The Role of NTFPs in Poverty Alleviation and Biodiversity Conservation

Proceedings of the international workshop on the theme in Ha Noi, June 2007

The Role of NTFPs in Poverty Alleviation and Biodiversity Conservation

Proceedings of the international workshop on the theme in Ha Noi, June 2007

Editing team

Katherine Warner

Edwin McCall

Susan Garner

Communication and Publication Support

Nguyen Thi Bich Hue

Tran Thi Thu Trang

February, 2008

Ha Noi, Viet Nam

Non-Timber Forest Products (NTFPs) play an important role in the livelihoods of the rural poor, as a source of food, medicine, construction materials, and income throughout the world. This is reflected in the Mekong region; in Viet Nam approximately 24 million people leaving in and around forest areas utilize NTFPs and in Lao PDR about 80% of the population pursue livelihoods within which NTFPs play a significant

The International Conference "The Role of Non-timber Forest Products (NTFPs) in Poverty Alleviation and Biodiversity Conservation" was organized in Viet Nam from 11 through 15 June 2007. The Conference attracted the participation of almost 200 participants representing researchers, policy-makers, managers, practitioners, and entrepreneurs from throughout Asia who are involved in NTFPs initiatives. They came to share information, to exchange experiences and to collectively explore the role that NTFPs can play in both reducing poverty and supporting biodiversity.

As this Proceedings illustrates, NTFPs initiatives are moving beyond the more narrowly focused programmes and projects of the past to more integrated ambitious approaches that seek to address both sustainable livelihoods and sustainable management and use of NTFPs. The papers, presentations and lively discussions of the Conference highlighted the complexity of such undertakings. As the reader of this Proceedings will find, successful initiatives are the result not only of long term commitment and providing of research and technical assistance, but also linking producers to markets, and enabling access to microfinance and business development support. Yet even with this wide ranging support, programmes will be ineffective if there are policies and practices that hinder access to resources, markets, and credit.

The Conference was an initiative by the Netherland Government funded NTFPs Sub-Sector Support Project Phase II with the support of the World Conservation Union (IUCN) and the Ministry of Agriculture and Rural Development of Viet Nam. The generous sponsor of the Netherland Government to NTFPs research and field projects in Viet Nam and to this Conference in particular is highly appreciated.

We sincerely hope that this first international conference on NTFPs organized in Viet Nam has brought the NTFPs into the higher level in the national conservation and development agenda. The discussions, results and recommendations from the conference will help Viet Nam and other countries in developing strategies and setting out action plans in the field of NTFPs in the coming years.

H.E Hua Duc Nhi

Vice Minister

Ministry of Agriculture and Rural Development, Viet Nam

Dr. Katherine Warner

IUCN Country Group Head

Cambodia, Lao PDR and Viet Nam

The Ministry of Agriculture and Rural Development of Viet Nam and the World Conservation Union (IUCN) wish to acknowledge the generous support of the Netherlands Government for the NTFPs project, in particular for the international Conference "The Role of Non-Timber Forest Products (NTFPs) in Poverty Alleviation and Biodiversity Conservation", as well as the publication of these proceedings. For the additional financial contribution from the German Technical Cooperation (GTZ) to the publication of this proceedings we are also grateful.

We would like to express our sincere appreciation to His Excellency Hua Duc Nhi, Vice Minister, MARD, for his valuable support and contribution to the Conference.

We gratefully acknowledge the support in preparation and organization of the Conference from the Ministry of Agriculture and Rural development (MARD) in Viet Nam and the following departments of MARD:

International Cooperation Department

Department of Forestry

Department of Science and Technology

Forest Protection Department

Department of Agro-Forestry Products Processing and Salt Industry

Forest Science Institute of Viet Nam

The Non-Timber Forest Products Research Center

Within MARD we would also like to especially thank the following individuals:

Mr. Tran Kim Long, Vice Director ICD/MARD; Dr. Pham Duc Tuan, Vice Director, DoF; Dr. Trieu Van Hung, Director of Department of Science and Technology; and National Project Director, NTFPs Project; Prof. Nguyen Hoang Nghia, Director of FSIV, Dr. Nguyen Huy Son, Director of the NTFPs RC.

We are grateful to the following agencies who have partnered with us in this initiative:

CARE International in Viet Nam (with special contribution from Ms. Fiona Percy, for her active role in facilitation and review of conference papers)

The Netherlands Development Organization (SNV)

The Regional Community Forestry Training Centre for Asia and the Pacific (RECOFTC)

The World Wildlife Fund for Nature (WWF)

The Swiss Import Promotion Programme (SIPPO)

We would also like to thank the NTFPs network for their help in organizing and conducting the conference.

Support from IUCN Viet Nam country office staff is also gratefully acknowledged, including Dr. Katherine Warner, Head, Country Group 1; Dr. Vu Van Trieu, Country Representative; Mr. Bernard O'Callaghan, Programme Coordinator; Mr. Nguyen Van San, Senior Technical Officer; Mrs. Nguyen Thi Yen, Programme Manager for Forests and Protected Areas; Ms. Sarah Webster, Ms. Susan Garner; Ms. Dinh Thi Minh Thu

GRET	Group for Technological Research and Exchange
GTZ	German Technical Cooperation
ICARD	Information Center for Agricultural and Rural Development
ICIMOD	International Centre for Integrated Mountain Development
ICRAF	World Agroforestry Centre
IFAT	The global network of Fair Trade Organisations
IFC	International Finance Corporation
INBAR	International Network for Bamboo and Rattan
IPGRI-APO	International Plant Genetic Resources Institute – Regional Office for Asia, the Pacific and Oceania
IRR	Internal Return Rate
ITTO	International Tropical Timber Organization
IUCN	World Conservation Union
JFM	Joint Forest Management
Lao PDR	Lao People's Democratic Republic
LHF	Leasehold Forest
MA&D	Market Analysis & Development
MAF	Ministry of Agriculture and Forestry
MAPPA	The Medicinal and Aromatic Plants Programme in Asia
MAPs	Medicinal and Aromatic Plants

The Conference on the Role of NTFPs in Poverty Alleviation and Biodiversity Conservation was convened to provide an opportunity to bring together researchers, practitioners and entrepreneurs from Asia involved in NTFPs (Non-Timber Forest Products) initiatives. While there have been a number of meetings in the region over the last few years on NTFPs, the linkages between NTFPs, poverty reduction and biodiversity had yet to be explored. Consequently, this conference was convened to fill this important gap by looking beyond NTFPs as a 'minor' product and explore not only the current, but also the potential, contribution of NTFPs to both livelihoods and biodiversity.

There is increasing recognition that NTFPs play an important role in the livelihoods of the rural poor as a source of food, medicine, construction materials and income. As noted in a presentation in the conference, it has been estimated that there are 60 million highly forest-dependent indigenous people in Latin America, West Africa, and Southeast Asia, with an additional 400 million to 500 million people directly dependent on these natural products. In this context, it is important to recognise that NTFPs can play a critical role in providing both food and income for the poorest households, notably by creating income and employment opportunities for women.

However, while there is growing appreciation of the importance of NTFPs for rural households, especially of the very poor, there are also concerns about the potential impact of NTFPs collection on biodiversity. A number of critical questions are often raised such as under what conditions can NTFPs be sustainably

In most countries, there is a continuing gap in policy and procedures regarding NTFPs. Participants stressed the importance of a **strategic orientation** in the development of NTFPs that encourages

- *NTFPs are for many a transition to other livelihoods:* While there is a high level of dependency on NTFPs, especially by the poor, other opportunities are emerging in the fast-growing economies of the Mekong. By providing income that can be utilised for education and training and networks for the flow of information, NTFPs initiatives enable community members to be able to better participate in these new opportunities.
- *Policies and regulations for NTFPs are urgently needed:* Policies and regulations are needed that create a framework for NTFPs conservation, as well as establish and secure rights for local people. These rights include not only access to the forest to harvest products, but also for processing (forming associations for processing and trade) and transporting products without high tariffs and fees.
- *Partnerships are necessary, but a continuing challenge:* While there is on-going interest in NTFPs for poverty alleviation and biodiversity conservation, the partnerships needed for success are not in place. Practitioners in the field need information that may not be of interest to researchers and often neither practitioners nor researchers have the skills and trust to seek and work with private sector partners. The challenge will be to create partnerships where researchers can be more responsive to needs that emerge from the field, and can access information and markets from the private sector. Tools such as value chain analysis can provide a mechanism for those involved in a product to build a better understanding of relative roles and benefits, and form mutually beneficial partnerships.

Nam, among which, the implementation of the NTFPs Project from 1998-2007 should receive a special mention. We would also like to express our thanks for IUCN's help in organising this important international conference.

Many thanks must also be expressed to our Vietnamese colleagues for their cooperation in agricultural and rural development, especially in NTFPs development.

On behalf of MARD, I am honoured to inaugurate the international conference on The Role of NTFPs in Poverty Alleviation and Biodiversity Conservation.

May the conference be a great success and I wish all participants the very best of health and happiness in the years ahead!

Your Excellency, Vice Minister Hua Duc Nhi of the Ministry of Agriculture and Rural Development, and Dr. Katherine Warner, Head of the IUCN Country Group I, Viet Nam, Lao PDR and Cambodia, and ladies and gentlemen.

Firstly, on behalf of IUCN, I would like to welcome you all to Viet Nam and to the International Conference on The Role of Non-Timber Forest Products in Poverty Alleviation and Biodiversity Conservation.

This is a very meaningful event as it is the first international conference to be held in Viet Nam involving collaboration between the Ministry of Agriculture and Rural Development (MARD) and The World Conservation Union (IUCN), together with other important IUCN members, and partners including GTZ, WWF, CARE International, SNV, Sippo and RECOFTC, who have been actively working to promote the equitable, ecologically sustainable use and conservation of natural resources, including NTFPs, in Viet Nam.

This international conference is held in the context of Viet Nam's rapid economic development and regional and global integration. Therefore, environment protection and the sustainable management of ecological systems have become urgent and important issues. The Government of Viet Nam increasingly recognises and is paying more attention to the important role of NTFPs in poverty alleviation and biodiversity conservation, especially in mountainous, remote and vulnerable areas.

This conference is one of the key activities within the framework of the NTFPs Sub-Sector Support Project Phase II 2002-2007, which was a collaborative project between MARD and IUCN, with financial support from the Royal Netherlands Government. The Royal Netherlands Government has supported Viet Nam in the field of NTFPs since 1998 via the pilot project Sustainable Utilisation of NTFPs 1998-2002. It has also expressed an interest in continuing to support Viet Nam's NTFPs sector through the implementation of a proposal entitled Pilot Programme for Support to the NTFPs Sub-sector 2007-2010, which was prepared by MARD with technical assistance from IUCN. On this momentous occasion, we would like to express our sincere thanks to the Royal Netherlands Government and people, especially the Royal Netherlands Embassy in Ha Noi, for their continued and meaningful support for NTFPs initiatives.

We also highly appreciate the efforts and commitments of the Viet Namese Government in natural resource management, including NTFPs development and conservation. On this occasion, we would like to thank MARD for its continuing efforts and effective and close cooperation and collaboration with IUCN in the development, management and conservation of natural resources, especially NTFPs.

IUCN is one of the most prestigious global organisations in the field of sustainable and equitable use of natural resources and biodiversity conservation. It was one of the earliest organisations to arrive in Viet Nam in the 1980s and has worked closely with Viet Nam on the National Biodiversity Conservation Strategy. IUCN has been actively working with relevant departments, research institutes and universities of MARD, in order to effectively support the NTFPs sub-sector since 1998.

Within the context of the continuing promotion and expansion of the achievements of the NTFPs Project Phase I, the NTFPs Project Phase II (2002-07) will be complets and lands EmeI.6829 Tm/Csmen NTFPs Proje

The NTFPs Project Phase II has achieved a great deal, including helping to develop the National NTFPs Strategy approved in 2006 by the government, and the National Action Plan on NTFPs; establishing two pilot provincial action plans developed for pilot sites in Quang Ninh and

INTRODUCTION

With a monsoon tropical climate and complex geographical characteristics spanning many latitudes, Viet Nam has a wide variety of different types of forest and is rich in biodiversity. In almost all forests in the country, there are a substantial amount of Non-Timber Forest Products (NTFPs) species, including plants and animals.

Due to the diverse range of 867 TD-.0744istic18 inbducT*,1.3 TD.8764 Tw522 0to t

reserves accounting for 1.2 million hectares, and 38 protected forests with a total area of more than 100,000 hectares.

Currently, Viet Nam lacks a substantial amount of information on the NTFPs resources of each locality and ecological area across the whole

traditional handicraft villages, which use NTFPs as their main materials.

- Expand NTFPs markets in the country and abroad and promote commercial exchanges on NTFPs to identify important products for development.
- Develop comprehensive, enabling policies that mobilise resources from different sectors, with support from the government and international donors.
- Encourage households, individuals and communities to participate in the sustainable protecting, planting and processing of NTFPs.
- Improve the capacity and technical infrastructure of institutions and training centres involved in NTFPs research and training.
- Enhance the government's capacity to manage NTFPs.

The conservation and development of NTFPs is a strategic direction for the forestry sector, which contributes to economic development and poverty reduction by creating jobs for mountainous and rural people, while conserving the forest biodiversity of Viet Nam.

To enable the forestry sector to carry out NTFPs conservation and development, it is necessary to conduct a range of comprehensive initiatives involving awareness-raising, policy development, capacity building, and mobilising resources from society to invest in NTFPs development. Furthermore, international support is crucial for NTFPs conservation and development in the short-term, as well as for the sustainable future of these species.

A success story from Lao PDR[1]

About 5 million people, or 80 per cent of the population, in Lao PDR pursue rural livelihoods, within which NTFPs play a significant role in food security, income generation, and the provision of numerous other non-food and non-cash inputs to households.

After rice, wild forest foods dominate the daily diet. More than 450 edible species have been identified, and collectively they provide the bulk of animal protein, leafy green vegetables and micro-nutrient intake of rural households (Clendon, 2001; Foppes and Kethpanh, 2000a, 2000b, 2004; WFP, 2004). In remote upland areas, households commonly experience rice shortages for up to three months. NTFPs provide food security through either direct consumption or through their barter or sale to obtain rice. NTFPs are even more important in bad times when crops fail or are destroyed.

A nationwide survey of forest-based food security of the World Food Programme (WFP) of the United Nations in 2004 found that all villages in the country had some dependency on forests for food, and that about 41 per cent of all villages were dependent on food obtained from forests within and around Lao PDR's national system of protected areas (WFP, 2004).

Nationwide it has been found that the dependency on forests for domestic consumption and income generation purposes is highest for the poorest households and of greatest importance to women because they dominate (non-hunting) the collection and management of NTFPs (Foppes and Kethpanh, 2000a, 2000b; Ingles et al, 1999; Broekhoven, 2002; Morris et al, 2004)

From 1995 to 2001, The World Conservation Union (IUCN) and the National Agriculture and Forestry Research Institute (NAFRI) of Lao PDR, with funding from the Government of the Netherlands,

1 This case study is drawn from Ingles, A.W., S. Kethpanh, A. S. Inglis and K. Manivong. 2006. Scaling Sideways and Up-ways:

use of forest resources, with a special focus on NTFPs, technical assistance, microfinance, business development support, markets that 'work for the poor', and policies that are not barriers to local market participation. We also have to promote policy and regulatory changes that will enable small producers to have access to forest resources and services such as credit, so that they can effectively manage their natural resources, participate in markets and move out of poverty.

References

Arnold, J.E.M. 2001 Forests and People: 25 years of Community Forestry. FAO. Rome.

Broekhoven, G. (2002) *"Sustainable Management Of NTFPs In Lao PDR: A Discussion Paper for the Forestry Strategy to the Year 2020 for Lao PDR" Consultant report to Sida and FAO, Vientiane, Lao PDR*

Clendon K. (2001) *The Role of Forest Food Resources in Village Livelihood Systems: A study of three Villages in Salavan Province, Lao PDR, IUCN, Vientiane, Lao PDR.*

Foppes, J., and Kethpanh, S. (2000a), *Forest extraction or cultivation? Local solutions from Lao PDR, Paper presented at the workshop on the evolution and sustainability of "intermediate systems" of forest management, FOREASIA, Lofoten Norway.*

Foppes J. and Ketphanh S. (2000b), *No more timber, more non-timber – discussion paper. DoF-IUCN*

Forest Trends 2003. *Company-Community Forestry Partnerships: Identifying Opportunities. Technical Briefs. Forest Trends, Washington,* D.C.

Ingles, A., Saypaseuth, T., Foppes J., Baker, J., Khetphanh, S., Bounsou S., and Sengkeo K. (1999), *A Rapid survey of the use and Government regulation of non-timber forest products (NTFPs) from the Nakai-Nam Theun National Biodiversity Conservation Area (NNT NBCA), Central Lao PDR. IUCN Vientiane, Lao PDR*

Ingles, A.W., S. Kethpanh, A. S. Inglis and K. Manivong. 2006. *Scaling Sideways and Up-ways: Identifying factors that affect the adoption of forest-based livelihoods development interventions in Lao PDR. (Draft final report). PROFOR/World Bank, Washington, D.C.*

Morris, J., Hicks, E., Ingles, A. and Ketphanh S. (2004) *Linking poverty reduction with forest conservation: case studies from Lao PDR. IUCN, Bangkok, Thailand*

Scherr, S.J., A.White, and D. Kaimowitz 2002. *Making Markets Work for Forest Communities. Policy Brief. Forest Trends, Washington, D.C.*

Scherr, S.J., A.White and D. Kaimowitz. 2004 *A new agenda for forest conservation and poverty reduction: Making Markets work for low income producers. Forest Trends, Washington, D.C.*

World Food Programme (2004) Lao PDR: Analysis of Forest Dwelling Populations and Vulne*rability to Food Insecurity at the Village Level. UN World Food Programme: Vulnerability Analysis and Mapping Unit, Vientiane Lao PDR*

Dr. Le Thanh Chien, Forest Science Institute of Viet Nam (FSIV)

BACKGROUND

Policy framework

Forest coverage in Viet Nam fell from 43 per cent (14.3 million ha) in 1943 to 28.2 per cent (9.3 million ha) in 1993. At the time, it was estimated that around 30 per cent of the population lived in and around forests and mainly depended on forest resources for their livelihoods.

In Viet Nam, there are three types of forests - production forests, protected forests and special-use forests. In 1991, the Government of Viet Nam issued the Law on Forest Protection and Development, which was revised in 2004. In July 1993, the Land Law was issued, which provided regulations on land management, land use planning and forest land allocated for households and enterprises (this law was revised in 2003). Decision 661/TTg of the Prime Minister was issued on July 29, 1998 to set out the goals, tasks, policies and organisations involved in the New Forest Plantation Programme, which covered an area of 5 million ha. Decision 202/TTg dated May 2, 1994 by the Prime Minister concerned forest allocation and protection, while in 1995, Viet Nam issued its Biodiversity Action Plan.

Institutional framework

The Ministry of Agriculture and Rural Development (MARD) has decentralised some important functions to the lower level of government. For example, the management of the Department of Agriculture and Rural Development's (DARD) Agriculture Extension Centres and Forestry Extension Centres was assigned to the Provincial and District People's Committees. However, the capacity of these level are limited, thus, the agroforestry extension services did not meet the requirements. There were insufficient numbers of proficient technical staff in some scientific research institutions and agricultural producers were not well equipped with enough knowledge and information regarding their products' value and quality. The management and business capacity of these organisations and producers was also low.

Until recently, the benefits from forests for communities came predominantly from the production of timber. However, this view changed when a government decree was issued in1997 on natural forest closing. At the time, insufficient understanding of the various values of Non-Timber Forest Products (NTFPs) by managers and planners led to a lack of interest in encouraging local communities to develop and change their approaches to the sustainable use of NTFPs. Similarly, there was not any recognition of the important of forest protection to maintain the ecological conditions for the development of NTFPs.

Therefore, there was an urgent need to develop a community participatory NTFPs managing system, which provided support in market analysis and product development.

PROJECT FORMULATION

Accordingly, a project on the sustainable use of NTFPs in Viet Nam was formulated through cooperation between The World Conservation Union (IUCN), the Government of Viet Nam (through the FSIV) and two local non-government organisations (ECO-ECO and CRES).

The NTFPs project was divided into two phases.

Phase 1: Project on the sustainable use of NTFPs in Viet Nam (pilot project for NTFPs)

Objectives and implementation

The project's objective was achieving forest and biodiversity conservation through promoting the use of NTFPs in livelihoods and ecological sustainability. It was scheduled to run from July 1998 to July 2002, (but was offl1),ods acomprisc2ione nervatgical

at the national and provincial levels. Knowledge regarding establishing NTFPs development strategies was lacking, as well as limited capacity for conducting impact assessments and analyses and establishing partnership networks for NTFPs management and information dissemination.

Together with incorporating the lessons from the first phase of the project, a suitable action plan was required, whose effectiveness could be tested through the project's activities.

Within that context, the NTFPs Support Project in Viet Nam was established to build upon the positive results achieved during the fi

In terms of transferring methodologies for sustainable NTFPs development, the project achieved the following outcomes:

- transfered the methodology on NTFPs Market Analysis and Development, Gender and Livelihoods to field officers and local staff at field sites;
- transferred land planning methodologies at the village level to households at project sites;
- trained trainers provided to forest extensionists in the provinces and districts of the project to support knowledge dissemination;
- trained thousands of people participating into the project in Participatory Research Assessment (PRA), planting techniques, sustainable harvesting, and conserving and processing some NTFPs species;
- developed trial models for NTFPs species conservation and development in cultivated forest land and farmland for more than 10 species including rattan, *Morinda officinalis, Holarrhena antidysenterica*, *Pimela alba*, *rhamnoneuron balansae*, *dioscorea persimilis, machilus odoratissima*, *desmodium styracifolium*, *dianella ensifolia*, *amomum longiligulare*, *ardisia gigantiflolia*, *jasminum subtriplinerve*, *Lyndera myrrha*, etc.);
- developed the model for insitu conservation (reinvigorated a 30ha rattan forest in Van Don, allocated separate land for NTFPs planting on a 63-ha area with rattan, morinda officinalis, pimela alba, rhamnoneuron balansae in Hoanh Bo, supported the rattan sustainable harvesting plan in a nine-ha rattan natural forest in Minh Hoa, Quang Binh province, and renovated 7.2 ha of mixed garden with NTFPs plants in Cam Xuyen districts);
- developed a model for processing Linh chi mushroom and *Myrica Farguhariana* fruit in Van Don, developed a model for a bamboo/ handicraft producing village in Van Don and, and developed village rattan handicraft production in Cam Xuyen and Tuyen Hoa; and

The project generated substantial interest among local households, with their total participating time comprising more than 3, 500 hours through activities such as breeding NTFPs, developing models for NTFPs conservation and development, and exploring processing models. A total of 1,957 households participated in the three field sites in the central region, while 1,500 households participated in the north, excluding households under the two Action Learning Funds.

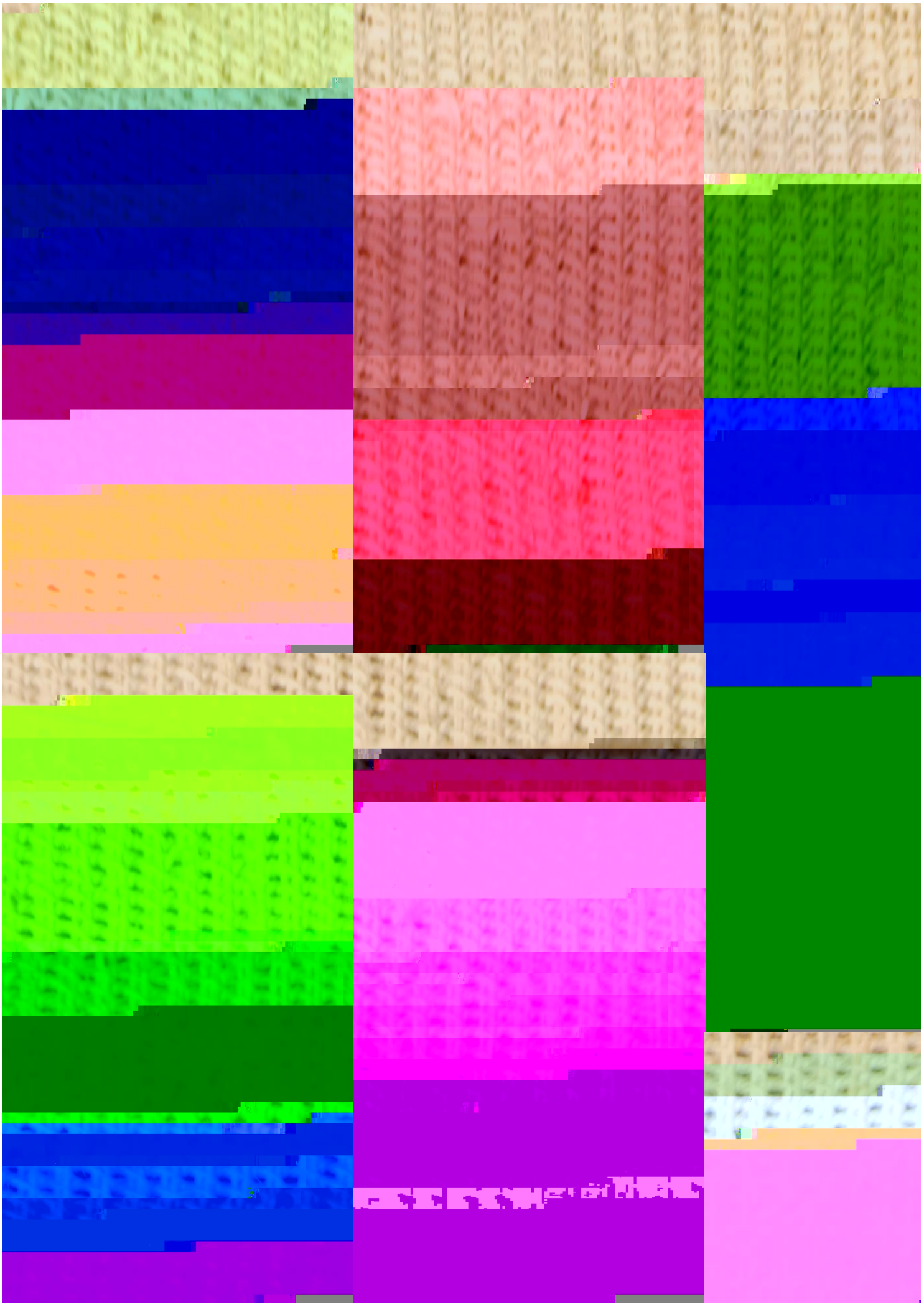
In terms of NTFPs awareness-raising, the project achieved the following outcomes:

- A NTFPs network was set up in partnership with the Viet Nam Forest Scientific and Technical Association with the voluntary participation of approximately 50 organisations and individuals, through which experiences and information on NTFPs are shared and disseminated;
- Workshops were organised on subjects such as Viet Namese bamboo, the sustainable marketing of NTFPs in Viet Nam, and NTFPs conservation and development in Viet Nam;
- A website was developed, together with a NTFPs Newsletter, which is issued every quarter;
- Books were published on *Amomum* (Sa nhan), *Morinda officinalis* (Ba kich), Pine resin, Agarwood (Tram huong), *Machilus* (Boi loi do) to support researchers and forest extentionists in their work;
- Planting Technical Guidelines for eight NTFPs species in central Viet Nam were developed and published, together with the Supporting Document for Forest Extension, which contains information on 22 NTFPs species in the north-west of Viet Nam;
- 20 traditional herbal gardens were established in health stations at the communal level and 10 botanical gardens were planted at high schools to improve community healthcare and awareness of NTFPs; and
- More than 40 bookstores were established at the village level containing more than 300 booklets.

CONCLUSION

To sum up, after the two phases of the project, which each had different objectives, many valuable results and lessons learned have been achieved, which actively contribute to raising awareness of the various benefits of NTFPs in society. These outcomes strongly support the development and successful implementation of socio-economic development policies, the Law on Forest Protection and Development, and the Forest Development Strategy.

Papers of the Conference



A surprising 84 per cent of the natural assets hits were about the impacts on forest conservation made possible by the NTFPs models and activities. This finding might seem "too good to be true" if it were not for the fact that the content of comments from widely separated sources triangulate well with other types of data, are coherent, and have an internal consistency that give them a real sense of authenticity.

The comments acknowledged impacts from the whole gamut of conservation measures, from awareness-raising ("The water source is exhausted, and Tau timber is heavily exploited, resulting in landslides. That is why it is necessary to protect people's livelihoods."), to classical protected area exclusion measures ("A protected area has been established, resulting in outlawing the destruction of the forest"), to in-situ conservation ("Local people are changing their awareness regarding the sustainable exploitation of NTFPs in natural forests" and "Forest enrichment counteracts natural forest destruction and preserves natural forests for the next generation through long-term economic management"), to ex-situ domestication ("Grow huong bai and rattan instead of going to the forest to collect it" and "Can now conserve some NTFPs species that are scarce in natural forests such as rattan and boi loi"), to livelihood substitution measures ("Women have learnt new techniques to plant NTFPs so they spend their time gardening and have reduced the time spent collecting NTFPs in natural forests").

Comments regarding a reduction in the number of visits to natural forests comprised a dominant theme, and many different reasons were cited. Perhaps the most succinct summary of the project's impact on conservation was the statement that "Time spent on the models results in less visits to the forest."

Others gave more elaborate explanations, such as this one on the impact of high-efficiency cook stoves: "Before the NTFPs project, women had to collect firewood ten times a month. Now they only spend one time collecting firewood in the forest and can invest their time in the fruit garden and selling [products] in local markets."

Other comments helped put the NTFPs-related conservation measures into proper historical perspective with respect to wider development changes: "Ten years ago, charcoal-making was an important activity for livelihoods, but now there are only three households that make charcoal because of increased enforcement in the protected area and because young men can get higher paying jobs in the south (e.g. in dam construction) and are not interested in charcoal-making."

Financial assets

Positive comments about impact on financial assets were volunteered by seven of the eight villages, with 11 out of the 23 hits comprising direct statements that the project had created or increased income or employment opportunities. Early benefits were highlighted in the comment that "Beekeeping yields immediate economic benefits," while several others emphasized the stable, long-term nature of the employment opportunities created by NTFPs. Villagers in Kim Trung linked this to conservation benefits by saying that long-term income from rattan planting would allow the local people to reduce logging in the future (the rattan had not yet reached harvestable age). Links between gains in financial assets and labour use (a human asset) were flagged in the comments "Busy but income increased" and "Landless households will have opportunities to sell labour" (the latter also implies the creation of new social assets). A more global kind of impact was highlighted in the terse comment from Am village citing "Improved management and utilization of cash for household economic development."

Not all the comments were positive. A respondent from Kim Trung, the poorest village in the sample, commented that the investment from the project was too small, which made it difficult for some households to select a model. This highlights the fact that the poorest villagers may in the short-term lack sufficient cash, land, labour and other assets to allow them to develop the long-term financial assets of NTFPs. A positive response to this dilemma was suggested by a woman in Dai Lang, whose hope was that the project would support handicraft manufacturing in the next

Dr. Nitaya Kijtewachakul[1]

ABSTRACT

Vongvilay Vongkhamsao

INTRODUCTION

In the symposium on biodiversity for food security organised in October 2004 by the Food and Agriculture Organisation of the United Nations (FAO) and the Lao PDR Ministry of Agriculture and Forestry (MAF), it was agreed that a wide variety of forest products made up a large proportion of the daily diet of rural Lao families. Over 450 of these edible Non-Wood Forest Products (NWFPs) have been recorded so far including edible shoots and other vegetables, fruits, tubers, mushrooms, small water animals, wildlife etc. The diversity of the NWFPs consumed reflects the rich agricultural biodiversity of the rural landscape in Lao PDR.

The Lao definition of food security is "to ensure enough food and foodstuffs for every person at all times, both in material and economic aspects, with increasing levels of nutritional quality, hygiene and balance so as to improve health and enable normal development and efficient employment" (NAPP).

This paper presents a conceptual framework for forest foods and food security linked to forest resource management, based on NWFP research projects conducted in Lao PDR and the preliminary results of the Agriculture Biodiversity Programme's project entitled "Enhancing food security through sustainable management plans for NWFPs".

CONCEPTUAL FRAMEWORK FOR FOREST FOODS AND FOOD SECURITY

The direct contribution of NWFPs to food security in valuation studies is roughly 50 per cent compared to rice, which is the country's staple food. Together, these foods make up around 80 per cent of the total value of family's subsistence expenditure. NWFPs also contribute indirectly to food security, as they can be sold to buy rice in times of shortages. NWFPs are estimated to contribute 40-50 per cent of the cash income of rural Lao households, while 50 per cent of an average household's cash income is used to buy rice (more for poorer families). NWFPs are therefore the most important safety net or coping strategy for the rural poor in Lao PDR.

The availability of this safety net is declining quickly following rapid deforestation for timber logging and conversion of forests to agricultural areas. The challenge is to adopt land use systems to keep enough forests in the landscape while allowing the poor access to forest resources. Another option is to domesticate wild species in agro-forestry systems and gardens. Lao forest foods also have potential to be exported as gourmet products to niche export markets.

Gathering of NWFPs is an important element in the livelihoods of most rural Lao families, especially for those living in upland areas. NWFPs contribute in two ways to food security (see also Figure 1):

- Direct consumption of forest foods accompanied by rice; and
- The sale of NWFPs to buy rice in times of shortages.

NWFP ACTIVITIES AND PROJECTS IN LAO PDR

Studies on the importance, role and value of NWFPs in Laos

The largest range of NTFPs species is found among edible plant products, edible animal products and ornamental plants (mainly orchids). These resources and others contribute significantly to the national economy due to their important role in the household economy and in rural food security, which is one of the government's main policy objectives for the agriculture and forestry sectors (Clairon, 1998).

Table 1. Villagers' ranking of 50 most important NWFPs

Ranking	Product	Ranking, %		
		Men	Women	Total
1	Bamboo shoots	13	17	13
2	Fish	13	7	10
3	Vegetables	11	11	9
4	Wildlife	11	6	8
5	Cardamom	7	7	7
6	Rattan canes	6	6	6
7	Damar resin	2	4	5
8	Frogs	5	5	5
9	Mushrooms	3	6	4
10	Yang oil	4	4	4
Total top 10 products		75	73	71
Other 40 products		25	27	29
Total 50 products		100	100	100

Source: The Use of NWFPs in Lao PDR, DoF/IUCN Vientiane, Foppes J., Ketphanh S., November 1997.

The IUCN/NTFPs Project has assessed the importance of NWFPs for the household economy in 28 villages of three provinces (see Table 1.).

When ranked against other NWFPs, bamboo shoots stand out as the single most important product. Women usually attach more importance to products such as vegetables and bamboo shoots, while men prefer products such as wildlife and fish. Most other products seem to be collected by both men and women.

Household use of NWFPs

NWFPs play a central role in the rural economy of the Lao PDR, and have been studied extensively (Clendon 2001, de Beer 1991, de Vletter 1997,

- an assessment was conducted by the villagers regarding the NWFP resources available in the surrounding forest, including seasonal calendar, forest transect, forest food resource matrices for dry and rainy seasons, participatory resource mapping, livelihood system diagram, etc. An NWFP inventory methodology will be developed in the future, depending on the NWFP products identified.
- a presentation was compiled comprising the survey results and identification by the villagers through listing, group meetings etc. of the main NWFPs and their importance to food security and nutrition, as well as their roles in the livelihoods of the villagers (source of cash income to buy food etc.). The project team also evaluated the potential and constraints of the products, and prioritised them based on local conditions, such as ecological systems, socio-economic situation, traditional knowledge and culture, land use, NWFP resources and also marketing opportunities (using the Product Assessment Table and others tools from MA&D).
- awareness session was conducted for the village target group on the presence of NWFP biodiversity in the forest, their use in the home garden and their importance to food security, nutrition and cash incomes at the village level.
- villagers have been assisted in identifying activities based on the constraints and opportunities identified for the selected NWFPs according to: (i) food security; (ii) natural resources; (iii) marketing; (iv) social and policy; and (v) technology.

Future activities

Within the next phase of the project, villagers and DAFEO will develop, together with the project team, NWFP sustainable forest management plan for villages, including community-based NWFP harvesting rules and multi-village NWFP conservation rules for selO will deveT*.05jias T*.267432w(NWFl be devk - deh the proest management)Tjn for

Main findings of the survey

- more than 50 per cent of poor groups in the five villages rely on NWFPs for their livelihoods
- 21 main species of NWFPs are used for food, sale, household consumption and border trade
- 10 species are used for selling and generating income for households (damar resin, mushrooms, orchids, ant eggs, frogs, rattan, roots of kham pair-climber, fish, wild vegetables and aroma snails).
- Laos is currently experiencing a boom of rubber plantations by private companies from neighbouring countries. The forest around one of the project villages was totally cut down in April 2007 for a rubber plantation. While destroying the forest that people depend on, the uncontrolled spreading of plantations poses a severe threat to the food security and livelihoods of rural people. The project has to change its original workplan of supporting community-based rattan management. Instead, the project has to plan for a baseline survey to be able to evaluate the impact of the plantations on agro-biodiversity (in particular NWFP resources), impact on the health of the villagers (their livelihoods and food security), and other cultural and socio-economical impacts.

supply chain to ensure there is neither great disturbance nor destruction of ecosystems. For example, Viet Nam is one of the world's largest manufacturers of wood products, and yet imports up to 80 per cent of the timber it uses. Supply/ nursery development needs to be addressed to develop a closed circuit that can be built, developed and managed locally. Don't "export" the problem.

- Make sure food security concerns are well addressed. Farmers should not depend solely on tenuous foreign markets. Households can rely on and support themselves with the right information if they have access to it.
- Only after market footholds are achieved locally and on a pilot basis should larger venues of regional, national and international markets be targeted. This steady, though tempered, progression allows for issues such as understanding and meeting contracts to be dealt with while keeping farmers' expectations realistic. It also provides a manageable way by even larger goals can be aimed for.[5]
- Risk can be reduced using limited scale pilot models and farmer-to-farmer exchanges and trainings, whereby innovations and lessons learned can be attempted, evaluated and, if successful, incorporated more broadly into a programme.
- Consider addressing important issues not wholly related to NTFPs, such as access to safe water and improved health, so that perceived risk is dealt with holistically. This builds local "buy-in" and confidence in your abilities to take on more challenging or "less appealing" work (such as with conservation).
- Co-operative mechanisms can help to achieve greater level of economies of scale.
- Site-specific land/resource management plans: tailor the solution as closely as possible to the local situation and to farm-specific variables (does this household or group have access to irrigation facilities, what soil improvements are needed, is electricity required for processing? etc.). Whether it is a short- or long-term plan, the more individualized a farm plan is, the more the farmer will be able to move their land through successive stages with confidence, as they will be able to predict their labour and input costs more accurately.[6]
- Access to credit may be necessary for the farmer to undertake improvements. Investment is required for the for-profit marketing arm as well.
- Continuously and honestly monitor and evaluate the programme's progress and discuss any positive changes that occur.

REDUCING RISK TO FOR-PROFITS FOR SUCCESSFUL PARTNERSHIPS

Risks occurs not only for farmers, but all along the value-chain – from the farmers to the processors, factories and marketing and distribution companies that have work forces to support - all the way to the end consumer. If NTFPs projects are concerned with developing incomes, then several things need to happen. At the most basic level, the following requirements are needed:

- Contracts must be honoured. There is a need for legal structures to make investments with farmers and guarantee deliveries.
- Local People's Committees must make guarantees that can be relied upon.
- Buyers in destination countries need a genuine commitment to support rural development and equality. We see lack of sincerity, even at the peak of the coffee pyramid. Fair Trade is a certificate, not a commitment. For example, Southern Sudan is the origin of much of Germany's hibiscus. It arrives in the US labelled as Egyptian. Buying from countries with child labour violations and weak human rights records (such as hibiscus from Khartoum, or cocoa from the Ivory Coast) while asking Indochina to sell products at lower prices is ethically inconsistent.

5 Becker, Aaron & Goldman, Emily. The Challenge of Risk Management within Analog Forestry Interventions. P. 77.

6 As above. P. 76.

within the project area. Traditionally, all domestic materials have been made of bamboos, rattans, and other NTFPs, which are widely available in the Churia area. Similarly, the local economy has increased through the selling of these products in the local bazaar. The sustainable use and management of resources is a crucial point to attend to. Increased demand for handicrafts also has attracted small-scale cottage cooperative and affiliated poorer groups. The scale-up scheme converting into enterprise all such cooperative groups has required support in developing their capacity as well as market networks. A study shows that 93% of people lack awareness and 41% of users had no idea about future planning with regards to NTFPs. (Chhote et al 2002). Therefore, market analysis and development training along with elimination and mapping of products based on continuous supply on a large scale and business planning activities, etc, will add to the value of such groups/cooperatives.

The project was initiated the cultivation of medicinal and aromatic plants (MAPs) with an aim of mainstreaming NTFPs (especially MAPs) within community forests (CF), leasehold forest (LHF), and private forest with the involvement of PVSE groups to improve lives and livelihood security. Similarly, the longer-term Churia Area Programme Strategy and Forestry Sector Plan, and the final evaluation of the Churia programme, have also recommended increasing the scope of NTFPs in the Churia area. Looking at the situation of poverty stricken people, including the landless, also benefits from CF and LHF. The LHF concept is specifically focusing on poorer and landless people within CF, giving patches of CF land for the maximum period of 45 years.

Specific Objectives

- Building the capacity of users
- To make users self dependent for production of seeds, seedlings, and marketing
- To develop as a part of income generating activities for CF, LHF, and private forest farmers, especially targeting the PVSE
- To develop and strengthen the network at district level for ensuring NTFPs marketing and rights
- Conducting market sub-sector analysis and value chain analysis

develop sustainable NTFPs/maps in cf, lhf and private forest as a main source of income with the involvement of pvse groups

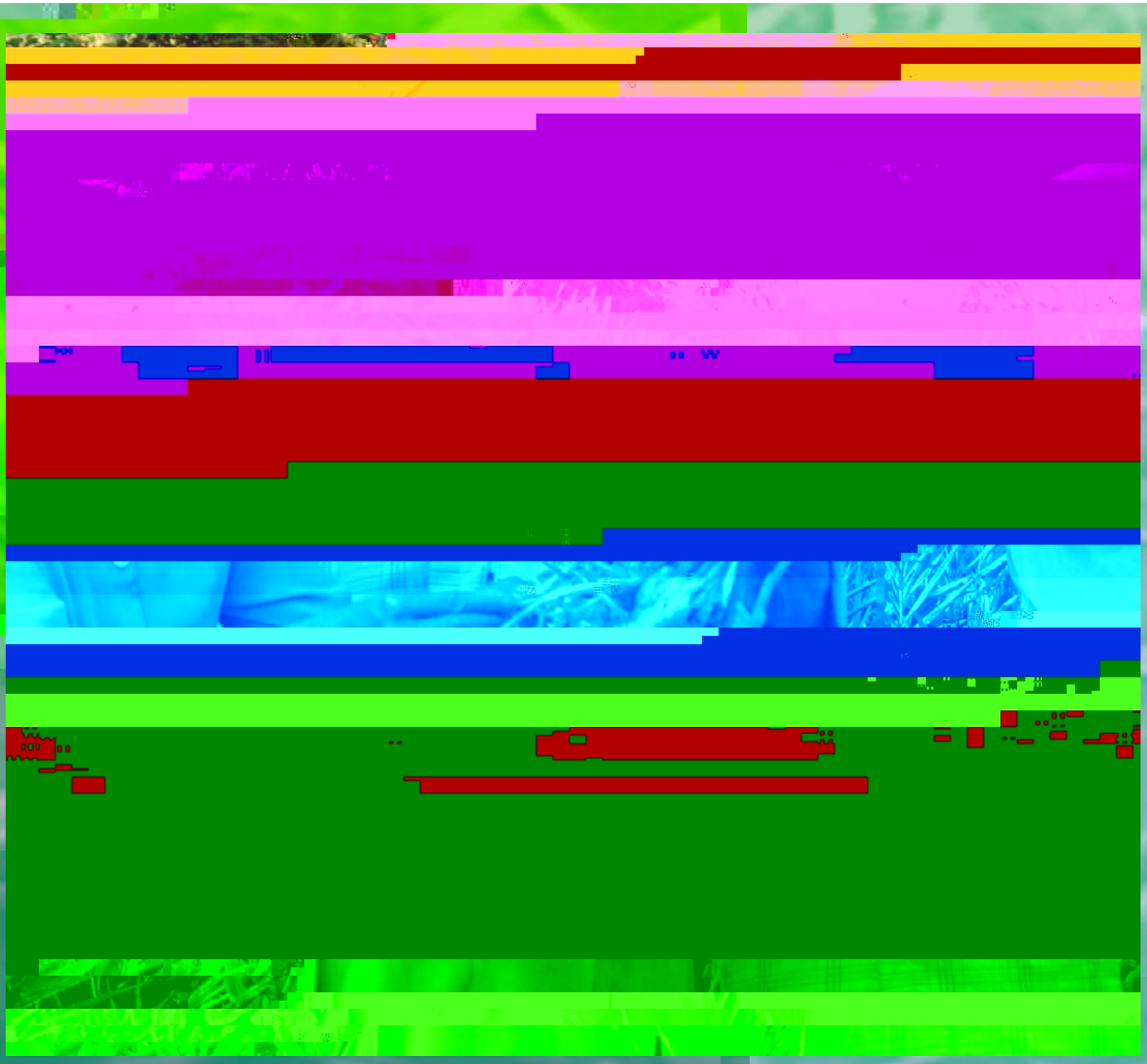
- More employment opportunities at the local level through establishment of local resources-based cottage industries and enterprises targeting pvse
- It is possible to ensure the local market through increasing local and outside uses, which ultimately encourage cultivation and enterprise development
- In the project area over 2000 hectares are public and degraded lands, (dfsp 2006), with the high potential to become areas for management of NTFPs/maps with the involvement of pvse through different forest management approaches
- Reduce the out-migration and secure livelihoods within rural communities
- Biodiversity maintenance and conservation

CONCLUSION

Developing tangible means and mechanisms reaching to the chronically poor through sustainable management of forest is a vital part for a significant reduction of poverty within the country. The Churia area is rich in terms of biodiversity and natural resources, including NTFPs/MAPs. A prudent use of such resources, which are abundantly available, is of prime concern within the community. Similarly, an appropriate technology suited to the local situation and considering the beneficiary groups (poor, vulnerable, socially excluded, landless and women) is required at all levels of the production cycle. The key issues and challenges also need to be addressed adequately. For this, supportive policies, appropriate technology, and an economically viable and environmentally sound package need to be developed. A market and/or sub-sector analysis and value chain analysis is also equally important to contribute to poverty reduction and improvement of the livelihoods of the most marginalized groups within society.

Finally, a comprehensive and coherent policy for the Churia and biodiversity conservation, and cultivation, management, and marketing of potential NTFPs/MAPs should be in place.

To obtain a copy of the full length version of this paper, please contact Rajendra Khanal at rajendrak@carenepal.org



THEME 2:

Nguyen Huy Phon[1] & Nguyen Thi Yen[2]

BACKGROUND OF NTFPS NETWORK IN VIET NAM

The Non-Timber Forest Products Project (NTFPs Project) funded by the Royal Netherlands Embassy (RNE) in Ha Noi with technical assistance from IUCN and implemented by the Forest Science Institute of Viet Nam (FSIV) under the Ministry of Rural Development (MARD) has the overall goal: *"To achieve forest conservation and biodiversity through capacity building for the management and sustainable use of NTFPs, both ecologically and economically, with benefits equitably distributed among all target groups, especially the poor living near and inside forest areas".*

The project has been implemented from 1998 to 2007 under two phases: Phase I (1998-2002) entitled *Sustainable Uses of NTFPs;* and Phase II (2002-2007) entitled *NTFPs Sub-sector Support in Viet Nam.*

The objective of Phase II is: *"To strengthen the capacity of research and management institutions in Viet Nam to support the ecologically sustainable and equitable use of Non-Timber Forest Products (NTFPs) to contributes to: biodiversity conservation; improved livelihoods for poor people residing in and around forest areas; and local and national economic development".*

At the beginning of the new millennium, more importance was attached to the role of NTFPs. Many activities related to NTFPs carried out by national organisations and international projects throughout the country have identified the urgent need for information-sharing and cooperation in the development of NTFPs. Therefore, in addition to the capacity building activities for NTFPs research agencies, the NTFPs Project Phase II also supported the establishment of a nationwide NTFPs network to *"encourage and strengthen NTFPs information-sharing and cooperation among organisations, individuals, and communities inside and outside the country to contribute to NTFPs conservation and sustainable development in Viet Nam".*

Under such favourable conditions, the NTFPs Network in Viet Nam was established in December 2003 with organisational support from FSIV and financial support from the NTFPs Project.

Participating parties in the establishment of the NTFPs Network include the NTFPs Project, the Viet Nam Forest Science and Technology Association (VIFA) and FSIV. The Network Executive Board (NEB) has been elected, including representatives from the forestry, health, conservation, development and enterprise sectors. Following its establishment, the NEB collected ideas and contributions from network members in order to revise the draft regulations for the network's operations, develop a workplan and arrange for the workplan's implementation.

According to the regulations agreed upon by all members, the network has five functions and tasks:

- Collect, exchange, update and disseminate information on NTFPs both inside and outside Viet Nam.
- Facilitate policy dialogues and support for developing policies related to the sustainable development, conservation and management of NTFPs.
- Facilitate technology transfers and cooperation in NTFPs research.

1 NTFPs Network Chairman

2 IUCN Viet Nam

- Contribute to awareness-raising regarding the role of NTFPs in conservation, bio-diversification and livelihood improvements for communities.
- Connect organisations and individuals working

- Q&A manual for bamboo and bamboo shoot plantation and tending techniques (published)
- technical manual for essential oil extraction (published)
- technical manual for awareness-raising and protecting valuable medicinal herbs (published in first quarter of 2007); and
- overview of NTFPs sub-sector in Viet Nam (in cooperation with the NTFPs project training group), published in the second quarter of 2007.

• Participated or led the following workshops, under the project's framework, to provide advice on techniques and NTFPs development policies:

- workshop on establishing mechanism for information-sharing inside and outside the network;
- workshop on introducing the RF and ALF funds and a workshop on lessons learnt from the implementation of the two funds in the first round of the NTFPs project;
- participated in developing the national strategy of NTFPs conservation and development 2006-2020 and the National Action Plan on NTFPs Conservation and Development 2007- 2010;
- organised a forum to collect ideas and contributions from local areas for drafting the National Action Plan on NTFPs conservation and development 2007- 2010; and
- participated in assessing and revising the design of the NTFPs project.

• Organised study tours for some members of the network to local areas and enterprises to learn from successful NTFPs activities.

• Introduced NTFPs resources and activities and related issues to many media agencies, who will help to disseminate and raise awareness about the roles of NTFPs in conservation, bio-diversification and improving livelihoods.

• Established an e-list for sharing information and connecting network members (this e-list is now available on the network's e-bulletin).

• Assigned members to attend a network workshop relating to NTFPs in the region to learn from other countries' experiences and disseminate this knowledge to local NTFPs network members (workshop on community forestry network in Nepal in 2006).

• Learn from the experiences of nepalese colleagues and with the active support of IUCN, the NTFPs network established a network working group in April 2007, which comprises international organisations concerned with NTFPs development and nature conservation in Viet Nam. Apart from meeting each two months for information sharing, the working group will help the NEB to develop strategies and maintain its activities. Though newly established, the working group is expected to have an important role in strengthening Viet Nam's NTFPs network.

ASSESSMENT OF THE EFFECTIVENESS OF NTFPS NETWORK ACTIVITIES

Achievements

• Contributed to the implementation of the NTFPs project phase II (technical advice for the implementation of RF and ALF, disseminated some achievements of the project through the NTFPs newsletter, developed the national strategy on NTFPs together with the project).

• Carried out some of the functions detailed in the network's regulations such as:

- collect, exchange, update and disseminate NTFPs information (e.g. held a workshop to identify a mechanism to share information and cooperate with mass media agencies);
- facilitate policy dialogues and support the development of policies related to the sustainable development, conservation

Joost Foppes[1]

INTRODUCTION

The National Agriculture and Forestry Research Institute of Laos (NAFRI) organised a cross-country exchange workshop on Non-Timber Tree and Forest Product (NTFPs) enterprise development for poverty alleviation in Vientiane on April 24-27, 2007. The event was supported

1 SNV Laos

Table 1. Summary of responses to key questions from 19 Action Learning Fund Sub-projects

Questions		% classified as excellent or good
1	Was this project innovative – was this new research?	68
2	Was the methodology appropriate for the activities being implemented?	74
3	Was the technical support provided during the project adequate?	69
4	Was communication and dissemination of new information effective?	63
5	Were the activities continued by farmers without project support?	58
6	Was indigenous knowledge used by researchers?	42
7	Were gender issues addressed by the project?	31
8	Are the activities introduced by the project sustainable?	32

The results show that the project methodology was effective in delivering much-needed technical knowledge support to poor farmers. It is also encouraging that a significant number of implementers have continued with project activities after assistance from the project had finished. This supports a report commissioned by the project and prepared by Raintree et al. in 2007 entitled "NTFPs impact on poverty, national development and biodiversity conservation through creating livelihood assets". The survey and report was designed to obtain the villagers' own assessment of the relevance and impact of the activities promoted by the project. The survey interviewed more than 100 people from eight sample villages. Survey results also showed that participants in project activities highly valued the project's provision of knowledge and skills, including advice on how to work in different ways and make more productive use of household labour. This fact is also somewhat corroborated in the above table, as questions two-to-five indicate the appropriateness of information skills that were strengthened by Research Sub-project activities.

Gender and indigenous knowledge

Although there was a mandate to do so, many of the Research Sub-projects did not deliver as well on gender issues or use indigenous knowledge as much as had been hoped. This is not an isolated problem. It is common for projects to intend to undertake work on these issues but fail to do so. The importance of involving women in the success of projects can be illustrated through the experiences of one of the Action Learning Fund Sub-projects entitled "Cultivation and development of ginger and saffron in the forested areas of Ha Tinh province". The excellent field trials and the high level of farmer interest led the evaluators to assess this project as one of the most successful in the programme. Table 2 below summarises the many components that participating farmers and evaluators considered key factors contributing to the success of the project.

Table 2. Cultivation of Ginger and Saffron in the forested areas of Ha Tinh Province

Reasons for success in order of importance
1. The farmers were interested in the topic
2. A group of farmers formed a club – The Forestry Perfume Club.
3. The club was composed of mainly women members
4. The site conditions were suitable for growing the two species
5. The local people know about these species and routinely harvest them from nearby natural forest
6. Low capitol inputs needed
7. There is a good market for the products and the farmers know the buyers
8. The price paid for these products provides good economic returns for labour input
9. The project approach was good with a large emphasis on field work
10. The trainer -

THEME 3:

of type (IB), which have special scientific, environmental or economical value, and have small populations in the wild or are in serious danger of becoming extinct; and

- Group II - vegetation of type (IIA) and animals of type (IIB), which have high scientific, environmental or economical value, and have small populations in the wild or are in serious danger of becoming extinct.

The regulations prohibit trade in flora and fauna from both groups I and II, and permission is required from the Ministry of Agriculture and Rural Development (MARD) to use any of the species described. Scientific research is allowed for Group II in specialised forest areas, however international agencies must seek permission to use any of the flora and fauna described. Control of Group IIA species is specified within the Regulations on Timber and Other Forest Product Exploitation, approved by MARD. For forest animals within Group IIB living outside special areas, permission for any activities aside from research must be sought from relevant central or provincial departments.

Policies relating to production, processing, trading and marketing of NTFPs

Plan for forest product areas, including NTFPs

Decision No. 661/QĐ-TTg (dated July 29, 1998), issued by Prime Minister for a new 5-million hectare afforestation project (Decision 661 for short), strongly affected the formation of forest material areas, including NTFPs areas. This document regulated incentives for forest re0 TaTFPs
in protected and cultivated forests, and considers natural forest re0 TaTFPs
for forest rehabilitation, including NTFPs. Other legal documents also encourage the development of NTFPs trees for making fine art products.

According to regulations stated in the Land Law (2003), and the Forest Protection and Development Law (2004), the state deliversjland use rights and forest use rights to organisations, households and indu11duals for long-term and sustainable use. These regulations
and transferring owTaTship rights amongjland and forest usersj(forest holders), as well as the policy

favourable conditions for the formation of forest product material areas, including NTFPs.

The Investment Law and implementation guidelines regulate forest use in 0 TaTFl, including growing NTFPs trees, forest product processing, and trading in traditional fine art. Various groups b Ta fit from preferential investment treatment, including trading businessesj(list A), mountainous areas or areas facing socio-economic difficulties (List B), and areas facing special socio-economic difficulties (List C).

According to the regulations of thisjlaw, NTFPs afforestation activities enjoy preferential investment treatment, including a reduction in land use fees (50 per cent reduction in 0 TaTFl areas and 75 per cent reduction or total exemption in areas facing difficult or extremely difficult socio-economic problems). In addition, such activities will be exempt from land rental costs for between three-to-six years from the date of signing the land lease. In areas of socio-economic difficulty, thisj exemption extends to between 11 and 15 years, while for areas facing extreme socio-economic difficulties, a complete land rental exemption applies for afforestation projects.

Currently, most NTFPs afforestation activities are carried out in difficult or extremely difficult socio-economic areas. Thus, such activities satisfy preferential treatment criteria for both type of activity and location.

Credit policies

There are currently two types of credit relating to NTFPs afforestation, namely government preferential credit and trade credit.

Government preferential credit is pro11ded for NTFPs afforestation projects, processing facil1998),

trees, through improving land conversion rights, land transfers, leasing, and capital sharing with equal land use rights. The allocation of forest land and granting of land use rights should be legalised for to local farmers and city dwellers who wish to invest in NTFPs planting in specified areas.

Some recommendations regarding policies on investment and credit include: allowing households, who contribute or buy shares in organisations that plant NTFPs trees, to borrow funds directly from

NWFP utilization by the Institute of Traditional Medicine Services

The Institute of Traditional Medicine Services currently experiences no difficulty in obtaining permits for collection and is usually granted a permit within seven-to-10 days without an approved management plan (Tideman, 2006). This institute is responsible for the development and provision of quality traditional medicinal care and there are 25 Traditional Medicine Units attached to district hospitals within the country. In 2005, they procured 12.5 tonnes of raw materials, and this quantity is expected to double within the coming years because of commercialisation plans. The Institute of Traditional Medicine Services is therefore closely cooperating with the Ministry of Agriculture in the cultivation of medicinal plants and training of farmers in good collection practices to ensure the sustainable production of medicinal plant resources (Phurba Wangchuk, 2006).

NWFP utilisation for export

The most commercially important NWFPs for export in Bhutan include lemon grass oil (*Cymbopogun flexuosus*), Matsutake (*Tricholoma matsutake*; a high-value mushroom in Japan), and *Cordyceps sinensis*.

The lemon grass oil industry in Bhutan started in 1981, and is at present carefully managed by the Essential Oil Development Program of the Ministry of Trade and Industry in collaboration with the Renewable Natural Resource-Research Centre in Mongar, Eastern Bhutan. The oil fetches a good price in the United Kingdom ($12.5 per kilo) and provides an additional income to more than 1,000 people. The total lemon grass production from 1995 to 2004 amounted to 105,581kg with a value of more than $1.3 million (Dorji Wangdi and Galey Tenzin, 2006; Prommegger, et. al, 2005). The research centre in Mongar carefully monitors the availability of the wild lemon grass resources and is currently undertaking research on the impact of forest fire on resource availability. Unless the results of the research reveal otherwise, burning of lemon grass areas will continue to be strictly forbidden as a method of stimulating grass growth.

Exports of Matsutake mushrooms started in 1991, with a peak of 11,470kg in 1997. Since then, exports have declined to less than one-fifth (Ministry of Agriculture, 2003). In 2005, only 1,663kg of Matsutake mushrooms were exported to Japan (Hikojiro Katsuhisa, 2006).

Malaysia. The sharp decline is mainly due to reduced market demands, and the lower quality of Bhutanese mushrooms because of quality loss during the long transport process. The National Mushroom Centre has developed rules to ensure the sustainable management of the Matsutake mushroom resources, which include start and end dates for the collection season, minimum size limits, and improved collection techniques (Dawa Penjor, 2006).

Cordyceps sinensis is called "Yar-tsa Guen-bub" in Dzongkhag which literally means "summer grass-winter worm" and can be found at altitudes of around 4,000 to 5,000m. asl. Cordyceps is a highly valuable product and one that and enjoys substantial international market demand (and a willingness by those markets to pay), with prices ranging from $2,000 to $5,000 per kilo. Until 2004, harvesting of Cordyceps was illegal, and therefore attracted many blackmarket collectors from across the border with China. Under the royal command of the Fourth King, the collection of Cordyceps was legalised in 2004 for a period of one month during the Cordyceps season based on careful studies (Namgyel 2003; Namgyel and Tshitila 2003). The Renewable Natural Resource Research Centre in Yusipang does extensive research on Cordyceps, including biological studies and studies related to sustainable harvesting and habitat preservation, and explores methods for cultivation (Kunzang Choden, 2006). In 2006, 507kg of Cordyceps was auctioned for a total value of just over $1 million.

Community-based management of NWFPs for domestic use and commercial purposes

According to the Social Forestry Division, at present four out of the 42 approved Community Forests focus on the management of NWFPs, including: the endemic bamboo species (*Borinda grossa*); lemon grass (*Cymbopogon flexuosus*); a pepper species used for medicinal purposes (*Piper pedicentilitum*); and bamboo and cane (scientific name unknown). At least nine other Community Forests are in the pipeline for the management of a number of NWFP species, including lemon grass (*Cymbopogon flexuosus*), *Illicium griffithii*, *Swertia chiryata*, *Cordyceps sinensis*, Matsutake mushroom (*Tricholoma matsutake*), bamboo (*Neomicrocalamus andropogonifolius*) and cane (*Calamus acenthospathus* and *Calamus altifolius*). All of the respective management plans contain a detailed resource assessment, and all consider both domestic use and commercial purposes.

Other factors influencing NWFP availability in Bhutan

The strict rules and regulations related to harvesting forest products for commercial purposes have strengthened the conservation and sustainable management of many NWFP species. However, it is not only strict regulations that have ensured continuous availability of forest products and NWFPs.

Where other Asian countries struggle to maintain their biodiversity, Bhutan has been able to conserve its rich natural resources. A number of reasons outside of forest policies can be attributed: the very recent "opening up" of the country to the rest of the trading world; the inaccessibility of the country due to its mountainous terrain and long walking distances; the relatively small population; the high respect for the law and its officials by local people; the relatively low incidence of corruption; and the strong influence of Buddhism, which includes a deep respect for nature and animals.

The following is an example to illustrate the strong influence of Buddhism. Dramitse, in Mongar district, eastern Bhutan, is an area famous for its vast lemon grass (*Cymbopogon flexuosus*) expanses. At present, the number of lemon grass distillers is dwindling. Among other reasons, this is due to the reluctance of local people in this religious area to produce lemon grass oil, which kills numerous insects in the distillation process (Dhanapati Dhungyel, pers. communication, 2007).

CONCLUSION

THEME 4:

contribute to at least 35 million person days of employment per year. Currently, 960 species are traded in India with a total consumption of 312,516 tonnes, including 123 species with a demand of more than 100 tonnes per year (GOI, 2001).

In Bangladesh, it is estimated that around 12,000 tonnes of dried medicinal plants worth around $4.5 million are sold from the rural collection and production areas that contribute significantly to the rural economy (SEDF/IC, 2003). The annual import of MAPs to Bangladesh has been estimated at Tk 500 million (Non Wood News, 2007).

In Nepal, an estimated 20,000 tonnes of MAPs worth $18-20 million are traded annually and about 90 per cent of this collection is exported mainly to India in raw form. Some 20 high-demand and high-value products constitute about 80 per cent of the volume and value in trade (Bhattarai and Olsen, 2000).

In Pakistan, dried medicinal plant material worth $30 million per year is used in the country, while a substantial quantity of crude plant drugs and their derivatives are exported to developed countries.

The scenario of MAPs in Bhutan is not very different from that of other countries of the region. About 300 species are harvested from the wild and the cultivation of a few selected species has only been initiated very recently. However, medicinal plant farmers have been highly encouraged to supply medicinal plants to the traditional medicine manufacturing units of the government. Therefore, a significant proportion of the cultivated products are used domestically for the preparation of traditional herbal medicines, while the majority is exported in crude forms.

In China, 8.5 million tonnes of MAP resources are used every year, which are mainly collected/ harvested from the wild. There are also records of significant trade of MAPs from Afghanistan and Myanmar.

ISSUES IN COMMERCIALIZING MAPS IN THE HIMALAYAN REGION

The increasing use of MAPs in natural products, health foods, cosmetics and nutraceuticals has implications on the sustainability of resources and pro-poor MAP-based livelihoods. In the Himalayan region, 90 per cent of medicinal plants are extracted from the wild, which often involves destructive harvesting. Most of the collected plants are exported in raw form with very little processing in their area of origin. Producers and collectors are often disorganised and have poor access to technology, credit and market information, and have critical disadvantages in terms of quality control and bargaining power. The marketing system is disorganised and secretive. In such a scenario, poor collectors in remote regions receive a meager share of the final value of the products they harvest. On average, this share of the final price paid by the consumer is as low as 10 per cent (Karki et al., 2003). Although the cultivation of MAPs has been proposed as a viable option to diversify farming practices, forward and backward linkages are yet to be adequately developed, and studies of the impacts on the landless to date are inadequate.

THE MEDICINAL AND AROMATIC PLANTS PROGRAMME IN ASIA (MAPPA)

MAPPA is a programme comprising strategic research, collaboration and networking on MAPs. It develops, provides and promotes appropriate options, methods, strategies and technologies and other sustainable solutions to provide direct benefit to poor and marginalised people and help conserve critical medicinal plant-related biodiversity wealth for use by future generations.

The emphasis of the program has been on action research that has the potential to benefit the

labeling protocols and ensuring the right storage conditions are met for quality maintenance. These are of critical concern to the production process and are continuously disseminated to the growers and MAP collectors, and compliance monitored. Chains of custody cards have been developed and distributed to members of 357 households covering five villages in Chhattisgarh, India.

Marketing of MAP products – experiences from India

In Chhattisgarh, India, the MAPPA project, being implemented by the Chhattisgarh Minor Forest Products Federation (CGMFPF), identified 11 species after detailed surveys were conducted on organic collection, processing, value addition and marketing. The various components leading to CBE development, value addition, and marketing are highlighted below.

Institutional mechanism for local value addition

In Chhatisgarh, the restructuring of adequate marketing facilities has safeguarded the interests of poor collectors and producers. This has been done by setting up self-help groups (SHGs) from within the forest protection committee (FPC) members, which comprise of both males and females managing MAPs processing centres. In order to generate a revolving fund, each member deposits Rs 10/month into the SHG funds. Workers in the processing centres are paid on the basis of the quantity of raw materials processed per day.

Value addition through appropriate technology

The project further prioritised five species out of the initial 11, namely Tikhur (*Curcuma angustifolia*), Baichandi (*Dioscorea hispida*), Satawar (*Asparagus racemosus*), Amla (*Phyllanthus emblica*) and honey, which were being processed by very crude methods and mostly under unhygienic conditions.

For the processing of 0 TD0ry ers o5veloped

SHtttholdsu337 (females rketingFeds BTsold 7 TD .a brs BTTf 9Rs 9.2934 05152 24,000rac$545).o5veloped)3974set0194

Name of species	Price before Project Intervention (INRs/kg)*	Price after Project Intervention (INRs/kg)	Increase in Percentage (%)
Andrographis paniculata	1.50-2.50	3.00-5.00	100
Woodfordia fruticosa	1.00-1.50	3.00-5.00	300
Cyperus scariosus	3.00	5.00	66
Embelia ribes	20.00	30.00-40.00	50-100
Phyllanthus emblica	10.00-15.00	20.00-25.00	100-166

**(1USD=42 INRs)*

development of MAP products in the project area. In order to take the products to the consumers, a herbal retail outlet called SANJEEVANI has been established in Raipur, the capital city of the state, with branches in other districts. SANJEEVANI buys the finished products from the community-managed processing centres.

The project is also facilitating the manufacturing of 19 different types of traditional medicines based on traditional knowledge and the prevalent diseases in the project area. These medicines are also sold through SANJEEVANI outlets as over-the-counter drugs and have been very well received by the market. All profits from the sale of MAP-based products contribute to the FPCs financial accounts.

Mainstreaming MAPs marketing

The project has also developed markets for MAP-based products beyond the state. Proper collection, storage, drying, processing and value addition have encouraged better prices and acceptance of MAPs in the project areas. The competitive rates offered by the project to collectors have not only developed a marketing system within the project area, but have also created a system of competition between traditional traders and middlemen, who normally exploited collectors by offering low prices. This has directly contributed to improving MAPs collectors' incomes by more than 100 per cent.

Innovations in MAP institution building and finance in Nepal

The Federation of Community Forestry Users Nepal (FECOFUN) is one of the country's leading institutions in community-based natural resource management. Functioning as a network of community forest users, presently FECOFUN covers 74 of the 75 districts of Nepal and involves 11 million people through 14,300 forest users groups. It directly manages over 1.3 million hectares of community forests in the country and generates additional benefits by producing an average revenue of Rs. 914 million (approximately $22 million) per year.

MAPPA is working with district FECOFUN and community forest user groups (CFUGs) in the Baitadi and Darchula districts of West Nepal. The main activities of the project in West Nepal have been the development of MAP cooperatives with local traders and the establishment of a capitalisation fund to benefit the collectors and traders.

Marketing information

Members of the CFUGs in the project area have been trained in various aspects of markets and marketing, including major herbal market studies and agricultural/herbal trade fairs in Nepal and India.

The district-level Project Coordination Committee is represented by the district-level herbal traders, in addition to other stakeholders. A mechanism has been developed for the district FECOFUN to obtain market prices and other herb trade-related information from various sources, which is then disseminated to the village-level stakeholders and community groups, including CFUG members. Local traders have provided market information and guidelines on primary processing and provided guidance on how to buy MAPs from community managed cooperatives.

Marketing cooperatives

With strong components of community-based research, capacity building and exposure, communities in remote regions are gaining from collective action in maximising the benefits gained from community forestry. Marketing cooperatives with endowment funds have been set up in Baitadi and Darchula districts in the far western region of Nepal for mainstreaming the collection and marketing of MAPs, which are backed by the development of collection and dispatch centres. The cooperatives have also been providing micro-credit to primary collectors and producers, and created a business platform for value addition and marketing. More than 200 tonnes of NTFPs/MAPs worth NRs 1.55 million was collected/produced in the two project districts during 2005. Simple interventions have resulted in a 50-per cent increase in the price of products at the local level. As the result, community members, especially women's groups, have initiated group farming efforts on some commercial MAPs in degraded community forest and land. The number of women practicing MAP cultivation in home gardens and farms is also increasing considerably.

Capitalisation fund

Capitalization funds worth NRS 80,000 were provided to 18 CFUGs to provide necessary credit and financial support to participate in MAP-based programmes. The funds were used to provide loans to individual members and self-help groups to initiate cultivation of MAPs and establish micro enterprises. A total of 206 males and 174 females were offered loans between NRs 500 to NRs 4000 in the two districts. In Baitadi, members from three CFUGs produced 1,538kgs of NTFPs and earned NRs 36,983. In Darchula, four CFUGs earned

producers through appropriate stakeholders, as well as through the documentation of useful knowledge and practices in the field of production, processing and marketing.

While developing CBEs for livelihoods, an understanding of markets plays a significant role in ensuring success. Lessons learned from the projects suggest that CBE models should be based on integrating value chains to reach the end consumer through a multi-stakeholder approach or by linking enterprises to the value chains of larger enterprises. Community mobilisation and capacity building is important to ensure compliance with standards and protocols. It has been observed that certification is extremely important for export markets, but it is not an end in itself. While certification is often expensive for CBEs, local group certification bodies, whose standards are harmonised with national standards (organic products, GMP, etc.), can provide a good base to start from.

FUTURE PLANS

Based on the lessons learned, ICIMOD-MAPPA is promoting CBEs that produce quality products in demand by the private sector. These enterprises have to be formed in clusters and will be linked to centralised common facility centres to produce consumer products and provide support services. Value addition at every stage is proposed to ensure enhanced bargaining power for growers and collectors, and better returns. It is envisaged that Public Private Partnerships (PPPs) will be developed to ensure mainstreamed production processes, adequate marketing infrastructure, and increased investment in the sector through better quality and enhanced brand awareness of MAPs products. The entire process is aimed at ensuring the conservation and sustainable utilisation of MAPs resources through MAP enterprise promotion in Bangladesh, Bhutan and Nepal, towards the further expanding of the initiative in the Greater Himalayan region to address the livelihoods problems of poor communities.

References:

Bhattarai, N.K. and Olsen, C.S. (2000) *Towards a generic framework for investigating national importance of medicinal plants trade. In: Amatya, S.M. Ed. Proceedings of the third regional workshop on Community Based NTFPs Management, South and East Asian Countries NTFPs Network (SEANN).* Institute of Forestry, Pokhara, Nepal. pp. 336-346

GOI. (2001). *Report of the task force on the conservation and sustainable use of medicinal plants.* Planning .36420247 Tw(incr*(D.49(d,cess .36 622ing)y) Tw(dem for4445 TD.4291inab

Centre (IDRC), South Asia Regional Office (SARO), New Delhi, India.

Non Wood News (2007). *Non Wood News, Issue 14.* Food and Agriculture Organisation, Rome, Italy.

Rawat, R.B.S. and Uniyal, R.C. (2005): *Sustainable use and management of medicinal plants in Himalayan region. In: Y. Thomas, M. Karki, K. Gurung, D. Parajuli (eds.). Himalayan Medicinal and Aromatic Plants, Balancing Use and Conservation.* His Majesty's Government of Nepal, Ministry of Forests and Soil Conservation, Kathmandu, Nepal. pp. 499-501.

SEDF/IC (2003). *Medicinal Plants Marketing in Bangladesh.* SEDF/Inter-corporation – a Swiss Development Foundation study.

Le Thi Dien & Tran Nam Thang[1]

BACKGROUND

More than 50 per cent of Thua Thien Hue's natural area comprises mountainous terrain, which is directly affected by the monsoon season. Thanks to the area's complex topography and climate, Thua Thien Hue has a diverse and unique range of fauna and flora, including various species of valuable trees and special forest products such as medicinal plants. However, local communities are currently harvesting medicinal plants from the forest without considering the need to address such practices in a sustainable manner.

Changes in government policies at the national level regarding the exploitation of forests have had both negative and positive impacts on forest resources in Thua Thien Hue. Among the policies that have affected local forest resources in recent years, the decentralisation of forestry authority has had profound impacts, particularly in terms of the exploitation of timber. In light of such changes, new sources of income, such as Non-Timber Forest Products (NTFPs), need to be identified for local people living near or in forests, of which medicinal plants are considered a viable and potentially efficient alternative.

Ha An village is located in Huong Phu commune, Nam Dong district, Thua Thien Hue province, and lies in the buffer zone of Bach Ma National Park. It was chosen by the Forestry Faculty of the Hue University of Agriculture and Forestry as a long term study site for faculty students to explore ways to help local people to increase their income from forest and forest land without losing or degrading forest resources.

Following a preliminary survey, it was found that local residents were concerned about developing medicinal plants at the household level due to fears about their products being accepted in the market. It was then agreed that research was urgently required to identify comprehensive solutions for developing an effective model for cultivating medicinal plants in allocated forests. This research identified a promising new direction for solving many of the difficult problems currently facing the forestry industry. The experimental models formulated through the research provide good examples for individuals, organisations and regions to learn from our experiences and apply the models, in order to achieve sustainable development in the area, as well as build up green corridors for the conservation of Bach Ma National Park.

RESEARCH GOALS AND OBJECTIVES

General objectives

The development of medicinal plant resources in allocated forest land in the area aims to help local people improve their use of forest and forest land through diversifying the NTFPs products they produce. Through such an initiative, the production ability of forest areas would also be increased, local people's incomes improved and pressure reduced on forest resources, leading to substantial improvements in the overall management and development of forest resources in the buffer zone of Bach Ma National Park.

1 Hue University of Agriculture and Forestry

Concrete objectives

- Establish models for medicinal plant cultivation at the household level in allocated forest, which produce good, high-quality fast yields, involve simple techniques and low inputs, and meet the long-term demands of the market.
- Compile a collection of the medicinal plant genes in the area in order to provide a good resource for forestry, natural resource management and pharmaceutical students from universities in thua thien hue province.
- Increase the capacity of forestry staff and local people in identifying and developing medicinal plant resources, as well as raise awareness about the value of medicinal plants in the buffer zone of bach ma national park.
- Establish fixed propagation techniques for some of the major medicinal plant models, and develop a proposal to expand these models into areas in the buffer zone of bach ma national park.

RESEARCH METHODOLOGIES

Background research

- Review literature on NTFPs and medicinal plants from the world, region and Viet Nam, especially concerning the buffer zone of Bach Ma National Park
- Study documents on the natural, social and economic conditions of the research area
- Examine reports of forestry programmes and development projects in the area

Specimen survey

- Conduct surveys of transects and standard plots in the field to identify the practical conditions required to group the targeted objects
- Identify the species and volume of medicinal plants in the study area

Social surveys

- Rapid rural assessment (rra) tools such as historical surveys, transect studies and village inventories were used to collect information about the land and forest, check the household conditions of those who participate in the model development, and choose the location for implementing the models
- Participatory rural assessment (pra) methods such as using boards, questionnaires and group discussions were used to survey the market, choose plant species, identify nursery and tending techniques, and select harvesting and processing procedures
- Participatory research (pr) and participatory technique development (PTD) were used in designing, implementing, monitoring, evaluating and communicating the models

RESEARCH RESULTS AND DISCUSSION

Current status of medicinal plants in study area

Through the preliminary survey, the study team identified 130 common medicinal plant species distributed in the study area, belonging to 59 flora families. Of the total, 30 medicinal plant species were associated with their scientific names. The Euphorbiaceae family had the highest number (10 species), followed by the Rubiaceae family (nine species), the Araliaceae family (eight species), and the Fabaceae family (eight species), while various other families had between one-to-w

species, occupying 23.85 per cent). There were 29 species of rare medicinal plants (representing 22.31 per cent of total), while common medicinal plant species had the lowest proportion at 23 species (17.69 per cent). Keeping these figures in mind, seeds and seedlings should be provided for models on a flexible basis, with rare species only being developed conservatively in order to ensure natural seed stocks are not depleted. For this reason, it is recommended that large amounts of seeds or valuable species be purchased from properly equipped centres.

Following further research, it was found that despite the diversity of medicinal plants in the area, local people only knew how to use 62 of the total 130 species identified (47.69 per cent). This proved that local people lacked knowledge, as well as experience, in utilizing the valuable medicinal plant species that grew naturally in their area. Of the 62 medicinal plant species exploited by local people, only 14 were commonly used (22.58 per cent). These were plants mainly used to create water infusions such as Chan chim, Che vang, Ngay, Buom bac, Tho phuc linh, Kim cang, and Mam nem. Commonly planted species in the home garden included Sa, Gung, Nghe den, Nghe vang, and San day. Species used on average comprised 14 species (22.58 per cent), with 22 species used sporadically (35.48 per cent). Rarely used species made up 12 of the total (19.35 per cent).

Most of the traditional medicinal plants species in the area are harvested for home use and only a small proportion is sold. Processing generally consists of drying the plants, which are then used by different groups of people in the community.

Role of medicinal plants in household income

In order to understand the roles of medicinal plants in households in the study area, 48 households were interviewed, which were spilt into the following categories: rich households Group I; wealthy households Group II; average households Group III; and poor households Group IV.

According to the survey, Group I's income from medicinal plants stands at VND2,000,000, per year, which is very low compared to the total income of the household (0.54 per cent). In general, these kind of households only plant monotonous species for household use, and rarely for sale; thus the income from this source is very low.

Group II uses more medicinal plants than Group I, mostly for water-based infusions, but also earns a greater percentage of its income from the plants (1.85 per cent, second-highest of all groups). It is important to recognise that the value of medicinal plants to these types of households is not only expressed by the amount of money earned, but also by the degree to which they are used in the daily lives of local people.

Households in Group III lead a lifestyle dependent on cultivation and grazing in hilly areas, and but also earns additional income from harvesting medicinal plants (VND1,550,000, representing

Most of the medicinal plants surveyed are present naturally in the study area and Thua Thien Hue province, especially in natural forest environments. This proves the huge potential of medicinal plants in Thua Thien Hue to not only meet the demands of the province, but also act as a valuable product for export to other provinces and markets.

However, in order to transform medicinal plants in Thua Thien Hue into valuable, high-income earning goods in the market, a comprehensive market development strategy must be developed.

Developing a medicinal plant model

Based on the set criteria, and together with the local people, the research team chose 20 households to participate in developing medicinal plant models comprising: shaded fruit tree garden; hilly garden; five households under plantation forest model; and three households under the natural forest model.

The medicinal plants used in the models included:

- Home garden model: nghe vang, kim ngan, nhan tran, gung, sa, nghe den, kim tien thao, san day, cho đe, tia to, ich mau, coi xay, mo long, co hoi, rau meo, ke đau ngua, lo hoi, ngai cuu, rieng, bo chinh sam, bo cong anh;
- Plantation forest model: nghe vang, tho phuc linh, kim ngan, khoai mai, gung, bong bong, nghe den, lac tien, kim tien thao, y di, cho de, coi xay, rau meo, lo hoi, ha thu o đo, ba kich, bo cong anh, la khoi; and
- Natural forest model: tho phuc linh, khuc khac, kim cang, thien nien kien, sa nhan, thach xuong bo, ha thu o đo, binh voi, la khoi, nghe vang, nghe den, khoai mai, Bong bong, Mia gio, Gung, Bo chinh sam, Cau tich, Buom bac, Chac chiu, Ngay.

Technical solutions were selected based on the suitable habitats (home garden, hilly garden, plantation forest and natural forest) for each species and on the experiences of local people integrated with modern techniques.

Local people fully participated in training workshops, and actively contributed ideas for improving the harvesting, planting and sowing techniques for the medicinal plants. The participants absorbed new knowledge quickly, as most of them could base it on their own experiences, and some had already participated in other projects in the area.

Through the research project, descriptions for identifying species and a guide to sowing, planting, tending, harvesting and processing 29 common, high-value medicinal plants was developed and distributed in the study area.

Living and growth ratio of species

- Home garden model: the model of planting medicinal plants in fruit tree gardens and hilly tree areas generated some income for local people. for wealthy and experienced households, approximately one hectare of a home or hilly garden can produce vnd7-8 million from medicinal plants planted with fruit trees such as lemons and oranges. however, the development of the model encountered difficulties after harvesting because local people did not receive support from outside, and actually did not consider the development of medicinal plants as an economical activity.
- Plantation forest model: a total of 11 species grew in an average density level of 1,100 plants per hectare. the growth of supplementary species occurred under the average level of perennial species such as ba kich, do bau, buom bac and sam bong because they are affected by the shading at the acacia plantation or excessive light at the rubber plantation. in the first year, annual species such as sa, san day and gung had good growth because they were planted in the open canopy and suited the conditions of the plantation.
- Natural forest model: similar to the plantation forest model, the density and number of species planted under natural forest fulfilled the demands of the project design, despite having to change some species due to a lack of seeds/seedlings. Some annual species were planted on the forest

GENERAL RECOMMENDATIONS

Indeed, there is great demand for *Holarrhena*