity. As we always said that some groups of people have no real understanding of the forest rehabilitation, that afterwards they proposed the guidelines and created a number of unsatisfied events. This respect will be beneficial if such concept is transferred to some ignorant persons. Lastly, the implementation in this topic has been totally complicated and needs some time to overcome. I believe that these procedures have been over and the development been progressing, and in the near future what we are talking now can more or less lead to the procedures.

Finally, I wish to thank IUCN for their support of this workshop, especially Dr. Andrew Ingles for his two day attentive participation. He may obtain some information and be able to promote some aspects into practical level. I also thank Dr. Hans Helmrich from SMRP who both organizes the workshop and summarises the results of group discussions. Thanks are due to many top executives of our organization who do us a great honour by attending the whole two day workshop, as well as to give us useful recommendations which enable the success of the workshop. Besides, I would like to thank all participants for the cooperation, exchanges of ideas and provision of more useful recommendations. Much of these enable the smooth and fruitful workshop that could be used in the next opportunity. I also thank all the organizing staff for their hard work in preparing the workshop during the past few days, and for achieving the workshop's objectives. Nevertheless, since this workshop is the first cooperation of RFD, SMRP and IUCN, there must be some kinds of inconvenience which I would like to apologize. Eventually, I wish all participants happiness and prosperity, and your home journey be a safety one. Thank you.

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Annex 1

เอกสารประกอบการประชุม

เรื่อง

เรื่อง การกำหนดนโยบาย
และแนวทางปฏิบัติในการฟื้นฟูทรัพยากรป่าไม้

ใน

การประชุมเชิงปฏิบัติการ ระดับชาติด้านนโยบาย
และดำเนินงานฟื้นฟูป่าไม้

(National Assessment of Forest
Rehabilitation Policy and Practice)

24-25 พฤศจิกายน 2542

จังหวัดเชียงใหม่

โดย นายประพันธ์ ผลพันธ์
เจ้าหน้าที่บริหารงานป่าไม้ 8
ส่วนอนุรักษ์ต้นน้ำ
สำนักอนุรักษ์ทรัพยากรธรรมชาติ
กรมป่าไม้

การกำหนดนโยบายและแนวทางปฏิบัติในการฟื้นฟูทรัพยากรป่าไม้

ประพันธ์ ผลพันธุ์

คำนำ

ในอดีตทรัพยากรธรรมชาติมีความอุดมสมบูรณ์ ทำให้ธรรมชาติมีความสมดุลภัยธรรมชาติที่เกิดขึ้นไม่มีความรุนแรงมากนักหรือเกิดขึ้นนาน ๆ ครั้ง แต่ในสภาวะปัจจุบัน เราทราบกันดีว่า ภัยธรรมชาติที่เกิดขึ้นมีความรุนแรงมากขึ้นและเกิดบ่อยครั้ง ไม่ว่าจะเป็น อุทกภัย วาตภัย ความแห้งแล้งหรือมลภาวะของอากาศ ซึ่งมิใช่เกิดขึ้นเฉพาะประเทศไทย เราทั้งหลาย ทราบกันดีว่าสิ่งที่เกิดขึ้น เนื่องจากทรัพยากรธรรมชาติถูกทำลายและเสื่อมโทรมลง ทำให้ขาด ความสมดุลในการปกป้องหรือบรรเทาภัยธรรมชาติ ปัจจัยที่สำคัญที่สุดที่ทำให้เกิดความสูญเสีย เสื่อมโทรมของทรัพยากรธรรมชาติและสิ่งแวดล้อม คือ "มนุษย์"

ทรัพยากรธรรมชาติที่สำคัญ-

ต่อความสมดุลของธรรมชาติและ เป็นปัจจัยสี่ในการดำรงชีพของมนุษย์ คือ "ป่าไม้"

พื้นที่ป่าไม้ของประเทศไทยเมื่อประมาณ 90 ปีที่แล้ว

มีพื้นที่ป่าประมาณร้อยละ 70 ซึ่งมีประชากรประมาณ 10

ล้านคน ในปัจจุบันพื้นที่ป่าเหลืออยู่ประมาณร้อยละ 25.28

(81 ล้านไร่) ประชากร 61 ล้านคน พื้นที่ส่วนใหญ่-

ที่ยังคงมีสภาพป่าที่สมบูรณ์

จะอยู่ในเขตพื้นที่ของอุทยานแห่งชาติ

เขตรักษาพันธุ์สัตว์ป่าและพื้นที่ต้นน้ำลำธาร แต่พื้นที่ดังกล่าว

บางส่วนก็ยังมีผู้เข้าไปยึดถือครอบครอง

พื้นที่ทำมาหากินบางส่วนทำให้เกิดผลกระทบต่อประชาชนตอนล่างของลุ่มน้ำ

ในอดีตที่ผ่านมาการแก้ไข-

หาดังกล่าวในมาตรการในด้านกฎหมายและการป้องกัน

ปราบปรามเป็นหลัก

แต่ในปัจจุบันนโยบายของรัฐได้กำหนดแนวทางในการส่งเสริมการมีส่วนร่วม

ในการอนุรักษ์ทรัพยากรธรรมชาติและสิ่งแวดล้อม ได้แก่

(1) แผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ ฉบับที่ 8

(พ.ศ. 2540-2544)

จากแผนพัฒนาเศรษฐกิจและสิ่งแวดล้อม แห่งชาติ ฉบับที่ 1-

7 (พ.ศ. 2504 - 2539) ให้ความสำคัญต่อการเจริญ-

เติบโตทางเศรษฐกิจโดยมุ่งเน้นการพัฒนาอุตสาหกรรมและการผลิต เพื่อสังคม แต่สำหรับแผนฉบับที่ 8 มีวิสัยทัศน์ที่ให้ความสำคัญ "คน" เป็นศูนย์กลาง แห่งการพัฒนาเศรษฐกิจและสังคม (2) รัฐธรรมนูญแห่งราชอาณาจักรไทย พุทธศักราช 2540 โดยให้รัฐต้องส่งเสริมและสนับสนุนให้ประชาชนมีส่วนร่วมในการสงวน บำรุงรักษา และใช้ประโยชน์ จากทรัพยากรธรรมชาติและความหลากหลายทางชีวภาพอย่างสมดุลรวมทั้งมีส่วนร่วมในการส่งเสริม บำรุงรักษาและคุ้มครองสิ่งแวดล้อม ตามหลักการการพัฒนาที่ยั่งยืน ตลอดจนควบคุมและ กำจัดภาวะมลพิษที่มีต่อสุขภาพอนามัย สวัสดิภาพและคุณภาพชีวิตของประชาชน (3) พระราชบัญญัติ สภาตำบล และองค์การบริหารส่วนตำบล พ.ศ. 2537 เป็นการกระจายอำนาจในการคุ้มครองดูแลและ บำรุงรักษาทรัพยากรธรรมชาติและสิ่งแวดล้อมสู่การบริหารงานส่วนท้องถิ่น นโยบายของรัฐ ทั้งหมดจะนำไปสู่การมีส่วนร่วมของรัฐ องค์กรเอกชน ชุมชนและประชากร ในการคุ้มครองรักษา และใช้ประโยชน์จากทรัพยากรธรรมชาติและสิ่งแวดล้อม ให้เกิดความสมดุลและยั่งยืนในอนาคตต่อไป

สถานการณ์ทรัพยากรป่าไม้

ประเทศไทยมีเนื้อที่ 513,115.02 ตารางกิโลเมตร จากข้อมูลสถิติการป่าไม้ ของประเทศไทย กรมป่าไม้ พื้นที่ป่าไม้ได้ลดลงตามลำดับ ซึ่งในปี พ.ศ. 2453 มีพื้นที่ป่าไม้ ร้อยละ 70 ประมาณ 22 ล้านไร่ จนถึงปัจจุบัน พ.ศ. 2541 พื้นที่ป่าเหลืออยู่ร้อยละ 25.28 (81 ล้านไร่) การลดลงของทรัพยากรป่าไม้ในช่วงแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ ฉบับที่ 1 เป็นต้นมา ดังตารางที่ 1

ตารางที่ 1 เนื้อที่ป่าไม้ของประเทศไทย ระหว่างปี พ.ศ. 2503-2541

ปีพ.ศ.	เนื้อที่ป่าไม้ (ตารางกิโลเมตร)	ร้อยละของพื้นที่ประเทศ (513,115.02 ตารางกิโลเมตร)
2503	273,628	53.33
2516	221,207	43.11
2519	198,417	38.67
2521	175,224	34.15
2525	156,600	30.52
2528	150,866	29.38
2531	143,803	28.03

2532	143,417	27.95
2534	136,698	26.64
2536	133,554	26.03
2538	131,485	25.62
2541	129,722	25.28

ที่มา: (กรมป่าไม้, 2541)

จากข้อมูลเนื้อที่ป่าไม้ (ตารางที่ 1)

ประเทศไทยได้เริ่มกำหนดนโยบายในการ พัฒนาประเทศ โดยจัดทำแผนพัฒนาเศรษฐกิจและสังคม

เพื่อเป็นแนวทางในการพัฒนาขึ้น เป็นฉบับแรกคือ

"แผนพัฒนาเศรษฐกิจและสังคม ฉบับที่ 1 (พ.ศ. 2504-2509) " จนถึง ปัจจุบัน

"แผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ ฉบับที่ 8 (พ.ศ. 2540-2544) "

ผลของการพัฒนาเศรษฐกิจและสังคม ตามแผนพัฒนาฯ ฉบับที่ 1-6 (พ.ศ. 2504-2534)

มุ่งเน้นการเติบโตทางเศรษฐกิจ

ทำให้เกิดผลต่อทรัพยากรธรรมชาติและสิ่งแวดล้อม ดังนี้ ปัญหาข้อจำกัดของพื้นที่เกษตรกรรมและการไม่มีสิทธิในที่ดินที่ทำกินของเกษตรกร ในระยะ ที่ผ่านมากการขยาย

การผลิตเกิดจากการขยายพื้นที่เพาะปลูก
โดยการบุกรุกเข้าไปในพื้นที่ป่าไม้มีผล
ทำให้พื้นที่ป่าลดลงอย่างมากและเป็นผลเสียต่อระบบนิเวศน์วิ
ทยา รัฐบาลจึงได้กำหนดให้มีพื้นที่ ป่าไม้ไม่ต่ำกว่าร้อยละ
40 ของพื้นที่ทั้งประเทศ เพื่อรักษาสภาพป่า
และฟื้นฟูสภาพป่าให้กลับคืนสู่ความ
สมดุลตามธรรมชาติจากเหตุผลดังกล่าว
จะทำให้พื้นที่เพาะปลูกซึ่งแต่เดิมเป็นปัจจัยการผลิตที่หาได้ง่า
ย มีจำกัดและจากการเพิ่มของประชากร
ประกอบกับความต้องการการใช้ที่ดินในกิจกรรมต่าง ๆ
มีเพิ่มขึ้น ส่งผลให้
ที่ดินทำกินของเกษตรกรมีขนาดเล็กลงและบางรายยังสูญ-
เสียกรรมสิทธิ์ในที่ดินเดิม ทำให้เกษตรกร
บางรายเข้าไปทำการเกษตรในเขตพื้นที่ป่าสงวนแห่งชาติ
ซึ่งไม่สามารถจะมีเอกสาร สิทธิ์ในที่ดินได้
เกษตรกรจึงไม่สนใจที่จะบำรุงรักษาและปรับปรุงในที่ดินให้มี
ความอุดมสมบูรณ์

อีกประการหนึ่ง ความเสื่อมโทรมของทรัพยากรธรรมชาติ
เช่น ดิน น้ำ ป่าไม้ ป่าชายเลน มีแนวโน้มที่จะลดลง
ซึ่งในอดีตได้มีการใช้ทรัพยากรดังกล่าวอย่างฟุ่มเฟือย
มีการบุกรุก ทำลายป่าไม้เป็นจำนวนมาก
เพื่อขยายพื้นที่เพาะปลูก ทำให้ป่าไม้และที่ดินเสื่อมโทรมลง
นอกจากนี้

ยังทำความเสียหายกับแหล่งต้นน้ำลำธารและความสมดุลของ
ธรรมชาติ ในปัจจุบันประชากรของ
ประเทศมีอัตราการเพิ่มอย่างรวดเร็วประมาณ 61 ล้านคน
กองวางแผนทรัพยากรมนุษย์ สำนักงาน
คณะกรรมการการพัฒนาการเศรษฐกิจและสังคมแห่งชาติ
คาดว่าในปี พ.ศ. 2563 (ค.ศ. 2020)
ประชากรของประเทศไทยจะมีประมาณ 70.5 ล้านคน

ประเทศไทยเป็นประเทศเกษตรกรรม มีประชากรเพิ่มขึ้น
ความต้องการพื้นที่ในการ ทำมาหากินก็ย่อมเพิ่มมากขึ้น
เพื่อการดำรงชีพและสนองต่ออุตสาหกรรมเกษตร
โดยการบุกเบิกพื้นที่ป่าเพื่อยึดถือครอบครองทำการเกษตร
ไม่ว่าจะเป็นพื้นที่เขตต้นน้ำลำธารก็ตาม จากการ
รวบรวมข้อมูลชุมชนบนพื้นที่สูง 20 จังหวัดในประเทศไทย ปี
พ.ศ. 2540 โดยกองสังเคราะห์ชาวเขา
กรมประชาสงเคราะห์
กระทรวงแรงงานและสวัสดิการสังคมพบว่า มีประชากร
ที่อาศัย อยู่บนพื้นที่สูง ดังตารางที่ 2

ตารางที่ 2 ข้อมูลชุมชนบนพื้นที่สูง

กลุ่มชาติพันธุ์	กลุ่มบ้าน	จำนวนครัวเรือน	ประชากร (คน)
ชาวเขา (10 เผ่า)		139,797	774,316
ชนกลุ่มน้อย	216	11,322	59,088
ชาวไทยพื้นราบ	879	36,031	157,718
รวมทั้งสิ้น	4,841	187,150	991,122

ที่มา : (กรมประชาสงเคราะห์, 2541)

สาเหตุทำให้พื้นที่ป่าลดลง

จากแผนการพัฒนาของรัฐและประชากรเพิ่มขึ้น ทำให้ความต้องการไม้และพื้นที่ป่าไม้ ซึ่งมีสาเหตุจาก

- **การบุกรุกแผ้วถางป่าเพื่อทำการเกษตรกรรม**
ประชาชนของประเทศประมาณ ร้อยละ 65 มีอาชีพเกษตรกรรม โดยทำการปลูกพืชเศรษฐกิจ ไม้ใช้เพื่อยังชีพเพียงอย่างเดียว แต่ยังคงผลิตเพื่อการค้าอีกด้วยทำให้ความต้องการพื้นที่เพิ่มมากขึ้น
- **การทำไร่เลื่อนลอย**
การบุกรุกลักษณะนี้จะปรากฏในพื้นที่สูงส่วนใหญ่เป็นพื้นที่ต้นน้ำลำธารตามภาคเหนือ โดยชาวเขาเผ่าต่าง ๆ เมื่อพื้นที่ดินขาดความอุดมสมบูรณ์ ก็เปิดพื้นที่ใหม่
- **การทำไม้**
ในอดีตนโยบายป่าไม้ได้เปิดป่าให้สัมปทานในการทำไม้

อัดเพื่อการค้า

ซึ่งการทำไม้จะต้องตัดเส้นทางเข้าไปดำเนินการชักลาก
ไม้ ออก ส่งผลให้ประชาชนเข้าไปยึดถือ

ครอบครองพื้นที่ ในปี พ.ศ. 2532

นโยบายรัฐบาลได้ประกาศยกเลิกสัมปทานป่าไม้ทั่วประเทศ
เมื่อวันที่ 17 มกราคม 2532

- **ไฟป่า** ในประเทศไทยไฟป่าเกิดจากมนุษย์ทั้งสิ้น
ก่อให้เกิดผลกระทบต่อ ป่าไม้
สัตว์ป่าและความหลากหลายทางชีวภาพ
- **การบังคับใช้กฎหมาย** เจ้าหน้าที่รักษากฎหมาย
โดยเฉพาะเจ้าหน้าที่ ป่าไม้
ไม่ปฏิบัติหน้าที่อย่างเข้มงวด
ทำให้มีผู้ฝ่าฝืนและกระทำผิดกฎหมาย
โดยเฉพาะอย่างยิ่ง
ราษฎรที่อาศัยอยู่บนพื้นที่สูงไม่รู้จักกฎหมาย
- **การขยายตัวของเมือง อําเภอ ตำบล**
เมื่อประชากรมากขึ้นการขยายตัวชุมชน ก็เพิ่มมากขึ้น
การก่อสร้างสิ่งอำนวยความสะดวกขั้นพื้นฐานเข้าสู่ชุมชน
ได้แก่ ถนนไฟฟ้า
ทำให้เกิดการเคลื่อนย้ายของประชากร เช่น
การขยายพื้นที่ดินและไปบุกรุกพื้นที่ใหม่

ในช่วง 30 ปีที่ผ่านมา การทำการเกษตร
เกษตรกรได้เปลี่ยนแปลงจากการทำการ

เกษตรกรเพื่อยังชีพ ไปสู่การทำเกษตรเพื่อการค้า
ทำให้พื้นที่ป่าถูกบุกรุกมากยิ่งขึ้น

โดยเฉพาะภาคตะวันออกเฉียงเหนือและภาคกลาง
จะปลูกปอ มันสำปะหลัง อ้อย ฯลฯ

ภาคเหนือโดยเฉพาะบนพื้นที่สูง จะปลูกฝิ่น
และเพื่อลดการปลูกฝิ่นก็หันมา ปลูกกะหล่ำ
ไม้ผลเมืองหนาวและพืชเศรษฐกิจอื่นๆ

ภาคใต้ จะปลูกยางพารา และปาล์ม

สำหรับพื้นที่ป่าชายเลน จะมีการบุกรุกเพื่อทำนากุ้ง

ผลกระทบที่พื้นที่ป่าลดลงหรือเสื่อมโทรม

ประการแรก ทรัพยากรป่าไม้ถูกทำลายลง
ทำให้เกิดการขาดแคลนไม้ใช้สอย และต้องสั่ง ไม้ท่อน
ไม้แปรรูปและผลิตภัณฑ์จากไม้ เข้ามาสนองความต้องการ
ทำให้สูญเสีย เงินตราต่างประเทศ ประมาณปีละ 2
หมื่นล้านบาท

ประการที่สอง สูญเสียความหลากหลายทางชีวภาพ
การบุกรุกแผ้วถางเพื่อทำ การเกษตร
สภาพป่าหมดไปโดยสิ้นเชิงแม้แต่ไม้พื้นล่าง

ประการที่สาม สูญเสียความสมดุลทางสภาพแวดล้อม

- สภาพภูมิอากาศแปรปรวน
- ปริมาณน้ำ การขาดแคลนน้ำ น้ำเค็มท่วมถึง และน้ำท่วม
- คุณภาพของน้ำ การใช้สารเคมี ตะกอนแขวนลอยการปล่อยน้ำเสียของชุมชน
- การกัดเซาะพังทลายของดิน
ให้ทำความอุดมสมบูรณ์ของดินลดลง การซึมซับน้ำของดินลดลง ตะกอนทำให้ลำน้ำตื้นเขิน

นโยบายในการฟื้นฟูทรัพยากรป่าไม้

1. แผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ

จากแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ ฉบับที่ 1-6 เป็นแผนที่ส่งผลกระทบต่อ ทรัพยากรธรรมชาติและสิ่งแวดล้อม ดังนั้นรัฐได้กำหนดนโยบายในแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ ฉบับที่ 7 และ 8

แผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ ฉบับที่ 7 (พ.ศ. 2535-2539) เป็นแผน

พัฒนาที่เริ่มให้การสนับสนุนให้ประชาชนมีส่วนร่วมกับรัฐในการอนุรักษ์ทรัพยากรธรรมชาติโดย

การส่งเสริมองค์กรประชาชนและองค์กรพัฒนาเอกชนและส่วนท้องถิ่น ให้มีบทบาทในการกำหนด

โครงการจัดการทรัพยากรธรรมชาติ

ตลอดจนการติดตามดูแลและประเมินผลการสำเร็จ
ของโครงการพร้อมทั้งเสริมสร้างจิตสำนึกของประชาชนที่มีส
วนได้ส่วนเสียกับการอนุรักษ์ทรัพยากร ธรรมชาตินั้น

ลดความขัดแย้งการใช้ทรัพยากรธรรมชาติ

โดยการกำหนดแผนการใช้ที่ดิน

สำหรับแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ ฉบับที่ 8

(พ.ศ. 2540-2544) เป็นแผน พัฒนาฯ

ที่กำหนดยุทธศาสตร์ที่รัฐจะดำเนินการ

1.

ส่งเสริมการมีส่วนร่วมและเสริมสร้างศักยภาพชุมชนในการพั
ฒนา

2. สร้างอาชีพและการมีงานทำ

3. สร้างศักยภาพในการบริหารการพัฒนาภูมิภาคและชนบท

3.1)

ต้องปรับเปลี่ยนแนวความคิดและวางแนวทางให้คน
ชนบท มีศักยภาพพึ่งตนเองได้

3.2)

ต้องสร้างโอกาสให้เกิดความเสมอภาคทั้งด้านเศร
ษฐกิจและสังคม

3.3)

สร้างคนให้รู้จักใช้ทรัพยากรธรรมชาติเป็นฐานการพัฒนาที่ยั่งยืน มีสภาพแวดล้อมที่ดี ปลอดภัยจากมลพิษ

3.4)

เพิ่มความสามารถของคนและชุมชนในชนบทให้มีความเข้มแข็ง เพื่อเข้าไปมีส่วนร่วมในการบริหารจัดการทรัพยากรธรรมชาติและดูแลสิ่งแวดล้อมอย่างเต็มที่

2. รัฐธรรมนูญแห่งราชอาณาจักรไทย

รัฐธรรมนูญแห่งราชอาณาจักรไทย พุทธศักราช 2540 เป็นกฎหมายสูงสุดของประเทศ ซึ่งเป็นรัฐธรรมนูญฉบับประชาชนได้กำหนดให้อำนาจแก่องค์กรปกครองส่วนท้องถิ่น ในการจัดการ บำรุงรักษา ทรัพยากรธรรมชาติและสิ่งแวดล้อมไว้ดังนี้

หมวด 3 สิทธิและเสรีภาพของชนชาวไทย

มาตรา 46 บุคคลซึ่งรวมกันเป็นชุมชนท้องถิ่นดั้งเดิม ย่อมมีสิทธิอนุรักษ์หรือฟื้นฟู จารีต ประเพณี ภูมิปัญญาท้องถิ่น ศิลปะหรือวัฒนธรรมอันดีงามของท้องถิ่นและของชาติ และมีส่วนร่วม ในการจัดการ การบำรุงรักษา และการใช้ประโยชน์จากทรัพยากรธรรมชาติและสิ่งแวดล้อมอย่างสมดุล และยั่งยืน ทั้งนี้ ตามกฎหมายบัญญัติ

หมวด 5 แนวนโยบายพื้นฐานแห่งรัฐ

มาตรา 79

รัฐต้องส่งเสริมและสนับสนุนให้ประชาชนมีส่วนร่วมในการสงวน บำรุง รักษาและ

ใช้ประโยชน์จากทรัพยากรธรรมชาติและ ความหลากหลายทางชีวภาพอย่างสมดุล รวมทั้งมีส่วนร่วม ในการส่งเสริม บำรุง รักษาและคุ้มครองคุณภาพสิ่งแวดล้อมตามหลักการพัฒนาที่ยั่งยืน ตลอดจน

ควบคุมและกำจัดการสะสมพิษที่มีผลต่อสุขภาพอนามัย สวัสดิภาพ และคุณภาพชีวิตของประชาชน

หมวด 9 การปกครองส่วนท้องถิ่น

มาตรา 290

เพื่อส่งเสริมและรักษาคุณภาพสิ่งแวดล้อมองค์กรปกครองส่วนท้องถิ่น ย่อมมีอำนาจหน้าที่ตามที่กฎหมายบัญญัติ

กฎหมายตามวรรคหนึ่ง อย่างน้อยต้องมีสาระสำคัญดังต่อไปนี้

(1) การจัดการ

การบำรุงรักษาและการใช้ประโยชน์
จากทรัพยากรธรรมชาติและ
สิ่งแวดล้อมที่อยู่ในเขตพื้นที่

(2) การเข้าไปมีส่วนร่วมในการบำรุงรักษา
ทรัพยากรธรรมชาติและสิ่งแวดล้อม
ที่อยู่นอกเขตพื้นที่เฉพาะในกรณีที่มีผลกระทบต่อ
การดำรงชีวิตของประชาชน ในพื้นที่ของตน

(3)
การมีส่วนร่วมในการพิจารณาเพื่อริเริ่มโครงการหรือ
กิจกรรมใดนอกเขตพื้นที่
ซึ่งอาจมีผลกระทบต่อคุณภาพสิ่งแวดล้อมหรือสุขภาพ
อนามัยของประชาชนในพื้นที่

3. พระราชบัญญัติสภาพและองค์การบริหารส่วนตำบล พ.ศ. 2537

ได้กำหนด อำนาจหน้าที่ของ อบต.

ในการจัดการทรัพยากรธรรมชาติและสิ่งแวดล้อม ดังนี้
มาตรา 67 ภายใต้บังคับแห่งกฎหมาย อบต.

มีหน้าที่ต้องทำในเขต อบต. ดังต่อไปนี้

(7) ค้ำครอง

ดูแลและบำรุงรักษาทรัพยากรธรรมชาติและสิ่งแวดล้อม
มาตรา 68 ภายใต้บังคับแห่งกฎหมาย อบต.

อาจจัดทำกิจกรรมในเขต อบต. ดังต่อไปนี้

(8) การค้ำครอง

ดูแลและรักษาทรัพย์สินอันเป็นสาธารณสมบัติของแผ่นดิน

4. นโยบายกรมป่าไม้

4.1 ในอดีต

การจัดการป่าไม้มีวัตถุประสงค์เพื่อการทำไม้ออกในรูปแบบของการให้สัมปทาน

ในปีแรกของแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ ฉบับที่ 1 (2504-2509) ได้กำหนด ให้มีพื้นที่ป่าไม้ ร้อยละ 50 ของพื้นที่ประเทศ

4.2 เมื่อวันที่ 3 ธันวาคม 2528

คณะรัฐมนตรีได้กำหนดนโยบายกรมป่าไม้ขึ้น

เพื่อเป็นแนวทางในการจัดการและพัฒนาทรัพยากรธรรมชาติ ให้ประสานสอดคล้องกับการพัฒนา ทรัพยากรธรรมชาติขึ้น พร้อมทั้งลดเป้าหมายพื้นที่ป่าไม้ของชาติ เหลือร้อยละ 40 ของพื้นที่ประเทศ

4.3 ในปี 2531 ได้เกิดอุทกภัยในท้องที่ภาคใต้

ซึ่งเป็นสาเหตุสำคัญที่ กล่าวกัน ในขณะนั้น

คือการใช้ประโยชน์ทรัพยากรและที่ดินป่าไม้ไม่ถูกต้องตามหลักวิชาการ ทำให้รัฐบาลตระหนัก

ถึงความจำเป็นในการอนุรักษ์ทรัพยากรป่าไม้

เพื่อรักษาความสมดุลของสิ่งแวดล้อมมากยิ่งขึ้น

กระทรวงเกษตรและสหกรณ์

โดยความเห็นชอบของคณะรัฐมนตรีได้มีคำสั่งที่ 32/2532

ลงวันที่ 17 มกราคม 2532

ให้สัมปทานทำไม้หวงห้ามทุกชนิด ทุกสัมปทานสิ้นสุดลง
(ยกเว้นสัมปทานป่าชายเลน)

4.4 คณะกรรมการนโยบายป่าไม้แห่งชาติ

ได้กำหนดนโยบายป่าไม้ของชาติ พื้นที่ป่า เพื่อการอนุรักษ์
กำหนดไว้เพื่ออนุรักษ์สิ่งแวดล้อม ดิน น้ำ พันธุ์พืช
พันธุ์สัตว์ที่หายากและป้องกัน

ภัยธรรมชาติอันเกิดจากน้ำท่วมและการพังทลายของดิน
ตลอดจนเพื่อประโยชน์ในการศึกษาการ

วิจัยและนันทนาการของประชาชนในอัตราร้อยละ 15

ของพื้นที่ประเทศและพื้นที่ป่าเศรษฐกิจ กำหนด

ไว้เพื่อการผลิตไม้และของป่า

เพื่อประโยชน์ในทางเศรษฐกิจในอัตราร้อยละ 25

ของพื้นที่ประเทศ ซึ่งคณะรัฐมนตรีให้ความเห็นชอบเมื่อวันที่

3 ธันวาคม 2528 ในแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ
ฉบับที่ 7 (พ.ศ. 2535-2539)

ได้กำหนดเป้าหมายของพื้นที่ป่าไม้ของชาติไว้ร้อยละ 40

โดยกำหนด พื้นที่ป่าอนุรักษ์ให้ได้ ร้อยละ 25

และป่าเศรษฐกิจร้อยละ 15 ของพื้นที่ประเทศ

4.5 ในปี 2535 รัฐได้ตราพระราชบัญญัติสวนป่า พ.ศ. 2535

เพื่อการส่งเสริม

การปลูกป่าให้แก่เอกชนและราษฎรทั่วไปที่มีที่ดิน ดังนี้

1)

ที่ดินที่มีโฉนดที่ดินหรือหนังสือรับรองการทำประโยชน์ ตามกฎหมายที่ดิน

2) ที่ดินที่มีหนังสือของทางราชการรับรองว่า
ที่ดินดังกล่าวอยู่ในระยะเวลา

ที่อาจขอรับโฉนดที่ดินหรือหนังสือรับรองการทำประโยชน์ตาม
ประมวลกฎหมายที่ดินได้ เนื่องจากได้มีการ
ครอบครองและเข้าทำกินในที่ดินดังกล่าวตามกฎหมายว่าด้วย
การจัดรูปที่ดิน เพื่อเกษตรกรรมหรือ
กฎหมายว่าด้วยการจัดที่ดินเพื่อการครองชีพไว้แล้ว

(3)

ที่ดินในเขตปฏิรูปที่ดินตามกฎหมายว่าด้วยการปฏิรูป
ที่ดินเพื่อเกษตรกรรม ที่มีหลักฐานการอนุ-
ขาดการเช่าหรือเช่าซื้อ

(4) ที่ดินที่มีหนังสืออนุ-

ขาดตามกฎหมายว่าด้วยป่าสงวนแห่งชาติ
ให้บุคคลเข้าทำ

การปลูกป่าในเขตปรับปรุงป่าสงวนแห่งชาติ
หรือเข้าทำการปลูกสร้างสวนป่า
หรือไม้ยืนต้นในเขต ป่าเสื่อมโทรม

(5) ที่ดินที่ได้ดำเนินการเพื่อการปลูกป่าอยู่แล้ว โดยทบวงการเมือง รัฐวิสาหกิจ หรือหน่วยงานอื่นของรัฐ

4.6 การกำหนดชั้นคุณภาพลุ่มน้ำที่สำคัญของประเทศไทย (25 ลุ่มน้ำ) โดย คณะรัฐมนตรี

มีมติเห็นชอบให้สำนักงานคณะกรรมการสิ่งแวดล้อม ดำเนินโครงการศึกษา เพื่อกำหนด ชั้นคุณภาพลุ่มน้ำ เพื่อเป็นพื้นฐานในการกำหนดนโยบายการใช้ที่ดินในอนาคต เมื่อวันที่ 27 กรกฎาคม 2525

ซึ่งได้กำหนดชั้นคุณภาพของลุ่มน้ำและมาตรการควบคุมการใช้ที่ดินที่ชัดเจน การกำหนดชั้นคุณภาพ ลุ่มน้ำทั้งประเทศ (25 ลุ่มน้ำหลัก) เริ่มต้นตั้งแต่ พ.ศ. 2528 ถึง 2538 ในการกำหนด

ชั้นคุณภาพลุ่มน้ำชั้นที่ 1 มีพื้นที่ 58.2 ล้านไร่

ชั้นคุณภาพลุ่มน้ำชั้นที่ 2 มีพื้นที่ 26.7 ล้านไร่

ชั้นคุณภาพลุ่มน้ำชั้นที่ 3 มีพื้นที่ 24.6 ล้านไร่

ชั้นคุณภาพลุ่มน้ำชั้นที่ 4 มีพื้นที่ 50.6 ล้านไร่

ชั้นคุณภาพลุ่มน้ำชั้นที่ 5 มีพื้นที่ 157.1 ล้านไร่

พื้นที่อ่างเก็บน้ำ 3.4 มีพื้นที่

รวม 320.6 ล้านไร่

มาตรการควบคุมการใช้ที่ดินในชั้นคุณภาพลุ่มน้ำในชั้นต่าง ๆ มีดังนี้

พื้นที่ชั้นคุณภาพลุ่มน้ำชั้นที่ 1A

มติคณะรัฐมนตรีกำหนดห้ามมิให้มีการเปลี่ยนแปลง

ลักษณะพื้นที่ป่าไม้เป็นรูปแบบอื่นอย่างเด็ดขาดทุกกรณี

ทั้งนี้เพื่อรักษาไว้เป็นพื้นที่ต้นน้ำ มติคณะรัฐมนตรี เมื่อวันที่

12 ธันวาคม 2532 เรื่องขออนุญาตใช้พื้นที่ลุ่มน้ำชั้นที่ 1A

เพื่อก่อสร้างทางเพื่อความมั่นคง

คณะรัฐมนตรีมีมติอนุมัติขออนุญาตให้กระทรวงคมนาคม

(กรมทางหลวง) ใช้พื้นที่ลุ่มน้ำชั้นที่ 1A

ก่อสร้างทางเพื่อความมั่นคงในพื้นที่กองทัพภาคที่ 3 จำนวน

3 เส้นทาง โดยยกเว้นไม่ปฏิบัติตามมติคณะรัฐมนตรี เมื่อวันที่

21 ตุลาคม 2529 เป็นกรณีพิเศษ เฉพาะราย

ต่อไปจะไม่อนุมัติให้ส่วนราชการหรือหน่วยงานใช้พื้นที่ลุ่มน้ำชั้น

ที่ 1A อีกไม่ว่ากรณีใด

พื้นที่ชั้นคุณภาพลุ่มน้ำชั้นที่ 1B

มติคณะรัฐมนตรีกำหนดให้ในกรณีที่ต้องมีการก่อสร้าง

ถนนผ่านหรือการทำเหมืองแร่

หน่วยงานรับผิดชอบจะต้องควบคุมการชะล้างพังทลายของดิน และ

กรณีส่วนราชการใดมีความจำเป็นที่ต้องใช้ที่ดินอย่างหลีกเลี่ยงไม่ได้ ต้องจัดทำรายงานการ

วิเคราะห์ผลกระทบสิ่งแวดล้อมของโครงการเสนอต่อคณะกรรมการสิ่งแวดล้อมแห่งชาติ เพื่อพิจารณาต่อไป

พื้นที่ชั้นคุณภาพลุ่มน้ำชั้นที่ 2

มติคณะรัฐมนตรีกำหนดให้ใช้พื้นที่ในกิจกรรมป่าไม้ เหมืองแร่ แต่ต้องควบคุมวิธีการปฏิบัติในการใช้ที่ดินอย่างเข้มงวดกวดขัน และการใช้ที่ดินเพื่อกิจกรรม

ทางด้านเกษตรกรรมควรหลีกเลี่ยงอย่างเด็ดขาด

พื้นที่ชั้นคุณภาพลุ่มน้ำชั้นที่ 3

มติคณะรัฐมนตรีกำหนดให้ใช้พื้นที่ในกิจกรรมป่าไม้

เหมืองแร่ กสิกรรมหรือกิจการอื่น ๆ

แต่ต้องมีการควบคุมวิธีการปฏิบัติอย่างเข้มงวดให้เป็นไปตามหลักอนุรักษ์ดินและน้ำ

พื้นที่ชั้นคุณภาพลุ่มน้ำชั้นที่ 4

มติคณะรัฐมนตรีกำหนดให้ใช้พื้นที่ทุกกิจกรรม แต่หากใช้พื้นที่เพื่อการเกษตรกรรม

ต้องเป็นบริเวณที่มีความลาดชันไม่เกิน 28 เปอร์เซ็นต์

และต้องมีการวางแผน

ใช้ที่ดินตามมาตรการการอนุรักษ์ดินและน้ำ

พื้นที่ชั้นคุณภาพลุ่มน้ำชั้นที่ 5

มติคณะรัฐมนตรีกำหนดให้ใช้พื้นที่ได้ทุกกิจกรรม

5.

นโยบายและแผนการส่งเสริมและรักษาคุณภาพสิ่งแวดล้อมแห่งชาติ (พ.ศ. 2540-2559) ซึ่งคณะรัฐมนตรีมีมติเห็นชอบ เมื่อวันที่ 26 พฤศจิกายน 2539

ในส่วนที่เกี่ยวข้องกับการจัดการทรัพยากรป่าไม้

1. นโยบายเพิ่มพื้นที่ป่าไม้เป็นร้อยละ 50 ของพื้นที่ประเทศ โดยพื้นที่ป่าอนุรักษ์ ไม่น้อยกว่าร้อยละ 30 และพื้นที่ป่าเศรษฐกิจร้อยละ 20 เพื่อสนองความต้องการทั้งในด้านเศรษฐกิจสังคมและ รักษาสมดุลของสภาพแวดล้อม
2. นโยบายการใช้ประโยชน์พื้นที่ป่าต้องเป็นไปตามวิถีทางในเชิงการอนุรักษ์ ทรัพยากรธรรมชาติ
3. นโยบายป้องกันรักษาป่าธรรมชาติที่เหลือไม่ให้ถูกทำลาย
4. นโยบายลดความขัดแย้งการใช้ประโยชน์ทรัพยากรป่าไม้และทรัพยากรอื่นในพื้นที่ป่าไม้

ในส่วนที่เกี่ยวข้องกับการจัดการความหลากหลายทางชีวภาพภายในระบบนิเวศน์ป่าไม้
ได้กำหนดนโยบายป้องกัน
สงวนรักษาและอนุรักษ์ไว้ซึ่งพันธุ์พืช สัตว์ป่า สัตว์น้ำ
ตลอดจน สิ่งที่มีชีวิต อื่น ๆ ในพื้นที่ป่า

การดำเนินงานด้านฟื้นฟูทรัพยากรป่าไม้แนวทางและกลยุทธ์ในการอนุรักษ์และพัฒนาป่าไม้ เพื่อเพิ่มพื้นที่ป่า

1. การป้องกันรักษาป่าธรรมชาติและป้องกันปราบปรามการกระทำผิดกฎหมาย
2. การป้องกันไฟป่า
3. การฟื้นฟูทรัพยากรป่าไม้และส่งเสริมการปลูกป่าภาคเอกชน
4. การจัดระเบียบการใช้ประโยชน์พื้นที่ของชุมชนที่อาศัยอยู่ในเขตป่า
5. การพัฒนาระบบการบริหารงานและการศึกษาวิจัย

การดำเนินงานด้านฟื้นฟูพื้นที่ป่าไม้

กรมป่าไม้ได้เริ่มทดลองดำเนินการปลูกป่า ตั้งแต่ปี พ.ศ.2449 จนถึงปี พ.ศ.2503 ได้พื้นที่ ปลูกป่าประมาณ 53,000 ไร่ (ส่วนให้เป็นการปลูกไม้สัก ร้อยละ 70) หลังจากนั้น ได้ดำเนินการ ปลูกป่าอย่างจริงจัง จนถึงปี

พ.ศ. 2538 ได้พื้นที่ป่าปลูก 4,039,100 ไร่
(โดยเป็นพื้นที่ป่าในเขตพื้นที่ต้นน้ำ 1,289,980 ไร่)

ตารางที่ 3 ผลการปลูกป่า ระหว่างปี พ.ศ. 2502 - 2538

ภาค	พื้นที่ป่า (ไร่)	พื้นที่ต้นน้ำ (ไร่)	รวม (ไร่)
เหนือ	1,426,560	1,091,880	2,518,870
ตะวันออกเฉียงเหนือ	703,870	116,000	819,870
ตะวันออก	226,000	29,560	255,560
ตะวันตก	72,590	21,700	94,290
กลาง	136,010	17,850	153,860
ใต้	184,090	12,990	197,080
รวม (ไร่)	2,743,120	1,289,980	4,039,100

โครงการปลูกป่าที่สำคัญ

1 โครงการปลูกป่าถาวรเฉลิมพระเกียรติ

พระบาทสมเด็จพระเจ้าอยู่หัว

เนื่องในวโรกาสทรงครองราชย์ ปีที่ 50

วัตถุประสงค์

1. เพื่อเป็นการสนองพระราชดำริของพระบาทสมเด็จพระเจ้าอยู่หัวและ สมเด็จพระนางเจ้าฯ พระบรมราชินีนาถ ด้านการอนุรักษ์ทรัพยากรธรรมชาติและสิ่งแวดล้อม

2. เพื่อเพิ่มพื้นที่ป่าไม้ของประเทศให้บรรลุผลตามนโยบายของรัฐบาล
3. เพื่อรณรงค์ให้คนไทยในชาติทุกหมู่เหล่าได้ตระหนักถึงความสำคัญของการอนุรักษ์ทรัพยากรป่าไม้และสิ่งแวดล้อมและมีส่วนร่วมในการแก้ไขปัญหาภัยธรรมชาติที่เกิดขึ้น
4. เพื่อปลูกฝังจิตสำนึกให้คนในชาติมีความรักและหวงแหนทรัพยากรป่าไม้

ระยะเวลาการดำเนินโครงการ 3 ปี (พ.ศ. 2537^๕ 2539) และมีการขยายระยะเวลา ของโครงการถึงปี พ.ศ. 2545

ผู้ร่วมดำเนินโครงการ

เป็นผู้มีความสนใจจะเข้าร่วมโครงการ 2 ลักษณะ

- ผู้เข้าร่วมโครงการที่มีความประสงค์ที่จะดำเนินการปลูกป่าด้วยตนเอง
- ผู้เข้าร่วมโครงการที่ไม่มีความประสงค์จะดำเนินการปลูกป่าด้วยตนเอง

กรมป่าไม้สนับสนุนกล้าไม้ที่จะใช้ปลูกในโครงการฯ

และให้ความรู้ในการปลูกและบำรุง

เป้าหมายของโครงการปลูกป่าถาวรเฉลิมพระเกียรติฯ

1. ปลุกป่าเพื่อรักษาต้นน้ำลำธาร 5 ล้านไร่ 1,345 แปลง
2. ปลุกไม้สองข้างทาง 50,000 กิโลเมตร
3. ปลุกไม้ในพื้นที่สาธารณะ สถานที่ราชการ วัด โรงเรียนและสองข้างลำน้ำ

ผลการดำเนินงาน เมื่อสิ้นปี 2541

1. ปลุกป่าในพื้นที่อนุรักษ์ 1.45 ล้านไร่
2. ปลุกไม้สองข้างทาง ระยะทาง 49,726 กิโลเมตร
3. ปลุกไม้ในพื้นที่สาธารณะอื่น ๆ 0.68 ล้านไร่

ผลการดำเนินงานโครงการปลุกป่าถาวรเฉลิมพระเกียรติฯ

ปี พ.ศ.	พื้นที่อนุรักษ์ (ไร่)	พื้นที่สาธารณะ (ไร่)	รวม	สองข้างทาง
2537	111,284.80	175,419.22	286,704.02	11,409.89
2538	636,300.70	277,956.54	914,257.24	24,778.05
2539	534,782.92	128,961.82	663,744.74	8,788.49
2540	134,076.50	36,309.94	170,386.44	910.40
2541	32,215.50	59,960.58	92,176.08	3,839.59
รวม	1,448,660.42	678,608.10	2,127,268.52	49,726.42

ที่มา: โครงการปลุกป่าถาวรเฉลิมพระเกียรติฯ (กรมป่าไม้ 2541)

2 โครงการส่งเสริมเกษตรกรปลุกป่า

เมื่อปี พ.ศ. 2532

ได้มีการปิดป่าสัมปทานทำให้เกิดการขาดแคลนไม้ใช้สอยสำหรับครัวเรือน และอุตสาหกรรมที่ใช้ไม้ในการผลิต ดังนั้นรัฐบาลได้เห็นชอบในโครงการส่งเสริมเกษตรกร ปลูกป่าเพื่อวัตถุประสงค์ในการแก้ไข-

หากการขาดแคลนไม้ใช้สอยและเป็นการปรับปรุงสภาพสิ่งแวดล้อม

รัฐบาลได้ให้การสนับสนุนค่าใช้จ่ายในการปลูกป่าจำนวน 3,000 บาท/ไร่/5ปี ซึ่งเกษตรกรจะปลูกป่าในที่ดินกรรมสิทธิ์ของเกษตรกรเอง

โดยระยะเวลาการดำเนินงาน 12 ปี (ปี พ.ศ. 2537^๕ 2548) เป้าหมาย 8 ล้านไร่

ผลการดำเนินงาน ปี 2537^๕ 2541

เกษตรกรเข้าร่วมโครงการฯ จำนวน 42,171 ราย
ได้พื้นที่ปลูกป่า 578,730 ไร่

พื้นที่ปลูกป่าตามโครงการส่งเสริมเกษตรกรปลูกป่า (พ.ศ. 2537^๕ 2541)

ปี ภาค	2537	2538	2539	2540	2541	รวม (ไร่)
เหนือ	172,179.40	64,258.25	22,887.75	22,764.25	3,004.50	285,094.15
ตะวันออกเฉียง เหนือ	139,490.75	31,761.75	10,228.00	10,925.00	2,814.00	195,219.50
กลาง	56,814.62	9,426.75	2,131.50	2,900.00	1,313.00	72,585.87
ใต้	21,260.97	3,157.00	865.50	971.00	76.25	25,830.72
รวม	389,745.74	108,603.75	35,912.75	37,580.25	7,207.75	578,730.24

ที่มา กรมป่าไม้ 2541

จำนวนเกษตรกรที่เข้าร่วมโครงการส่งเสริมเกษตรกรปลูกป่า (พ.ศ. 2537 - 2541)

ปี ภาค	2537	2538	2539	2540	2541	รวม (ไร่)
Norin	13,362	5,299	1,898	1,798	336	22,693
Northeast	10,495	2,024	497	602	137	13,755
Central	2,826	490	141	122	43	3,622
Southern	1,675	298	39	80	9	2,101
Total	28,358	8,111	2,575	2,602	525	42,171

ที่มา กรมป่าไม้ 2541

3 โครงการปลูกไม้โตเร็วเพื่อลดการปลูกพืชเศรษฐกิจ

วัตถุประสงค์ของโครงการ

- เพื่อลดพื้นที่การปลูกพืชเศรษฐกิจที่ล้นตลาดและราคาตกต่ำ (โดยเฉพาะ มันสำปะหลัง)
- ส่งเสริมปลูกไม้โตเร็วเพื่อใช้สอยและป้อนโรงงานเยื่อกระดาษ
- เพื่อยกระดับรายได้ของเกษตรกร

ระยะเวลาการดำเนินงาน 3 ปี 2537^๙ 2539

เป้าหมาย จำนวน 430,000 ไร่

ผลการดำเนินงาน ได้พื้นที่ 599,000 ไร่
ซึ่งเกินเป้าหมายซึ่งส่วนให้มากกว่าร้อยละ 80
ได้ปลูกยูคาลิปตัส

ผลการดำเนินงานที่เกินเป้าหมายต้องขยายโครงการฯ อีก
5 ปี พ.ศ. 2540 = 2544 โดยมีเป้าหมาย จำนวน 1.5
ล้านไร่

แต่ต้องชลอโครงการเนื่องจากสภาวะทางเศรษฐกิจไม่อำนวย

4 โครงการฟื้นฟูพื้นที่อนุรักษ์

เป็นโครงการที่ดำเนินงานภายใต้งบประมาณประจำปี
ในแต่ละปี

- กิจกรรมปลูกป่าตามโครงการพระราชดำริ
- กิจกรรมฟื้นฟูระบบนิเวศน์ต้นน้ำ ซึ่งส่วนอนุรักษ์ต้นน้ำ
สำนักอนุรักษ์ ทรัพยากรธรรมชาติ

กรมป่าไม้ เป็นผู้ดำเนินโครงการเริ่มดำเนินในปี พ.ศ.
2535 = 2542 ดำเนินการไปแล้ว 299,240 ไร่

การดำเนินงานฟื้นฟูระบบนิเวศน์ต้นน้ำ
เป็นวิธีการที่ทำให้สภาพป่าต้นน้ำที่จะเริ่ม
ฟื้นตัวตามธรรมชาติจากไร่ร้างให้กลับเป็นพื้นที่ป่า
เพื่อเป็นแหล่งต้นน้ำโดยเร็วยิ่งขึ้น จากการ
ศึกษาของคณะวนศาสตร์ มหาวิทยาลัยเกษตรศาสตร์ พบว่า

พื้นที่ไร่ร้าง โดยทั่วไปหากปล่อยทิ้งไว้

ตามธรรมชาติเป็นเวลา 18 ปี

จะมีพันธุ์ไม้เบิกนำประเภทไม้ยืนต้นเนื้ออ่อนขนาดเล็ก

เท่านั้น ขึ้นอยู่ในพื้นที่และหากพื้นที่ดังกล่าวถูกไฟป่าเผาผลาญซ้ำซากก็จะกลายเป็นป่าละเมาะ เป็นระบบ

นิเวศน์ต้นน้ำที่ไม่สมบูรณ์

เนื่องจากขาดต้นไม้หลักที่มีระบบรากลึกและเรือนยอดที่สมบูรณ์ แต่เพื่อให้ได้ป่าต้นน้ำที่มีระบบรากลึกในระดับต่าง ๆ

และมีเรือนยอดที่หลากหลายชั้น ก็จะดำเนินการ

ปลูกไม้หลักเสริมจำนวน 25 ต้น/ไร่

จะทำให้เกิดสภาพโครงสร้างของป่าธรรมชาติที่สมบูรณ์

มีสมรรถนะภาพในการยึดเกาะพื้นดินและเอื้ออำนวยให้เพิ่มอัตราซึมน้ำของดินเป็นการเสริมสร้าง

ประสิทธิภาพและมาตรการการอนุรักษ์ดินและน้ำได้อย่างมีประสิทธิภาพสูงสุด

กิจกรรมในการดำเนินงาน

- จัดทำแนวกันไฟรอบพื้นที่
- จัดชุดลาดตระเวนป้องกันไฟป่าและดูแลป่าสม่ำเสมอ
เนื่อง
- ปลูกเสริมด้วยพันธุ์ไม้ยืนต้นประจำถิ่น 25 ต้น/ไร่
- บำรุงรักษาต่อเนื่องเป็นเวลา 10 ปี

งบประมาณ

ปีแรก 600 บาท ต่อไร่
ปีที่ 2 400 บาท ต่อไร่
๙- 6
ปีที่ 7 275 บาท ต่อไร่
๙- 10

บทสรุป

นโยบายของรัฐในปัจจุบัน

เรื่องของทรัพยากรป่าไม้มุ่งเน้นการดูแลบำรุงรักษาและ
ใช้ประโยชน์จากทรัพยากรธรรมชาติอย่างยั่งยืน

โดยการมีส่วนร่วม ตั้งแต่ร่วมกันคิด ร่วมกัน

วางแผนและร่วมกันปฏิบัติ

เพื่อให้สอดคล้องกับกฎหมายสูงสุดของประเทศ รัฐธรรมนูญ-
แห่งราชอาณาจักรไทย พุทธศักราช 2540

การดำเนินงานของกรมป่าไม้ในการดำเนินการฟื้นฟูทรัพยากร
ป่าไม้ โดยเฉพาะอย่างยิ่งในพื้นที่ต้นน้ำลำธาร

โดยส่วนอนุรักษ์ต้นน้ำ ดำเนินการในรูปแบบการจัดการลุ่มน้ำ
แบบผสมผสาน ตั้งแต่ปี พ.ศ. 2515 เป็นต้นมา

ซึ่งได้รับความช่วยเหลือจากองค์กรต่างประเทศ ได้แก่

โครงการทดลองจัดการลุ่มน้ำแม่สา

โครงการพัฒนาป่าไม้ที่สูง โครงการพัฒนาลุ่มน้ำ แม่แจ่ม

โครงการพัฒนาชนบทลุ่มน้ำพอง ฯลฯ

โดยดำเนินการร่วมกับส่วนราชการอื่นที่เกี่ยวข้อง

ในปี พ.ศ. 2530

ได้ดำเนินการจัดการลุ่มน้ำโดยอาศัยหลักการดำเนินงาน

โดยมุ่งเน้นการพัฒนาชุมชนแบบผสมผสานโดยการให้

ชุมชนเป็นผู้ปฏิบัติและรัฐเป็นผู้สนับสนุน

เพื่อการพึ่งตนเองและสามารถดำเนินการวิธีชีวิตอยู่ร่วมกับป่าไม้

อย่างสงบสุข ได้แก่ โครงการ พัฒนาที่สูงสามหมื่น

โครงการพัฒนาที่สูงดอยเวียงผา โครงการพัฒนาดอยตุง

โครงการ วนศาสตร์ชุมชนบนพื้นที่สูง

โครงการปกป้องป่าไม้เมืองไทยเพื่อเร่งรัดฟื้นฟูต้นน้ำลำธาร

โครงการ จัดการลุ่มน้ำน่าน

นโยบายของกรมป่าไม้ พ.ศ. 2541

ในยุคสมัยของ นายปลอดประสพ สุรัสวดี อธิบดีกรมป่าไม้

ได้มอบนโยบายและ

แนวทางปฏิบัติให้แก่ข้าราชการกรมป่าไม้ ดังนี้

กรมป่าไม้จะต้อง เป็นแกนหลักในการรวมพลังจากทุกฝ่ายที่เกี่ยวข้อง

และมุ่งมั่นบริหาร จัดการในลักษณะป่าของเรา

แทนการบริหารจัดการในลักษณะป่าของจีน โดยจะบริหาร

จัดการระบบนิเวศป่าไม้

ซึ่งต้องผสมผสานความรู้และประสบการณ์ ทั้งในด้านวิชาการ

ด้านการบริหารจัดการ ด้านนิติศาสตร์
ด้านรัฐศาสตร์และด้านเศรษฐกิจและสังคมหรือให้การ
ดำรงอยู่ของคน ป่า สัตว์ป่า สรรพสิ่งอยู่ร่วมกัน
พึ่งพาอาศัยกันซึ่งกันและกัน ได้อย่างกลมกลืนและสมดุล
เกิดสันติสุขและยั่งยืนตามวิถีของธรรมชาติ

1. นโยบายด้านการป้องกันและปราบปรามการกระทำ
ผิดกฎหมายป่าไม้
2. นโยบายด้านการบริหารจัดการพื้นที่ป่าอนุรักษ์และก
ารส่งเสริมการท่องเที่ยว เชิงอนุรักษ์
3. นโยบายด้านการจัดระบบบริหารจัดการที่ดินในเขต
ป่าไม้
4. นโยบายด้านการฟื้นฟูป่าและส่งเสริมการปลูกป่า
5. นโยบายด้านการเพิ่มประสิทธิภาพการบริหารงาน
6. นโยบายด้านการวิจัยพัฒนา และส่งเสริมการป่าไม้
7. นโยบายทั่วไป
8. นโยบายและแนวทางปฏิบัติ เฉพาะพื้นที่

สำหรับนโยบายด้านการฟื้นฟูป่า และส่งเสริมการปลูกป่า
ได้กำหนดดังนี้

1. *การปรับปรุงการปลูกสวนป่าของรัฐให้ได้ผลเป็นรูปธรรม*
 - ให้จ้างเหมาให้เอกชนปลูกป่าในพื้นที่ของรัฐและช่วยเงิ
นเป็นงวดตามผลงาน

- ให้ส่งเสริมและสนับสนุน อบต. หรือสภาตำบล จัดทำแผนปลูกสวนป่าแปลงเล็ก 50 = 100 ไร่ โดยใช้งบประมาณจากกรมป่าไม้ดำเนินการ
- ให้กำหนดเป้าหมายและวางแผนระยะยาวในการปลูกสวนป่าและให้น้ำ
 วนวัฒนวิธีมาใช้ในการจัดการเพื่อให้สวนป่ามีความหลากหลาย ใกล้เคียงกับ ธรรมชาติ เช่น ตัดรางขยายระยะต้นไม้ที่ปลูกไว้เดิมออก แล้วปลูกพันธุ์ไม้ชนิด อื่นทดแทน
- ให้ปลูกต้นไม้ริมน้ำในลักษณะ Water Front Forest ตามพระกระแสของ พระบาทสมเด็จพระเจ้าอยู่หัว

2. การดูแล บำรุงรักษาและพัฒนาการจัดการสวนป่า

- ให้สำรวจปริมาณและชนิดไม้ของสวนป่าของรัฐที่มีอยู่ในปัจจุบัน และดูแลรักษา เพื่อป้องกันการลักลอบตัดไม้ในสวนป่า
- ให้กำหนดมาตรการและปรับปรุงแนวทางปฏิบัติ เพื่อพัฒนาการจัดการ สวนป่าตั้งนี้
 ทำการทดลองนำไม้มาใช้ประโยชน์ จัดทำเป็นแหล่งท่องเที่ยว
- ให้ระมัดระวังป้องกัน-
 หาโรคและแมลงระบาดในสวนป่า

3. โครงการส่งเสริมปลูกไม้เศรษฐกิจ

การปลูกไม้เศรษฐกิจจะต้องดำเนินการต่อไป
เพื่อให้มีไม้ใช้สอยในอนาคต และลดการ
นำเข้าไม้จากต่างประเทศ
โดยคณะรัฐมนตรีได้เห็นชอบและให้กรมป่าไม้
ดำเนินการตามแนวทาง ที่ปรับปรุงใหม่ ดังนี้

- ให้ป่าไม้เขตเข้ามาร่วมตรวจสอบรับรองผลการดำเนินงานในขั้นตอนต่าง ๆ ให้รัดกุม โปร่งใส
- ลักษณะการดำเนินงานตามแนวทางใหม่ คือ

1. ส่งเสริมการปลูกไม้เศรษฐกิจในพื้นที่ ส.ป.ก. 4
01 ปลูกต้นไม้ 20%
และพื้นที่แนวเขตกันชนระหว่างพื้นที่ปฏิรูปที่ดินกับเขตป่า
2. พื้นที่บางแห่งราษฎรจะไม่ได้รับเงินแต่ได้ต้นไม้
โดยจะจ้างองค์กร/นิติบุคคล เป็นผู้ปลูก
3. พื้นที่ดำเนินการโครงการตามทฤษฎีใหม่
สามารถร่วมโครงการหรือขอรับกล้าไม้ ไปปลูกได้

- รูปแบบที่จะใช้ในการดำเนินการส่งเสริมปลูกไม้เศรษฐกิจ คือ

1. ปลูกไม้เศรษฐกิจ กับพืชไร่
2. ปลูกไม้เศรษฐกิจ กับพืชสวน
3. ปลูกไม้เศรษฐกิจ กับไม้ยางพารา
4. ปลูกไม้ยางพารา กับพืชสวนหรือพืชไร่

- ให้ปรับปรุงแก้ไขระเบียบในการนำไม้เศรษฐกิจมาใช้ เพื่อให้ราษฎรและผู้ประกอบการ มั่นใจ

4.

การส่งเสริมให้ภาคเอกชนดำเนินการปลูกสวนป่าในพื้นที่ป่าสงวนแห่งชาติ

ให้ทบทวนนโยบายและระเบียบปฏิบัติ เกี่ยวกับการอนุญาตให้ใช้พื้นที่ป่าสงวนแห่งชาติที่เสื่อมโทรม เพื่อปลูกสวนป่า โดยปรับปรุงแนวทางเกี่ยวกับการคัดเลือกและควบคุมการดำเนินงาน เพื่อส่งเสริมให้ภาคเอกชนที่มีศักยภาพดำเนินการปลูกสวนป่าร่วมกับราษฎร

5. การปลูกต้นไม้เพื่อป้องกันสภาวะเรือนกระจก

จะสนับสนุนให้ราษฎรมีรายได้จากการปลูกต้นไม้เพื่อเป็นแหล่งดูดซับ คาร์บอนไดออกไซด์ โดยประสานงานให้ประเทศอุตสาหกรรม และประเทศที่พัฒนาแล้วเป็นผู้ออก ค่าใช้จ่าย

6. ป่าชุมชน

- ให้เร่งรัดพระราชบัญญัติป่าชุมชน
- ให้ส่งเสริมการปลูกป่าชุมชนและให้ความรู้เกี่ยวกับการจัดการ ป่าชุมชนอย่างยั่งยืน

7. ธนาคารอาหารจากป่า (Food Bank)

กรมป่าไม้จะจัดทำโครงการสำรวจป่าหย่อม เล็กหย่อมน้อยที่กระจายอยู่ทั่วประเทศ

ประเทศและมีปัจจัยในการดำรงชีพของราษฎรที่พึ่งพิงป่า เพื่อมอบให้ชุมชนบริหารจัดการและใช้ประโยชน์อย่างยั่งยืน โดยจะให้ป่าไม้อำเภอรับผิดชอบดำเนินการ

8. กล้าไม้และการปรับปรุงพันธุ์ไม้

- ให้จัดระบบการเพาะชำกล้าไม้และแจกจ่ายกล้าไม้ให้ป็นมาตรฐาน มีความชัดเจน โปร่งใสและตรวจสอบติดตามประเมินผลอย่างต่อเนื่อง และให้มีกล้าไม้เพียงพอสำหรับแจกจ่าย
- ให้เน้นและให้ความสำคัญในการคัดเลือกพันธุ์C การปรับปรุงพันธุ์ไม้ การทำ พันธุ์วิศวกรรม จัดทำ Seed Bank, Genetic Resourecs เพื่อให้ได้พันธุ์ดี เจริเติบโต มีผลผลิตสูง โดยเฉพาะพันธุ์ไม้หลัก 20 ชนิด

โครงการ "ป่ารักษน้ำ รักษาแผ่นดิน"

เฉลิมพระเกียรติ

สมเด็จพระนางเจ้าฯ พระบรมราชินีนาถ

1. หลักการและเหตุผล

ในวโรกาสวันเฉลิมพระชนมพรรษา 12 สิงหาคม 2542 เมื่อวันที่ 11 สิงหาคม 2542 สมเด็จพระนางเจ้าสิริกิติ์ พระบรมราชินีนาถ ได้ทรงมีพระราชดำรัสฯ ในเรื่องการอนุรักษ์ทรัพยากรป่าไม้ ฯพณฯ นายกรัฐมนตรี จึงได้มีบัญชาให้กรมป่าไม้จัดทำโครงการ เพื่อสนองแนวพระราชดำริในการ อนุรักษ์และฟื้นฟูสภาพป่า

2. วัตถุประสงค์

- 2.1 เพื่อเพิ่มประสิทธิภาพการป้องกันรักษาป่า
- 2.2 เพื่ออนุรักษ์และฟื้นฟูระบบนิเวศในพื้นที่ต้นน้ำที่วิกฤต
- 2.3 เพื่อเพิ่มประสิทธิภาพในการเพิ่มพื้นที่ป่าไม้

3. เป้าหมาย

- 3.1 ป้องกันรักษาป่าและควบคุมไฟป่า ในท้องที่ที่มีพื้นที่ป่าไม้เพื่อลดความรุนแรง ใน 65 จังหวัด
- 3.2 อนุรักษ์และฟื้นฟูระบบนิเวศในพื้นที่ต้นน้ำที่อยู่ในสภาพวิกฤต 20 ล้านไร่ ในพื้นที่ลุ่มน้ำ 16 จังหวัด

3.3 เพิ่มพื้นที่ป่าสีเขียวทั่วประเทศ
โดยการมีส่วนร่วมของประชาชนทุกหมู่เหล่า
ในท้องที่ 75 จังหวัด

4. ขอบเขตและวิธีการดำเนินงาน

4.1 ขอบเขตการดำเนินงาน

4.1.1

ปรับปรุงระบบและกระบวนการเพื่อเพิ่มประสิทธิภาพการป้องกันรักษา ป่าไม้ที่เหลืออยู่ในท้องที่ 65 จังหวัด

4.1.2 พื้นฟูระบบนิเวศในพื้นที่ต้นน้ำสำคัญ-
ที่อยู่ในสภาพวิกฤต ประมาณ 20 ล้านไร่ ใน 16
จังหวัด

(1) พื้นที่ป่าที่ถูกบุกรุก 8 ล้านไร่

(2) พื้นที่ที่คงสภาพป่า 12 ล้านไร่

4.1.3 ปลูkp่าเพื่อเพิ่มพื้นที่สีเขียวในพื้นที่ 75
จังหวัด

4.2 วิธีการดำเนินงาน

แบ่งการดำเนินงานเป็น 3 โครงการย่อย คือ (1)
โครงการเฝ้าระวังป่า (2) โครงการ
ฟื้นฟูระบบนิเวศต้นน้ำ (3) โครงการแผ่นดินเขียวขจี

4.2.1 โครงการเฝ้าระวังป่า

(Forest Monitor, Surveillance and Control
Project)

(1)

งานเฝ้าระวังพื้นที่ป่าไม้ที่เหลือน้อยอย่าง
เข้มข้นใน 65 จังหวัด

(2) งานควบคุมไฟป่า 65 จังหวัด

(3)

งานสำรวจและติดตามผลการเปลี่ยนแปลง
พื้นที่ป่าไม้ อย่างต่อเนื่องใน 65
จังหวัด

(4)

งานประชาสัมพันธ์การอนุรักษ์ทรัพยากรป
่าไม้ 75 จังหวัด

4.2.2 โครงการฟื้นฟูระบบนิเวศต้นน้ำ

(Watershed Rehabilitation Project)

(1)

งานฟื้นฟูสภาพป่าต้นน้ำและระบบนิเวศ
20 ล้านไร่

(2) งานพัฒนาบ้านเล็กในป่าใหญ่ในท้องที่
16 จังหวัด

4.2.3 โครงการแผ่นดินเขียวขจี

(Green Forest Project)

(1)

งานรณรงค์สร้างจิตสำนึกการมีส่วนร่วมในการปลูก
ป่า 75 จังหวัด

(2)

งานส่งเสริมการปลูกป่าโดยมีส่วนร่วมของประชาชน
และ หน่วยงาน 230,400 ไร่ / 14,400
กิโลเมตร ใน 75 จังหวัด

5. ระยะเวลาดำเนินงาน

ระยะเวลาดำเนินโครงการ 5 ปี ตั้งแต่ปีงบประมาณ พ.ศ.
2543 - 2547

6. แผนปฏิบัติงานและงบประมาณ

แผนปฏิบัติงานและงบประมาณในช่วงระยะเวลาดำเนินการ 5 ปี ตามตารางที่ 1 (เอกสาร 1)

7. การบริหารโครงการ

7.1 คณะกรรมการอำนวยการโครงการ

ฯพณฯ นายกรัฐมนตรี เป็นประธาน ฯพณฯ รัฐมนตรีว่าการกระทรวงเกษตร และสหกรณ์ เป็นกรรมการและเลขานุการ อธิบดีกรมป่าไม้ เป็นกรรมการและผู้ช่วยเลขานุการ

7.2 คณะกรรมการบริหารโครงการ

ฯพณฯ รัฐมนตรีว่าการกระทรวงเกษตรและสหกรณ์ เป็นประธาน อธิบดีกรมป่าไม้ เป็นกรรมการและเลขานุการ

7.3 คณะกรรมการดำเนินโครงการฯ ระดับจังหวัด

ผู้ว่าราชการจังหวัด เป็นประธาน ป่าไม้เขต เป็นรองประธานและป่าไม้จังหวัดเป็น กรรมการและเลขานุการ

7.4 ผู้ดำเนินงาน

(1) ผู้จัดการโครงการ

รับผิดชอบโครงการในกรมป่าไม้แต่ละโครงการ รวม 3 โครงการ

(2) ป่าไม้จังหวัด

รับผิดชอบโครงการระดับพื้นที่ภายในท้องที่จังหวัดทุกโครงการ

(3) ผู้จัดการโครงการย่อยแต่ละพื้นที่

รับผิดชอบดำเนินงานตามแผนปฏิบัติงานและรายงานผลการดำเนินงานต่อป่าไม้จังหวัด

8. ผลที่คาดว่าจะได้รับ

8.1 ลดความรุนแรงของการบุกรุกพื้นที่ป่าไม้ที่เหลืออยู่ใน 65 จังหวัด โดยความร่วมมือ ของประชาชนทุกหมู่เหล่า

8.2

ทุกจังหวัดทราบการเปลี่ยนแปลงพื้นที่ป่าไม้และมีฐานข้อมูลระบบสารสนเทศ ภูมิศาสตร์

ทรัพยากรป่าไม้ในการติดตามสถานการณ์การเปลี่ยนแปลงพื้นที่ป่าไม้

8.3 พื้นที่ต้นน้ำที่สำคัญ (ชั้นที่ 1A, 1B และชั้น 2)

ในกลุ่มน้ำหลัก 5 กลุ่มน้ำ 20 ล้านไร่ ในท้องที่ 16 จังหวัด จะได้รับการฟื้นฟู

8.4 ชุมชนและราษฎรที่อยู่อาศัยในพื้นที่ป่าไม้

มีความมั่นคงในการดำรงชีวิต ที่เหมาะสม

ในลักษณะเศรษฐกิจพอเพียง

สามารถพึ่งตนเองได้และมีคุณภาพชีวิตดีขึ้น

8.5 เพิ่มพื้นที่สีเขียว จำนวน 230,400 ไร่ และ 14,400
กิโลเมตร ซึ่งจะช่วยให้เกิด สภาพแวดล้อมที่ดีในท้องถิ่น

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ANNEX 2

FOREST REHABILITATION POLICY AND PRACTICE IN THAILAND

Compiled

by

Prasong Jantakad

and

Don Gilmour

November 1999

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Acronyms and abbreviations

CMU	Chiangmai University
DLD	Department of Land Development
DOLA	Department of Local Administration
FFKU	Faculty of Forestry Kasetsart University
FAO	Food and Agriculture Organization
FIO	Forest Industries Organization
ICRAF	International Center for Research in Agroforestry
IIED	International Institute for Environmental Development

IMPECT	Inter-Mountain People Education and Culture in Thailand
INGO	International Non-Government Organization
IRD	Institute for Research and Development
JICA	Japanese International Cooperation Agency
KU	Kasetsart University
KKU	Khonkaen University
LDI	Local Development Institute
MCC	Multiple Cropping Center
NDF	Northern Development Foundation
NESDP	National Economic and Social Development Plan
NGO	Non-Government Organization
OEPP	Office of Environmental Planning and Policy
ONCB	Office of Narcotic Control Board
PAS	Protected Area System
PTT	Petroleum Thai Authority
RECOFTC	Regional Community Forestry Training Center
RFD	The Royal Forest Department
SRI	Social Research Institute
TAO	Tambol Administrative Organization
TDRI	Thailand Development and Research Institute
TEI	Thailand Environment Institute
TFSMP	Thailand Forestry Sector Master Plan
UN	United Nations
UNDP	United Nation Development Programme

USAID United States Agency for International Development
WSC Watershed Classification

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During this study many people contributed freely of their time and knowledge and this is gratefully acknowledged. People in government and non government organisations provided access to documents, particular project documents and other "grey" literature, without which it would have been impossible to carry out the analyses. Particular thanks are due to Udhai Tongmee, Phichart Watanapruteep, Jetsada Kaewchote, of Watershed Management Division Royal Forestry department for their comments.

Financial support to carry out the work came from several sources. The GTZ-MRC Project through its team leader Dr Hans Helmrich, provided not only significant financial support, but also logistical backup and encouragement. Various programmes in IUCN also contributed financially and technically, in particular the global Forest Conservation Programme and the Commission on Ecosystem Management. Substantial financial support was also provided by the WWF Forests Reborn Project, and this is gratefully acknowledged.

To all of those who contributed, sincere thanks. It is hoped that the material in this publication and the discussions and dialogue that took place during data collection will contribute to a better understanding of the processes leading to deforestation and forest degradation in Thailand. The hope is that the country can move towards a situation where the remnant forests are being managed sustainably and the degraded forests

are rehabilitated to provide a range of goods and services of benefit for the whole of society.

GLOSSARY

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

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

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

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

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

1. EXECUTIVE SUMMARY

Thailand, along with most countries in the region, has experienced a substantial loss of forest during the past half century. Forest cover was reduced from 53% in 1961 to 25% in 1998, and deforestation was occurring at a rate of about 300,000 ha per year in the first half of the 1990s (about 2.6% per year). All forest types in all regions of the country have been affected. There are many reasons for the loss of forest and the associated degradation of the remaining forests. Thailand has an expanding population and has undergone rapid economic development during the past few decades. This combination of factors has put enormous pressure on all natural resources, and government policy has encouraged the expansion of agriculture and a move towards cash cropping.

Chief among the direct causes of deforestation are:

- i. Encroachment into reserved forest for permanent cultivation;
- ii. Poorly controlled concessionaire logging operations;
- iii. Shifting cultivation;
- iv. Harvesting of wood fuel;
- v. Illegal logging of teak and other forests;
- vi. Infrastructure development.

In many cases these direct causes are the visible side of more pervasive underlying causes. The most important of these is the unclear and ambiguous tenure of the estimated one million farm households (a fifth of the total population) who are residing in reserved forest. Lack of security of access and use rights (tenure) of these people acts as a disincentive for them to invest in long term resource management. It also puts them in a position of conflict with the staff of the RFD who view them as illegal encroachers.

Past attempts by the RFD to rehabilitate degraded reserved forest lands have had little success as they have been thwarted

by the overwhelming constraint posed by the problem of people residing in the forests and using forest resources "illegally". Attempts to force solutions by top down interventions have generally failed. Plantations established under these circumstances have a very low initial survival rate (partly because of technical shortcomings) and rarely survive long term due to encroachment and loss by fire. Local people feel disenfranchised from the process even when they are employed as wage labour for planting and protecting forest plantations. Local communities have demonstrated that they can take effective action to halt and reverse forest loss and degradation (even within reserved forests) if they feel that they will reap the benefits of their endeavours.

Policy is now evolving towards developing a partnership between the government and local communities that can ensure that government policy objectives and the development aspirations of local people can both be achieved. The statements in the 1997 Constitution relating to the rights of local communities to use and manage natural resources and the environment give legitimacy to attempts to devolve authority and responsibility for forest management to local levels. Several versions of a Community Forestry Bill are presently under consideration, and if an effective version is passed, it will provide one practical mechanism to progress this partnership. However, this transition to more participatory forms of management is strongly resisted in some quarters.

A major consequence of these changes is the need to define a new role and a new culture for the RFD. The role of many parts of the organisation during most of this century has revolved around overseeing the commercial exploitation of the country's forests by private concessionaires¹. That role came to an end in 1989, when Parliament cancelled logging concessions in forest reserves. The challenge for the future is to define a new role based on a partnership with civil society and focused on

rehabilitation of the degraded forest landscape and conservation of the remnant forests. This new role, with its emphasis on the active participation of different stakeholder groups in forest management planning and implementation, is likely to require a major cultural adjustment within the Department.

2. INTRODUCTION

2.1. Purpose of the study and methodology used

The objectives of this study are to assess forest rehabilitation policies and practices in Thai land focusing on the following issues:

- The status of forests in the country
- Policies and laws related to forestry and land use in general
- Policies and laws related to forest rehabilitation
- Technical approaches to forest rehabilitation
- Lessons learned from past experiences
- Institutional / policy constraints to rehabilitating degraded forest land

Information gathering was based primarily on reviews of literature from libraries of both government and non-government agencies in Thailand. These included: ICRAF, Chiang Mai University (CMU), Northern Development Foundation (NDF), IMPECT Association in Thailand, Social Research Institute (SRI)/CMU, Multiple Cropping System (MCC)/CMU, Khon Kaen University (KKU), Research and Development Institute (IRD)/KKU, Kasetsart University (KU), Faculty of Forestry /Kasetsart University (FFKU), RECOFTC, The Royal Forest Department (RFD), Thailand Environment Institute (TEI), Local Development Institute (LDI), FAO and the UN.

In addition, personal consultations and interviews were conducted with key officials of the Royal Forest Department (particularly staff of the Watershed Management Division).

2.2. General background on Thailand

Thailand has a land area of 514,000 sq km (51 million ha) and in 1996 had a population exceeding 60 million with a growth rate of 1.5% per annum. The economy is diversified with manufacturing, service industries and agricultural production being the three principle sectors. In 1997, 51% of the workforce was employed in agricultural based occupations (National Statistical Office 1997). The country is urbanising rapidly; in 1965, only 13 % of the total

population lived in urban areas whereas by 1990, the figure had increased to 23 %. The population density in 1990 was 107 persons per sq km overall, and 275 persons per sq km of cultivated land (Warr 1993). The population consists of approximately 75 % Thai, 14 % Chinese and 11 % of other ethnic groups. Thailand is bordered by Malaysia, Myanmar, Lao PDR and Cambodia.

Between 1960 and 1993, Thailand's forest cover diminished from 50 % of the total land area to about 26 %. The most rapid forest loss occurred during the mid to late 1970s and early 1980s. Between 1976 and 1982, the annual deforestation rate reached 3.85 %, which was then the highest among tropical countries worldwide.

3. TERMINOLOGICAL CONFUSION-RESTORATION, REHABILITATION

While some degraded ecosystems are able to recover naturally, many are not, because of some limitation. Even at sites where natural recovery is taking place, the process may be slow. This

increases the chance of further disturbances recurring and degrading the site once more. Human intervention may be needed to either initiate the recovery process or to accelerate the rate at which it proceeds. A variety of approaches might be used. These range from those where the objective is to restore the original ecosystem and recover the former biodiversity through to those where the aim is simply to use the site for some productive purpose such as agriculture or forestry. The different approaches have fostered a confused terminology. In this report a particular distinction is made between restoration, rehabilitation and reclamation.

Restoration is used only for those situations where the intent is to recreate an ecosystem as close as possible to that which originally existed at the site.

Rehabilitation, on the other hand, is used where, for ecological or commercial reasons, it has been necessary to include exotic species in the new succession. This might be because only exotic species such as *Acacia* can tolerate the soils now present at the degraded site and are necessary as nurse species to facilitate the entry of the original native species. Or it may be that commercial imperatives demand certain agricultural or timber species be included to justify the rehabilitation effort.

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

4. PATTERNS OF LAND USE AND LAND OWNERSHIP

Thailand is well endowed with cultivable land covering about 65% of the land area (Mingsarn et al. 1995). This includes:

13.5 million ha suitable for paddy,
 10.8 million ha suitable for upland crops, and
 2.6 million ha suitable for perennial crops.

Forests occupy about 11.6 million ha, or about 23% of the total land area (FAO 1997). The general trend over the past few decades has been that the area of agricultural land has expanded at the expense of the forest. Table 1 shows the distribution of land uses by different regions in the country. It is evident that all regions in the country have reasonable areas of both agricultural land and forests, with the north being the most heavily forested. It should be noted that different sources give different estimates of areas under various types of land use. These variations are caused partly by the use of different techniques and different standards for defining forest and non forest land. In addition, much of the aerial photo data base is quite old, so even if estimates are precise, they may not represent the present day reality. However, they give useful comparative data.

Table 1: Land Use by Regions in 1991

LAND USE	AREA (000 ha)					%
	North	North-east	Central	South	Thailand	
Forest	9,392	2,624	3,232	2,384	17,632	34.4
Forest in good condition	7,712	-	-	-	-	-
Forest in need of improvement (degraded)	1,680	-	-	-	-	-

Non-forest	7,568	14,256	7,152	4,688	33,664	65.5
Tree crops	8	9.6	912	3,376	4464	8.7
Non-tree crops (incl paddy)	6,736	11,840	5,392	784	24768	48.3
Grassland/idle	0	64	32	16	112	0.2
Aqua-culture	0	0	96	32	128	0.2
Residential/urban land	32	32	160	48	274	0.5
Rangeland and scrubland	480	1,776	368	192	2816	5.5
Mines, wetland, waterways	240	448	192	240	1120	2.2
Total	16,960	16,880	10,384	7,072	51,296	100

Source: Forest statistics of Thailand and DLD 1990 land use maps.

During the past few decades farmers have been encouraged to move from subsistence agriculture to more market oriented cash crops, which has required an expansion of the agricultural land base. The government has also had a policy of leasing "degraded forest lands" to the private sector for the establishment of plantation crops such as oil palms, eucalypts and for large scale shrimp farming. Some of the resulting large agri-businesses forced people off their land so that they had to seek new farming land, which generally meant they were obliged to move into the forest and clear more land. These economic factors operating outside the forest sector have been major drivers of forest clearance. The northern region, which has traditionally been an area dominated by shifting cultivation, has witnessed a significant shift towards more sedentary agricultural practices, with an emphasis on cash crops (in some cases as a replacement for opium).

Despite relative land abundance, land ownership lacks clarity for many farmers. As many as a million farm households or a fifth of the total population, are technically squatters on forest reserves as their farms are located on lands belonging to the RFD (Siamwalla *et al.* 1993). Even outside the reserve area, at least 30 % of farmers have not been able to obtain sufficiently clear land titles to use their lands as collateral. The implications of this lack of clarity of land ownership are two-fold. First, with such a large number of people occupying forest reserve land, the RFD has great difficulty in developing and implementing policies for sustainable forest and conservation management.

Second, because farmers do not have guaranteed tenure and they can not use their land as collateral, they are unwilling or unable to make investments in the land or equipment. This in turn affects the potential to manage the land (both agricultural land and forest) productively. A further point is that the ambiguous situation has led to a rise in tension between farmers and the government in general and the RFD in particular. This adds to the difficulties in resolving the dilemma.

In 1993, 5.52 million ha of reserved forest land were passed to the Office of Land Reform for redistribution to farmers under the "Sor-Por-Kor 4-01" programme. However, distortions occurred in the process of land distribution and influential non farmers were able to acquire large areas of land. The resulting scandal had major political ramifications.

When protected areas were declared during the past 30 years, the people who resided within the boundaries became "illegal squatters", irrespective of their length of residence. This has caused considerable conflict. Forced resettlement has been attempted in many situations, but has not worked well. The people affected were not consulted during planning for resettlement, and the programmes largely failed. Productive

forests outside the protected areas were cleared to make room for new settlements, but most of the resettled people returned to their old farms inside the newly created protected areas.

5. FORESTS IN THAILAND

5.1. General

The country has two main forest types, broadleaved closed canopy (evergreen) and broadleaved open canopy (deciduous)^a see Table 2 for details of area covered by different forest types.

Broadleaved closed canopy forests cover some 36% of the total forested area. Small but important areas of bamboo, coniferous forests and mangroves also occur.

Broadleaved open canopy forests cover 54% of the forest area and include:

- Mixed deciduous forest with and without teak
- Dry dipterocarp forest, and
- Savannas

Table 2: Area and type of forest in Thailand (1990)

FOREST TYPE	AREA (000 ha)	% OF TOTAL FOREST AREA
Broadleaved closed forest	5,020	35.7
Bamboo	800	5.7
Coniferous	150	1.1
Mangrove	570	4.0
Broadleaved open canopy	7,530	53.5

forest		
Total	14,070	100.0

Source: Collins, et al. (1990)

5.2. Status of forests

The Office of Agriculture Economics reported that the forest cover of Thailand in 1910 was 35.9 million ha, or 70% of the land area. In the intervening decades the forest area has declined to the present 26% coverage. Much of the loss has taken place since the 1960s, during which time the forest area has halved (Tables 3 and 4).

The biggest percent loss of forest was in the North-east Region with a reduction from 7.1 million ha in 1961 to 2.1 million ha in 1998. At the end of the 1960s, 70 % of the north of the country was covered with forest. However, by the 1990s, two thirds of the forested area above a thousand metres in elevation had been modified by shifting cultivation by ethnic Thai and hill tribe people. In addition, a large percentage of forest in the north had been heavily logged or burned and as a result has been converted to savanna woodlands and open grassland (Charupatt, 1998).

An international meeting on mangrove ecology held in 1996 noted that Thailand was listed as number one among 10 countries where mangrove forests have been reduced to a critical level. At that time, only 160,000 ha of mangrove forest remained, 50% of the total area 30 years ago. Satellite photographs showed that in the Central region, mangrove forests were reduced from 312,000 ha in 1979 to only 53,000 ha in 1993. Cabinet passed a resolution in 1996 revoking concessions in the mangrove forest. However, it is not yet clear whether this decision will solve

problems of mangrove destruction as they may be due in large part to illegal encroachment for prawn farming, resorts and other uses.

Table 3: Changes in forest cover in Thailand from 1961 to 1998

YEAR	FOREST AREA (000 ha)	% of TOTAL LAND AREA
1961	27,363	53.3
1973	22,121	43.2
1976	19,842	38.7
1978	17,522	34.1
1982	15,622	30.5
1985	15,087	29.4
1988	14,380	28.0
1989	14,342	27.9
1990	14,111	27.5
1991	13,670	26.6
1993	13,552	26.0
1995	13,148	25.6
1998	13,038	25.4

Table 4: Changes in forest area in Thailand between 1961 and 1998 for each region

REGION	LAND AREA (000 ha)	FOREST AREA (000 ha)			
		1961		1998	
		Area (000ha)	%	Area (000 ha)	%
Northern	16,964	11,628	68.5	7,306	43.1
North-east	16,885	7,090	42.0	2,098	12.4
East	3,650	2,116	58.0	1,551	20.6
Central	6,740	3,566	52.9	1,605	23.8
South	7,072	2,963	41.9	1,213	17.1
Total	51,311	27,363	53.3	12,972	25.3

Source: Charuphat (1998)

Estimates from FAO (1997) indicate that between 1990 and 1995, 329,000 ha of forest were being lost each year. This equates to an annual rate of forest loss of 2.6%. Most of the remaining forests have been heavily logged and little attention has been paid to regeneration. Hammond (1997) reported that productive hardwood forests had been reduced from four million ha in 1980 to half a million ha in 1990.

5.3. Administrative arrangements for forest management

The Royal Forest Department (RFD), within the Ministry of Agriculture and Cooperatives, has the mandate for forest management in all reserved forests. The Department consists of six division, seven offices and one unit at the central administration level, and 21 regional forest office (centrally administered). At the provincial administration level, there are 76 provincial forest office and more than 600 district forest offices. The central division consists of the Office of the Secretary, Financial Division, Personnel Division, Permission

Division, Legal Affairs Division, Planning Division and Training Division, Regional Forest Office, Natural Resources Conservation Office, Information Office, Reforestation Office, Forest Research Office, Forest Protection Office and Internal Audit Unit.

RFDs legal mandate with respect to forest resources is comprehensive. It includes forest resources surveys, planning activities, enforcement of forest laws, issuance of permits and control of logging concessions, study and protection of watershed areas, study and promotion of forest products, determination of wildlife sanctuaries and recreation areas, planning forest plantation programmes, issuance of permits for use of land in forest reserve areas and the survey and allocation of land for forest villages.

In 1992, the National Reserved Forest was divided into three categories:

- i. Conservation Forest (14.08 million ha)
- ii. Economic Forest (8.32 million ha)
- iii. Agricultural land (1.42 million ha)

The creation of a special category of Conservation Forest was recognition of the changing emphasis the nation was giving to forest management objectives. Likewise, the allocation of agricultural land from the forest estate acknowledged the reality that much forest land had, in fact, been used for agricultural purposes for long periods (often many generations) and should be allocated to farmers.

In addition to the formal forest categories, there are reported to be 400 community forests in eight provinces (Chiang Mai, Chiang Rai, Lamphang, Lamphun, Phayao, Mae Hong Song, Nan and Phrae) in upper northern Thailand covering about 304,000 ha

(Anchalee 1995). The management arrangements for these community forests are locally negotiated and informal, and examples exist in both Conservation and Economic forests. They represent a tacit acknowledgment by the RFD of the legitimacy and effectiveness of community management of forests, even though there is no legislative backing or procedural system for this form of forest management.

5.4. Biodiversity conservation and forest management

Thailand lies at the crossroads of South East Asia and the Pacific, and thus, relative to the size of the country, has a particularly rich biodiversity derived from both mainland Asia and the Sundaic region to the south. There are suggestions that the country contains approximately six vascular plants in the world (McQuistan 1999). In response to the threats to this biological heritage, the RFD established the first protected area (Khao Yai) in 1960. Since then, expansion of the protected area system has continued and today, almost eight million ha (16% of the country's land area) is included in the protected area system. Thailand now has a substantial area of its forest included in a protected area system, with 54 wildlife sanctuaries, 86 national parks and 45 non-hunting areas. However, recent analyses suggest that substantial gaps in coverage still exist (A. Ingles, pers. com.) In addition, effective management of the reserves is problematic because of the pressure on the resources by various groups including forest dwellers (often considered to be "illegal encroachers") and illegal loggers.

Many people live inside reserve boundaries (and in some cases have done so for many generations). This technically puts them into the category of illegal encroachers, and they are subject to eviction. Consequently there are very tense relations between

local people and RFD staff. Many development NGOs and local religious figures have taken up the cause of the local people and promoted the idea that protected areas are anti-people. In extreme cases whole villagers have been forcibly removed from protected areas by the military and resettled elsewhere. However, this action has been strongly resisted by the people directly affected and various supporters among the NGO communities. Little attention has been paid to the question of biodiversity conservation in land use categories outside protected areas, but this is becoming an increasingly important topic for both policy debate and practical consideration.

5.5. Causes and consequences of deforestation and forest degradation

Numerous factors that contribute to deforestation have already been discussed. Generally accepted causes of deforestation and forest degradation relate to population growth, extension of permanent and shifting cultivation, poorly planned and managed concessionaire logging and illegal logging. The Government has encouraged the commercialisation of the agricultural sector. This has brought substantial economic benefits, but it has been at the cost of forest cover. The RFD has attempted to contain this loss by curtailing forest encroachment, particularly by small holders. A major difficulty has been lack of policy and planning coordination between the various sectors. The forest sector has attempted to make and enforce regulations that apply to forest land (as is their mandate). Similarly, the agricultural sector encourages agricultural expansion and the move to cash cropping. However, much agricultural land is within forest reserves, so there are overlapping mandates and policies. The lack of effective coordination mechanisms has been a constraint to developing overall approaches to land use planning. In addition, rising demands for fuel wood, charcoal

and other wood products have accelerated deforestation. It is difficult to separate the overall impact of legal and illegal logging from population growth and agricultural expansion.

A key reason for the exploitation of forests in Thailand is that they have been a major source of foreign exchange and government revenue for many years. In many situations, the original destruction was carried out by people in middle to high socio-economic positions, living far from the forests, through direct cutting or by encouraging farmers to clear lands.

Rerkasem (1995) noted that there were both internal and external forces causing rapid changes in the mountainous areas of northern Thailand. These can be summarised as:

Internal factors

- Increased population
- Farmers felt the need to increase productivity and to improve the stability of their production

External factors (related to government policy)

- The effect of nationalisation and integration policy implemented by the Department of Local Administration
- Enforcement of forest and watershed conservation and afforestation schemes by the RFD
- Strict law enforcement on illicit opium cultivation by the ONCB
- Improved access and transportation.

Large scale logging, both legal and illegal, has contributed to degradation of the country's forests both directly and indirectly. In a direct sense, over-exploitation of forests has often left them in a condition which puts their long term sustainable use in jeopardy. Indirectly, construction of access roads through forests has often provided access for the

subsequent movement into the forest of people seeking new agricultural land. The RFD has had difficulty in exercising effective control over legal logging operations, and in curtailing illegal logging, even in national parks. In addition, little attention has been paid to regenerating the logged forests. Figure 1 shows the various factors that contribute to on-going forest degradation and loss.

The most obvious consequence of forest loss and degradation is the loss of biodiversity. Thailand's rich reserves of biodiversity have been severely degraded, particularly during recent decades. However, the extent of the loss is not clear. Also of importance is the loss of environmental services, such as watershed functions and carbon sequestration. Quantification of these services is even more difficult to determine. There is also a widely held view that the loss of forest cover has impacted adversely on water supplies in Thailand's major river systems (Box 1). Even though the weight of scientific evidence does not support these views, they have become part of the local belief system.

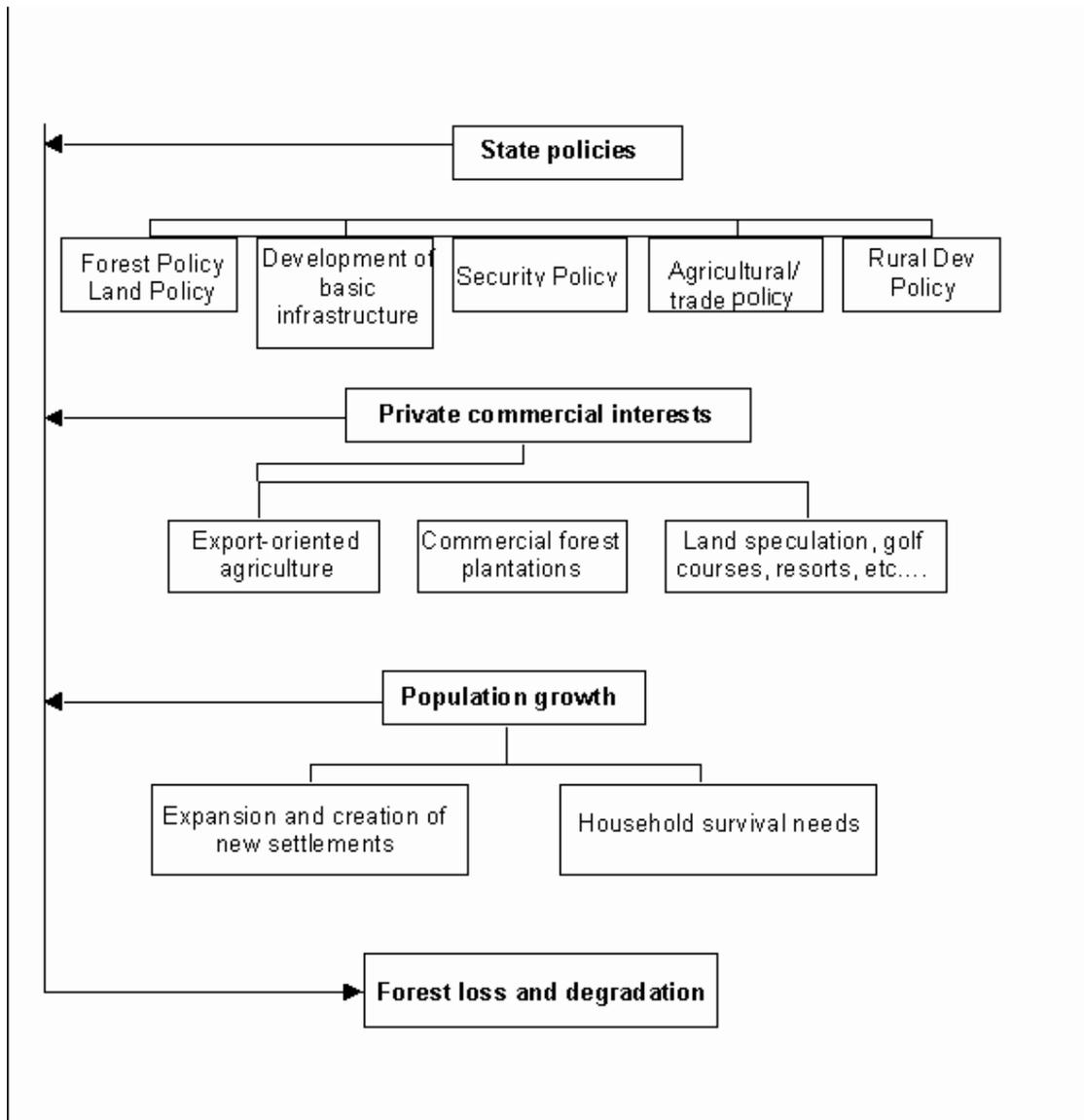
Box 1. Reported adverse impact of deforestation on river flow

The Director General of the RFD, Mr. Plodprasop Suraswadi, recently stated that the level of the Chao Phraya River, the central region's lifeline, could fall drastically over the next seven years unless there is a quick end to deforestation in upstream watershed areas (The Nation 20-8-99). Before 1993, the volume of the river was recorded at 4.925 billion cubic meters. At present, it is only 2.391 billion cubic meters and could decrease by 96 % to some 180 million cubic meters by the year of 2006 if deforestation continues at its current rate. The widespread destruction of the watershed forest upstream from the Nan River that supplies the Chao Praya River, could deplete that river's flow from 11 billion cubic meters at present to 6.685

billion cubic meters in the next seven years. At least 480,000 ha of the total 1,280,000 ha of forest have been affected by deforestation. Deforestation from the Yom River, another feeder of the Chao Phraya River, could also bring its current volume of 3.65 billion cubic meters down to 2.072 billion cubic meters by the year of 2006.

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As well as the direct and indirect impacts of deforestation on the ecosystem, forest degradation also degrades the life of people living in and adjacent to forests. This gives added emphasis to the sentiments expressed in the proposed community forestry legislation that effectively managed community forests will contribute to the national interest by improving the quality of life of forest dwellers.



6. BRIEF HISTORY OF FORESTRY IN THAILAND

In summary, the history of Thai forestry can be divided into four stages:

- i. Mid-1890s to early 1930s. This is referred to as the stage of exploitation with the RFD being established in 1892 to regulate forest exploitation, particularly in the northern

teak forests. During this time, commercial logging commenced.

- ii. 1930s to early 1960s. This stage is called the forest exploitation and management period when logging became an important economic activity. During this time, the Forest Industries Organisation (FIO) was established.
- iii. 1960s to 1980s. This is the stage when forest exploitation peaked and declined. During this period, export-oriented agriculture expanded rapidly, and national economic development gained momentum. Forest management was also introduced but achieved only limited success.
- iv. Late 1980s to the present. The forest declined to a point where the nation decided that the remaining forest should be kept for conservation rather than further exploitation.

Timber from Thailand, particularly teak, has long been a valuable export commodity on the world market. Records show that in 1927 there were 32 forest concessions in force, mainly operated by European companies, and that these yielded one and a half million teak trees (Tai-Usa 1992).

For more than a century Thai forestry operated in the form of a partnership aimed at producing commercial timber. The first partnership was between the feudal chiefs and logging concessionaires in the 1880s. However, it soon became evident that exploitation was not well controlled, and King Rama V established the Royal Forest Department in 1892 to exercise some control. This started the second partnership, between the State and logging concessionaires. The RFD was mandated to oversee timber harvesting and regularise tax revenues. Perhaps the most far reaching change was the vesting of all forest land in the King. During more recent times the Department has been involved in establishing a regulatory framework to define forest management procedures and practices, with the aim of ensuring that the forest was managed sustainably. However, in reality, the industry maintained the major control over forest

operations, with the result that the forests were rapidly over cut and degraded.

Forest conservation became a more explicit part of management in the 1960s with the establishment of the first National Park. This marked the beginning of an era where conservation and protective functions of the forests began to assume greater significance. This era culminated in some respects with the issuance of a Royal Decree in January 1989 terminating timber concessions in the uplands. This was in response to severe flooding and consequent loss of life that were presumed to be linked to industrial timber harvesting. Strong public pressure played a significant role in influencing these official actions, and demonstrated the increasingly powerful role being played by civil society in national resource management decision making.

A fundamental problem with both the partnerships described above, was that the large number of people who lived in and around the forests, and who depended on the forests for subsistence and other purposes, were largely excluded from participation². Local people were alienated from the process and were considered to be illegal encroachers. During the past 20 years the relationship between the RFD and the citizens of Thailand could be characterised as divisive - "strong links to an authoritative establishment and arbitrary enforcement of laws have resulted in alienation of the populace and NGOs by RFD" (IUCN 1996: 15).³

The Government has embarked on a series of initiatives to encourage protection of the remaining forests and to encourage private sector involvement in the development of plantations. Several groups have become involved in establishing fast growing species, generally eucalypts, to meet pulpwood demands. However, results to date seem to be qualified.

Natural forests have declined dramatically in both area and quality throughout this century, and it has become clear that other forms of partnership will be necessary if forest degradation is to be halted and reversed. At the present time there is vigorous debate within the bureaucracy and civil society about the nature of the partnership needed to ensure that Thailand's forests are managed in a sustainable and equitable fashion.

Mingsarn *et al.* (1995) reported that the perception of environmental degradation by many of the Thai conservation NGOs (generally urban based) is similar to that of the government and academics. Deforestation, water use, urban and industrial pollution are all priority issues for these NGOs as they are for government agencies. However, the two groups have different views on the possible causes of these problems and on the approaches needed to solve them. Conservation NGOs have focused on forest conservation as one of their major concerns. They also attempt to draw the government's attention to the negative impacts of infrastructure development such as dam construction on forest and watershed ecology as well as on the forced eviction of rural communities from forest reserves.

Meanwhile, development NGOs tend to emphasise community forestry as a potential answer to forest conservation problems and as an important tool to achieve sustainable land use and rural development (Mingsarn *et al.* 1995). Some NGOs have strongly resisted commercial plantation schemes while the government sees commercial plantations as part of the solution to address the shortage of industrial wood products caused by deforestation and forest degradation.

7. EVOLUTION OF FOREST POLICY

A series of Royal Orders, Decrees and Acts of Parliament have been used to define forest policy, with the focus changing as the priorities for forest management changed. The following time line gives an historical perspective of the Thai forestry legislation.

- 1874, a Royal order was issued to collect tax on the export of timber;
- 1897, a Royal Order was issued to regulate cutting in teak forests;
- 1913, the Forest Conservation Act was passed during the time of King Rama VI;
- 1938, the Forest Protection and Reservation Act was passed to categorise forest as protected forest or reserved forest;
- 1941, the Forest Act was passed, which provided the most comprehensive coverage of forest law. It has been amended several times, but remains the basis of forest law. It regulates forestry related activities on all lands that are not under private ownership and prohibits the felling of certain species of trees whether they are on private or public lands;
- 1964, the National Reserve Forest Act was passed with the intention of slowing deforestation by including forest into the National Forest Reserves system. A target was established to set aside 50% of the country's land area as forest;
- 1960, the Wildlife Protection and Preservation Act was passed;
- 1961, the National Park Act was passed;
- 1975, the Enhancement and Conservation of Environment Quality Act was passed;
- 1992, the Forest Plantation Act was passed.

There are other major pieces of legislation that impinge on the forest sector. The most important of these are:

- Land resources: The land code of 1954 is a major law governing the acquisition of land by private individuals, the acquisition of land title deeds, legal procedures regarding land rights, etc;
- The Agricultural Land Consolidation Act of 1974 is intended to provide land development for agricultural purposes through the consolidation of multiple parcels of land;
- The Agricultural Land Reform Act of 1975 is concerned with the allocation of state-held land (which the state had purchased) to agricultural workers or to those who intend to pursue agricultural occupation;
- The Land Development Act of 1983 authorises the committee on land development and the Department of Land Development to undertake any activity related to improving the efficiency or quality of land including soil and water conservation.

A National Forest Policy was drawn up and adopted by cabinet in 1985 in an attempt to unify forest policy in the country and to place forestry within the context of overall national development. The process of preparing the policy was thorough and detailed, with extensive public hearings and input. Reforestation and afforestation were seen as important initiatives to supply future wood needs. This part of the policy encouraged the private sector to become involved in tree planting projects for both domestic and export supply. Emphasis was placed on a partnership with the private sector. However, the private sector was interpreted to mean concessionaires and business people rather than rural people.

Although the forest policy was adopted by cabinet in 1985, it is widely considered that it did not give adequate attention to three crucial areas (RFD, 1993). These are:

- Deforestation, with all its negative impacts, continued because its root causes were not addressed.
- The Kingdom's household and industrial wood demand was not met in a sustainable manner.
- The conflict over forest land use by many "illegal" occupants of state forest land remained unresolved, thereby accelerating land degradation and maintaining social tension.

Since 1985 forest policy has been overtaken by events that have dictated shifts in policy directions. The 1989 cancellation of logging concessions in natural forests was partly in response to the fact that forest administration had lost effective control over logging. This was also interpreted as a signal that forest conservation and protection were more important to the Kingdom than industrial wood production. The cancellation was made permanent in 1992 and state forest administration has moved from wood harvesting to conservation forestry. The 7th Five-Year Plan (1992-1996) proposed that 25% of the Kingdom should be protected as conservation forest (i.e. virtually all of the remaining forest).

In the early 1990s another major forest policy planning exercise was commenced. The Thai Forest Sector Master Plan was a wide ranging exercise but was largely driven by outside technical experts, and seems to have had little national ownership. In addition, the process and outcomes have been severely criticised by NGOs (both inside and outside the country) on three basic counts (IUCN 1996):

- The plan did not pay sufficient attention to broader sectoral issues;
- The plan was not sufficiently attuned to changing societal interests in forest management, particularly the shift from an emphasis on exploitation to one on conservation;

- The process used to develop policy positions was too technically driven and lacked effective participation of key stakeholders.

As a result of these shortcomings the plan has never been implemented.

To address deforestation problems, RFD has been working with different programmes in land settlement, agro-forestry, reforestation and land entitlements in reserve forest areas. These activities are supplemented by other site-specific projects in watershed conservation in highland agriculture, mini-watershed development, and village woodlot programmes. The main objectives of these programmes are to:

- i. encourage tree planting on large to medium scales;
- ii. increase forest plantation areas to compensate for the loss of national forest land;
- iii. organise forest and forest margin populations to include appropriate agricultural technology;
- iv. increase the domestic production for the improvement of the people's living condition.

The reforestation programme of RFD seeks to solve the problem of timber shortages, degradation of forest land, and help to address rural poverty (RFD 1984). The programme has the following main objectives:

- i. *Economic*. Planting forest for economic benefit to produce income in various ways such as from logs, fuel wood, posts or wood pulp.
- ii. *Conservation*. Planting forest for protection means that there is no direct economic return but instead watershed areas are protected and soil erosion is prevented.
- iii. *Social*. Planting forests can give direct and indirect social benefits especially in rural areas where people's lives are bound to the forest. This is based on the

assumption that if people in or nearby the forest areas have secure work and income besides having land to farm, then the problems of forest destruction will be gradually reduced.

Responsibilities for reforestation within RFD are shared by a number of its divisions:

- *Silviculture Division*: responsible for teak plantation, planting of important non-teak hardwood species, establishment of nurseries.
- *National Forest Land Management Division*: responsible for planting degraded national forest reserves and establishing forest villages.
- *Watershed Management Division*: responsible for restoration of watershed areas, implementation of the village woodlot programme for the hill tribes and protecting natural forest in watershed areas (RFD 1987).

NGOs play an important role in Thai society, and many of them are actively involved in rehabilitation activities, often as part of a wider agenda. NGOs include people's organisations, temples and schools. The forestry related concerns of this sector are mainly:

- Social action involving community forestry
- Advocacy of local people's rights
- Conservation and improvement of the environment

The 8th NSED Five Year Plan (1996-2001) outlines proposed activities for the forest sector and is probably the best indicator of the current focus of policy. A summary of relevant sections covers:

Private and Land Reform Lands

- Encourage people's participation in reforestation & forest management
- "Economic zone": support loans and crop insurance for "reforestation" with fast growing species on 800,000 ha
- Support the private sector to develop forest plantations on 160,000 ha

Conservation Forest

- i. Continue and extend demarcation of boundaries
- ii. Buffer zones: promote management by community forestry
- iii. Provide loans for farmers in buffer zones to develop agroforestry

It is clear that participation of local communities is seen as a major method of implementing policy and of ensuring sustainability. There is also a strong emphasis on activities aimed at rehabilitating degraded forests. This focus is reinforced in the implementation guidelines for the 8th Plan (1996-2001), which emphasise:

- A. Protection of the remaining forest
- B. Forest rehabilitation and promotion of reforestation
- C. Administration and research development

The growing interest in community involvement in forest management led to the drafting of a Community Forestry Bill in 1996. However, there is considerable opposition from various sections of society to allowing communities to live in and use forests, and the Bill has so far failed to pass through Parliament.

The new Constitution of Thailand (1997) also places considerable emphasis on the rights of rural people in participating actively in the management and use of natural resources. Key clauses in the Constitution are:

Section 3: Rights and freedom of the Thai people

Clause No. 46: Communities shall have the right to preserve and restore the traditional culture, knowledge and local fine arts of their local community and of the nation, and participate in the management, maintenance, preservation and utilisation of natural resources and the environment in a balanced way as provided by law.

Clause No. 56: The human right to participate with the state and community for maintenance and utilisation of natural resources and biodiversity and protect and promote the quality of environment for better living and better quality of life. This right must be covered by law.

Section 5: Basic policy guideline for the state

Clause No. 79: The state shall promote and encourage public participation in the preservation, maintenance and balanced exploitation of natural resources and biological diversity and in the promotion, maintenance and protection of the quality of the environment in accordance with development principles.

These principles enshrined in the Constitution give the clearest indication to date of the direction that future resource management is likely to take, and may provide an added stimulus to passing a Community Forestry Bill.

8. EXPERIENCES IN REHABILITATION OF DEGRADED FOREST LAND

8.1. Approaches to forest rehabilitation

The first reforestation trial in Thailand was initiated in 1916 in Phrae Province by using direct seeding, although there seem to be no records of the results. Larger scale efforts date from the 1960s and have been concentrated on degraded forest land

both inside and outside conservation forests. The major objective of activities outside conservation forests has been to produce an industrial crop for the wood processing industry. Activities inside conservation forests have aimed primarily at rehabilitating the protective function of the forest. Table 4 indicates the increasing emphasis on reforestation activities in the RFD after the 1960s.

Table 5: Area of land reforested during different periods of the National Social, Economic and Development Plan (NSED P)

NSED P	PERIOD	AREA PLANTED (ha)
Before NSED P		8,754
1 st NSED P	1961-66	12,409
2 nd NSED P	1966-71	25,965
3 rd NSED P	1971-76	57,788
4 th NSED P	1976-81	305,691
5 th NSED P	1981-86	210,072
6 th NSED P	1986-91	
7 th NSED P	1991-96	
8 th NSED P	1996-2001	
Total		620,679

The emphasis in many of the reforestation programmes of RFD has been to create "protective" forest cover for watershed protection. However, because of the view of RFD staff about the

legitimacy of people residing inside forest reserves, local people's needs are not considered in most of these programmes, regardless of how important the forest is to supporting local livelihoods⁴. Consequently, many activities (particularly in the past) tended to be very top down in planning and implementation and excluded local people from any meaningful role. In addition, most reforestation projects use monocultures, particularly pines, in watershed areas, and these have limited value for local people. Eucalypts have also been promoted throughout the country for industrial plantations and in some cases as agro forestry crops. These also have limited value to local people.

Table 6: Major RFD plantation establishment programmes for the 41 year period 1956 to 1997

OBJECTIVE	AREA (ha)	DISTANCE (km)
Conservation forest with major activities:	1,148,807	
1. Planted in conservation forest such as		
1.1 Conservation forest /conservation mangrove forest	164,932	
1.2 Watershed area	277,313	
2. Planted under H.M. The King's celebration project	226,562	
Planted in economic forest	953,297	
1. Community forestry development	26,040	
1.1 Community forestry	288	

1.2 Buffer zone	5,536	
1.3 Multipurpose trees planted for home consumption	379,345	
2. Economic forest		
3. Project for adjustment of production system	149,958	
4. Project for replantation demonstration		
4.1 Reforestation demonstration	5,584	
4.2 Distribution	287,697	
5. Golden Jubilee Project		
5.1 Planted in government office and public land	98,849	733,774
5.2 planted on both side of the road		
Total	2,102,104	733,774

Source: Charuphat, 1998.

In 1996, the Northern Farmer Network in the eight provinces of upper northern Thailand made plans to initiate forest rehabilitation and forest protection which they called the "50 million tree ordination". About 100 community forests have been selected as sites for planting 50 million trees under this programme, covering an area of 25,600 ha. It is too early to judge the effectiveness of this initiative.

In 1993 a change of government policy on reforestation, emphasis directed towards supporting farmers to plant trees on their own land. This programme aimed to reduce the conflict with local

people over land use rights, to reduce forest encroachment and to increase the production of economically trees.

The programme provided cash incentives for up to five years for farmers to plant and protect trees. The total incentive amounted to 3,000 Baht/rai/5 years. However, uncertainties over the allocation of benefits from the forest limited the interest of farmers in the scheme. It seems to have been viewed by farmers as a wage labour scheme to plant trees for the government (TEI, 1996).

In 1994 a major reforestation programme was activated in recognition of the Royal Golden Jubilee. Targets set for reforestation in each region were: North, 531,286 ha (65.4%); North east, 159,838 ha (19.7%); Central, 83,704 ha (10.30%) and South, 38,036 ha (4.7%). As with many other similar programmes, the major emphasis was directed to the Northern region.

Promising approaches have been developed by the Forest Restoration Research Unit at Chiang Mai University to rehabilitate degraded forest ecosystems by using strategic plantings of natural species (Elliott *et al.* 1998). Emphasis is given to careful matching of species to the site, producing robust seedlings and working in partnership with local communities. Examples are given of using low density "framework" plantings to minimise costs while maximising impact. The approach is useful in degraded watersheds and protected areas where increasing biodiversity and improving environmental services are important considerations.

8.2. Industrial plantations

In 1967, the private sector became involved in reforestation programmes, primarily to provide raw material for industry. Legislation was approved in January 1983 enabling the private sector to invest in forest plantations on degraded national forest reserves and private lands. This Act also allows the

export of wood harvested from private plantations. Planting rent periods vary from 5 to 30 years. The area of plantation established by various public and private groups up to 1987 is shown in Table 7.

Table 7. Area of plantations established by different public and private agencies up to 1987.

AGENCY	SPECIES PLANTED (ha)		TOTAL (ha)
	Teak	Others	
RFD	123,552	436,873	560,425
FIO	37,144	26,476	63,620
Thai Plywood Co. Ltd.	1,829	4,999	6,828
Other private sectors	0	40,080	40,080
Total	162,525	508,428	670,954

Much of the focus of the FIO activities was on tree planting associated with forest village projects, particularly in the northern region. Up to 1993, about 72,051 ha had been established. Two basic approaches are taken to reforestation within this programme:

- i. Support for farmers to grow trees themselves;
- ii. Tree planting around villages using fast growing species.

It is not clear how much of the targeted planting has been achieved.

Table 8. Private sector targets for reforestation programmes

Company	Year of establishment	Annual Planting Programme (ha.)	
		Annual	Target
Thai Plywood	1967	800	16,000
Forest Industry Organisation	1968	800-1,600	800,000
Siam Pulp & Paper	1987	Not fixed	Not fixed
Siam Forestry	1993	32,000	136,000
Forestry Asia	1994	800	24,000
Western Farm	1998	Nursery	Nursery
Asia Tech.	1994	16,000	48,000

Source: Tai-Usa, 1992

Table 9. Priority species for private company plantation establishment

COMPANY	PRIORITY SPECIES		
	1 st	2 nd	3 rd
Thai Plywood	Teak	Eucalyptus	Acacia
Forest Industry Organization	Teak	Eucalyptus	Rubber
Siam Pulp and Paper	Eucalyptus	-	-
Siam Forestry	Eucalyptus	-	-
Forestry Asia	Eucalyptus	Pterocarpus	Teak
Western Farm	Teak	Eucalyptus	-

Asia Tech	Eucalyptus	Acacia	Pine
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Source: Tai-Usa, 1992

8.3. Forest rehabilitation in highland watershed areas

Watershed management became a priority for the RFD in the early 1950s. Public relations work was begun through print and broadcast media to inform people about the damage to soil and water resources caused by frequent fires. At about the same time rehabilitation of denuded watersheds was commenced in the northern region by means of reforestation. A number of RFD stations were established in the north and north east of the country for headwater protection and rehabilitation.

Rehabilitation by reforestation continued on the assumption that only forests can provide ideal hydrological conditions. The watershed management activities were mainly agency-oriented and were focused on technical interventions.

Technical interventions

In 1970, the RFD began to realize the difficulty of trying to stop deforestation and resource degradation without at the same time addressing economic development of the people living in the watersheds. Subsequent approaches focused on economic growth and improvement of living conditions of the farmers, improvement of the environment by seeking alternatives to slash-and-burn agriculture, fostering market oriented agriculture and reforestation. However, it was found that success in introducing alternative livelihood strategies was seriously constrained by an inability to provide farmers with secure land tenure.

From 1965 to 1996, the RFD through its Watershed Management Division rehabilitated 211,231 ha of forest primarily through

reforestation activities, and mainly in the Northern region. The forest rehabilitated in each region is shown in Table 8.

Table 10: Area of forest rehabilitated by the Watershed Management Division between 1965 and 1996

REGION	AREA (ha)
North	153,623
Central	18,028
North east	37,029
South	2,550
Total	211,230

Source:Charuphat, 1998

All highland communities are directly affected by national forest policy and its implementation. As all mountain lands essentially "belong" to the RFD, the highland villagers's rights to use land can be revoked by a forestry officer at any time. At the village level, this policy translates into an enforcement of land use restrictions without redress to any social and economic assistance. An example of how the insecurity of tenure can have a devastating effect on people's lives comes from the experience of the Lahu village of Lo Pa Krai, north of Chiang Mai. Their village and was classified for economic development, and a large tract of this land in the area was awarded by the RFD in Bangkok to the Forestry Industry Organisation (FIO), a government owned company mandated to develop eucalypt plantations. This action essentially disenfranchised the local villagers from their traditional lands, and they were without redress (Ramitanondh and Somswasdi, 1992).

However, the approach of the RFD to watershed management has evolved over the years as experience has been gained. Table 11 summarises the major policy and practical shifts that have taken place in the past four decades.

Table 11. Evolution of watershed management policy in Thailand

PERIOD	POLICY FOCUS	MAJOR ACTIVITIES
1976-1980	Watershed rehabilitation	Reforestation of abandon swidden area; relocations of hill tribe villages and improvement of quality of life.
1980-1990	Integrated watershed management	Land use planning, soil and water conservation measures, forest fire control and promotion of agricultural extension.
1990-1999	Participatory watershed management	Local peoples participation, village committee, watershed network, rules and regulations.
2000-	Watersheds for the people	

Source: Watanapratchee, 1999

8.4. Local experiences in forest rehabilitation

The experience of most small farmers in government or company sponsored reforestation activities is confined largely to the use of eucalypts, and the majority believes that eucalypts have negative environmental impacts. These include competition with other crops, reduction in soil moisture and lowering of water tables in the vicinity of eucalypt plantations. However, these farmers feel that land used for eucalypt planting can still be

utilised for other crops after the stumps are removed. However, they do not think that eucalypts will help to improve the soil, climate and water conditions. They tend to see the adverse effect of eucalypts and therefore, they want the government to promote other tree species in reforestation projects. Local people perceive eucalypts as having economic benefits rather than ecological ones and complain that such economic benefits tend to go to companies and more wealthy farmers rather than to them. Appendix 2 shows the results of a questionnaire survey of small farmers on their perceptions of the economic and environmental impacts the effects of eucalypt plantations.

In one district in north eastern Thailand near the border with Cambodia, the local people's struggle against eucalypts has become a symbol of what can be achieved when people in the community work together for their rights. For almost 10 years, the villagers of Nong Yak and neighbouring communities in Surin province, have engaged in a struggle to reclaim their land from eucalypts. This culminated two years ago, when the local people began cutting down and uprooting the eucalypts on their land. Not only have they regained the rights to manage their land following a cabinet resolution, but they have also received compensation from the government, and have established community managed natural forest regeneration (Thongpan et al. 1990).

There are numerous examples of local communities developing and applying institutional arrangements to govern access and use of forests in the immediate vicinity of their villages. Derno and Warner (1994) report on an Akha village in Chiang Rai Province. The village was located in an area of degraded forest as it was on a major migration path from Burma. Resource degradation reached the stage of causing severe problems to the villagers. Firewood was in short supply and other forest products were not available. About 20 years ago the villagers instituted a set of rules and regulations to control access and use rights aimed at regenerating the natural forest while at the same time allowing

controlled use of the resource. In the intervening period the forest has expanded from almost nothing to about 400 ha. A similar example in a different setting is given by Limchoowong and Pansri (1994).

8.5. Results of rehabilitation activities

Reforestation has aimed to increase the forest area by involving both the private and public sectors. However, the overall impact of reforestation over the last 80 years has been small, with only about 480,000 ha of new forest established across the whole country (*TONGPAN ET AL.* 1990). This contrasts with a deforested area of about 12.8 million ha and an annual rate of forest loss of more than 160,000 ha.

FAO (1988) noted that during the decade of the 1980s, the total area reforested was substantially less than that deforested in a single year. In 1984, only one percent of the land base had been replanted, and in 1985 only 10 % of the annual rate of natural forest destruction was being replanted. As is the case in many countries, most reforestation programmes in Thailand are created to meet the future supplies of industry rather than the needs of rural people (Hurst 1987) and in some situations this has created tension between rural people and government officials.

Even the recent programme to encourage reforestation of some 0.8 million ha in honour of H.M. The King's Golden Jubilee has achieved only qualified success. Charabongse (1995) noted that targets set for the first two years of the initial three year programme were not achieved, with only about 11% of the target figure having been reached at well over the half-way point. As a result the programme is now being extended to 2002 (McQuistan 1999). Technical problems associated with the lack of achievement were considered to be:

- i. Seedlings for planting were not strong enough;
- ii. There was a lack of budget for continuous seedling production.

This result is consistent with the results of other rehabilitation programmes. In addition, it has been noted that the official figures given for plantation establishment targets are often much greater than the area actually planted. Official assessments have indicated that the survival rate for those trees that are planted is generally very low (as reported by the Office of State Budget and Auditing). This office evaluated 18 reforested sites in the northern region and 9 in the southern region. Three major problems were found to be:

- i. The RFD received only 63% of the budget they had requested.
- ii. The survival rate of tree seedlings in the field was only 44-61%. This was mainly due to high competition from weeds.
- iii. Forest areas that were established were encroached or damaged by local people and by forest fire.

It is evident that the area of effective forest that finally results from reforestation activities is likely to be only a small fraction of the area originally targeted for planting. It is equally clear that a critical assessment is needed of the various factors that contribute to such poor performance in order to draw lessons from the experiences of the past and improve practices in the future. This topic is taken up in later sections of this paper.

9. LESSONS LEARNED

Sabrungreong () reported that the expected increase in forest area by government reforestation efforts had achieved only limited success, primarily because of conflict over tenure. It seems clear that unless this conflict is resolved, then even the

land already planted with trees by the government is likely to be encroached by farmers who will ultimately destroy the trees. Farmers perceive that they will receive little or no benefit from the tree planting activities, so they have little vested interest in affording the planted trees any protection. Indeed, their short term interests may well be served better if the trees were not there. To resolve this problem, it is vital to encourage local people to participate fully in planning and implementation of any rehabilitation programmes and to ensure that they are major beneficiaries of the activities.

For more than 10 years, the Watershed Management Division of RFD has gained experience in working with projects focusing on local participation in natural resource management and conservation. Chief among the constraints to achieving success have been:

- The rights of local people to use natural resources,
- The legitimacy of local institutions to make decisions about natural resources use, and
- The weakness of local institutions and organisations (Watanapratchee, 1999).

Chantanaparb and Wood (1986) summarised the problems and constraints encountered by the RFD in reforestation activities as:

- i. Government policy. The policy for natural resource management, especially land resources conveys a mixed image.
- ii. Budget. The establishment of plantations and their subsequent management require a large budget and a lot of time to get a return on the money, so it is necessary to have a budget commitment on a long-term basis rather than the traditional one-year basis.
- iii. Problems of current regulations. The procedure and process for planting is quite cumbersome. In many cases the delay

in processing makes it impossible to carry out planting in the correct season.

- iv. Technical problems. These include the lack of know-how in planting some species, insufficient seeds for the planting season and lack of knowledge in producing seedling.
- v. Planting site. The sites normally available tend to have poor soil fertility, existing weed problems and "illegal" forest dwellers (the last is the most critical problem).
- vi. Hiring labour. This is an increasing problem in some areas because many people have their own occupations that pay better than getting daily wages from working in plantations.
- vii. Marketing problems. The private sector has little confidence that investing in forest plantations will provide a sound financial return.

Experience suggests that relying on hiring local labour for planting trees is not conducive to sustainable outcomes, as there is little sense of ownership of the forest by the local people. Consequently, they have little vested interest in carrying out long term protection of newly established plantations.

Based on past experiences, recommendations have been made aimed at improving watershed management interventions in the future (Apichart 1999). These are that:

- RFD should acknowledge and endorse traditional rules and regulations framed by local communities to conserve watersheds in their village areas.
- Forest and watershed management approaches should emphasis working in partnership with local people and third parties.
- Activities should focus on strengthening the capacity of local communities to manage their own natural resources.

- RFD officers should change their attitude towards forest conservation and try to encourage the active participation of local people.

From a broader policy perspective, the government believes that there are six major issues that need to be addressed (Senator Committee for MoAC, 1997):

- i. Based on the 8th NSEDP, focus on people centred development, search for and encourage the use of local wisdom.
- ii. Focus on natural resources and environmental rehabilitation in both rural and urban areas with the participation of local people (including the promotion of community forestry).
- iii. Improve the administrative system by emphasising decentralisation of authority for resource management to local organisations.
- iv. Focus forestry operations on three areas:
 - Forest protection and conservation with emphasis on people's participation in watershed areas.
 - Reforestation promotion, emphasising community and private management.
 - Administration and research, emphasising agro-forestry with people's participation.
- v. Develop a long-term plan for budgeting to support communities to develop community forests.
- vi. Improvement or revision of necessary forest land, must be decreasing to match with TAŐs decrees. Implement in 1994

10. VISION FOR THE FUTURE

There is a strong interest in Thailand, both within the bureaucracy and civil society, to conserve a significant area of forest for future generations. The purpose is to ensure the provision of environmental services (particularly watershed protection) and biodiversity conservation. During the past several decades the area proposed for retention as forest has been steadily revised downwards from 40% in 1985 to 25% today. The downward revision has been in line with the steady decline in the total forest cover. The continuation of the ban on logging in natural forests indicates an on-going interest in the conservation of forest environmental goods and services over economic benefits from commercial logging⁵. It is also clear that there is a strong desire to rehabilitate the large areas of degraded forest land that have resulted from various practices of the past.

An analysis of the various policy documents presented earlier in this paper indicates a recognition that the RFD, acting alone, cannot exercise sufficient control over forest land to enable it to manage the remnant forests sustainably, or to rehabilitate degraded forest lands. The Director General of the RFD, Mr Plodprasop Suraswedi, is reported as saying that the challenge is to: "find a way to mingle the two (people and forests) with minimum impact (on the forest)" (Bangkok Post, 7-6-99).

Arising from the previous analyses, the key elements of a vision for the future of Thailand's forests seem to be:

- A stable area of forest of about 25% of the land area, mostly reserved within a protected area system.
- Degraded areas of forest rehabilitated to provide commercial and environmental goods and services.
- Community forests under the control of local communities to provide a wide range of economic and environmental goods and services.

- Industrial wood supplies being derived from industrial plantations, community and farm forests, managed to optimise economic goods and environmental services.
- Management of forest reserves being carried out in partnership with local communities, with an equitable sharing of costs and benefits.
- Integration of trees into farming systems throughout the country so that agroforestry can contribute to the provision of both economic and environmental goods and services.
- Integration of trees into urban areas to provide improved environmental benefits for urban dwellers.

A consequence of the vision postulated above is a substantial change in the role of the RFD. In simple terms, this could entail a change from a past role that emphasised policing and licensing functions to a future one that focuses on the facilitation of on-ground forest management in partnership with others.

11. CONCLUSIONS

A variety of direct and indirect factors has contributed to the massive degradation of Thailand's forests throughout this century. According to Anchalee (1995) the most important of the direct factors are:

- i. Encroachment into reserved forest for permanent cultivation;
- ii. Poorly controlled concessionaire logging operations;
- iii. Shifting cultivation;
- iv. Harvesting of wood fuel;

v. Illegal logging of teak and other forests;

vi. Infrastructure development.

A rapidly expanding population and rapid economic development have also contributed to the difficulties of containing forest destruction and degradation and carrying out effective rehabilitation.

One of the major indirect (underlying) factors contributing to forest destruction is the lack of interest by rural communities in forest conservation and sustainable use. The reason for this seems to be linked to the lack of security of tenure over land, not necessarily "ownership" *per se*, but security of access and use rights.

The implicit assumption of past policy is that biodiversity conservation is being addressed by setting aside a network of different categories of protected areas. As a result, little attention is being paid to addressing biodiversity conservation in other land use categories. However, as deforestation and forest degradation continue to erode the biodiversity base of the country, it is becoming increasingly clear that the protected area system alone will not be sufficient to ensure that biodiversity is adequately conserved⁶. Analyses in many countries have indicated that, while a well designed network of protected areas provides the essential backbone of conservation needs, attention should also be paid to a conservation agenda outside the protected areas (Kanowski *et al.* 1999). The introduction of biodiversity conservation as an element of rehabilitation activities is one way of doing this.

An inevitable conclusion of the material presented in this paper is that, without a fundamental revision of the relationship between the government and civil society (particularly rural communities) there will be a continuing decline in forest area and condition. This conclusion has been stated in various ways

by many observers, and the policy evolution in the Watershed Conservation Division of the RFD suggests that there are signs that some parts of the Department are also moving in this direction.

The growing interest in legislating for recognition of community forests is another sign of the move towards greater devolution of forest management from central agency domination to more diverse forms. This move is underpinned by the new Constitution which makes clear statements regarding the rights of citizens to conserve and sustainably manage natural resources. The challenge for the future is for the bureaucracy to adapt to changing circumstances so that it can become a more effective partner and contribute to achieving a stable, productive and protective forest cover.

Perhaps the most fitting final comment for this paper is a quote from an address made by a former Prime Minister of Thailand and reported in the Bangkok Post in early November 1999. He is reported as saying that the needs of society will be best served in the long run by "dynamic (government) agencies constantly reacting to the challenges of the future and not mired in the old ways of doing things. We need to try new programs, listen to new voices, accept and plan for uncertainty. We need, in short, to invest in agency renewal that will look at different ways of doing things." the scale and pace of change will need to be far greater than anything that has ever been considered before. (Fundamental differences and concerns) must be brought out and discussed freely in public sessions increased public involvement in decision-making is a right of all Thai people. The challenge now is to find appropriate ways of re-weaving the people into the fabric of societal decision-making". (Bangkok Post 4-11-99).

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¹ It is worth noting that some Divisions of the RFD, in particular the Watershed Management Division, have been evolving towards a more participatory approach during the past decade.

² Participation as used here refers to a process where the key local stakeholders participate actively in reaching decisions about forest management, in particular in sharing the associated costs and benefits.

³ Following the *coup d'état* in 1991, the Internal Security Operations Command began implementing *khor jor kor*, a massive programme of forced resettlement of families living in National Forest Reserves. The programme was eventually halted by popular protests.

⁴ In spite of this general approach in the RFD, the Watershed Management Division has been evolving towards paying greater attention to satisfying the needs of local people - see Table 11 for changing policy emphasis during the past decade.

⁵ It is worth noting that most of the commercially valuable timber had been extracted before the ban was imposed, and much of the remaining timber has been harvested illegally since the ban.

⁶ As noted earlier, it seems that there are significant gaps in coverage of the existing protected area system. If so, this highlights even more the importance of considering conservation needs outside protected areas.

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ANNEX 3

OVERCOMING TROPICAL FOREST DEGRADATION:

WHETHER TO PLANT MANY SPECIES OR JUST MANY SEEDLINGS.

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ABSTRACT

Large areas of tropical forest are being degraded but satisfactory methods of restoring biodiversity to these have not been developed. Managers are usually forced to choose between restoring biological diversity to a small area by planting a large number of species or, alternatively, restoring just productivity over a large area by planting a large numbers of individuals of a single species. There is, in fact, a wider range of choices and I review some of the options that might be used to foster forest restoration on a large-scale as well as some of the trade-offs that must be made. Promising results have been obtained using dense, species-rich plantings. However these are usually difficult to implement over large areas because of the difficulty of obtaining sufficient seed of many species and because of the costs involved. An alternative is to plant at a

similar density but use a much smaller number of species. This avoids the first of these problems and costs can often be reduced further if species are introduced by directly sowing seed. Biodiversity may then be regained once the succession is initiated if intact forest is nearby and species from this are able to colonise the planted areas. Commercial plantation monocultures represent a third option. Traditional silvicultural practices usually preclude the development of much biodiversity in these but species mosaics, mixed-species plantings or understorey management offer a means by which commercial plantations might yield productivity benefits as well as some degree of landscape biodiversity. Finally, large degraded areas might be reforested using low density plantings that simulate the "perch tree" effect widely observed in many abandoned pastures. Seedling colonisation around these by bird-dispersed species can take place provided intact forest remains in the region. Each of these approaches have advantages and disadvantages depending on the ecological conditions prevailing, the social circumstances and on the resources available for restoration.

Key words: restoration, rehabilitation, rainforest, tropical forest, plantation

1. INTRODUCTION

The extent of degradation and of biological simplification in the world's tropical forests is attracting widespread attention (Brown and Lugo 1994, Elliott et al. 1995, Grainger 1988, Lugo 1988, Parrotta et al. 1997a, Uhl 1988). In some places the original forests have been totally cleared and replaced by grasslands. In others most of the original tree species may still remain in the area but the structure and biomass of the

forest is substantially altered. There is common agreement that some form of rehabilitation should be carried out on these degraded lands. However, there is much less agreement over how this should be done.

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

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

These three alternatives can be represented as a choice between various combinations of two factors. The two factors are the numbers of species used in replanting and the density of individuals planted. The advantage of planting a large number of species (ie. a high proportion of the original biodiversity) at a degraded site is that species diversity is rapidly enhanced and there is a strong likelihood that structural complexity will

also be fostered. This can enhance the likelihood of regaining the former wildlife diversity. The disadvantages of using a large number of species is that it can be difficult to get the seed of many tropical forest species and raise large numbers of seedlings. Further, a high plantation diversity may reduce the commercial yield or financial outcome because it reduces the productivity per hectare of the most commercially preferred species.

The advantage of planting at a high tree density is because it helps to quickly eradicate weeds and also leads to a higher initial productivity. The most obvious disadvantage of a high planting density is that the planting cost is also higher.

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

2. ECOLOGICAL RESTORATION USING DENSE PLANTINGS OF MANY SPECIES

2.1 Method

Dense plantings using many species have been used to restore biodiversity to severely degraded tropical sites in high rainfall areas where few original species remain present (Group A of Fig 1). The implicit goal has been to restore the site to something approaching its original condition (ie. to move from the degraded state at point B to point A in Fig 2). A common approach has been to remove all weeds by intensive tending or weedicide applications and then plant seedlings of a variety of species (Goosem and Tucker 1995, Kooyman 1996, Miyawaki 1993, Tucker and Murphy 1997). All species are planted at the same time at densities up to 3000 trees per ha. and weed control is maintained until canopy closure is achieved. Necessary mycorrhiza can be inoculated on seedlings in the nursery. Since it is rarely possible to replant all the species that might have been originally present, plantings usually concentrate on fast growing species able to quickly occupy the site but may include poorly dispersed species unlikely to easily colonise from any intact forest remnants still present in the landscape. Other species might include those with contrasting life forms (to foster structural complexity), nitrogen fixers, to improve soil fertility, or bird attracting species such as figs (Lamb et al. 1997). Up to 80 tree species per site have been replanted in some studies (Parrotta et al. 1997b, Tucker and Murphy 1997).

At sites where degradation has been caused by mining a similar approach has been used except that more site preparation is often necessary at such sites (Brooks and Bell 1984, Foster 1985, Parrotta et al. 1997b). Success is more likely where topsoil has been removed before mining and stockpiled. This can then be replaced over the old mine tailings. It is also often necessary to rip the new soil material to reduce soil compaction before replanting. Fertilisers are commonly needed since infertile subsoil material may have been brought to the surface by mining and be now part of the rooting zone for the new plant community. Plants can be re-introduced to these mine sites as seedlings although direct seeding is also possible in many

situations since mineral soil is exposed and weeds are temporarily absent.

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

2.2 Problems and Issues

2.2.1 Restoring all species and trophic groups?

It is usually impossible to deliberately restore all the original plant species that might have been present at a tropical forest site, even in the unlikely event that the identity of all of these was known. For example, the numbers of tree species that can be re-introduced is usually much less than 50 per cent of the original tree flora which may total several hundred species in many tropical areas. The task of collecting the seed of such a large number of species is simply too great, especially since most are often represented by only a few individuals per hectare in natural communities. Similarly, in most tropical situations it is usually impossible to directly assist the recolonisation of other plant life forms such as vascular epiphytes or wildlife species. This means that a more likely short-term outcome is to point F of Figure 2; at this point structural recovery is virtually complete but the forest

has not yet regained its initial biodiversity. This may still happen over time with further colonisation from nearby remnants.

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

2.2.2 The proportion of each species to plant

The species used in any reforestation program are often chosen on the basis of certain criteria (eg. nitrogen fixing species, poorly dispersed species with large fruit, rare or endangered species etc.) and using pragmatic considerations such as the availability of seed. However, there are usually few guidelines to suggest what the relative planting densities of these species should be. Many restoration projects use mainly long-lived, secondary species or primary forest species representative of late successional stages. The densities at which these are planted often mean that many individuals are eventually excluded by competition. Since the seed of these species are commonly difficult to collect and it might be preferable to use more easily obtained seed of short-lived pioneers to act as "fillers"

between these desired species. Even though this risks the possibility that some may be temporarily overtopped by the faster growing pioneers, the shade tolerant primary species can normally persist until such time as the fast growing pioneers die. There are presently few guidelines on which to base the proportions of primary forest species or of the proportions of primary species versus pioneer species and care will need to be taken to monitor the outcome of the present establishment methods.

The task is more difficult when shade intolerant species are being used. Rehabilitation of sclerophyllous forest in subtropical Queensland following mining for heavy minerals (rutile, zircon etc.) was originally carried out using 700 gm per ha. of Acacia seed to rapidly enhance the nitrogen content of the replaced soil (Table 2). In initial trials the early community growth was promising and a high plant diversity became established. But after 10 years the Acacia had overtopped all other species and began to shade them out and plant biodiversity plummeted. The site was subsequently burned by wildfire when many Acacia trees began to senesce cause massive regeneration of soil stored Acacia seed and a perpetuation of the monoculture. Trial and error has since reduced the application rate of Acacia seed to only 30 gm per ha. Where species are shade tolerant the problem may not be as significant. In the absence of other guidelines it might be most appropriate to broadly replicate the relative populations of the species in the original forest.

2.2.3 Assembly rules

Studies of successional sequences in a variety of situations have shown the importance of initial conditions in determining community outcomes (eg. (Janzen 1988) but there are few guidelines for determining whether species can be all planted at the same time or whether some planting sequence should be followed. Epiphytes obviously need trees before they can enter a

community but do certain tree species require particular "facilitator" species to enable their establishment? Some evidence suggest they might. For example, some primary rainforest species from mature successional stages appear able to tolerate being established in open conditions but others, such as many south east Asian dipterocarps require some degree of shading for best growth (S. Appanah. pers. com.). Likewise, certain members of the Meliaceae appear to suffer less insect attack and have higher rates of survival when established under some shade than when planted in the open (Keenan et al. 1995). Current approaches to solving this problem rely primarily on trial and error testing.

3. ECOLOGICAL RESTORATION BY PLANTING HIGH DENSITIES OF FEWER SPECIES

3.1 Method

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

introduced by direct sowing in the weed free environment once the new canopy is established (Tucker, pers. com.).

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

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

3.2 Problems and Issues

3.2.1 Poorly dispersed species

Early trials using densely planted seedlings suggest the technique can be quite useful in excluding grasses and weeds and initiating successional processes. The weakness of the approach is its high reliance on further seed dispersal to re-establish significant levels of biodiversity. Certain species, particularly large-fruited species, may have no vectors able to

disperse them across the landscape and into a site being rehabilitated in this way. Such species may never recolonise unless they are deliberately planted (Hardwick et al. 1997, Wunderle 1997).

3.2.2 Weed species

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

3.2.3 Direct sowing

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

ecological situations with a wider variety of species to refine the approach further (Hardwick et al. 1997).

3.3 Commercial timber plantations and agroforestry systems providing some biodiversity benefits

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

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

Plantations of fire - tolerant exotic species such as eucalypts might also be useful in buffer areas to protect stands of more fire sensitive native species.

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

Mixed species plantations can take a variety of forms including random mixes of trees, alternate rows or patchworks of monocultures . These can be established with or without an overstorey nurse crop (Ball et al. 1995, Lamb and Tomlinson 1994, Wormald 1992). Some of the possible approaches are outlined in Table 3. These alternatives all increase the contribution plantations might make to regional biodiversity but they may also offer some functional advantages as well (Kelty 1992, Lamb 1998). For example, there may be nutritional advantages or watershed protection advantages from these more complex designs over that provided by exotic monocultures and

there is now renewed interest in these forms of silviculture in some tropical areas for these reasons alone. Similar benefits can be derived from some forms of agroforestry, especially those involving native forest trees (Cooper et al. 1996, de Foresta and Michon 1997, Wickramasinghe 1995).

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

3.3.1 Problems and issues

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

But even in other circumstances foresters have been reluctant to embrace mixtures. There are several impediments. Perhaps the most important is that the general perception that they are too difficult to manage and that they have a lower productivity. The former is almost certainly true but the latter may not be. In fact there is evidence from a number of trials that productivity can be enhanced in some situations (eg. Montagnini et al. 1995, Lamb 1998, Wormald 1992). The problem is that there is rarely a

good understanding of the overall contribution the plantation makes to the overall regional economy. What are the true overall costs and benefits? Has productivity really been lost? And if it has, is there an accompanying gain because of biodiversity or watershed benefits? Since it is difficult to assess some of these non-market values (eg. the benefits of biodiversity) such comparisons of the real economic or social advantages and disadvantages of various alternative plantation designs are usually not made.

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

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

4.1 Plant isolated trees, clumps or lines in grasslands.

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

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

4.2 Enrichment planting in degraded forests.

In some rainforests heavy logging causes a significant change in structure and stand biomass but has a rather smaller effect on plant biodiversity (Point G in Fig 2). Even though species richness may be reduced on a particular hectare, the landscape as a whole still contains most of the original plant biodiversity. A common solution is to leave such forests to recover unaided or to provide a limited amount of tending of existing seedlings and the growth of residual trees will restore the original structure and productivity over time. But heavy

logging can sometimes remove a high proportion of the population of certain commercially favoured tree species leaving the naturally regenerating forest with a lower representation of these species as seedlings or saplings. As a consequence the forest is likely to have a much lower future commercial value. One way of overcoming this form of degradation is to carry out "enrichment planting" in which seedlings of commercially attractive species are planted in widely spaced rows within the forest (Adjers et al. 1995, Appanah and Weinland 1993, Montagnini et al. 1997). The density of these plantings can be reach several hundred trees per ha. If properly tended these seedlings can grow up in the canopy gaps left by logging and eventually join the canopy layer. A similar approach could be used to increase the populations of endangered, vulnerable or rare species. Unlike the cases of restoration described previously, enrichment planting promotes movement of the system along the structure and productivity axis of Fig. 2 rather than the biodiversity axis.

4.3 Problems and Issues

4.3.1 Poor survival of planted seedlings

Grassland areas are prone to recurrent fire and great care is necessary to exclude fire for sufficient time for the seedlings to become established, even when the species being used may be fire tolerant as adults. This usually means a system of fire-breaks is usually needed (Janzen 1986). Seedling survival in grasslands can also be low because of the competition offered by grasses and the fact that regular weeding is difficult when widely dispersed plantings are used. There are usually no opportunities to replant in these widely dispersed plantings as can be done, for example, in closely spaced commercial tree plantations. However, there are some conflicting reports. Hardwick et al. (1997), working in the seasonal forests of northern Thailand, found higher survival rates at the end of the

hot season for some tree seedlings in sites that were not tended than in sites that had grasses removed by slashing. Likewise, Tolkamp and Aldrianto (1998) noted some species were able to tolerate being planted in grasslands and given minimal tending and survived better than being planted in canopy gaps in secondary forest. These differences may be due to differences in shade and drought tolerance of these particular species.

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

4.3.2 Further seedling colonisation

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

5. CHOOSING BETWEEN OPTIONS

The most appropriate method to use in any particular situation will be governed by both ecological and socio-economic factors.

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

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

Despite such imperatives, any choice represents a series of trade-offs. One of these is the trade-off between the likely rate of biodiversity accretion and the area that can be treated (Fig 3). The Group A methods (many species and high planting densities) rapidly reintroduce large numbers of plant species but the resources needed and costs of doing this are high. Consequently it is usually only possible to treat comparatively small areas using these techniques. Group B methods (few species

but high densities) generate slower rates of recovery although these can still be quite significant if large areas of intact forest remain nearby. Since fewer species are involved it may be feasible to treat larger areas, especially if direct seeding is possible. Group C methods involving commercial forest plantations or agroforestry systems offer the possibility of covering very extensive areas of degraded land.

The rate at which these contribute to the return of biodiversity varies with the plantation or system design but may be significant if understorey development can be fostered. Group D methods involving low density plantings of a small number of species may also enable large areas to be treated but the rate at which biodiversity is likely to increase is slow.

Overall, there is a trade-off between being able to foster rapid plant biodiversity recovery or being able to cover large areas.

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

6. CONCLUSIONS

The massive extent of forest degradation that has occurred in the tropical forest regions, especially this century, needs to be halted and the process reversed. Ecological restoration that

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

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

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Table 1: Summary of some reforestation approaches used to overcome degradation.

Method	To use when
A. High densities of many species.	
1. plant many seedlings of many species.	need rapid site capture and recovery of diversity
2. direct sowing and supplementary plantings of many species	mineral soil is exposed or weeds can be eradicated and large seed volumes of many species are available.
B. High density plantings of fewer species.	
1. plant seedlings of small number of early pioneers	seed-dispersing birds and bats can transfer seed from nearby forest remnants
2. direct sowing of a few early pioneer species	mineral soil is exposed or weeds can be eradicated and seed can be dispersed from nearby forest remnants.

C. High density plantings of a few commercial timber or agroforestry species	
1. nitrogen fixing trees	degraded sites have infertile soils
2. patchwork mosaic of monocultures	there is considerable spatial site heterogeneity and species-site relationships are well known
3. mixtures of plantation species	silviculture of complementary species are known
4. enhanced plantation understorey	forest remnants remain nearby
D. Low density plantings of a few species.	
1. isolated tree or clumps	large areas need rehabilitation and funds are limited
2. line plantings of wind dispersed trees	many species are dispersed by wind
3. enrichment plantings in heavily logged forest	populations of commercial or otherwise desired species are small

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

Process	Benefit
Spread soil material after extracting minerals to re-establish original site	helps restores hydrological character and habitat conditions of site

contours	
Spread stockpiled topsoil (from original 0 - 30 cm depth)	restores mycorrhiza and soil seedbank
Directly sow seed mix (up to 25 species including Acacia and other understorey species)	composition of mix depends on original species present before mining
Sow hybrid Sorghum seed	reduces wind erosion; dies after one year
Add NPK fertiliser	improves topsoil fertility
Spray bitumous coating to stabilise soil (or use brush matting)	reduces wind erosion; brush matting may also contain some seed
Plant seedling of species having very small seed (ie unsuitable for direct sowing)	may not be possible to collect enough seed to allow direct sowing of all species

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

Method	Technical Limitation
Buffer strips around plantation monocultures	reduces overall commercial productivity of site
Patchwork mosaics of monocultures	requires good knowledge of species-site relations
Mixed species plantations	requires knowledge of compatible species and appropriate silvicultural techniques
Encourage understorey	need intact forest nearby as

development	seed source
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ANNEX 4

การฟื้นฟูสภาพป่าไม้ในพื้นที่ทรงงานโครงการ พัฒนาดอยตุง อันเนื่องมาจากพระราชดำริ

เมื่อ พ.ศ. 2530

สมเด็จพระศรีนครินทราบรมราชชนนีทรงมีพระราชดำริที่จะปลูกป่าในพื้นที่ดอยตุง และได้ทรงสร้างพระตำหนักดอยตุง เพื่อเป็นที่ประทับในการทรงงานปลูกป่า

พระราโชบายในการปลูกป่าที่ดอยตุง คือคนและป่า ต้องอยู่คู่กัน ป่าเจริญอกงาม เพราะคน ช่วยดูแลรักษา คนอยู่ได้อย่างผาสุก เมื่อป่าสมบูรณ์ และสามารถทำมาหาเลี้ยงชีพ จากป่าได้

พื้นที่ทรงงานประกอบด้วยป่าสงวนแห่งชาติ และป่าถาวรของรัฐบาล รวม 5 แปลง เนื้อที่ 93,515 ไร่ หรือประมาณ 150 ตารางกิโลเมตร
สภาพพื้นที่ก่อนโครงการพัฒนาดอยตุง เกิดขึ้น ร้อยละ 54 เป็นป่าเสื่อมโทรมที่ชาวเขาปลูกฝิ่นและทำไร่เลื่อนลอย

มีป่าไม้ธรรมชาติ หลงเหลืออยู่ประมาณ ร้อยละ 28
และป่าปลูกอีกร้อยละ 17 รวมป่าไม้ ร้อยละ 45

โครงการเริ่มขึ้นด้วยการชี้แจงทำความเข้าใจกับชาวบ้าน
(ชาวเขา และชนกลุ่มน้อย)
ถึงผลกระทบของสิ่งแวดล้อมที่เสื่อมโทรมกับความเปราะบางของ
พวกเขา พร้อมกับสำรวจความต้องการ
ของพวกเขาจากโครงการ
ทำความเข้าใจกับชาวบ้านอย่างต่อเนื่อง
และมีการปรับความเข้าใจ ให้ตรงกัน อยู่ตลอดเวลา
ซึ่งทำให้ความมีส่วนร่วมของชาวบ้านกับโครงการเกิดขึ้น
และให้ความร่วมมืออย่างเต็มที่

ผลตอบสนองต่อความร่วมมือต้องปรากฏเป็นรูปธรรม
โดยเฉพาะในการเปลี่ยนวิถีทาง
ดำรงชีพจากการตัดไม้ทำลายป่า
เพื่อปลูกฝิ่นและทำไร่เลื่อนลอยมาเป็นการทำเกษตรที่ยั่งยืน
ต้องแสดงให้เห็นอย่างชัดเจนว่าเขาเดินทางไปในท
างเลือกที่ถูกและดีขึ้น โครงการ
ได้วางแผนการปลูกป่าโดยให้ชาวบ้านมีส่วนร่วมทุกขั้นตอน
เริ่มแต่การวัดแปลง หมายหลุมปลูก ขุดหลุม เพาะกล้า
นำกล้าลงปลูก การปลูกซ่อมตลอดจนถึงการดูแลบำรุงรักษา
มีการจ้างแรงงานอย่าง ต่อเนื่อง และจ่ายแจกผลตอบแทน

(ค่าจ้าง) โดยสม่ำเสมอ เพื่อให้เขาได้เห็นว่าการปลูกป่าสร้างชีวิตที่ดีกว่าให้กับพวกเขา

นอกจากให้ชาวบ้านมีรายได้จากค่าจ้างแรงงานเป็นเงินสด โครงการยังให้ผลประโยชน์ ทางอ้อมอีกหลายอย่าง เช่น ส่งเสริมให้ปลูกพืช เงินสด (CASH CROPS)

ในแปลงปลูกป่า ในขณะที่ต้นไม้ยังไม่พร้อมเงาลงบังแสง พืชที่ปลูกแซมเมื่อได้รับปุ๋ยที่โครงการใช้บำรุง ป่าจะเจริญงอกงาม

ให้ผลตอบแทนต่อผู้ปลูกสูงขึ้น โดยไม่ต้องลงทุนส่งเสริมปลูกพืช (กล้วย) ในแนวกันไฟ เป็นต้น

หนึ่งการรับจ้างปลูกป่าเปรียบเสมือนการได้รับทุนการศึกษาวิชาเกษตร ไปในตัวด้วย

การปลูกป่ามีขึ้นทุกปี ในช่วง 5 ปีแรก ของโครงการ (2532^๕ 2536) ป่าแต่ละแปลง ต้องมีการดูแลรักษา 3^๕ 5 ปี ทำให้มีการจ้างงานติดต่อกันในช่วง 10 ปี

พระราโชบาย

คนกับป่าอยู่ร่วมกันยังคงทำให้มีการนำวนเกษตรมาปฏิบัติในพื้นที่ ป่าไม้ ที่สมบูรณ์แล้ว เช่น การนำไม้ดอก

สมุนไพรและพืชเส้นใยบางชนิดที่สามารถเจริญเติบโต

ได้ภายใต้ร่มป่ามาปลูก เพื่อเป็นรายได้เสริม

เมื่อคนพึ่งป่าได้ คนก็ต้องรักษาป่าเอาไว้ทำนอง

"ไม่ทุบหม้อข้าวของตัวเอง"

การปลูกป่าตามแนวพระราชดำริ

ไม่มุ่งเน้นเฉพาะการอนุรักษ์ แต่เป็นการปลูกป่า

เอนกประสงค์

มีการศึกษาสภาพดินและสิ่งแวดล้อมก่อนการตัดสินใจว่า ณ
พื้นที่ใดควรปลูก ป่าไม้ชนิดใด ดังนั้น

ในการปลูกป่าจึงมีทั้งป่าอนุรักษ์ ป่าเศรษฐกิจและป่ายังชีพ
ทราบเท่าที่ พันธุ์ไม้ที่นำมาปลูกมีระบบ

รากที่สามารถยึดดินไม่ให้เลื่อนไหลและมีใบเขียวชะอุ่มตลอด
ทั้งปี สำหรับฟอกอากาศให้บริสุทธิ์

และให้ความชุ่มชื้นต่อบรรยากาศ เพื่อชะลอหรือป้องกันภาวะ
เรือนกระจก (GREEN HOUSE EFFECT) ได้บางส่วน

ป่าเศรษฐกิจและป่ายังชีพ

มีความหมายโดยเฉพาะในโครงการพัฒนาโดย

ป่าเศรษฐกิจคือ

ป่าไม้ที่ให้ผลตอบแทนในเชิงเศรษฐกิจที่นอกเหนือจากการน
ำเนื้อไม้มาใช้ ประโยชน์ เช่น ต้นแมคคาเดเมีย

และกาแฟอาราบิก้า ส่วนป่ายังชีพ คือไม้ผลที่ปลูกในลักษณะ

ของป่าไม้ พืชหลายชนิดอยู่คู่กัน ในสภาพป่าไม้

ผลไม้คือส่วนที่เจ้าของสามารถเก็บเกี่ยว

แล้วนำไปขายหรือบริโภคได้ สิทธิในที่ดิน

มีเพียงต้นไม้ที่ถือ เป็นทรัพย์สิน ส่วนที่ดินยังคง เป็นของรัฐ

ผู้ใช้ประโยชน์ต้องจ่ายค่าเช่าเป็นรายปี

พื้นที่ทรงงาน โครงการพัฒนาโดยตุง

โดยนัยทางกฎหมายเป็นป่าสงวนแห่งชาติที่เสื่อมโทรม

แต่โดยนัยทางภูมิศาสตร์เป็นป่าต้นน้ำลำธาร

เมื่อสมเด็จพระศรีนครินทราบรมราชชนนี ทรงปลูกป่า

จึงมีพระราชดำริ

ให้เป็นการปลูกป่าถาวรเลียนแบบป่าธรรมชาติ

ในระยะแรกมี การนำพันธุ์พืชที่เจริญเติบโต รวดเร็วมาปลูก

ก็เพื่อยับยั้งการเลื่อนไหลของดิน และเพิ่มชีวมวล

เพื่อให้โอกาสแก่พันธุ์พืชดั้งเดิม สามารถฟื้นกลับขึ้นมาใหม่

ในปัจจุบัน สภาพการฟื้นกลับเริ่มเกิดขึ้น

ในสักวันหนึ่งข้างหน้าสภาพป่าไม้อันอุดมสมบูรณ์

จะคืนสู่เทือกเขานางนอน

หรือบรรลุตามพระราชปณิธานที่ลูกหลานไทย

ผู้มีความจงรักภักดีมุ่งมั่น ที่จะสืบสาน

ในขณะที่งานปลูกป่ากำลังดำเนินอยู่

งานพัฒนาคุณภาพชีวิตต้องดำเนินควบคู่ไปด้วย

ถ้าความยากจนยังรุมเร้าคนก็ต้องดิ้นรนเพื่อความอยู่รอด

ช่องทางใดที่สามารถหารายได้จะฉกฉวยทันที ดังนั้น

ในระยะเริ่มต้น โครงการฯ ได้เร่งระดมปลูกป่า

กระจายทั่วทั้งพื้นที่เพื่อกระจายงานไปสู่ชุมชน ให้มากที่สุด

ในวันหนึ่งๆ มีการจ้างแรงงานนับพันคน

นอกจากการเร่งพัฒนาสิ่งแวดล้อม

การดูแลด้านสุขภาพอนามัย การส่งเสริมการศึกษา

การพัฒนาโครงสร้างหลักและสาธารณูปโภคได้เกิดขึ้นด้วย

เป็นการเพิ่มพูนการจ้างงานและทักษะ

ให้แก่ประชาชนในพื้นที่

การพัฒนาดังกล่าวต้องมีแผนปฏิบัติงานที่ชัดเจนกำหนดขึ้นโดย

อาศัย วัตถุประสงค์และเป้าหมายของโครงการเป็นหลัก

ทั้งนี้ เพื่อให้หน่วยงานต่างๆ อันประกอบด้วย

หน่วยราชการจาก 6 กระทรวง 35 กรม

รัฐวิสาหกิจหลายแห่ง และภาคเอกชนได้ทำงานที่ประสาน

เป็นหนึ่งเดียว

มีความเป็นเอกภาพไม่ปฏิบัติงานอย่างไรก็ตาม

ภาพของความก้าวหน้าที่เป็นรูปธรรม

ปรากฏชัดหลังจากเวลาผ่านไปกว่า 10 ปี

ผู้ที่เคยมาเยือนดอยตุงแต่อดีต และได้กลับมาอีก ณ บัดนี้

สามารถยืนยันความแตกต่างจากอดีต

ซึ่งเคยเป็นโชดเขาที่โล่งเตียน เต็มไปด้วยความแห้งแล้ง

และประชากรที่อดทุกข์ กลายเป็นดินแดนที่เขียวขจี

ผู้คนยิ้มแย้ม อิ่มเอิบด้วยความสุข

นับว่าสมเด็จพระศรีนครินทราบรมราชชนนีได้พระราชทานชีวิต

ใหม่ ที่ผาสุขให้แก่พวกเขาในพื้นที่แห่งนี้

สำนักงานประสานงานโครงการพัฒนาดอยตุง
(พื้นที่ทรงงาน) อันเนื่องมาจากพระราชดำริ
อาคารเอนกประสงค์ พระตำหนักดอยตุง อำเภอแม่ฟ้าหลวง
จังหวัดเชียงราย โทรศัพท์ (053) 767001 , 767015 -
7 โทรสาร (053) 767077

ANNEX 5

กิจกรรมป่าชาวบ้านในพื้นที่ปฏิบัติงานโครงการ รหลวง

1. ความเป็นมา

โครงการหลวงได้ทำการศึกษาวิจัยปลูกไม้ผล พืชผัก
และไม้ดอก มาตั้งแต่ปี 2512 จนกระทั่งปี 2525
จึงได้ทดลองหาพันธุ์ไม้ที่จะขึ้นได้ดีในพื้นที่สูง
ในอันที่จะฟื้นฟูสภาพของป่า ในพื้นที่
โดยมีคณะอาจารย์จากมหาวิทยาลัยเกษตรศาสตร์และองค์กา
รทหารผ่านศึกได้หวัน ร่วมสนับสนุน
เพื่อที่จะได้เป็นประโยชน์ตามพระราชประสงค์ของพระบาทสม
เด็จพระเจ้าอยู่หัวฯ
ในปัจจุบันนี้ได้พบว่าไม้โตเร็วและไม้ไผ่จำนวนมากหลายชนิดที่สา
มารถขึ้นได้ดีบนพื้นที่สูงและทั่วไป
จากการที่สมเด็จพระเทพรัตนราชสุดาฯ

ได้เสด็จพระราชดำเนินเยี่ยมศูนย์พัฒนาโครงการหลวง
แก่งน้อย เมื่อวันที่ 3 กุมภาพันธ์ 2537
และได้ทรงทราบถึงปัญหาการขาดแคลนไม้ฟืนของ
เกษตรกรในพื้นที่ จึงทรงโปรดให้มีการปลูกไม้โตเร็ว
เพื่อใช้เป็นเชื้อเพลิงเพื่อลดปัญหาที่เกิดขึ้น และทรงรับเป็น
องค์อุปถัมภ์โครงการปลูกป่าชาวบ้านของมูลนิธิโครงการหลวง
ด้วย

2. วัตถุประสงค์

2.1 เพื่อส่งเสริมให้เกษตรกรในพื้นที่เป็นผู้ปลูก ดูแลรักษา
และได้รับประโยชน์จากไม้ ที่ปลูกโดยตรง

2.2

เพื่อเป็นการอนุรักษ์และฟื้นฟูป่าต้นน้ำลำธารในพื้นที่โครงการหลวง

3. หลักการดำเนินงาน

3.1

เป็นการดำเนินงานตามแนวพระราชดำรัสของพระบาทสมเด็จพระ
เจ้าอยู่หัวฯ เกี่ยวกับการปลูกป่า 3 อย่าง
แต่ได้ประโยชน์ 4 อย่างคือ ป่ากินได้ ป่าฟืน
ป่าใช้สอยหรือสร้างบ้าน และประโยชน์ที่ 4 คือ
ป่าเพื่อการอนุรักษ์

3.2 ปลุกในที่ซึ่งสำรวจแล้วว่าควรเป็น "ป่าเพื่อการผลิต"
คือเมื่อตัดฟันไม้มาใช้ประโยชน์
แล้วจะไม่ก่อให้เกิดความเสียหายต่อสิ่งแวดล้อม

3.3 เน้นส่งเสริมการปลูกและการดูแลรักษาต้นไม้ที่ปลูก
ให้อยู่ในพื้นที่ทำกินของเกษตรกร
แต่ละรายบุคคลหรือครัวเรือน

3.4 เกษตรกรสามารถตัดฟันไม้ที่ปลูกมาใช้สอยได้โดยอิสระ

4. การเตรียมการดำเนินงาน

4.1 สำรวจและจำแนกพื้นที่ให้เหมาะสมต่อการใช้ประโยชน์
โดยไม่ก่อให้เกิดความเสียหาย ต่อสภาพแวดล้อมของพื้นที่

4.2 แนะนำและควบคุมการจัดการพื้นที่
โดยเน้นการใช้พันธุ์ไม้ และประโยชน์ของพื้นที่ เป็นหลักคือ

4.2.1 พื้นที่อนุรักษ์จะไม่ให้มีการตัดฟันไม้มาใช้ประโยชน์

4.2.2

พื้นที่ส่งเสริมให้มีการปลูกเพื่อเป็นป่าไม้ที่ให้ผลทางเศรษฐกิจ
สามารถตัดฟัน ไม้มาใช้ประโยชน์ได้

4.2.3 พื้นที่ที่เหมาะสมในการทำกิจกรรมการเกษตร เช่น
ปลูกไม้ผล พืชไร่ ไม้ดอก และ พืชผัก
ให้พิจารณาตามหลักการให้เหมาะสมของพื้นที่และภูมิอากาศ

5. ชนิดพันธุ์ไม้ที่แนะนำ

5.1 กระถินดอย (*Acacia confusa*)

5.2 เมเปิ้ลหอม (*Liquidambar formosana*)

5.3 จันทร์ทอง (*Fraxinus grifithii*)

5.4 การบูร (*Cinnamomum camphora*)

5.5 เพาโลว์เนีย (*Paulownia taiwaniana*)

5.6 ไม้หมาจู้ (*Dendrocalamus latiflorus*)

5.7 ไม้สีจู้ (*Bambusa oldhamii*)

6. ระยะเวลาการปลูก

ควรเริ่มปลูกตั้งแต่ปลายเดือนพฤษภาคมเป็นต้นไป

ซึ่งเป็นช่วงต้นฤดูฝน โดยเฉพาะบนที่สูง

ฝนเริ่มตกเร็วกว่าพื้นราบ โดยแบ่งระยะเวลาการปลูกออกเป็น 2

ลักษณะคือ

6.1 พื้นที่ปลูกเป็นผืน หรือเป็นแปลง

6.1.1 หากไม่ปลูกพืชอื่นควบในแปลงป่าชาวบ้านฯ

ควรปลูกระยะประมาณ 2x2 เมตร

(ส่วนมากเป็นพื้นที่ที่ดินขาดความอุดมสมบูรณ์)

6.1.2 หากปลูกพืชอื่นควบในแปลงป่าชาวบ้านฯ เช่น ข้าวไร่ ข้าวโพด ถั่วลิสง ฯลฯ ควรปลูกระยะประมาณ 2x4 เมตร เพื่อให้สะดวกในการดูแลรักษา

6.2 พื้นที่หัวไร่ปลายนาที่ว่างเปล่าหรือปลูกตามแนวรั้ว ให้พิจารณาระยะปลูกตามความเหมาะสมกับพื้นที่

7.

คำชี้แจงข้อสงสัยบางประการเกี่ยวกับโครงการป่าชาวบ้าน

7.1 โครงการป่าชาวบ้านคือโครงการอะไร?

โครงการป่าชาวบ้านคือโครงการซึ่งชักชวนให้ชาวบ้านที่อยู่อาศัยในเขตป่าอนุรักษ์ ปลูกไม้ป่า

โตเร็วในพื้นที่ทำกินของตนเองถือครอง ทั้งนี้

เพื่อให้การบำรุงดูแลรักษาไม้ที่ปลูกและการตัดฟัน เพื่อใช้ประโยชน์จากเนื้อไม้และส่วนประกอบอื่นๆ ของไม้ที่ปลูกนั้นสามารถทำได้อิสระ

7.2 ป่าชาวบ้าน ต่างกับ ป่าชุมชนอย่างไร?

ป่าชาวบ้าน เน้นการปลูกไม้ป่าและการดูแลรักษาไม้ที่ปลูกนั้น ให้เป็นการดำเนินการ

โดยแต่ละบุคคลในพื้นที่ทำกินของแต่ละบุคคลในที่ดินทำกินที่มีอยู่กระจายจัดกระจายในพื้นที่ทำกินของ หมู่บ้าน

เพื่อให้แต่ละบุคคลเป็นอิสระในการปลูก ดูแลรักษา

และใช้ประโยชน์จากไม้ป่านั้นๆ เมื่อถึง
เวลาเก็บเกี่ยวผลผลิต
โดยไม่ต้องตั้งกฎเกณฑ์หรือกติกาต่างๆ ในการมาร่วมกันปลูก
ร่วมกันดูแลรักษา
และร่วมกันใช้ประโยชน์เหมือนกับการปลูกป่าชุมชน
ซึ่งจะต้องเป็นการร่วมกันทำโดยชาวบ้านในชุมชน
ทุกคนร่วมกัน

7.3

โครงการป่าชาวบ้านทำให้ป่าธรรมชาติถูกทำลายน้อยลง
ได้หรือไม่?

เมื่อชาวบ้านให้ความร่วมมือในการปลูกต้นไม้ป่าตามโครงการ
ป่าชาวบ้าน และสามารถ
ใช้ผลผลิตจากเนื้อไม้และส่วนประกอบอื่นๆ
ของไม้ที่ปลูกได้เช่นเดียวกับไม้จากป่าธรรมชาติ
ก็จะทำให้ไม่ต้องไปตัดไม้จากป่าธรรมชาติมาใช้
เป็นการช่วยให้ป่าธรรมชาติถูกทำลายน้อยลงได้

7.4

ทำไมชาวบ้านที่อยู่อาศัยในเขตป่าอนุรักษ์จึงไม่ค่อยเห็นด้วยกับ
การชักชวน ให้ปลูกไม้ป่า?

1. ชาวบ้านยังไม่ตระหนักถึงความ	1. อธิบายให้ชาวบ้านเข้าใจถึงค
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<p>มจําเป็นที่จะ ต้องปลูกไม้ป่าเอาไว้ใช้สอย เนื่องจากยัง สามารถไปตัดฟันไม้ในป่าธรรม ชาติได้ ง่ายอยู่</p>	<p>ความเข้มงวด เข้ามาใกล้ตัวมากขึ้นทุกขณะ ทั้งจาก เจ้าหน้าที่ป่าไม้และเจ้าหน้าที่ ในพื้นที่ป่า ออนุรักษ์ การปลูกไม้ป่าตามโครงการป่ า ชาวบ้าน ช่วยลดความกดดันในเรื่องนี้ เพราะเป็นการตัดไม้ที่ปลูกเอ งมาใช้</p>
<p>2. ชาวบ้านเกรงว่าถ้าพื้นที่ทำกิน ของคนยัง มีไม้ป่าขึ้นอยู่ ทางราชการ (ป่าไม้) จะมา เอาพื้นที่ไป</p>	<p>2. อธิบายให้ชาวบ้านเข้าใจว่าไ ม่ป่าที่โครงการ ป่าชาวบ้านนำมาส่งเสริมให้ปล ูกเป็นไม้ โตเร็วที่ไม่ใช่ "ไม้หวงห้าม" ตามกฎหมาย ป่าไม้ เพราะฉะนั้นสามารถตัดฟันเพื่ อใช้สอย ในพื้นที่ได้โดยไม่ผิดกฎหมายป่ าไม้พ.ร.บ. ป่าสงวนแห่งชาติ พ.ศ. 2507 มาตรา 16</p>

	มีข้อกำหนด สำหรับอนุ- าตการตัดสิน ดังกล่าวไว้)
<p>3.</p> <p>ชาวบ้านไม่แน่ใจว่าไม้ป่าที่โค รกรป่าชาวบ้าน ชักชวนให้ปลูกลนั้น เมื่อโตขึ้นแล้วจะสามารถ ตัดฟันมาใช้ได้โดยไม่ผิดกฎหมาย</p>	<p>3.</p> <p>แก้ไขทัศนคติของชาวบ้านที่คิด ว่าหากพื้นที่ ทำกินของตนมีไม้ป่าขึ้นอยู่ทาง ราชการจะยึดเอา พื้นที่โดยอธิบายให้เข้าใจว่า พื้นที่ทำกินของ ชาวบ้านแต่ละรายนั้น ถ้าแบ่งบางส่วนมา ปลูกไม้ป่าตามโครงการป่าชา วบ้านและดูแล รักษาจน ให้ทางราชการเห็นว่า ตนเองก็มี ส่วนที่ทำให้ประเทศมีพื้นที่ป่าไ ม่เพิ่มขึ้นเป็น ข้อพิสูจน์อีกข้อหนึ่ง ที่ทำให้เห็นว่าคนกับ ป่าสามารถอยู่ด้วยกันได้</p>
<p>4.</p> <p>ชาวบ้านเกรงว่าจะเสียพื้นที่ทำ กิน ถ้านำไป ปลูกไม้ป่า</p>	<p>5.</p> <p>อธิบายและสาธิตให้ชาวบ้านเ เข้าใจถึงการ</p>

และมีทัศนคติว่าไม้ป่านั้นจะ
ต้องรอให้โตเต็มที่
อายุตั้งแต่ประมาณ 20 ปี
ขึ้นไปจึงจะสามารถตัดฟันมา
ใช้ได้โดยไม่ว
ทราบว่าไม้ป่าที่โครงการป่าช
าวบ้านนำมา
ส่งเสริมให้ปลูกนั้นเป็นไม้ป่าโ
ตเร็ว สามารถ
ใช้ประโยชน์จากส่วนต่างๆ
ของไม้ได้ตั้งแต่ 6-7 ปีขึ้นไป
และใช้ประโยชน์ได้ทุกๆ
ระยะ ที่ไม้ั้นโตขึ้น

ปลูกพืชไร่ควบกับ
ไม้ป่าในระบบวนเกษตร ว่า
ชาวบ้านจะไม่ต้องเสียพื้นที่ทำ
กิน ถ้าหาก ปลูกไม้ป่าตาม
โครงการป่าชาวบ้าน อย่าง
ถูกวิธีตามที่เจ้าหน้าที่แนะนำ
เพราะว่าหาก
ปลูกไม้ป่าและดูแลรักษาอย่าง
ถูกต้องแล้ว
สามารถปลูกพืชไร่ควบได้ตลอด
ปีและสาริต
การใช้ประโยชน์จากส่วนต่าง
ๆ ของไม้ป่า
ที่ปลูกตามโครงการป่าช
าวบ้านตั้งแต่เมื่อ ไม้ั้น อายุได้
6-7 ปีขึ้นไป โดยนำผู้นำ
ชาวบ้านและผู้สนใจ
ไปดูและศึกษาการ
ใช้ประโยชน์ จากส่วนต่างๆ
ของไม้ป่าที่
สถานีเกษตรหลวงอ่างขาง
ซึ่งเป็นศูนย์รวม
งานโครงการป่า

	<p>ชาวบ้านของมูลนิธิโครงการหลวง</p> <p>เช่นการนำกิ่งไม้เมเปิลหอมอายุ 6-7 ปี มาเพาะเห็ดหอม การนำกิ่งก้านและหรือลำต้นของไม้พญาโลเนีย กระถินดอย จันทร์ทอง ไต้หวัน การบุรุษ มากสิ่ง</p>
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7.5 ป่าชาวบ้านไม่ใช่โครงการปลูกป่า เพราะไม่ได้เป็นพื้นที่แปลงปลูกป่าผืนให้ ไร่หรือไม่?

โครงการป่าชาวบ้านคือ การชักชวนให้ชาวบ้านปลูกไม้ป่าโตเร็วในที่ดินถือครองของตนเอง ในลักษณะเดียวกับการชักชวนให้ปลูกไม้ผล ขนาดของพื้นที่แปลงตั้งแต่รายละ 1/2 - 2 ไร่ ถึง 5 หรือ 10 ไร่ แล้วแต่ความสามารถของชาวบ้านแต่ละราย หรือปลูกในพื้นที่หัวไร่ปลายนา หรือ ปลูกเป็นแนวรั้วในระยะแรกๆ ที่เริ่มโครงการ

พื้นที่แปลงปลูกจะอยู่กระจัดกระจายไปตามพื้นที่ทำกินของชาวบ้าน

แต่ในระยะยาวเมื่อชาวบ้านปลูกไม้ป่าตามโครงการป่าชาวบ้านมากขึ้นๆ

พื้นที่ปลูกก็จะเริ่มขยายขึ้นและจะขยายจนเข้ามาชิดกัน
ทำให้ดูเป็นลักษณะผืนใหญ่ ในทำนอง
เดียวกันกับสวนไม้ผลของเจ้าของแต่ละรายที่อยู่ติดๆ
กันนั่นเอง ในกรณีเช่นนี้ก็จะได้พื้นที่ ปลูกป่าผืนใหญ่
ซึ่งก็คือเป็นการปลูกไม้ป่า 3 อย่าง เพื่อให้ได้ประโยชน์ 4
อย่างตามแนวพระราช
ดำรัสของพระบาทสมเด็จพระเจ้าอยู่หัวฯ
ที่ได้พระราชทานไว้ นั่นคือ

1. ปลูกไม้ป่าที่กินได้สำหรับการบริโภค
2. ปลูกไม้ป่าที่ใช้ทำฟืนได้สำหรับเป็นพลังงานความร้อน
3. ปลูกไม้ป่าที่ใช้ทำไม้กระดานได้สำหรับการก่อสร้างที่อยู่อาศัย และเมื่อไม้ป่าทั้ง 3 ชนิด ที่ปลูกนั้นโตขึ้น มีพื้นที่กว้างขึ้น ก็จะร่วมกันให้ประโยชน์อย่างที่ว่า 4 นั่นคือช่วยให้เป็น พื้นที่ป่าปกคลุมดิน ยังประโยชน์ในการช่วยอนุรักษ์ดิน น้ำ และสิ่งแวดล้อมให้แก่ประเทศ ชาตินั่นเอง

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