VOICES FROM THE FIELD:
SIXTH WORKSHOP ON COMMUNITY MANAGEMENT OF FOREST LANDS

Edited by

J. Fox, D. Donovan, and M. DeCoursey

Program on Environment
East-West Center
Honolulu, Hawaii

February 6 - March 17, 1995

The Program on Environment publishes Occasional Papers, Working Papers, and Project Papers.

Occasional Papers are monograph-length manuscripts which are subject to internal and external peer review, edited, and distributed at a modest cost.

Working Papers present results of completed and ongoing research to inform interested colleagues about work in progress. They are reviewed internally, edited, and distributed in limited numbers for comment and discussion.

Project Papers present research results with the least possible delay. They are approved for publication by a fellow, are not always reviewed or edited, and distributed by the projects.

CONTENTS

PRODUCT DEVELOPMENT

PREFACE

The papers in this volume were prepared during the 1995 Workshop on Community Management of Forest Lands held at the East-West Center from February 6 to March 18. Fifteen participants from seven Asian countries attended the workshop. In addition we were joined for a few weeks by two observer-*cum*-participants from the United Kingdom and Germany, both of whom have been working in Asia (Nepal and Indonesia, respectively). This year's participants included individuals from a wide variety of backgrounds and experience--government, NGOs, universities, and research institutes. They came from both headquarters and field offices, and from the ranks of the recently graduated as well as of those with more than a decade of experience in development work. This year was unique also in that we had nearly as many women as men participating.

The topical focus of the 1995 workshop was non-timber forest products (NTFPs). According to promoters, NTFPs not only hold great potential for rural development by expanding employment and income opportunities in impoverished forest areas, but also can increase government revenues and conserve forests at the same time. Environmentally conscious consumers in the industrialized West can assist these efforts by simply making informed purchases. NTFP development has thus become the latest panacea, a cure for the ills of tropical deforestation and rural poverty. But like all cure-alls, there is often a healthy dose of hyperbole behind the efficacy. Does NTFP development truly offer the world something innovative and promising, or, as Dove[1] argues, is it nothing more than a red herring in a green market?

Deanna Donovan reminded us the first day that the current push for NTFP development is not new. Many products have trading histories of several hundred years or more, and less than twenty years ago the development field was littered with pilot projects based on small-scale forest industries. While no comprehensive study has been done on the legacy of these projects, many ended up in the development trash heap. What conditions, if any, are different now? What makes us think these enterprises will succeed in the present era, much less continue into the future, as a long-term source of income and employment? What is the real challenge of NTFP development: marketing, people's control of resources, or people's control of people? No doubt improvements in production and marketing are warranted, but at what scale, and to what end?

The 1995 workshop faced these issues head-on, anchoring the promise of NTFPs to the pragmatism learned from years of field experience. Two overarching issues became clear as the workshop progressed: that NTFP development is an extremely complex and multidimensional undertaking, contingent on the particular ecological characteristics of the species under consideration, the social and political context, and the scale; and that the major thrust in current thinking stems mainly from Latin American experiences and does not adequately address conditions in Asia.

---

[1]Dove, M. R. 1993. Marketing in the rainforest: 'Green panacea or red herring? *Asia Pacific Issues* No. 13, Honalulu: East-West Center

This series of papers brings Asian perspectives on NTFPs into clearer focus. Attesting to the fact that NTFP development has implications for society at multiple levels, the papers are divided into three application-based sections: policy formation, program design and implementation, and product development. This division reflects the inherent variability of the topic, and underscores the message that each plant, ecosystem, target group, and country must be treated as a unique entity requiring a customized approach. Even so, as the papers show, some guiding principles remain constant: local participation, secure tenure, and improved marketing systems.

Commercializing NTFPs alone will not preserve the lifestyles of traditional forest peoples, make poor people rich, or ensure the preservation of forests and biodiversity. It does, however, offer another land use strategy for improving the welfare of forest-dependent communities and promoting more conservative use of forest resources.

We hope that the exchange of ideas, the exposure to current thinking and relevant literature, and the many hours of editing assistance broadened the particpants' experience and gave their papers -- and future work -- a conceptual foundation from which to build on. We would like to thank the participants for their hard work and dedication, and hope that readers will benefit from their insights. We would also like to thank The Ford Foundation and the John D. and Catherine T. MacArthur Foundation for their generous support of this workshop.

SUMMARY OF PAPERS

Policy Formation

Mia Siscawati leads off the policy section by examining the potential impacts of NTFP certification focusing on one of Indonesia's most famous exports--rattan. She points out that even though the production process will become more transparent and ecologically informed, the costs of certification may ultimately be transferred to those least able to bear it--small holder cultivators, collectors, and manufacturers.

Retno Maryani describes an innovative social forestry project in West Kalimantan where local people are being given a legal concession to manage customary forests. She emphasizes the policy and institutional aspects of this project, underscoring the need for formalization of customary management practices and well-planned communication channels involving all the stakeholders.

Ali Akbar Buiyan analyzes patterns of extraction and marketing among some 300,000 members of the Bawali tribe who depend on NTFPs from the rich mangrove forests of the Sundarbans for their subsistence. After identifying contradictions and inconsistencies between forest policy and implementation, he argues strongly for an ecosystem approach to forest management based on partnerships with local Bawalis.

Munni Gautam points out that even though Nepal has been on the forefront of the community forestry movement in Asia, government policies have been slow to respond to changes in the rural economy and to villagers' ever-increasing need for cash incomes. She shows how NTFP development in community forests can help mediate these new challenges, and how it may built on linkages with the growing private sector throughout the country.

Jay B. S. Karki provides empirical case study data on the social and economic factors that determine NTFP use in three Nepali villages. He concludes that although collecting naturally occurring NTFPs is an important source of income for some people, the majority of respondents considered domestication as too labor intensive and the returns as too uncertain to make it worth their investment. He also notes that improved market infrastructure has led to deforestation throughout the southern sections of Nepal.

Zuo Ting rounds out the policy perspectives by unraveling some of the complexities surrounding NTFP development in China's Yunnan Province. A history of collecting and using NTFPs are insufficient precursors for developing a successful NTFP industry. Many bottlenecks exist, such as poor infrastructure, production shortages, limited processing capability, and information delays. As a whole, the policy papers strongly demonstrate that NTFP development remains a contentious issue on many fronts, calling for flexible adaptive strategies rooted in local socioeconomic conditions.

Program Design and Implementation

Andreas Graefen, our participant-observer from GTZ/Germany, provides a detailed description of product selection and development as a component of the social forestry project in West Kalimantan, Indonesia.

Flora Leocadio's paper addresses the marketing issue head-on with an in-depth description of "what it takes" to get a rural development project based on NTFPs up and running. Her experience with the Upland Marketing Project of the Philippines provides wise advice to those attempting similar projects in other parts of the world.

As China shifts its policies more toward market-oriented socialism, **Lin Ling** explores the potential for income generation and poverty alleviation through NTFP development in the mountains of southwest Sichuan. His observations stem from baseline research undertaken for a pilot community forestry project in this region.

Using case study material from one of Nepal's community forests, **Thakur B. Karkee** takes on another under researched aspect of NTFP development: increasing NTFP productivity. He examines the potential for intensive management of fuelwood, fodder, and poles using a silvicultural technique known as TSI, or tree stand improvement.

Sumita Ghatak focuses on West Bengal's Joint Forest Management Program, presenting a long overdue analysis of gender issues in NTFP development. She convincingly argues that women's participation in NTFP development will not only enhance their economic independence and family welfare, but bring the forest protection goals of JFM that much closer to success. Not only must women's access to markets, credit, and training be improved, but foresters also need to improve their own awareness and skills to identify women's needs and knowledge and incorporate them into interventions. Her insights as one of two female field foresters in the West Bengal Forest Department are invaluable.

Product Development

Nuchanart Nilkamhaeng gives a detailed description of lac cultivation in Thailand, highlighting problems faced by farmers and potential ways to overcome them. She echoes sentiments from previous papers that development should be addressed in an integrated manner.

Wahyu Kisdwiutomo tackles similar issues with damar, a Dipterocarp resin with a long history of trade in Indonesia. He focuses his study on a small forest community in South Sumatra Province, identifying the trading patterns that have persisted for over a century and exploring ways to increase local benefits.

Finally, **Rana Rawal** puts his fifteen years of experience in the medicinal and aromatic plant industry on paper with a study of the constraints to NTFP development in Nepal. Using examples from two commercial essential oil-bearing plants collected in the wild, he details both political and production problems, citing India's control over the South Asian market and lack of government support for market development as major factors in Nepal's underdevelopment of this sector.

POLICY FORMATION

POTENTIAL IMPACTS OF NON-TIMBER FOREST PRODUCT CERTIFICATION IN INDONESIA

Mia Siscawati[1]

Abstract

Non-timber forest product certification in Indonesia is a promising new mechanism for ensuring sustainable use of non-timber resources. It can be used as both a marketing and monitoring tool to increase the transparency of production, to stabilize the resource base, and to expand international markets that are becoming more environmentally conscious. Inappropriate planning and implementation may inadvertently have negative socioeconomic impacts and place a greater share of the burden on rural communities.

The promise of achieving conservation and development objectives through 'green' forest-based enterprises has excited great enthusiasm. Mechanisms are being devised for ensuring sustainable use of forest products: eco-certification is one example. Eco-certification is a form of environmental labelling which is used to certify environment-friendly products (EFPs). The United Nations Commission on Trade and Development (UNCTAD) broadly defines EFPs as products whose manufacture, use, and disposal place a reduced burden on the environment (UNCTAD, 1994). But there is no rigid formula or decision hierarchy for defining what constitutes an EFP. Products which are environment-friendly in one context may be less so in another social context or geographical location.

As green consumerism continues to grow in developed countries, export opportunities for eco-certified products from developing countries may also expand. Indonesia is now establishing a certification institute and specific procedures for timber. These are being organized through the Indonesian Eco-Labelling Working Group and will be administered on voluntary basis The working group will start to develop a non-timber forest product (NTFP) certification scheme soon.

This paper examines the potential implications of NTFP certification, focussing on the product that is traded from Indonesia in the largest quantities -- rattan. The main reasons behind this examination are:

(1) the difficulties/ambiguities associated with defining certified products;
(2) the possibility of misleading claims made by the producer because of the difficulty in verifying the environmental friendliness of products (Indonesia

[1]Forest Management Researcher, Institute for Forestry and Environmental Research and Service, Jl. Sempur Dalam No. 6, Bogor 16154, Indonesia

may find it even more difficult to establish credibility as the production structures are informal and small scale);

(3) inappropriate design and implementation of certification schemes could potentially have serious socio-economic consequences.

The paper begins with some background information about Indonesian forest resources and the evolution of certification initiatives. After describing the social and ecological characteristics of rattan, the next section explores the potential impact of rattan certification. The analysis is based on personal engagement with the Indonesian Eco-Labelling Working Group since January 1994. The perspective presented is derived from numerous discussions with the various stakeholders during the preparation of the certification program and a survey of related literature.

Background

Forest Resources of Indonesia

Indonesia possesses 60 percent of all forested lands in Southeast Asia and an even greater proportion of the remaining primary rain forest (World Bank, 1989). Forests are of immense importance to the country, with nearly 75 percent of the land area under official forest cover. Rich biological diversity characterizes Indonesia's forest ecosystems, including over 10,000 species of trees, 1500 types of birds, and 500 varieties of mammals (Anon., 1990). Forests also support thousands of indigenous tribal peoples who have historically resided in the interior reaches of the outer islands, as well as a growing number of migrants from densely populated Java. At the same time, logging of valuable tropical hardwoods, primarily of the family Dipterocarpaceae, has contributed significantly to the generation of foreign exchange, especially during the 1970s and 1980s. Due to the multi-purpose importance of forests, considerable attention has been given to the formulation of forest use policies in Indonesia (Table 1).

Table 1 Indonesian forest resources

1.	Total land area		193.6
2.	Total forest area*		143.0
3.	Elements of forest area**		
	a.	Protection forest	30.3
	b.	Nature conservation and tourism forest	19.0
	c.	Production forest (available for commercial harvesting)	64.0
		i. Limited production	30.0
		ii. Permanent production	34.0
	d.	Production forest that may be converted to non-forestry purposes	30.0
4.	Area awarded to concessionaires or in process of award		65.4
	a.	Area under concession (holders of forest exploitation rights)	52.2
	b.	Areas under forestry agreements (last step prior to award or rights)	13.2

* Total rain forest area, 82.2 million ha; total swamp forest area, 12 million ha; total secondary forest area, 14.6 million ha; other forest area, 34.2 million ha.
** Because of rounding, totals differ slightly
Source: Forest Area 1985. Departemen Kehutanan, Indonesia

Non-Timber Forest Products

Research by Hall (1985) shows that Indonesia's rural people have depended on non-timber forest resources for commercial purposes since the second or third century A.D. Exchange networks comprised of collectors and traders have long been a part of the Indonesian landscape; local networks evolved into broad regional networks, extending from China to Southeast Asia and the Middle East. Today Indonesia's commercial NTFPs include:

- **rattan**, primarily Calamus and Daemonorops spp.;
- **charcoal**, from wood of the Rhizoporaceae family and coconut shells;
- **illipe nut**, from Shorea pinanga Scheff, S. amplexicaulis Ashton, S. sumatrana, S. beccariana Burck, S. lepidota Bl., S. palembanica Miq., S. scaberrima Burck, S. seminis B.SI., S. macrophylla;
- **damar**, an exudate from Shorea javanica, S. lamellata, Hopea dryobalanoides, H. intermedia, H. globosa, H. myrtifolia;
- **jelutung**, a latex from Dyera costulata;
- **eaglewood** (*gahru*), an aromatic resin from the heartwood of Araucaria spp;

- **casiavera**, an aromatic spice from Cinnamomum zeylanicum and C. Burmanni;
- **copal**, a resin from Agathis alba.

NTFPs are not only important to the rural economy for subsistence and commercial use, but several have sizeable export markets as well (Figure 1).

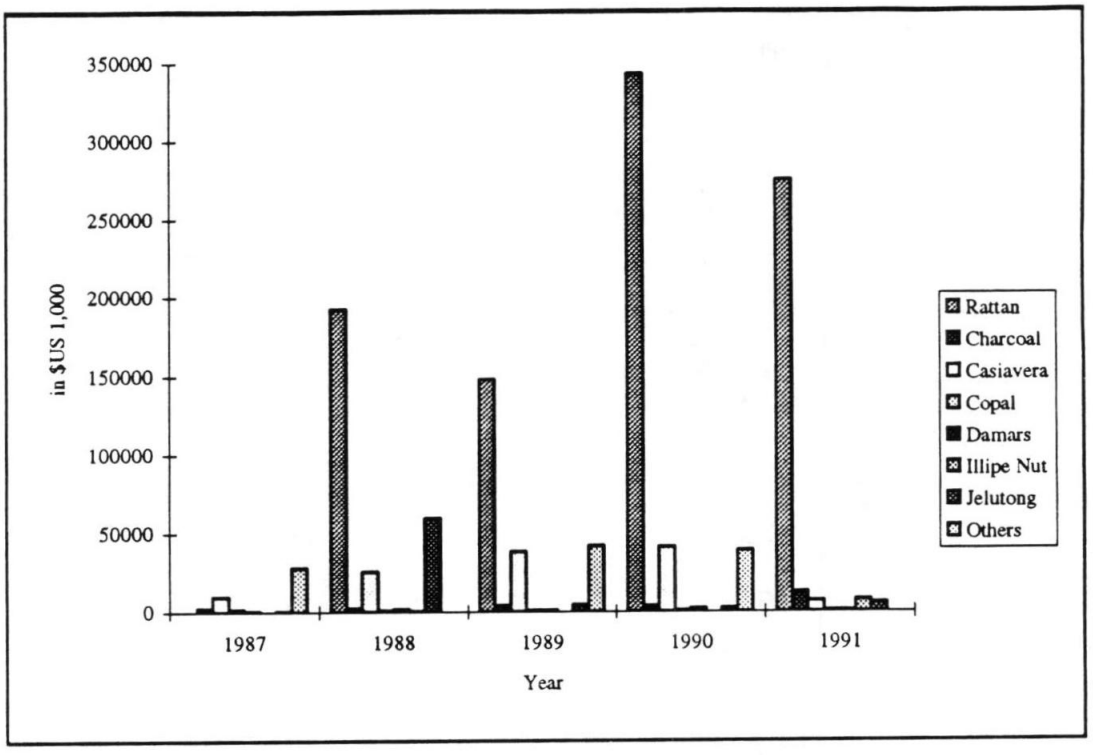


Figure 1 Value of Indonesian NTFP Exports, 1987-1991
Source: Departemen Kehutanan, 1992

Forest Product Certification

Initiatives and views of international organizations. One type of environmental labelling is a specific label awarded by a third party to natural and man-made products which are more 'environment-friendly' than others in the same category. This is done on the basis of preset criteria (normally there is also a certain degree of government involvement), and is commonly-known as eco-labelling. Eco-labelling is not used in product categories which have little environmental impact, such as bicycles (UNCTAD 1994). EFPs covered by eco-labelling are promoted on the basis of environmental claims, and have great potential for

improving trade opportunities. UNCTAD (1994) cites three groups of natural products which could be improved: one is non-timber forest products.

Interest in forest product certification has been driven by lobbyists in industrialized countries who demand that timber imports come from sustainably managed forests. Both legal and consumer boycotts of tropical timber products have been advocated until such demands are fulfilled. On the institutional side, the International Tropical Timber Organization (ITTO) issued a decree in 1990 that all tropical timber trade should originate from sustainably managed forests by the year 2000. The Forest Stewardship Council (FSC), initiated in 1993 by the World Wide Fund for Nature (WWF) and numerous international NGOs concerned with tropical forests, recently announced its 'Principle and Criteria for Forest Management' applying to all temperate, boreal, and tropical forests. This will be done through an international accreditation program: national groups will ensure implementation in the field. FSC accreditation aims to provide a guarantee for the authenticity of the certifiers' claims (FSC, 1994). The International Standard Organization/Technical Committee 207 (ISO/TC207) is expected to act as a clearing house for forest product certification research, and The Tropical Forest Foundation (TFF) is reportedly working to establish a 'Tropical Forest Recognition Program' designed to allow companies to voluntarily disclose confidential information on the environmental friendliness of their products to an expert review committee. The committee will then provide recognition for companies whose supply bases are moving toward sustainability (USDA, 1993).

Countries which are involved in forest product certification schemes are: Canada, the United States, Austria, Germany, United Kingdom, France, Belgium, Finland, Switzerland, New Zealand, Brazil, Malaysia, Indonesia, the Philippines, and Papua New Guinea. Several African countries are also involved through the African Timber Organization (Ahmad 1994).

Certification Requirements. The objectives of forest product certification are:

- to provide consumer information on production, including assessment/verification of management, harvesting, processing, and end-use;
- to monitor the health of forest resources and the social compatibility of forest resource utilization (Kelompok Kerja Ekolabel, 1994).

To serve as a market-driven management tool, a certification scheme must have credible information on environmental and socio-economic compatibility. With respect to non-timber forest products, certification should include:

- a meaningful certificate with reliable information about the production process;
- a verifiable certification system;
- voluntary participation of producers;
- internationally agreed principles, standards, and criteria;
- accreditation system for certifiers, and
- GATT compatibility (Ahmad, 1994).

Certification activities in Indonesia. Eco-labelling and forest product certification issues emerged in Indonesia in 1992 when the Austrian parliament enacted a law imposing mandatory eco-labelling for tropical timber imports. Lack of information and understanding on the effects of this legislation generated a wide range of reactions from Indonesian society. Timber-related businesses voiced their concerns that eco-labelling would limit their market access into developed countries and reduce their international competitiveness. Indonesia, supported by other ASEAN (Association of Southeast Asian Nations) countries questioned the GATT (General Agreement on Tariff and Trade) legality of the Austrian eco-labelling law since it discriminated against tropical timber. The law was amended in 1993 to cover all types of timber, and compliance was relegated to a voluntary basis.

Meanwhile, Indonesian NGOs (non-governmental organizations) started to investigate the eco-labelling issue more seriously, and in 1993 they capitalized on international pressure and persuaded the government to develop a certification scheme. Internal concerns over poor forest management and lack of commitment by Indonesian industry to achieve the ITTO Year 2000 objectives propelled the government to undertake preparations for the Indonesian Eco-labelling Institute (LEI/Lembaga Ekolabel Indonesia). Under the direction of Emil Salim, former Minister of the Environment, working groups were formed to develop certification principles, standards, and criteria, and to develop an institutional framework. At this time, the major concern of the stakeholders is to establish an independent forest management inspection system. The draft certification system is included in Figure 2.

The certification process will be divided into two stages: 1) field testing and verification done by assessors; 2) certification done by the LEI. To maintain its independence, the LEI will assign a third party as assessor. The assessor will submit an inspection report to LEI which will be used as the basis for certification. Certification will involve two groups institutionalized within the LEI: the Expert Panel and the Forum of Ecolabel Parties. Both groups will be organized on an *ad-hoc* basis according to the case under review. The major role of the Expert Panel is to review the assessors' findings and make award recommendations; the Forum of Eco-label Parties settles any dispute emerging from the LEI's decision, and proposes revisions of certification principles and criteria.

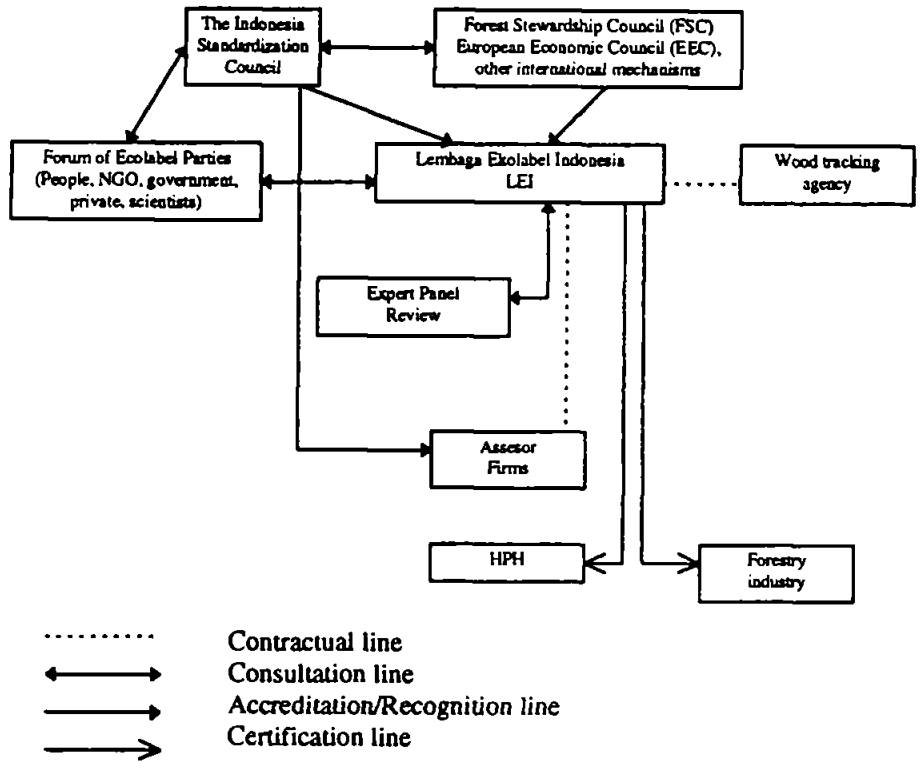


Figure 2 Draft timber certification scheme proposed by the Indonesian Eco-Labelling Working Group
Source: author

Potential Impacts of NTFP Certification: A Case Study of Rattan

Most certification programs focus on the sustainability of timber production alone; the unique social and environmental characteristics of non-timber resources have yet to be scrutinized and regulated in this fashion. Sustainability of all forest products, both timber and non-timber, has three components: ecological, social, and economic (Robinson, 1993; Peters, 1994). A rattan certification scheme must therefore include all three if it is to be an effective, market-driven resource management tool. After describing some key features of rattan ecology, harvesting, regulation, and trade, this section explores these components in the context of NTFP certification and its potential impact.

Ecology

Rattans are climbing, spiny palms that occur in the mixed Dipterocarp forests of Southeast Asia. They have woody, flexible stems that climb through the trees in the forests; some have been known to reach 150 meters in length (Dransfield, 1981). Rattans grow well in virgin and secondary forests primarily in the gaps created by logging (Panayotou, 1992). The most productive species require high moisture and soil fertility. Canes can be harvested in six to seven years, but they do not come into full bearing until the fifteenth year. Mature rattans can have up to fifty or more stems, 26 to 30 meters long; 10 percent of these can be harvested every two to three years on a sustainable basis (Purseglove, 1972).

Of the 600 species known, about one-third are located in Indonesia. Economically useful rattans include *rotan manau* (Calamus manan), *rotan sega* (Calamus caesius), and *rotan irit* (Calamus trachycoleus). The thicker diameter canes (rotan manau) are used in the construction of furniture frames. The thinner canes (irit or sega) are also used in the furniture industry for wrapping low quality thick canes, for weaving the back, sides, and seats of furniture, and for marking cores. The outer layer of the thin canes is often used for weaving mats, mostly for local use or export to Japan (Panayotou, 1992).

According to A. R. Wallace (1869), one of the early western naturalists to visit Southeast Asia, rattans "greatly improved the appearance of the forest as seen from the coast, for they vary the otherwise monotonous tree tops with feathery crowns of leaves rising clear above them, each terminated by an erect spike like a lightning conductor." The lightning

conductor -- or new sword leaf -- protrudes from the tip of the stem, tightly furled. When a supporting tree dies, or where a shoot fails to find a support, coils of rattan can be found on the forest floor.

Harvesting, Use, and Regulation

The typical rattan collector sets off into the forest armed only with a knife. He must first locate a suitable rattan plant so he can return periodically over the upcoming years to collect new stems. Once located, he pulls down as much as possible from the canopy and collects the coils which lay on the ground. The older parts of the stem may be too well anchored to be pulled down; the youngest parts may be too soft to use. Between these extremes is the saleable rattan. Aside from the ubiquitous ant nests, dislodging a stem can also bring down wasp nests, dead limbs of trees, clumps of epiphytes, and, of course, the waving barbed whips of the rattan itself.

Commercially viable rattan is typically found in state-owned natural forests designated as production forest (refer to Table 1 for forest classification system). Rattan collectors are forest villagers who live in or adjacent to these areas. They collect on a part-time basis during slack periods in the agricultural cycle. There is also widespread planting of rattan by farmers in their private fields and forest gardens (Menon, 1980; Peluso, 1986).

In 1989, government control on rattan extraction was formalized through the *Hak Pemungutan Hasil Hutan Rotan* (HPHHR) or 'License to Harvest Rattan Forest Products'. This legislation defined rattan harvesters as those who live in the vicinity of the forest who have been given permission by the authorities to harvest wild rattan. Collection areas can be located in various types of production or conversion forest where 'Rattan Plantation Licenses' have not already been granted. Harvesters are not allowed to collect in Protected Forests, Nature Reserves, Recreation Forests, and National Parks.

Additional government legislation affecting rattan harvesting is the *Hak Pengusahaan Hutan Tanaman Rotan (HPHTR)* or 'Forest Enterprise License for Rattan Plantations'. Licenses may be granted to government and private enterprises, cooperatives, farmer groups, and individuals. This allows grantees to plant, maintain, and benefit from plantation rattan in areas ranging from 2,500 to 10,000 hectares. Individuals and cooperatives may establish plantations only in areas of less than 2,500 hectares. Grantees are required to establish new

rattan processing industries or cooperate with existing ones. All licenses are issued initially for twenty years.

Besides commercial use, smallholder farmers plant rattan in their gardens for their own needs. Here rattans are often mixed with rubber or fruit trees, and grow at a greater density then found in the forest; hence, the search time is considerably lower. In Central Kalimantan, small-diameter rattans (C. caesius, C. trachycoleus) have been cultivated for over a century in low-lying secondary alluvial forest on the banks of the Barito River (Dransfield, 1987).

Trade

Traditionally rattans were traded through networks of riverboat or village-based middlemen to their final destination at an exporter or processing factory in the urban areas. Collectors were tied to particular middlemen, and middlemen to higher order traders, through debt: individuals purchased subsistence and trade goods on credit from village shopkeepers or river middlemen to whom they were then obligated to sell their collected forest produce, in this case, rattan (Peluso, 1983). Contemporary patterns are very much the same.

When the government announced its intention to ban the export of semi-processed rattan in the mid-1970s, the processing factory became an integral part of the rattan marketing chain. Until then, most rattan was exported in the raw or semi-processed state. In 1989, the ban was expanded to include half-finished rattan, and placed all exports of finished rattan under the control of the Indonesian Association of Furniture Producers. These policies disrupted traditional marketing patterns and created a new, more complicated market chain (Figure 3).

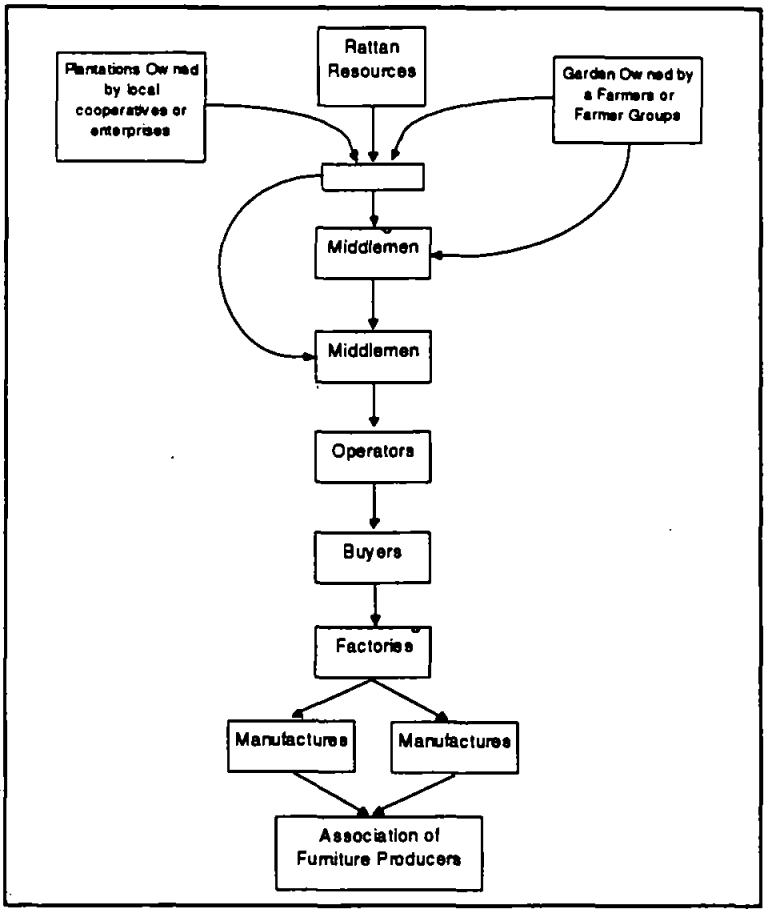


Figure 3 Rattan marketing chain in Indonesia
Source: author

Rattan Certification: An Incentive for Sustainability?

Ecological considerations. Stated simply, sustainable use is that which does not compromise the regenerative capacity of an individual plant or population. Thus, appropriate harvesting methods are a major requirement (Robinson 1993). Unfortunately, the reported minimal ecological impact of commercial NTFP harvesting is rarely questioned (Peters 1994; Panayotou 1992). According to Peters (1994),

> ... this assumption is both untenable and potentially dangerous. In reality, the sustainable harvest of non-timber forest products requires quite a bit more than 'blind faith' in the productive capacity of tropical plants. It requires careful selection of species, resources and sites. It requires controlled harvesting and periodic monitoring of the regeneration and growth of the species being exploited.

Rattan is a well-known example of a plant species which is commonly killed in the harvesting process. In a limited (and little understood) number of cases, however, it will regenerate even if vegetative structures are removed. The actual impact of harvesting depends on the specific growth form or type of rattan that is cut (Peters 1994). Large cane rattans usually possess a single stem that does not re-sprout after cutting; harvesting kills these individuals. Smaller cane rattans, however, are typically multi-stemmed and can re-sprout after cutting if sufficient time is allowed between harvests.

Intensive and uncontrolled harvesting of large cane rattans due to industry's need for raw materials has drastically reduced their abundance; the over-exploitation of multi-stemmed species is due to the rising demand for small-diameter. Collection rates have increased is a direct result of government policy, particularly the ban on raw and semi-processed exports, and the ill-planned expansion of national industries (Panayotou 1992). At present, about one-third of the rattan species in Indonesia are under threat of extinction (Dransfield 1987). Panayotou (1992) calculated that current natural supplies of rattan in Indonesia may only last another 15 years.

NTFP certification could help alleviate some of these problems. Field testing and verification -- crucial elements of certification -- assures that preset principles and criteria for sustainable use of NTFPs such as rattan are followed. Correct ecological data is an inherent component of this process, and helps to determine the biophysical features of management in any given source area for rattan. From an ecological standpoint, one of the most essential ingredients required to achieve a sustainable level of resource use is information (Peters, 1994). This includes:

- the density and distribution of resources within the forest;
- the population structure and productivity;
- the ecological impact of differing harvest levels.

Monitoring is done after certification to ensure the credibility of issued certificates. In the context of the Indonesian rattan industry, a key consideration is to monitor both resource management and processing activities together. Periodic adjustments in both harvesting and processing may be needed to make rattan a true 'environment-friendly' product.

Economic considerations. Non-timber forest product certification may entail three types of cost:

- costs of raw materials;
- capital costs;
- costs of testing and verification (UNCTAD 1994).

Raw material and capital expenditures are needed to update resource management activities, including harvesting and processing, to meet certification standards. This includes forest inventory, yield studies, regeneration surveys, and research on appropriate harvesting methods.

In Indonesia, the rattan industry comprises approximately 1000 small-scale and 500 medium to large-scale enterprises, and employs over 250,000 laborers. A large number of communities living in or near forests are also involved, obtaining employment and cash income from rattan in three ways: collecting[2], trading, and processing. Some specialize in collecting year-round, but the majority are involved on a part-time basis during slack periods of the year (Menon 1980; Peluso 1986). In Masamba district of South Sulawesi, all residents agreed that rattan is extremely important resource due to the lack of alternative income sources (Siebert 1986).

Given this wide variation and participation, coordination amoung indivdual farmers and collectors, plantation owners, and manufacturers is needed to adjust current practices and ensure the certification protocols are being followed. This may entail a greater outlay time, labor, and money. If a manufacturer joins the certification program, there may be an increase in the cost of raw materials. This could inadvertently be transferred to the producers, including collectors who take rattan from production forests, farmers who take rattan from personal forest gardens, and local smallholder cooperatives. These additional costs could adversely affect their income. Poor farmers and collectors may be especially vulnerable due to the marginal status of their operations and overall livelihood.

---

[2]Collecting is defined here as a component of gathering that is focussed on the market.

Processing and manufacturing industries are commonly wary of claims made by certification advocates that the environment will be improved through the use of sustainably managed raw materials. They are also skeptical of the scientific basis of certification requirements. They may have to purchase new equipment and/or upgrade old units, which could entail significant costs. In some cases, the required technology may not be available at all. Capital costs could also increase due to the need for information and checking at very stage of production. Recurrent costs for sustainably managed raw materials may also be higher. Thus, profit margins may be significantly reduced; in extreme cases, some operations may be eliminated altogether. UNCTAD (1994) points out that plant inspection may be costly for developing country producers and poses particular problems for small firms. The possible high cost of certification and compliance would likely put Indonesia in a disadvantaged position in international markets (Ahmad 1994).

At the national level, rattan certification may involve significant costs such as foregone export earnings and/or opportunity costs of the resources committed to develop the certification scheme. This considers the needs of government commitment to reduce rattan harvest in order to maintain the continuity of rattan supplies which, as noted earlier by Panayotou (1992), may only last another 15 years. With respect to timber, the Indonesian government recently announced its commitment to reduce logging to a sustainable level from 31.4 to 22.5 million cubic meters per year, to be reached over the next five years. If this is taken as a way to implement sustainable forest management, in terms of plywood exports it will cost the country at least USD 300 million per year in the form of foregone foreign exchange revenue (Ahmad 1994).

There are no reliable cost estimates for testing and verification activities such as field checks, tracking of raw materials, and monitoring post-certification activities of harvester and processor. These costs will be influenced strongly by the availability and reliability of existing data. If current information is judged to be adequate, testing and verification costs will be less. Fieldwork in Indonesia, such as testing, monitoring, and conducting inventories may be expensive due to the remote location of the resource and the density of the forest.

Rattan products with high value-addition potential and market demand such as furniture could be the first green market for non-timber forest products to be developed.

The high volume and consistent demand allows certification costs to be absorbed relatively easily (Crossley *et al*, 1994).

Eco-sensitive Rattan Markets. In markets with consumer preferences for 'environment-friendly' or 'green' products (the so-called eco-sensitive markets), certification can serve as a marketing instrument (UNCTAD 1994). According to Ahmad (1994), demands for certified rattan products are expected to come from:

- importers who are directly faced by strong local environmental pressures;
- traders who see a new market niche and certified rattan as having a competitive advantage relative to similar products on the market;
- public sector projects in accordance with regulations, and
- architects, designers, distributors, and other environment conscious consumers.

Consumers in the US, Canada, Germany, the Netherlands, and the UK, where the green marketing concept originated, have the highest level of environmental awareness, but it is not evenly distributed. In Japan, the largest rattan importer in East Asia, conservation organizations and environmental NGOs still maintain a double standard: despite the existence of the EcoMark System since 1989, concern about the sustainability of forests, especially tropical forests, has not yet become apparent in the Japanese society (Ahmad 1994).

Figures 4a and 4b show Indonesia's rattan exports in 1989-90 by country of destination. While the majority were traded to East Asian markets (those with the least environmental demands), approximately 47 percent went to North America and European markets. Since pressure for green products primarily comes from these regions, it seems prudent that Indonesia start engaging in rattan certification. Furthermore, since Indonesia's timber certification program is well underway, the country may be in an advantageous position (with respect to other producer countries that enter the market later) to capitalize on new green market preferences (Ahmad 1994). Taiwan, Korea, and other Asian countries still have a long way to go to enter this market. Recent trends indicate that Japan and Singapore, despite their current dualistic attitude towards green consumerism, appear to be heading more towards eco-sensitive purchases; once they enter this market, other producer countries will most likely follow.

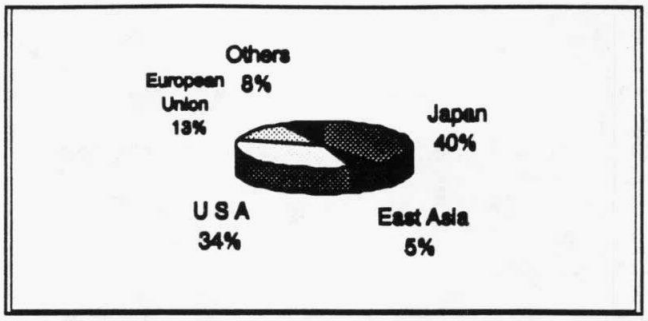


Figure 4a Export of rattan products by country of destination, 1989
Source: Badan Pengembangan Ekspor Nasional,1991

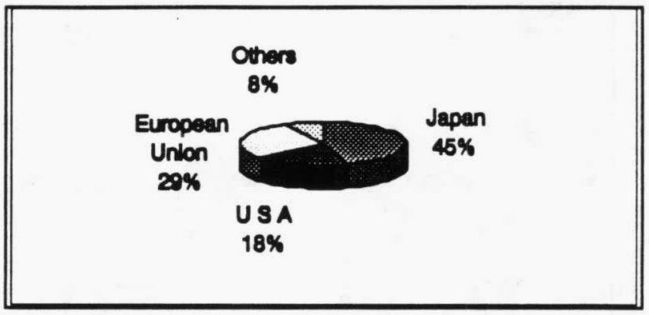


Figure 4b Export of rattan products by country of destination, 1990
Source: Badan Pengembangan Ekspor Nasional,1991

Social considerations. From a social standpoint, rattan certification could have both positive and negative implications. These implications will be discussed with respect to the key actors, or stakeholders, in the rattan trade network. These include collectors, traders, small-scale processors, and large-scale manufacturers. As noted in the previous section, new harvesting, processing, and transportation requirements arising from certification may increase the cost of collecting and local trading. If this happens, collectors, who have the weakest bargaining position in comparison with middlemen, and middlemen, who have limited bargaining power with respect to urban buyers, might suffer reduced incomes and increased economic hardship. People's decisions to collect forest products -- either as a casual, opportunistic activity or as an economic mainstay -- is affected by different factors. These include the urgency of their need for cash, the price they expect to receive, the time they can spare from other activities, the likelihood of obtaining significant volumes of the product(s) sought, and the hardship the trip will entail (de Beer and McDermott, 1989). If the price of one commodity decreases, forest-dwellers may shift to another product with better returns.

Due to the important role of the collector as the first key actor in collecting raw material, changes in livelihood orientation could negatively influence the continuity of raw material supplies.

Positive impacts of certification include the establishment of socio-economic criteria that focusses on rural collectors, traders, and industrial laborers. These criteria must be met by manufacturers who desire certification.

Both small-scale and large-scale industries may be faced with a number of investments in order to comply with certification. Small-scale processors may particularly suffer because the changes may not be economical/feasible given the scope of their operation (UNCTAD, 1994). In the long run, manufacturers, as consumers of processed products, may take on the role presently filled by small-scale processors. This could cause a collapse in small-scale rattan industries. In the manufacturing sector, increased production costs (from the additional cost of extraction, processing, and certification fees, all of which need to be taken care of before the certification award) could cause a decrease in the income of wage laborers. To offset major problems, potential income adjustments will be stated clearly in the social criteria for certification.

Conclusion

Certification programs are designed to provide important information on the environmental and socio-economic impacts of a product so that consumers can make an informed choice at the time of purchase. They may, however, have unanticipated consequences for key actors as well as the resource. From a social standpoint, rattan certification may entail additional production costs which may increase the price of end-products; consumer 'willingness to pay' for rattan has yet to be surveyed. Long term socio-economic benefits of rattan certification for *all* actors also remain uncertain. From an ecological standpoint, certification has more clear benefits, including better information on the density and distribution of resources within the forest, the population structure, and productivity. Certification can also be used as a vehicle for monitoring harvesting impacts and for making necessary adjustments to protect the resource.

Designing a realistic and informed rattan certification scheme must consider the potential impacts mentioned above. Otherwise, it could have negative effects on production and marketing, and place a greater share of the burden on those least prepared to bear it -- small-scale farmers, collectors, traders, and laborers involved in primary production and processing. With careful construction, however, rattan certification could improve the livelihoods of all participants, enhance the sustainability of the resource, and act as a model for other commercial non-timber forest products.

Acknowledgements

The author is grateful to Drs. Deanna Donovan and Jefferson Fox for their invitation to join the Writing Workshop on Community Management of Forest Lands, and to Ms. Maureen DeCoursey for her valuable comments and suggestions on how to improve this paper.

References

Ahmad, M. 1994. *The importance of Eco-labelling and timber certification for Indonesia's export market.* The World Bank, East Asia and Pacific Countries Department III, Environment and Country Operation Divisions. Washington D.C.

Anonymous. 1990. Forestry: A saw point for technology. *Far Eastern Economic Review, 19 April.*

Badan Pengembangan Ekspor Nasional. 1991. *Pengembangan Mata Dagangan Barang Jadi Rotan*. Departemen Perdagangan Republik Indonesia.

Crossley, R., Braga, C. and P. Varangis. 1994. Economic rationale for eco-labelling. Working paper, Department of Agricultural Economics, Michigan State University, East Lansing.

de Beer, J.H. and M. J. Mcdermott. 1989. *The economic value of non-timber forest products in Southeast Asia.* Netherlands Committee for IUCN. Amsterdam.

Dransfield, J. 1981. The biology of Asiatic rattans in relation to the rattan trade and conservation. In *The Biological Aspects of Rare Plant Conservation*. John Wiley and Sons. New York.

_____. 1987. The Conservation Status of Rattan in 1987: A Cause for Great Concern. Paper delivered at the International Rattan Seminar, November 12-14, at Chiangmai University.

Indonesian Eco-labelling Working Group. 1994. Forest product certification system: A case study of Indonesian scheme. In *Proceedings of the International Conference on Forest Product Certification*, September 14-17, Jakarta.

Kelompok Kerja Ekolabel. 1994. Persiapan Pembentukan Lembaga Ekolabel Indonesia. Laporan Tahap II. Jakarta.

Panayotou, T. and P. Ashton. 1992. *Not by timber alone: Economics and ecology for sustaining tropical forests.* Island Press. Washington D.C.

Peluso, N. L. 1983. Markets or merchants? The East Kalimantan forest products trade in historical perspective. Master's thesis, Cornell University.

Peters, C. M. 1994. *Sustainable harvest of non-timber plant resources in tropical moist forests: an ecological primer.* Biodiversity Support Program. Washington D.C.

Purseglove, J.W. 1972. *Tropical Crops: Monocotyledons.* Longman Scientific Publications. London.

Robinson, J. G. 1992. The limits to caring: sustainable living and the loss of biodiversity. *Conservation Biology* 7(1): 20-26.

Siebert, S. F. 1986. Notes on rattan collection and trade in the Masamba District, Sulawesi Selatan. *Borneo Research Bulletin* 18(1): 59-64.

United States Forest Service. 1993. Timber certification. *International Forestry Issues Brief.* Washington D.C.

United Nations Conference on Trade and Development (UNCTAD). 1994. International cooperation on eco-labelling and eco-certification programmes and market opportunities for environmentally friendly products. Report TD/B/WG.6/2. Geneva.

Wallace, A.R. [1869] 1986. *The Malay archipelago.* Reprint, Oxford University Press, Singapore.

World Bank. 1989. Indonesia forest, land, and water: Issues in sustainable development. Report No. 7822-IND. Asia Regional Office. Washington, DC.

A FOREST CONCESSION FOR LOCAL PEOPLE IN SANGGAU, WEST KALIMANTAN, INDONESIA

Retno Maryani[1]

Abstract

This paper describes the Social Forestry Development Project (SFDP) in Sanggau Regency, West Kalimantan. The organizational structure of a people's forest concession is discussed including the parties involved, their obligations and rights, and the conflicts that may occur in the development process. Several lessons can be learned from this project. First, institutional development is necessary to enable people to utilize their customary laws and traditions for managing natural resources and resource access. Second, developing these institutions requires great effort, particularly for developing human resources, and extension of activities. Third, institutional development in resource management requires an integrated approach including basic needs such as food, shelter, and health. And finally, social forestry institutional development requires the development of supporting systems and infrastructure. Even though the success of this approach has yet to be determined, there are good reasons to be optimistic about the role of community participation in forest management.

The lives of people living in and near forests in Indonesia are being transformed today by rapid and far reaching political-economic and environmental changes. Much of this transformation is driven by various types of market pressures: the commercialization of subsistence resources, the substitution of commercial crops for subsistence crops, and the extent of outside control over the production or extraction and marketing of local resources. As these changes provide outsiders with access into more remote, and often physically marginal areas, both the claims of local people to local resources and their means of managing these resources are being contested.

In recognition of these and other problems the Indonesian government has initiated various polices to overcome isolation and to combat poverty. These programs include the development of large scale plantations for timber, rubber, oil palm, and other products; the implementation of IMPRES or special programs of the Indonesian President for market development, road construction, re-greening, etc. A recent program called IMPRES *Desa Tertinggal* (the most left behind villages), seeks to improve the livelihoods of people living in approximately 22,000 villages. Many of these villages are located in or near forests and villagers are heavily dependent on forest products for their subsistence.

Within this framework of fulfilling the needs of the people living in and close to forests, it has become obvious that national development policy must focus on issues of land

[1]Researcher, Agency for Forestry Research and Development, Ministry of Forestry, Jakarta, Indonesia

tenure, traditional customary rights, participation, and decentralization. This paper describes the Social Forestry Development Project (SFDP) and its attempts to develop a people's forest concession in Sanggau Regency, West Kalimantan. The organizational structure of this concession is discussed including the parties involved, their obligations and rights, and the conflicts that may occur in the development process.

The Social Forestry Development Project

The Social Forestry Development Project in Sanggau, West Kalimantan is a cooperative project between the Government of Indonesia (Ministry of Forestry) and Government of Germany (GTZ). The project began in 1990 and will run until 2001. The project seeks to sustain forest resources and to increase the self-reliance of forest dwellers.

The project is located in the northern part of Sanggau Regency (*Kabupaten*) and covers an area of 102,250 hectares. The area is classified as state-claimed forests with approximately 33% of the land zoned as protection forest, 52% as limited production forest, 12% as conversion forest (can be converted to other land uses) and 3% for other purposes, such as public services. Soils in the area are red-yellow podzolic and have low fertility.

Approximately 18,000 people live in the area in 3,100 households scattered in 8 villages made up of 60 hamlets. Most people are Dayak, the indigenous people of the area. Major income sources include rubber tapping and agriculture (shifting cultivation). Non-timber forest products (NTFP) are collected for local consumption, though some of these products (such as *damar* (resin), durian, rattan, honey, and bamboo) are marketable. Few roads connect villages in the area and only a few hamlets are accessible by four wheel drive. River transportation is not available. Health and education facilities are minimal.

Dayaks generally live in forest areas, collect and gather forest products, and practice shifting cultivation to meet their livelihood needs. They generally live on land they consider to be their customary land (*tanah adat*) and follow traditional customary institutions and regulations (*hukum adat*) to regulate the utilization of land and forest products (timber and non timber). The head of a Dayak community is called the *kepala adat* (head of *adat*) or *tamanggung* in West Kalimantan, *damang* in South and Central Kalimantan, and *bizu* or *bio* in East Kalimantan (Florus 1995). The State (national) Law Act No. 5 (1979) concerning

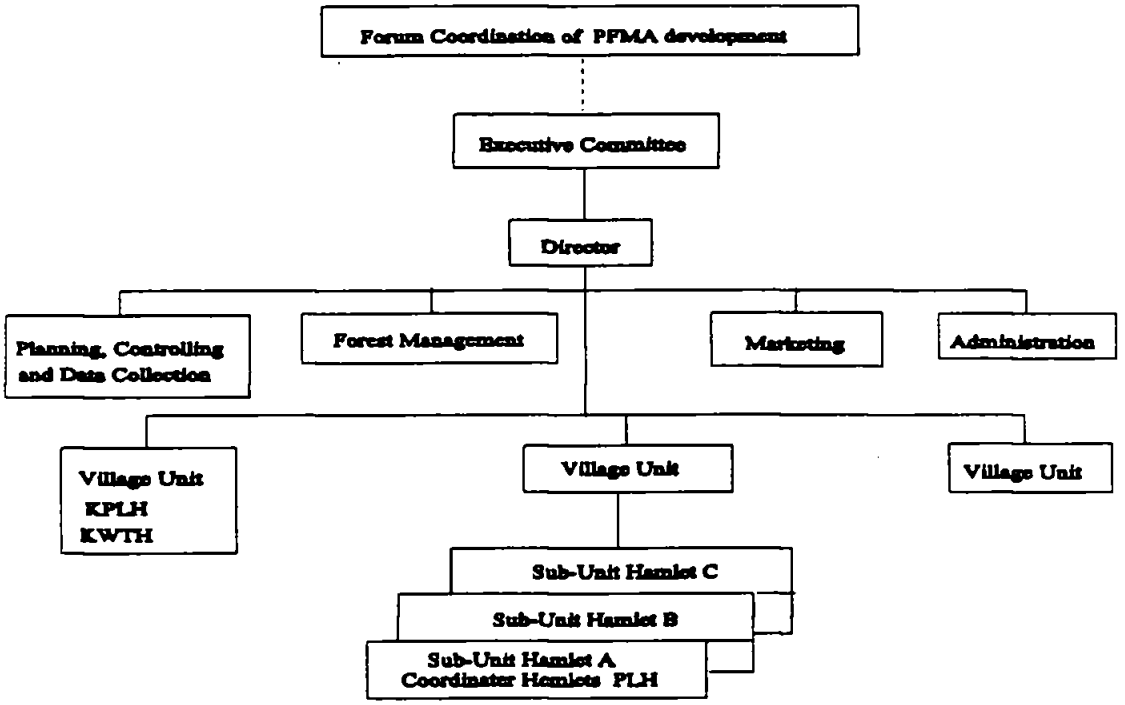
village administration stresses that *adat* institutions are situated under the control of the village council (*Lembaga Musyawarah Desa* [LMD]) and the village leader (the village leader is an ex officio chairman of LMD).

Customary land rights (*hak ulayat*) are recognized by the Constitution of Indonesia, as well as by the Basic Agrarian Law (1960), and the Basic Forestry Law (art.17) (1967) (see Wangsadidjaja and Ismanto 1993; Adisoesanto 1995). The Basic Forestry Law, however, while stressing that customary property rights should be maintained in order to protect production functions of forest, stresses that these rights should not conflict with national law or hindered national development plans. The stress the Basic Forestry Law places on national interests has weakened customary resource management systems and had significant impact on the future of Indonesian's native peoples, their resource access, and their basic livelihoods. The weakening of customary systems has led to growing inequalities between native peoples and migrants, and moreover, has led to the loss of valuable knowledge of both timber and non-timber resources.

Given that the participation of local people in forest management is a necessary condition for sustainable forest management and that real participation depends on institutional frameworks that accommodate local needs and belief systems while maintaining government control over land resources, the SFDP seeks to develop a management body for meeting these needs. This management body, which will be called a Participatory Forest Management Body (PFM Body) (*Lembaga Pengelolaan Kawasan Hutan Partisipatif*), and will be in charge of Participatory Forest Management Areas (PFMA). Within PFMAs, non-forestry development activities will also be developed, therefore, the project is also setting up a coordinating body called the Forum Coordination. The Forum will coordinate various development activities such as agriculture, health, (home)industry, and others (see Figure 1).

The supervisor of the Forum Coordination for PFMA development will be the Head of Sanggau Regency, the *Bupati*. Advisors to the forum will include the representative from the district level development plan, the *Bappeda*; the representative from the village level community development plan, the *Pemda*; a representative from the Forest Service in Sanggau (Ministry of Forestry); and representatives from the *adat* councils of Sanggau Regency. The District Heads of Noyan, Kembayan, Bonti, and Jangkang will alternate as forum chairman.

The Heads of Village Community Development Plans (*Pembangunan Masyarakat Desa*) will alternate as secretary. Members will include village leaders, *adat* leaders, and informal leaders from the 8 villages in the PFMA.



KPLH - forest land use management group; KWTH - women's agroforestry group; PLH - forest land extension
Figure 1 Organizational structure for participatory forest management areas

The project recognizes that it is not possible to have forestry development activities without other community development activities. Therefore, other support services in PFMAs will include market development for agricultural products and NTFPs; saving and credit systems; processing systems for agriculture products and NTFPs; information and training on agriculture, participatory forest management, soil conservation and other topics; planning resources, including boundary delineation and village level land-use management plans. Management plans will include delineating village boundaries and zoning areas for permanent agriculture, production and limited production forests, and conservation forests; and rehabilitation of degraded forest areas with local tree species.

Existing government regulations that support the institutional development of PFMA include customary rights regarding timber harvesting in natural and plantation forest, fire damage control, forest land utilization, land inheritance, forest protection, minor and major violations and penalties; the Basic Agrarian Law (1960) recognizing the existence of customary rights; the Basic Forestry Law (1967) recognizing local peoples rights to collect NTFP; Government Regulation Act. No. 9 (1984) concerning cooperation and settlement of dispute between villages; Minister of Forestry letter No. 1675/M-D/92 concerning the designation of areas for PFMA development; and the decree from the Head of Sanggau Regency No. 137/1994 on establishing a coordinating forum for PFMA development in Noyan, Kembayan, Bonti and Jangkang districts.

Other regulations yet to be drafted include a constitution of Participatory Forest Management Areas; agreements between the Ministry of Forestry and Participatory Forest Management Areas; and agreements between Participatory Forest Management Areas and its members. Support funds for PFMAs will come from the Reforestation Fund of the Ministry of Forestry, and the national and regional development budgets.

Organizational Structure

The organizational structure of the PFM body will consist of a General Assembly (*Rapat Umum Anggota*), an Executive Committee (*Badan Pengawas*), a director, and a support staff for implementing participatory forest management.

The General Assembly will be the highest forum in the PFM Body. Members of the General Assembly will include village leaders, village secretaries, *adat* leaders, representatives from the Village Councils (LMD), the chairmen of the Village Community Development Councils (LKMD) and representatives of agroforestry and women's agroforestry groups. If both the General Assembly and the Forum Coordination agree, the PFM Body can be dissolved. The dissolution of the PFM Body should be reported to the Ministry of Forestry and the Head of Sanggau Regency. If the PFM Body is dissolved, forests and other property will be returned to the Ministry of Forestry.

The Executive Committee will consist of village leaders, *adat* leaders, and representatives of agroforestry groups. The committee must examine and agree with the

annual plan proposed by the PFM Body before the plan can be submitted to the General Assembly. The committee is also responsible for monitoring and controlling activities of the PFM Body.

The director will be chosen by the General Assembly for a five year period from individuals residing within or outside of the PFMA. The director and her staff will be responsible for planning annual activities and the annual budget. The director will submit annual reports to the Executive Committee and the General Assembly, and will coordinate with the Ministry of Forestry and the Forum Coordination. The director will have a mandate to cooperate with third parties based on the needs of the community and prevailing regulations.

The support staff for implementing participatory forest management will be selected by the director. The staff will have responsibility for assisting the director fulfill the duties required by her mandate.

With respect to violations of existing forest regulations, two types of penalties will be imposed. In the case of minor violations, the penalties will be determined by the *adat* and village leaders. In the case of major violations, the penalties will be determined by state regulations. When the regulations are open to misunderstanding, the *adat* council will judge the case.

Funding for the PFM Body will comes from several sources. These include the marketing of timber and NTFPs from the PFMA, interest from the saving and credit systems, support from the SFDP, and other sources.

Rights and Obligations

The major parties involved in the development of an institutional framework for forest management in Sanggau will include the Ministry of Forestry, the PFM Body, and the local communities. The rights and obligations of each party are described below.

The Ministry of Forestry will provide communities with long-term usufruct rights (70 years) to forest lands through the PFM Body based on a contractual agreement. The Ministry will also provide office facilities for the PFM Body, as well as incentives, training, and education for its staff. The Ministry will provide extension services to the local communities,

reforestation incentives, infrastructure development, initial capital for a revolving savings and credits system, and others necessary items.

In return for these services, the Ministry of Forestry has the right to supervise, guide, and control activities of the PFM Body group. In addition, the Ministry maintains the right to determine timber production targets, and to identify the forest block to be cut based in the participatory forest management plan. Finally, the Ministry will receive periodical activities and financial reports from the PFM Body.

The PFM Body group will prepare periodical progress, activity, and financial reports for the Ministry of Forestry and the local communities. The PFM Body will also develop 25 year and 5 year plans for participatory management. The PFM Body has the responsibility for paying taxes and royalties on timber and NTFP collection to the government, coordinating activities of villages under the PFM Body including encouraging people to save money, managing and controlling field activities based on PFM Body plans, and coordinating activities with Coordination Forum. Finally, the PFM Body will be responsible for marketing timber products and maintaining accounts based on formal accounting procedures.

In return for these services, the PFM Body will obtain office facilities from the Ministry of Forestry. The PFM Body will also receive from the Ministry of Forestry salary incentives for maintaining its staff for five years, as well as education and training for its staff. The PFM Body will receive supervision and incentives for maintaining reforested areas, developing support facilities, and establishing a savings and credit system. The PFM Body has the right to develop regulations for managing the PFMA, to collect taxes and royalties based on existing regulations, and to obtain research results from the PFMAs.

The PFMA communities have an obligation to safeguard and maintain plantations and natural forests as outlined in the village land-use plans. The communities will market timber products to the PFM Body. They will obey rules and technical guidelines of the Ministry of Forests as well as obey the rules on NTFP collection and mixed-garden management

developed by the PFM Body and the communities[2]. The communities will develop permanent agriculture systems in areas delineated for such use in the village land-use plan, and they will apply appropriate silviculture techniques.

In return for these services, the communities will receive access to a revolving savings and credit system for permanent agricultural development. They will have access to timber and NTFPs from forest plantations on community lands and based on regulations formulated by the PFM Body. They will be able to develop proposals for regulating the PFM Body and for managing the PFMAs. They will be able to choose (and to be chosen) staff members of the PFM Body. They will receive recognition of their customary plantation areas and sacred places. Finally, they will receive regular activities and financial reports from the PFM Body.

Discussion

The forest management institutions developed by the Social Forestry Development Project represent a totally new approach for the Indonesian Ministry of Forest. Human resources development is a key point in this approach and this is in line with national policy priorities for the Sixth Five Year Development Plan (PELITA VI). Unlike other large scale forest management enterprises, which are purely business oriented, the Participatory Forest Management Areas will be legally managed by the Dayak, the native people in this area. This program challenges Dayaks to prove that they have the capability to manage forests for profit and sustainability. Lintu (1995) argues that the profit orientation of this project challenges the sustainability of non-timber forest products, because the local communities will control all basic functions, including collecting, processing, marketing and human resources development.

The organizational structure gives a strong role to the General Assembly so as to induce community participation in planning and decision making. The inclusion of several

---

[2]The agreement between the PFM Body and the local communities will categorize lands in terms of forest or permanent agriculture based on a village land-use plan. The agreement will include technical guidelines for the planting, tending, and protection of trees as well as compensation for lost trees. Finally, the agreement will include regulations on the harvesting and marketing of timber and NTFPs (including how prices will be determined).

development agencies in the General Assembly will also hopefully provide opportunities for incorporating village development into forest management decisions. The social forestry approach developed in Sanggau with its emphasis on the development of management institutions (i.e., the General Assembly) is unique in comparison with other approaches such as joint forest management in India and extractive reserves in Brazil.

This approach explores opportunities for group formation and the motivation of villagers through groups (e.g. incentives for reforestation activities, savings and credit systems, etc). The regulations and agreements between the PFM Body and local communities are determined by *adat* law and hopefully will be strengthened by this law.

In the beginning the local Dayak communities participated only reluctantly in this program. This reluctance may have been due to previous experiences with other top-down development activities. Since becoming involved with this project, however, a noticeable change in the attitude of these communities can be discerned in their enthusiastic attendance at project meetings, as well as their suggestion that reforestation targets be increased from 600 hectares to over 1000 hectares.

The implementation of this approach required various revisions in government regulations, and hence the program can be considered almost revolutionary from the government perspective. The Basic Forestry Law (article 14) clearly states that forest management can be granted to state-owned institutions (i.e., Perum PERHUTANI on Java), to state-owned forest enterprises (i.e., PT. INHUTANI) or to private enterprises (i.e., forest concessions). Forest management, however, has never been given to a social or community institution. The development of a legal framework for meeting the needs of local communities as well as the Ministry of Forestry is an exciting breakthrough. This legal framework covers the period of agreement, rights and obligations of each party, and penalties.

The PFM Body as a business institution/unit requires an initial capital investment. This investment is expected to form a revolving fund from the Ministry of Forestry for starting business activities. Nevertheless, support regulations for these funds are needed, since reforestation funds are allocated mainly for reforestation/rehabilitation purposes. Furthermore, the extent the PFM Body will be involved in forestry management practices need to be defined more clearly, (i.e., whether it should be treated as a full business

institution or more as a social institution). A full business institution is expected to be operated professionally, effectively, efficiently, and profitably. While a social institution is more concerned with achieving equity for its member. The PFM Body approach to forest management may provide less revenue to the government (compared to private concessions), but it may provide greater social and political stability, and perhaps even contribute towards resource sustainability. In general it is expected that the PFM Body approach to forest management will form one solution to combating poverty and resource degradation. Furthermore, as Indonesia has many indigenous ethnic groups, it can be anticipated that there will be great interest in this approach to forest management throughout the country.

Conclusions

Several lessons can be learned from the Social Forestry Development Project in Sanggau. Among others these lessons include the fact that institutional development is necessary to enable people to utilize their customary laws and traditions for managing natural resources and resource access. Second, developing these institutions requires great effort, particularly for developing human resources, and extension of activities. Third, institutional developments in resource management need an integrated approach including basic needs such as food, shelter, and health. Finally, social forestry institutional development requires the development of supporting systems and infrastructure. Even though the success of this approach has yet to be determined, there are good reasons to be optimistic about the role of community participation in forest management.

Acknowledgements

The author is grateful the East-West Center for providing facilities and supervision during the preparation of this papers. Special thanks to Jeff Fox who made great effort to capture the author's ideas and to state them in clear English. I also greatly appreciate the help of SFDP project staff members who provided strong motivation for this paper. Finally, I would like to thank the MacArthur Foundation for funding my attendance at this workshop.

References

Adisoesanto, K. 1995. Beberapa aspek hukum kehutanan dan penerapannya. Unpublished paper no. 05 1994/1995, Ministry of Forestry, Jakarta, Indonesia.

Florus, P. 1994. *Kebudayaan Dayak: Aktualisasi dan transformasi.* PT. Gramedia Widisarana: Jakarta, Indonesia.

Lintu, L. 1995. Trade and marketing of non-wood forest products. Paper presented at Expert Consultation on Non-Wood Forest Products, FAO/Government of Indonesia, Yogyakarta, 17-27 January, 1995.

Wangsadidjaja S. and A. D. Ismanto. 1993. The legal case for social forestry in the production forests of Indonesia. In J. Fox (ed.), *Legal Frameworks for Forest Management in Asia: Case studies of community/state relations.* Program on Environment Occasional Paper No. 16, Honolulu, HI.

WHO BENEFITS AND WHO LOSES: THE BAWALIS AND NON-TIMBER FOREST PRODUCTS OF THE SUNDARBANS, BANGLADESH

Ali Akbar Bhuiyan[1]

Abstract

The Sundarbans mangrove forests constituting 40 percent of the total productive forest of Bangladesh is nationally very important as a source of timber and non-wood forest products. Some 300,000 persons, locally known as Bawalis, depend on extraction and marketing of NTFPs from this forest for their subsistence. The State policy provides for preferential extraction permit to the Bawalis at subsidized rate. The Bawalis are subjected, however, to intimidation and coercion by the government regulatory staff, and exploited by the moneylenders and boat owners, plunging them below a subsistence level standard of living. Presently Bawalis have no resource tenure and so do not identify their welfare with the welfare of the forests. They often exhibit perverse attitudes in product harvesting retaliatory to coercive pressures, thereby degrading the biological potential of the resource base. Organizing Bawalis into a beneficiary group, giving them suitable resource tenure, assisting them with 'soft' loans for logistics and expedition costs, training them in harvesting and management techniques, offers them new opportunities for their socio-economic development is recommended. Such a program would elicit reciprocity and cooperation from Bawalis so essential for the sustainability of the resource. NGO involvement, for organizing Bawalis' cooperative organization and for extending the needed financial assistance and training, could also protect them from bureaucratic coercion and help reduce the burden on the State exchequer. Such involvement should be viewed as complementary to rather than competitive with functions of government officials. The current FAO/UNDP Technical Assistance Study Project for integrated development of the Sundarbans should take a holistic approach to resource development and formulate management plan involving Bawalis as important partners in management for the sustainable development.

Nowhere else are mangroves deemed nationally so important for timber and non-wood products as in Bangladesh. The *Sundarbans*, the natural mangrove forest of the country, constitutes 40 percent of the forest area under the control and management of the Forestry Department, and one-fourth of the total forest land of the country.

Unlike the hills and plains forests, the Sundarbans has escaped the pressure of squatters and shifting cultivators because of its unique location in tidal swamps. It, however, provides subsistence living and business opportunities for a section of the population and dependent industries. Several hundred thousand forest extractors, locally known as *Bawalis*, depend on this forest for their subsistence mainly through wood cutting and non-timber forest products (NTFPs) extraction. As traditionally they are subjected to intimidation and extortion by officials, and exploitation by traders and middlemen, their socio-economic condition has remained unaltered over the ages. At the same time the resource base, the mangrove forest, has suffered in their hands because they never identified their welfare with the welfare of the forests as the administration has never guaranteed, exploitation-free benefits to the Bawalis.

---

[1]Director, Forestry Development and Training Centre, Bangladesh Forest Department

This lack of incentives for the individuals to conserve available resources for long-term use leads to a condition of perverse incentives which in fact encourage over-harvesting (McNeely 1988). Community participation in NTFP development, management, harvesting and marketing could prove extremely useful and beneficial for both the users and the resource base itself. Policies designed to encourage the production and improvement of the non-timber goods and services, not just the production of timber, could help to increase the economic value of the mangrove forests This mode of resource management, that is, by enlisting the participation of the extractor community in resource development compatible with environmental equilibrium, could pave the path for the sustainability of both the resource and future harvests.

The enthusiasm expressed in this proposal is fueled by a contemporary study commissioned by the Government of Bangladesh and conducted by the FAO with funding for technical assistance from the United Nations Development Programma (UNDP). The FAO study is designed to develop a management plan for the integrated resource development of the Sundarbans mangrove forests including timber, NTFPs (both plant and animal origin), fisheries, tourism, environment and socio-economic uplift of the extractor community (FAO 1994). The study reports so far published (Moss 1994; Shiva 1994) reiterate the scope, and hope, of ecological and economic potential and social justifications for conservation and development of this productive but delicate ecosystem. To be sustainable, however, the development efforts must involve the Bawalis, who are the *de facto* silviculturists and pisciculturists in this areas, but who also are equipped with dangerous tools of exploitation. If this group is not ardently sympathetic to and does not cooperate with the management plan and philosophy, the resource base could be significantly depleted and sustainable economic development efforts jeopardized.

This paper endeavors to identify the shortcomings, including the oppressive lacunae in the existing extractive systems and development strategies, and suggests a mode of enlisting the earnest participation of the Bawalis in NTFPs development, harvesting and marketing, the key to ensuring the sustainability of the mangrove resource.

Background

The study site is the Sundarbans, the natural mangrove forests of Bangladesh which comprise the largest continuous mangrove ecosystem in the world. It encompasses an area of 0.57 million hectare (ha) of which 0.402 million ha support terrestrial vegetation; the remaining 0.175 million ha is covered by rivers, canals, and creeks (Chaffey 1985). The forest is free of permanent habitation and retains a crown density of 70 percent (ODA 1985).

The Sundarbans has a diverse population of flora and fauna. Some 68 species of plants have been recorded (Khan 1978; Chaffey and Sandom 1985; Khatun and Alam 1987). *Sundri* (Heritiera fomes) is the predominant species with 65 percent of the growing stock, followed by *gewa* (Excoecaria agallocha) constituting 17 percent, and *keora* (Sonneratia apetala) covering four percent. Other tree of importance are *passur* (Xylocarpus mekongensis), *dhundul* (X. granatum), *kankra* (Bruguiera sexangula) and *bain* (Avicennia officinalis), (Chaffey 1985).

Thirty two species of mammals are known to occur in the Sundarbans including the Royal Bengal tiger (Panthera tigris), spotted deer (Axis axis), wild boar (Sus scorfa), and Rhesus macaque (Macaca mulatta) (Hosain 1974; Hendrich 1975; Salter 1984; Bowler 1985). Another 186 species of birds, 35 species of reptiles and 8 species of amphibians have been reported. This forest also supports a large commercial fishery and 87 species of fish have been identified (Ahmed 1966).

The Sundarbans is endowed with a surfeit of NTFPs which are both extensively and intensively harvested — extensively on account of easy accessibility by water routes and intensively because of high demand and commercialization of many products. Important NTFPs include *golpata* (Nypa fruticans), *Hental* (Phoenix paludosa), honey and beeswax, *nol* (Phragmites karka), *hogla* (Typha elephantina), *bhola* (Hibiscus tiliaceous), *shingra* (Cynometra ramiflora), *goran* (Ceriops decandra), fish and crustaceans, oyster and other shells, among others.

During the three consecutive years (1976 to 1978) I lived in the Sundarbans as the chief executive manager (Divisional Forest Officer), I conducted an investigation of NTFPs extraction. For example, I observed the boat registration, assemblage of Bawalis, and harvesting and marketing of products. I conducted standardized interviews with Bawalis and

traders acting as financiers and stockists of the harvested commodities. I also had extensive discussions with local, regional and national level officers of the Forestry Department about streamlining NTFPs extraction with people's participation and about eliminating the middlemen and the corrupt coercive practices of the regulatory officials. I conducted a further investigations updating information and the data base with a second visit in 1988, consulting various expert reports of the on-going UNDP/FAO technical assistance project which has been given the mandate to formulate a management plan for integrated resource development in the Sundarbans (Shiva 1994; Moss 1994).

Exploitation of Non-Timber Forest Products -- the Present Situation

Non-timber forest products have been exploited from the Sundarbans forests by the adjoining coastal populace for centuries (Curtis 1933). The forest, being distantly located from habitation, is not readily available for the harvesting by consumers. Also because the mangrove forest is typically a hazardous environment due to the tigers, crocodiles, and sharks which inhabit the area, and the frequent catastrophic sea storms which frequent the region, a special group of forest harvesters, locally known as *Bawalis*, collect the forest products as a profession. In the extraction process, though hundreds give their lives annually falling prey to wild beast or drowning in the furious sea they have never abandoned the traditional family occupation. Such stories, where a father was killed by tiger while harvesting forest products but his son or relatives went again to the forest with the deceased's permit for collection of the permitted goods, are abundant among Bawalis. Their resolve to gamble with life testifies to the economic distress of these people. Numbering an estimated 300,000, the Bawalis still rely on the extraction of a highly diversified portfolio of NTFPs for sustenance.

In the hills and plains forests, NTFPs, wherever occurring in bulk quantities, are disposed of by a procedure of standing sale to enlisted purchasers through a system of open auction or sealed bids. In consideration of the difficult socio-economic conditions of the Bawalis and the hazardous nature of the extraction operations, the government offers permits for NTFP extraction in the Sundarbans to Bawalis on a concessional basis.

The State policy lays down a benevolent and fairly straight-forward extraction system for NTFP collection from the Sundarbans which *inter-alia* provides permits to the Bawalis on

a first-come, first-served basis. The number of permit-seekers is large and each one wants to begin extraction the soonest possible. From the perspective of the Forest Department, it is felt that there is a technical necessity to oversee extraction operations to insure the enforcement of extraction rules and regulations. Constraints of supervisory staff and logistics, however, preclude the simultaneous superintendence of a large number of extractors. Thus, arises the need to prepare 'priority lists' of extractors to safeguard systematic and unbiased permit issuance. For priority listing, the Bawalis are required to line up in Forest Department toll stations with boats, to register boat capacity and to wait in turn for a permit. Because waiting has a cost and influences ultimate profitability of the expedition, there exists both provocations by a certain section of the Bawalis, and temptations on the part of the officials to indulge in underhand deals, causing the manipulation in the priority listing and jeopardizing the interests of non-indulgent, or non-cooperative members of the group. Abuses include coercive over-payments of fees, often a few times more than the approved royalty rate. Although State policy is aimed at protecting Bawalis rights, i.e. through eliminating monopolistic control of extraction and dictation of the terms of trade by the most powerful middlemen, illicit payments demanded by regulatory bureaucrats almost always skim off the cream, so to speak. This keeps the Bawalis at subsistence level or lower, despite the fact that they bear the brunt of the risks of working in this highly dangerous environment.

Extraction operations in this mangrove forest are virtually impossible without a boat, which serves both as transport as well as accommodation for the whole expedition. A complete trip of extraction and marketing usually takes one to three months, depending on the group's success in collecting as well as manipulative ability in priority listing their boat. Two to six individuals, according to boat capacity, are usually needed to organize an extraction expedition. During this period, for their own food and for provisions for the families left at home, the Bawalis need substantial cash which is difficult to obtain. Such money is usually borrowed from rural money lenders, locally called '*mohajon*', at high rates of interest (often 15 to 20 percent per month), to be repaid after completion of the expedition.

The total investment for the extraction expedition, i.e., the shadow payments made for priority listing, excess payments for permit issuance, boat rental costs, interest on borrowed capital, and the Bawalis' own labor input, hardly equals the return. Sometimes sale proceeds

fall short of total expenses in which case the Bawalis slip further into debt. At times goods-laden boats capsize in the river or sea and cannot be salvaged. The Bawalis are then in real trouble and may have to sell their movable property or land to clear this debt.

Unless the Bawali community can be protected from the coercive and intimidating clutches of the regulatory officials and the exploitative terms dictated by their capital backers, this section of the population will remain at barely more than a subsistence level and their problems will multiply. Moreover, they may be tempted to indulge in illicit extractions to make good the losses incurred and injustices suffered. In doing this, they threaten not only their own livelihood but survival of the mangrove forests, a resource valuable as much for its diverse products and employment potential as its role in coastal stabilization.

The Potential for Further Development of Non-Timber Forest Products Sector

Although known for many years as minor forest products, the non-timber forest products of the Sundarbans mangrove ecosystem are scarcely 'minor' in most aspects. Firstly, their magnitude and incidence of occurrence are neither sporadic nor infinitesimal as are similar products of the mesophytic forests. Secondly, these products play a very important role in the economy, especially in providing employment and meeting the basic needs of a large number of people. As the mangrove forests in general have less diversity of species, most NTFPs of such ecosystems are gregarious in their occurrence, because of strong site preferences, and substantial in quantity. This facilitates their location and contributes to the cost effectiveness of collection.

Ecological Factors

Admittedly, a primary factor in determining success and sustainability of an extractive system is the density and occurrence of the desired species in the forests (Peters 1990). The density of a given plant (or animal) species tends to be inversely related to the overall species diversity of the system. Species density affects the *search time* necessary to locate target individuals, the *travel time* needed to move between individuals, and *gathering time* in the harvesting process, and the *carrying time* needed to bring the gathered product back to a central point. A basic tenet of optimal foraging models of behavior holds that as the density of a given species decreases (and thus search, travel, collection and carrying time

increases), the overall return from the product decreases and hence the product should be less preferred (Charnov 1976; Kerbs and McCleery 1984). The pattern of occurrence of NTFPs in the Sundarbans ecosystem is fairly concentrated, gregariously patchy and hence relatively inexpensive in terms of collection costs. This is indicative of a commercially profitable undertaking with considerable scope for development, enrichment, and refinement, and thus perfectly justifiable as an investment venture provided other factors concomitant with conservation and sustainability, especially the human prerogative for participation in such conservation and development, are pragmatically addressed.

A systematic inventory of NTFPs of the Sundarbans has not been done as yet although exhaustive inventory of the timber stock was done a decade ago (ODA 1985). NTFPs are harvested regularly from the length and breadth of the forests, and their harvesting from any and all corners does not pose a problem as the forest is highly accessible by water routes. Thus, the annual output of extracted products may be considered a good approximation of harvestable growing stock. The NTFP output and revenue for the period 1987-1993 is furnished in Tables 1a and 1b.

The tables show that despite the current very low input of technological intervention and financial investment, a fairly stable and significant quantity of products are extracted at present. Missing from the current scheme is the mix of technological innovation, financial investment, social participation and reciprocity, and administrative liberalism in approach, attitude and practice that will insure the sustained production of these products in the future. Non-timber forest products being renewable resources have the potential for quantitative as well as qualitative improvement. Considerable scope exists for aggressive programs of development with a relatively low level of investment and recurring cost, but a promised high rate of return on investment[2]. A holistic approach is long over due for integrated development of this nationally important resource base. To this effect, the findings and recommendations of the current FAO/UNDP project noted above deserve sympathetic and pragmatic analysis (FAO 1994).

---

[2] Because of a relatively cleaner forest 'floor' and lesser weed growth in the mangrove ecosystem as compared to the mesophytic forests of the inlands, TSI and other tending operations are quicker and more cost-effective in the mangrove forests.

Table 1a Production of selected non-timber forest products from the Sundarbans, 1987-93

Name of product	Quantity (MT)					
	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93
Golpata (Nypa fruticans)	78,941	68,241	66,966	72,392	74,368	na
Hental (Phoenix paludosa)	7,874	8,367	7,227	6,770	8,860	na
Honey	223	99	146	211	159	na
Beeswax	56	25	37	53	44	na
Fish, Shrimp and Crabs	na	na	na	na	na	na
Oysters	na	na	na	na	na	na

Table 1b Earnings from selected non-timber forest products of the Sundarbans, 1987-93

Name of product	Revenues (000 Taka)*					
	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93
Golpata (Nypa fruticans)	4,216	3,976	6,723	6,799	4,889	6,278
Hental (Phoenix paludosa)	210	223	339	334	437	na
Honey	178	84	625	563	465	663
Beeswax	89	40	196	211	174	na
Fish, Shrimp and Crabs	8,468	7,438	12,784	15,378	14,562	16,210
Oysters	48	49	49	141	71	449
Total	13,209	11,810	20,808	23,351	20,598	23,600

*USD 1.00 = 39.50 Taka
Source: adapted from Islam 1992; Moss 1994

Generally silvicultural problems do not pose a major obstacle to forest resource development. The human factors, especially as they affect the sustainability of technological and financial investment efforts, present the most formidable barrier to achieving advancement in forestry in most developing countries, including Bangladesh. Forestry professionals, planners, and policy makers must appreciate this fact, and accordingly modify the traditional custodial approaches to forest management and adopt more people-oriented policies and practices in over-populated and highly competitive land-use situations. Unless a more flexible approach is taken, and a sense of involvement and partnership is developed between the users of the resource and the government's custodians, vast open-access resources, such as the forests, can scarcely be protected. The events of the last half century have proved this unequivocally.

The Sundarbans mangrove forest has been under regular management for over a century, and intensively managed for the last half a century. The first management plan was drawn up in 1933 (Curtis 1933). The forest, located on alluvial mud flats formed by silts deposit washed down from the Himalayan catchments, is fertile and productive. During the long and tortuous course of past management, major socio-political changes have taken place in the Indian sub-continent, and the Sundarbans was subjected to various abuses at odds with the objective of sustainable harvest. Nevertheless, the resource has shown considerable resilience, and never has reached crisis stage except for the artificial problems created through the construction of a barrage on the River Ganges by India. A trans-national river, the Ganges, which originates in the high Himalayas, naturally drains through the Sundarbans before it reaches the Bay of Bengal. Diverting a major portion of water flow during the dry season to Calcutta port deprives Bangladesh of its legitimate share of water. Due to this man-made interruption, the sweet water surge as well as the silt and nutrient dressing to the forest floor has been seriously reduced, and the salinity level, due to the backward tidal thrust, has greatly increased. As a consequence, Heritiera fomes, in economic terms the principal timber species (65 percent of the growing stock), occurring in fresh and brackish water zone has developed die-back on an epidemic scale. With increasing salinity, the floristic composition of the forest is also showing a tendency for gradual transition towards a preponderance of Rhizophoraceae. Overall, however, the affect on NTFPs have however been visible, although

some growth retardation and quality decline may be reasonably expected. While the river-water sharing issues are being negotiated nationally and internationally, the long-term sustainability of the population of harvested species and of the ecosystem overall is not likely to undergo serious changes to the detriment of NTFPs, provided the removal of a given product from the forest does not upset the delicate natural balance which exists.

Given the very large population of Bangladesh, demand for products is greatly in excess of the supply sustainably available from the resource base. As to be expected, prices spiral up, especially when extraction season is coming to close, and the pressure to overexploit grows. Recutting of *golpata*(Nypa fruticans) fronds in the same season, cutting of undersized stem of *goran* (Ceriops decendra) and catching of fish in the spawning season are frequently attempted. Such illicit extractions, which not only deplete growing stocks but degrade vigor of the parent material, must be strictly regulated. Technological innovation and regulatory enforcement are strongly needed. Given the widespread nature of the resource, regulatory enforcement by the Forest Department staff alone is hardly a realistic goal. Therefore persuasive rather than police action, and a participatory rather than parental approach should be the strategy of future management.

The management system in the Sundarbans currently relies entirely on natural regeneration. Manipulation of silvicultural practices to facilitate natural regeneration is rarely done because of funds and staff constraints. For the product and ecosystem sustainability, appropriate tending operations to facilitate natural regeneration are both necessary and justified. Simultaneously, endeavors are also needed to enrich the resource base with plantations to address the growing demand.

Socio-Economic and Political Factors

Lack of incentives for individual extractors to conserve available resources for long-term use is a theme of this paper. Since the Sundarbans is managed on the concept of the so-called Reserved Forests with custodial approach, the extractors are *ab initio* viewed as tendentious of violating extraction rules and regulations, and thus are seen to require strict control. At times, the penal action against Bawalis accused of regulatory violations exceeds proportionality of offense committed. On the other hand, deliberate oppressive measures are almost always taken by regulatory staff who compel over-payment for 'priority listing' and

permit issuance. These are almost unwritten laws and widely known but apparently unsurmountable. The unholy bureaucratic chain is so long and well-knit that administrative warnings or summons are of no avail. Bawalis, being helpless victims of the administrative vicious circle, cannot but yield to these customary extortions because of essentially two reasons. Firstly, there are few alternative employment opportunities. Secondly, the Bawalis are not well organized to resist or to offer a united voice against the malpractice of the officials. On their part, the Bawalis often respond to these perverse incentives by over-harvesting the resource, firstly, to accommodate profit margins and, secondly, because they enjoy neither secure land nor resource tenure. Neither can they reap the fruit of benevolent concessional provisions in the state policy designed to assist them. As a result conservation of resources and sustainable management have very little appeal to them.

Escaping the clutches of the unholy extortioners should be attempted with a systemic rather than administrative approach which has not been successful in the past. Formation of a Bawali welfare association and granting Bawalis resource tenure would be two important steps preparatory to greater administrative cleansing. This would help create a sense of belonging among the users with, and a concern for improvement of the resource. Such an organization would create an enabling environment, in other words give Bawalis the requisite numerical and the moral strength to collectively resist the malpractice of the officials (Hyden 1988; Rahim 1993). The latter group would then also become cautious about their actions given the Bawalis' strength and plausible resistance, and consider more carefully the consequences.

For the Forest Department, the formation of such a users' group would provide an avenue through which to channel extension material regarding scientific aspects of resource tending and harvesting with a focus on sustainability. Philanthropic organizations and NGOs could help Bawalis to play a broader role in socio-economic development and improve their ability to resist coercive and intimidating manipulation by different agencies.

To free the proposed Bawali welfare association from dependence on a money lender, a fund of some four billion Bangladesh *taka* (about USD 100 million) would be needed for boat construction and working capital. This amount reflects the large number of Bawalis (300,000) involved in extraction and the scale of production referred to in Table 1a. This

money could be made available by the government to the Bawali association as a revolving fund. Alternatively, credible NGOs could be invited to organize and facilitate the extraction program with both money and supervisory assistance. Grameen Bank (Rural Bank), a Bangladesh NGO institution exclusively to help the landless in their endeavors with production activities, could be a good institution to assist the Bawalis. Grameen Bank provides expert services for building cooperative organizations for their clientele and also the funding needed for mini-enterprise development. It could function not only as a responsible benefactor of the Bawali community and watchdog vis-à-vis government interactions with Bawalis, but also as mediator and negotiator in matters of issuing extraction permits and securing resource tenure.

Market Demand for NTFPs

Household consumptions and lack of demand for the harvested products in the commercial market for household consumption is perhaps the most important impediment for the survival and continuance of any extractive system (Pinedo-Vasquez et al. 1990). This problem is further compounded by the emergence of synthetic substitutes for many natural products (Salafsky et al. 1993). NTFPs extracted from the Sundarbans are primary products used principally by the rural household sector for hut construction, and by the rural and urban domestic sector for cooking energy. Other major products include honey and wax, fish and crustaceans, and shells. Under the present trends of economic development and annual growth rate in Gross Domestic Product (GDP), no dramatic change in the pattern of use of NTFPs is expected in the near future. The rural housing sector is presently in a wretched condition and the overall GDP growth rate is almost always at par with population growth rate (2.2 percent), and consequently no perceptible impact is felt in the development of the rural sector. Notwithstanding, theoretically speaking, if housing improvement leads to a decline in demand for *Nypa* palm, there is the possibility that this species may be tapped for its sap and sugar production (Shiva 1994). Nypa sap contains 17 percent sucrose, and in Indonesia the nipa sugar yield compares favorably with values for the sugar cane industry (Hamilton and Murphy 1988).

The energy sector in the country is in a state of crisis. There is no petroleum reserves nor any economically recoverable anthracite deposits. Hydroelectric power generation is low

(only 230 MW) (Anon. 1993). Natural gas deposits, estimated to be some 1.0 trillion m^3, are used primarily for organic fertilizer manufacture, thermal power generation and only on a limited scale for city domestic and commercial heating (Anon. 1993). Fuelwood consumption for domestic cooking and food processing will continue to increase with population growth. Fuel collection from the Sundarbans might be expected to be pursued even more vigorously.

Honey and wax have big demand and at a scale much higher than what the Sundarbans currently produces. The protein supply in the country's diet is highly deficient and the demand for fish is high, both for domestic consumption as well as for export. With no limestone deposits in the country, oyster and other shells found in the mangrove environment play an important role in supplying lime which is in perpetual demand.

Ecotourism, especially game watching, presents unique opportunities for development of an alternative industry in the Sundarbans. Tourism management and wildlife husbandry would require substantial infrastructure development, work which would best be done with Bawali participation.

Pressure for Alternative Land Uses

An average arable land holding per caput of only 0.08 ha and a relatively high population growth rate (2.2 percent) on an already dense population base coupled with a low level of industrialization give a good indication of the level of poverty in the country. Accordingly, the pressure of land-hungry agricultural communities on the mangrove ecosystem is tremendous. At times this pressure is fueled by political opportunists who voice in unison the demands of the landless as an election winning strategy.

In the past decades, shrimp culture has emerged as a profitable element of the fishing industry, encouraged in part by the government through various fiscal incentives because of the significant contribution to scarce foreign exchange earnings. Shrimp farmers construct rearing ponds by clearing forest vegetation and constructing dykes for water storage. They have also gone for intensive cultivation by developing hatcheries for shrimp fry production and artificial feeding. The shrimp-based neocapitalists, a strong and powerful lobby weighing heavy in political circles, are constantly pressing for extra land for shrimp culture. The pressure groups, however, have not been able to make much of a dent in the Sundarbans because of a number of favorable factors, namely:

(a) low degree of forest cover remaining in the country;
(b) location of the mangrove forests on a fragile landscape;
(c) protective function of these forests against frequent cyclonic storms and tidal bores; and
(d) economic dependence of a large community, *the Bawalis*, on these forests for their subsistence.

Thus even though pressures of alternative land uses are voiced, there appears no immediate cause for concern in this regard. The development of projects to enhance the production of non-timber forest products would be another positive factor in support of the preservation of the Sundarbans.

Management Considerations

Sustainability presupposes the wise use of the resource consistent with recuperating productivity before the next cycle of harvesting. Success in achieving sustainability is *inter alia* dependent on the level of knowledge and sympathy of the harvesters and the effectiveness of the regulatory measures. In the process of NTFP harvesting, apart from the inadequacy of the Forest Department staff to effectively monitor all extraction operations, the lack of appropriate technology and requisite knowledge among the harvesters results in a high level of unintentional damage to the resource base and the poor quality of the products extracted. For example, the honey collectors kill a substantial number of bees by using flames, instead of smoke, in their bid to drive the bees away from the beehives so that honey and wax could be collected without an undue risk of stings.

The Sundarbans is a megafishery covering a permanent water area of 0.175 million ha but with scope for fish movement, feeding and spawning through the entire 0.57 million ha of forests for six months during the extended rainy season and at high tide during the balance of the year. In the mangrove ecosystem, food from the vegetative organs of plants as well as from insects, and the dropping of wild animals are abundant. The mangrove habitat also provides secure sanctuary for fish. At present no regulatory control regarding size of fish caught, fishing gear used, or season of fishing. Currently, the main damage to the fishery is as a result of fish caught during spawning season and fish fry caught with nets of very small mesh (similar to mosquito curtain).

The fishery potential in this mangrove ecosystem, in reality, could be no less than from forest products. This economic prospect needs deeper appreciation by the administration and better scientific and regulatory management with participation of the occupational group. Regular training courses must be introduced so that the fishing community, having fully appreciated the importance and need for observance of a regulated fishing season, recognize limits on both the size of fish and the size of the catch or harvest. The government's regulatory control must also be strengthened.

Summary and Analysis

A summary of the ecological and socio-economic factors characterizing the potentials and limitations of NTFPs extraction system of the Sundarbans is illustrated in Table 2 below. As described and analyzed in the foregoing discourse, the ecological conditions and socio-economic settings of the Sundarbans present an attractive opportunity for development into a diversified multiple-use resource base. Though historically the forest suffered the ravages of abusive harvesting practices under technologically low intervention management regime, the ecosystem has exhibited considerable resilience, and continues to be a natural 'green gold mine' for Bangladesh. As a resource base, it is a megastore of timber and non-timber forest products, including fish, simultaneously offering employment and commercial and subsistence opportunities for tens of thousands of people. It has the significant potential of further development in terms of both quality and quantity of goods and services. The more encouraging feature is the suggested participatory management program expanding opportunities for employment and income generation to an economically downtrodden section of society. This complements the government's policy of emphasizing investment projects having greater promise to improve the quality of life of the people of lower income groups.

Table 2 Characteristics of NTFP extraction systems in the Sundarbans

Parameter	Occurrence	Significance	Potential management options
Ecological Factors			
Density of exploited species	High to moderate	Search, travel and collection time are reasonable	Strict adherence to cutting/collection rules; enrichment planting
Temporal availability of product	Regular, except for honey and wax, which are seasonal	Regeneration season for plants and spawning season for fish must be banned to extractors. Inclement weather needs avoidance.	Management plans agreed in consultation with Bawalis and followed with their participation
Sustainability (species level)	Moderate	Long-term viability is technically feasible and administratively practicable	Enrichment planting and strict adherence to cutting/collection rules
Sustainability (system level)	Moderate	Overall system could continue for long-term	Participatory/joint management system with Bawalis installed and enrichment planting
Socio-Economic and Political Factors			
Resource tenure	Not specified	Incentives for resource conservation and development non-existent	Recognition and formalization of resource tenure to Bawalis
Physical infrastructure	Good, naturally developed water routes	Collection and transportation of products to market is convenient and relatively cheap	Soft-term loans for boat construction must be made available
Social infrastructure	Weak	Provides harvesters opportunities for work and subsistence	Help formation of Bawali association and eliminate chances of coercion and intimidation.
Market demand	Moderate to high	Producer response to market good, but with products often cut at more than sustainable levels	Enrichment of resource base, both qualitative and quantitative terms
Political power of participants	Minimal	Grievances are weakly voiced	Political awareness and education
Tourism and recreation	Minimal	Helps creation of sympathy and support for resource conservation	Develop needed infrastructure and publicity
Pressure for alternative land use	Strong	Shrimp culture lobby is a strong threat to forest	Holistic ecosystem management strategies to be adopted

Source: Author

Most of the ecological limitations highlighted in Table 2 could ultimately be overcome by the appropriate design and careful implementation of management regimes. For example, product yield could be artificially enhanced by enrichment plantings of *golpata* (Nypa fruticans), *khalshi*, and *goran* (Ceriops decandra) species (Habib 1982). Plausible future shifts in product use and consequent marketing problems could be offset by switching to new products, e.g., nipa palm juice extraction (Shiva 1994).Introduction of new strains of honeybee and installation of artificial beehives could augment the quality and quantity of honey and wax produced. Finally, ecosystem sustainability could also be enhanced by forging international cooperation and sympathy to persuade India to release a due share of the Ganges water to Bangladesh, recognizing that the quality and sustainability of the mangrove ecosystem depends largely on the level of freshwater flows (Hasan et al. 1990).

The outstanding socio-economic factors limiting sustainability of NTFP extraction could be mitigated through pragmatic approaches to enterprise management. An overhauling of the age-old custodial management orientation is the need of the hour; in the context of high population growth, custodial protection without people's sympathy and support is unachievable. Also to be recognized is the simple but significant fact that forest management and development are aimed at the welfare of all the people. Organization of the Bawali community users association should thus constitute the foundation of the new approach of participatory enterprise management. Funding for the logistics and working capital for Bawalis users association could be organized through the creation of a revolving fund based on government contributions or NGO donations.

As requisite expertise in the cooperative management of natural resources is not available within the Forest Department, NGO association would be beneficial to oversee operations, especially given the scale involved the training required in technical, organizational, financial and marketing aspects. Initially all cooperative activities would have to be supervised, and on that account also, NGOs' involvement would be necessary to provide the requisite number of supervisors. Political will, prompted by education, and committed action would be needed as the fillip to get the program powered up and progressing in the right direction at sufficient speed. A crash program of orientation training of Forest Department professionals, technical and field staff regarding the concept and mechanism of

participatory or joint management would facilitate implementation. Finally, a holistic management approach and strategies through integrated development of forestry, wildlife, fisheries, tourism and human development must be adopted to derive maximum possible benefits and sustained economic returns from this resource base (FAO 1994).

The potential management and development strategies suggested and analyzed earlier are all technically sound, economically viable, socially desirable and politically feasible without adverse social repercussions. The participatory or joint management system when introduced by organizing the Bawalis, program benefits are likely to start flowing in a very short span of time (three to six months) rebuilding participants' trust in the program. The enrichment plantations are likely to yield increased quantity of yield in about five to seven years, but better observance of cutting and extraction rules would start qualitative improvement of the existing growing stock from the inception of the proposed program. Ultimately, with the building of mutual trust between the Bawalis, Forest Department staff and promotional NGOs, the creation of a congenial atmosphere conducive to production and conservation could be possible (Roy 1991).

Conclusion

Based on my observations and intimate knowledge of working in the Sundarbans, and also being encouraged by the outcome of participatory/joint forest management results in the highly disturbed Shorea robusta forests in Bangladesh and India (Roy 1991), I can offer the following conclusions concerning the overall development of the Sundarbans mangrove ecosystem.

- The productive potential and protection needs of the Sundarbans mangrove forests deserve greater national appreciation; both are much greater than generally understood.

- A holistic approach to resource development should form the basis for future management of the Sundarbans and in this context, the current FAO/UNDP technical assistance study should receive support to develop sound management plans for the integrated development of the total resource base including forestry, fishery, and tourism.

- The forestry profession and the government should appreciate the need for a multi-disciplinary technical and management input for the balanced development of the Sundarbans resources, and accordingly reschedule the management strategy replacing traditional forest managers with multi-disciplinary expert teams.

- The Bawalis' key role in the Sundarbans forest resource sustainability needs proper appreciation and the need for their participation in the future development and management of these resources must be acknowledged. Such participation should be ensured through appropriate government policy adoption and when needed, through introduction of new legislation. *Bawali* training in product harvesting is very important and needs to be better be organized.

- NGO involvement as facilitators in forest management could greatly reduce the burden of regulatory expenditure on the State exchequer. Such association also enhances effectiveness and credibility of the government policy and intentions. NGO involvement thus should be encouraged in the Sundarbans integrated resource development program as complementary rather than competitive to forestry professionals' administrative and technical role.

Acknowledgements

I would like to express my sincere thanks to the East-West Center, Honolulu, Hawaii, USA for inviting me to the Workshop on Community Management of Forest Lands, February 6 to March 17, 1995, which gave me an extensive exposure to the production, management, socio-economic and ecological aspects of non-timber forest products both from a national and international perspectives. Special thanks are to Dr. Deanna Donovan, organizer of the Workshop, for her untiring help and guidance in the course of writing of this paper, in going through the manuscript, offering helpful suggestions and comments, without which it could not have been possible to bring out the paper in the present form. Thanks also to Dr. Jefferson Fox, Fellow, and Ms. Maureen DeCoursey, Consultant, Program on Environment, East-West Center and to all the support staff of the East-West Center, Program on Environment, who were admirably cooperative and unhesitatingly helpful in making the Workshop successful in all respects.

Thanks are also due to the unnamed Bawalis and forest traders of the Sundarbans, who gave willing interviews in course of my investigations, and to the staff and officers of the Bangladesh Forest Department, who discussed the pressing socio-economic issues of Bawalis. Thanks to my professional colleagues, the Workshop participants from the South and Southeast Asian Countries, who actively participated in the discussion in the presentation session of this paper and contributed in its improvement through their valued suggestions.

References

Ahmed, N. 1966. Fish and fisheries of the Sundarbans. In *Proceedings of the Symposium on Scientific Problems of the Humid Tropical Zone Deltas and Their Implications, Dhaka, 24 Feb to 2 Mar, 1964.* Paris: UNESCO. pp. 264-271.

Anon. 1993. Forestry master plan. Ministry of Environment and Forests, Dhaka, Bangladesh.

Bowler, A. 1985. Wildlife conservation in the Sundarbans. Sundarbans Forest Inventory Project, Overseas Development Administration (ODA)(UK), Bangladesh.

Chaffey, D.R. 1985. Forest inventory of the Sundarbans, Bangladesh. Land Resources Development Centre, ODA, Surbiton, UK.

Chaffey, D.R. and J. H. Sandom. 1985. A glossary of vernacular plant names and a field key to the trees. Overseas Development Administration, London.

Charnov, E.L. 1976. Optimal foraging: the marginal value theorem. *Theoretical Population Biology* 9:129-136.

Curtis, S.J. 1933. Working plan for the Sundarbans Division, 1931-1951. Bengal Government Press, Calcutta.

Das, S. and N.A. Siddiqui. 1985. The mangroves and mangrove forests of Bangladesh. UNDP/FAO Project BGD/79/017, Khulna.

FAO. 1994. Integrated resource development of the Sundarbans Reserved Forests. UNDP/FAO Project BGD/84/056, Khulna, Bangladesh.

Habib, M.G. 1982. Improvement of the Sundarbans forests by enrichment plantation. In *Proceedings, Second Bangladesh National Conference on Forestry, Dhaka, Bangladesh.* pp. 150-155.

Hamilton, L.A.S. and D.H. Murphy. 1988. Use and management of Nypa palm (Nypa fruticans) Araceae: a review. *Economic Botany*, 42(2):206- 213.

Hasan, M.M., A.H. Mazumder, A.T.M.N. Islam, and A.T.M.E. Hossain. 1990. Soil hydrology and salinity of the Sundarbans in relations to top dying, regeneration and survival of *Sundri* (Heritiera fomes)trees. pp 1-11, In *Proceedings of the Seminar on Top Dying of Sundri trees*. Dhaka: Bangladesh Agricultural Research Council.

Hendrich, H. 1975. The status of the tiger (Panthera tigris tigris Linn.)in the Sundarbans mangrove forests (Bay of Bengal). *Augetierkundliche Metteilungen*, 23:161-199.

Hosain, K.A. 1974. *Introduction to wildlife of Bangladesh*. Dhaka: Book Promotion Press.

Hyden, Goran. 1988. Preface. In *Approaches that work in rural development*, ed. John Bridge. Munich: K.G. Saur Verlag.

Islam, M.A. 1992. Some relevant information about the Sundarbans. Government of Bangladesh, Sundarbans Forest Division, Khulna, Bangladesh.

Kerbs, J.R. and R.H. McCleery. 1984. Optimization in behavioral ecology. In *Behavioural ecology*. eds. J.B. Kerbs and N.B. Devis, 91-121. Sundarland, MA (USA).

Khan, M.S. 1978. *Flora of Bangladesh. Vol. 7: Family-Rhizophoraceae*. Dhaka: Bangladesh National Herbarium

Khatun, B.M. and M.K Alam. 1987. Taxonomic studies in the genera Avicennia Linn. from Bangladesh. *Bangladesh Journal of Botany* 16(1):39-44.

McNeely, J.A. 1988. *Economics and biological diversity: using economic incentives to conserve biological resources*. Gland: International Union for the Conservation of Nature and Natural Resources.

Moss, P. de V. 1994. Tourism and recreation report. Field document 1. UNDP/FAO Project BGD/84/056, Khulna, Bangladesh.

ODA. 1985. A forestry inventory of the Sundarbans, Bangladesh. Land Resources Development Centre, ODA, Surbiton, UK.

Peters, C.B. 1990. Population ecology and management of forest trees in Peruvian Amazona. In *Alternatives to deforestation: steps towards sustainable use of the Amazona rain forest*, ed. A.A. Anderson, 86-96. New York: Columbia University Press.

——— 1991. Population ecology and management of illipe nut in a mix Dipterocarp Hill forest. Paper. Conference on the Interaction of People and Forests in Kalimantan. New York Botanical Gardens, Bronx, New York, USA

Pinedo-Vasquez, M.D., P. Zarin, P. Jipp, and J. Chota-Inuma. 1990. Use values of tree species in a communal forest service in northeast Peru. *Conservation Biology* 4:405-416.

Rahim, S.A. 1993. An emerging trend in rural development: interpretation of rural development communication at the grassroots. Cultural Studies Series No.4, East-West Center Honolulu, Hawaii, USA.

Roy, B.A. 1991. Arabari experience: a model for forest management with peoples participation. Department of Forest, Government of West Bengal, India.

Salafsky, N., B.I. Dugelby, and J.W. Terborgh. 1993: Can extractive reserves save the rain forests? An ecological and socioeconomic comparison on non-timber forest product extraction systems in Pete'n, Guatemala, and West Kalimantan, Indonesia. *Conservation Biology* 7(1).

Salter, R.E. 1984. Integrated development of the Sundarbans, Bangladesh: Status and utilization of wildlife. Report prepared for the Government of Bangladesh. FAO, Rome.

Shiva, M.P. 1994. Mangrove non-wood forest products report. UNDP/FAO Project BGD/84/056, Khulna, Bangladesh.

NON-TIMBER FOREST PRODUCT DEVELOPMENT: NEW DIRECTIONS FOR NEPAL'S COMMUNITY FORESTRY PROGRAM

Munni Gautam[1]

Abstract

Forest management policies in Nepal have undergone considerable change in recent decades, but little consideration has been given to non-timber forest products. Policy changes within the Community Forestry Program are needed to develop this sector. In view of the changing rural economy, more emphasis should be placed on commercial production. This includes training,research,extension and legislation.

In 1978, in recognition of the critical dependence of the rural population on forest resources, the government of Nepal implemented a people-oriented policy which handed over the responsibility of forest management to local communities. Today, the main goal of this program remains the same: to help rural people manage forest resources to meet their needs. This policy, known as community forestry, involves:

- systematic transfer of all accessible hill forests to the extent that communities are able and willing and able to manage them, and
- identification of forest user groups and formulation of simple management plans.

Although researchers have identified several successful aspects of Nepal's community forestry program, different issues regarding the development of forest resources have yet to be explored. Increased market activity in some parts of rural Nepal has placed greater demands on the forests for various products (Malla, 1994), yet community forestry programs are oriented toward meeting subsistence needs for fodder, fuelwood, and timber only. They give little consideration to the changing rural economy and have no provision for the supply of commercial forest products to a rapidly developing market. These products, known as minor or non-timber forest products (NTFPs), have great potential to increase rural incomes with improvements in productivity and marketing. Thus, there is an urgent need to promote the sustainable use, development, and management of non-timber resources.

---

[1]Agroforestry Officer, Community and Private Forestry Division, Ministry of Forests and Soil Conservation, Kathmandu

This paper examines several issues related to NTFP development in Nepal, emphasizing their incorporation into community forestry initiatives. After some brief background on the country and its people, the history of community forestry and the current status of Nepal's NTFPs are described. The discussion highlights ways to incorporate NTFPs into community forestry programs and policies.

Background: The Country and its People

General Overview

Nature has blessed Nepal with a variety of climate and topography, making it rich in flora and fauna. From tropical forests in the lowlands to the alpine meadows of the high Himalaya, Nepal enjoys a diversity of vegetation. Nonetheless, economic development remains poor: over-population, rugged topography, a declining resource base, and lack of infrastructure continue to be major obstacles (Chetri, 1992).

The total land area is 14,700 square kilometers (km^2). In 1991, the total population was 18 million and continues to grow at a rate of 2.66 percent annually. Average land holding is 0.5 hectare (ha) per household. A survey of land use within Nepal was carried out in 1986 and identifies six major categories (Table 1). Non-cultivated inclusions are small pockets of land adjacent to cultivated land, comprised of barren areas or pockets of trees, shrubs, and grass. Within the category of forest land, plantations are an insignificant percentage of the total. Other land use categories include urban and industrial land, lakes and rivers, and rocky areas.

Table 1 Land use in Nepal by ecological zone*

Category	Mountain (%)	Hills (%)	Terai (%)	Total (%)
Cultivated	252.2 (4)	1481.3 (23.4)	1234.6 (58.5)	2968.1 (20)
Grazing	1394.1 (22.1)	313.3 (4.9)	49.7 (2.4)	1757.1 (11.9)
Forest	1786.7 (28.3)	3238.8 (51.2)	591.3 (28.0)	5616.8 (38.1)
Shrubland	247.9 (3.9)	440.6 (7.0)	1.4 (0.1)	689.9 (4.7)
Non-Cultivated	149.1 (2.4)	720.7 (11.4)	117.1 (5.6)	986.9 (6.7)
Other	2478.6 (39.3)	134.9 (2.1)	116.1 (5.5)	2729.6 (18.5)
Total	6308.6 (100)	6329.6 (100)	2110.2 (100.1)	14748.4 (100)

*per 1000 ha
Source: Land Resources Mapping Project, 1988

Forest Use and Composition

Nepal's forests, especially those of the Middle Hills, are used by over 90 percent of the population and cover 37.6 percent of the total area (HMGN, 1989). Subsistence farming and herding continue to be a way of life for most people, and forests play an important role in their daily lives. Fodder for livestock, leaf litter for manuring, firewood for cooking and heating, timber and poles for making houses and animal sheds, and numerous other necessities are derived from the forest. Forest products are especially important to the poor who have little land or other income-generating opportunities. Rising human and cattle populations have increased the demand for forest products producing widespread degradation in many part of the country, especially in the Middle Hills. Fodder shortages have been linked to declining agricultural productivity at a rate of 1 percent annually.

The forests of Nepal vary greatly with altitude. Tropical forests dominated by Shorea robusta occur below 1000 meters (m). Along the streams and rivers, one can find a mixture of Acacia catecheu and Dalbergia sissoo. Subtropical forests are found between 1000-2000m comprised of Pinus roxburghii in the west and mixed stands of Schima and Castanopsis species in the central and eastern regions. In wet areas and along the streams and rivers, Alnus nepalensis is found. Temperate forests mainly consist of Pinus wallichiana and Quercus spp. growing from 2000-3000m; Quercus semicarpifolia and Rhododendron arboreum dominate the upper altitudes. Between 3000-4000m the forests are subalpine: Abies spectabilis and Betula utilis are found throughout, with Rhododendron spp. on wet sites and Juniperus indica on dry sites. Shrubby rhododendrons and junipers continue up to 4500m.

The Evolution of Community Forestry

Nepal's forests have been exploited in various ways over the years (Mahat *et al*, 1986; Wallace, 1988). In the early years of the country, government policies called for the export of forest products to earn revenue, and encouraged forest conversion by making land grants (*birta*) to its citizens. Thus, the government turned the nation's forests into an 'open access' resource and communities lost the right to manage and control forest use in their area. Deforestation continues to be a severe problem, especially in the Middle Hills, because of the growing population. This has created a settlement pattern in which forests are highly fragmented and intermixed with farms and pastureland.

To overcome these problems, the government introduced the Private Forest Nationalization Act of 1957. This act recognized that:

> Forests constitute an important part of the national wealth. It is expedient to prevent the destruction of national wealth and to ensure the welfare of the country and the people.
>
> (quoted in Wallace, 1988)

The act was passed with the expectation that the government will manage and protect the forest. This strategy, however, restricted rural people from using forest resources and overlooked the protection and management systems they traditionally employed to ensure sustainable use. In response, people destroyed many forests by converting them into agricultural land in order to register them under private ownership (Chetri, 1992). This act also caused local people to become distrustful of government attempts to manage the forest. In spite of these problems, many communities throughout Nepal continued to practice their own management system to conserve forest resources for their own benefit.

In 1978, a major change in forest policy occurred with the introduction of the Panchayat[2] Forest and Panchayat Protected Forest Act. The main intention of this act was to involve communities in the management of forests. In 1982, the government passed supporting legislation, the Decentralization Act, which introduced the concept of 'protection committees' in an attempt to ensure the participation of the local people in development activities, and transfer the management of degraded of deforested land to the local panchayat. These areas were to be operated under an official management plan with the objective of supplying the forest produce needs of the people living in the panchayat. Protection committees were fully authorized to organize and implement forestry and development activities. Success, however, was limited. One major reason for the disappointing results was the impractical nature of management and use rules which failed to create an environment for the full participation of all users. Procedures for the transfer of authority for protection,

---

[2]A panchayat is the former administrative unit in Nepal. It is composed of nine wards, similar in concept to village or township. It has recently been replaced with Village Development Committee (VDC).

management, and utilization of forests were unclear and subject to manipulation. In effect, forest responsibility was transferred to the *Pradhan Panch*, or village mayor.

In 1988, the government adopted the 'forest user group' concept to manage forests that were still under the responsibility of local panchayats. The degraded forests which could be handed over to communities were limited to 125 ha of Panchayat Forest and 250 ha of Panchayat Protected Forest.

Early community forestry activities were plantation-oriented and concentrated mainly on reforesting degraded land. People's participation in these programs, however, was very limited. Local communities were not meaningfully involved in the planning process and were not given much responsibility for management. As a result, people were not interested in forest and plantation development.

In 1990, Nepal's panchayat system of government came to an end. Today, the term 'community forest' refers to any forest, including the panchayat forests of the past, under user group protection and management. After the dissolution of the panchayat system, the interim government issued instructions for the implementation of community forestry to hasten the transfer of all accessible hill forests to forest user groups. District forestry staff assist in this process by helping to identify forest user groups, develop simple operational plans, and demarcate community forests. After these tasks are completed, the community forest is formally handed over to the user group by the Department of Forest. Local users control the forest as long as they follow the mutually-agreed operational plan. The user group assumes the responsibility to manage the forest resources in a sustainable manner and are entitled to all the benefits.

Community forestry has been institutionalized within the Department of Forest with the creation of the Community and Private Forestry Division, headed by the Deputy Director General of Forests (DDG). The DDG coordinates planning, budgeting, implementation, follow-up, and evaluation, but delegates responsibility for day-to-day activities to the 75 District Forest Officers. Table 2 shows area available for community forestry.

Table 2 Land available for community forests

Forested	1876,300 ha (32%)
Non-forested	1,585,800 ha (27%)
National Forest	2,313,100 ha (39%)
Already established Community Forests	99,500 ha (0.02%)
Total	5,874,700 ha (100)

Source: CPFD, 1991

Non-Timber Forest Products in Nepal

Government Perspectives

In Nepal, NTFPs can be defined as all goods for commercial, industrial, or subsistence use derived from forests other than timber. As such, they are an important part of community forest resources (Messerschmidt and Hammett, 1994). There has been an increasing awareness among policy makers of the importance of NTFPs as a result of many factors such as the dependence of rural communities on NTFPs, the new market preference for natural products, and concern about the conservation of forest resources.

According to the 8th Five Year Plan (1992-1997), NTFPs should be developed to:

- increase income and employment opportunities for small farmers and marginal people in the forestry sector, and
- conserve ecosystems and biodiversity in Nepal.

The Department of Forest is the sole implementor of forest laws that encompass NTFPs. Its issues collection permits and collects government royalties; both practices are used to ensure sustainable harvests, but have had limited success. While the Department of Forest oversees forest conservation, export and trade is handled by the Customs Department. Customs officials and border police, as well as checkposts along major highways, are not equipped with required information to deal with NTFPs.

Seven types of non-timber forest products are officially recognized: bamboo, *katha*, *lokta* paper, pine resin, *sabai* grass, sal seeds, and medicinal and aromatic plants. These are described below.

Bamboos are very common up to an elevation of 2000m throughout the country. About forty species have been identified to date. Bamboos are commonly made into a number of household items including round trays for winnowing, a variety of storage baskets,

and head baskets for carrying loads. Bamboos are also used for roof beams, pillars, fencing, and panelling, as well as livestock fodder and fuelwood. Finally, the shoots are a favorite food for people throughout Nepal.

Katha is a dye obtained from the heartwood of Acacia catechu. It is an important ingredient of *pan* and *pan masala*, a popular food item throughout south Asia. Katha is also used in tanning. It is produced in large quantities from six processing plants in the southern lowlands (*terai*). The official figure for katha production in 1988 was 784 tons; almost all was exported to India (FINNIDA, 1993 in Edwards, 1995).

Lokta paper is manufactured by using the bark of two shrubs of the genus Daphne. Daphne bholua grows under the forest canopy at an altitude of 1800-3100m and Daphne papyracea grows from 1500-2100m. Lokta paper is one of Nepal's oldest and most important cottage industries. It is traditionally harvested by stripping the bark from the standing shrub; this effectively kills the plant but may stimulate regeneration from root suckers. To make the paper, the inner bark is removed and softened by boiling for several hours in water mixed with wood ash. The softened bark is then washed and beaten to a homogenous pulp. The pulp is spread on a cloth mesh tensioned on a wooden frame and dried in the sun.

Established markets for lokta paper exist in Kathmandu. In addition, UNICEF started a greeting card manufacturing project based on lokta in 1981 and continues to provide funds for its development. Under this program, the lokta industry benefits from a stable overseas market and pays the bark harvesters an equitable price.

Pine resin is tapped from natural stands of Pinus roxburghii. Eighty percent of these forests grow in the Middle Hills between 1500-2500m.

Sabai grass (Eulalopsis binata) is a tropical herb used in the production of low quality paper. Several factories located in the southern portions of the country are based on this product. Government records indicate that in 1988-89 harvesting rights were granted for 30,000 tons, and in 1993-94 for 53,000 tons (FINNIDA, 1993 in Edwards, 1995).

Sal seeds from Shorea robusta are collected and pressed, yielding an edible oil. Small industries exist in the southern portions of the country.

Approximately 100 **medicinal and aromatic plant products** are collected from Nepal's forests and grasslands. One government industry (Herbs Production and Processing Company

Ltd.) and at least three private industries have been set up to develop these products, although the vast majority of raw materials are traded to India for processing.

Community Perspectives

Rural people use many other forest products besides timber, fodder, and fuelwood in their daily lives, for subsistence as well as commercial purposes. These include leaves, seeds, grasses, charcoal, medicinal herbs, bamboos, and a large variety of other non-timber goods. Virtually all farmers rely on these products to some extent for household use, and many are involved in some aspect of processing and trade. Complex networks of harvesters, middlemen, and small and large-scale entrepreneurs bring products from the hills into market places throughout Nepal.

About 700 species of medicinal plants collected from forests and other natural areas throughout Nepal have been recorded. These are used by rural communities for traditional medicine or sold for further processing. Many plants are also collected for human consumption such as nuts, fruits, vegetables, and roots. Wild foods are important during the time of food deficit (March, April, and May), before the main crop harvest. A total of 133 species are described as edible. Other NTFPs used locally are tannin, gums, resins, incense, oils, and fibers, all obtained from wild plants.

Several products are utilized commercially by rural people, some of which have a large market demand. Bamboo has been domesticated and is a good source of income for rural people. Collecting Daphne spp. and processging it into lokta paper is especially popular. Medicinal and aromatic species also collected for the purposes of trade include *kutki* (Picrorhiza kurroa), *chiraito* (Swertia chirata), *jatamansi* (Nardostachys jatamansi), *bikh* (Aconitum spp.), and *nagbeli* (Lycopodium clavatum). These products are heavily extracted without any management.

NTFPs and Community Forestry: Directions for the Future

Even though NTFPs have been designated as the sixth substantive program of the Forestry Sector Master Plan (HMGN, 1989), there has been little development to date. Collection typically occurs in an uncoordinated and poorly managed fashion: chiraito, for example, is increasingly collected by villagers before flowering and seeding, resulting in

pronounced local depletions. NTFPs are also harvested in a wide variety of ways which may or may not be conducive to long-term productivity. A few small industries have been established, however proper studies of raw material supplies are few.

NTFPs with good markets should be the first to be developed within the context of community forestry. Bamboos, for example, can be planted in large-scale plantations managed by the community. Private growers could also benefit from community forestry assistance. Bamboos are easily propagated by vegetative means through rhizomes and stem cuttings; tissue culture may be used for large-scale propagation. Technical expertise and market training is sorely needed, however. This is an area where the government can give strong support.

Forestry development staff should also be trained to recognize, appreciate, and incorporate indigenous knowledge into the design of management plans. This includes information on managing, harvesting, processing, and marketing. By doing so, they will be better prepared to respond to local needs and provide relevant technical assistance and advice. Forestry staff also need to learn more about the actual resources and products involved including basic identification, ecology, processing techniques, and marketing patterns. Finally, better training in record keeping is needed to increase reliability of production and trade statistics and improve government revenues.

It is apparent that many collectors, small traders, and forest user groups do not know enough about NTFP management, processing, and marketing to make the best use of the existing opportunities for development. Proper training and support for both cultivation and wild harvests is needed. NTFP inventories, including baseline information on ecology, species density, and abundance, could be undertaken in community forests by forest user groups assisted by local forestry staff. This information is absolutely critical to NTFP development. Enrichment planting of NTFPs into community forests could also be tried with the consensus of the users. Extension services ensuring that plants parts are harvested at the physiologically-correct time would help to improve yield and sustainability. Local people should also be made aware of appropriate technologies for harvesting, processing, and transporting..

Aside from various types of training and extension, there should be a strong push to develop markets and NTFP-based enterprises for local producers. Common property management of NTFPs by user groups may improve marketing by selling products directly to traders and by-passing middlemen. User groups could also act as marketing cooperatives but only if the group is genuinely interested in doing so.

Many NTFPs, especially medicinal plants, continue to be collected illegally. Formal permission is sought only for the movement and export of the collected materials. This has had adverse effects on many plants and has threatened natural regeneration which could ultimately lead to a loss in biodiversity. Immediate action is needed by the government to ensure a sustainable supply of raw materials and to improve marketing practices. To accomplish this, NTFPs should be addressed during the formation of the forest user groups and operational plans.

Regulations hindering the marketing and transport of forest produce need to be reviewed. For example, it is very difficult to distinguish products that originate from state, private, or community managed land -- all are taxed regardless of source. Products from private and community land deserve special consideration. Changes in legislation are also needed to encourage cultivation and management by user groups: there should be a strong clear-cut policy to develop and market products growing in community forests.

Conclusion

The government should not underestimate the potential of NTFPs to improve rural incomes and generate employment. In view of the changing rural economy, the Community Forestry Program may need to reconsider its mandate: priority should not only be given to subsistence needs and major forest products like timber, fuelwood, and fodder, but to the variety of undergrowth species which are of great value to rural people. Concern for the sustainable harvesting of NTFPs should be an important part of operational plans which at present is a neglected topic in forest planning activities. NTFP development, including commercial production and small-scale enterprises, offer promising new directions for community forestry.

References

Chetri, R. B. 1992. *User group forestry in the far western region of Nepal.* International Center for Integrated Mountain Development. Kathmandu.

Community and Private Forestry Division (CPFD). 1991. Operational guidelines for implementing community forestry program. Community and Private Forestry Division -- Hattisar. Kathmandu.

Edwards, D.A. 1995. *Non-timber forest products from Nepal: The medicinal and aromatic plant trade*. Forest Research and Survey Center Occasional Paper xx/95. Kathmandu.

His Majesty's Government of Nepal (HMGN). 1989. *Master plan for the forestry sector.* Ministry of Forest and Soil Conservation. Kathmandu.

Mahat, T.B.S., Griffin, D.A., and K.R. Shepherd. 1986. Human impact on some forests of the Middle Hills of Nepal, part 2: Some major human impacts before 1959 on the forests of Sindhu Palchok and Khabre Palanchok. *Mountain Research and Development* 6(3):223-230.

Malla, S. *et al.* 1993. *Minor forest products of Nepal: General status and trade*. Report submitted to Forestry Sector Institutional Strengthening Program, Component No.2. Ministry of Forests and Soil Conservation. Kathmandu.

Malla, Y. B. 1994. *Sustainable use of communal forests in Nepal.* Disucssion paper, Nepal-Australia Community Forestry Project. Kathamndu.

Messerschmidt, D. A. and A. L. Hammett. 1993. Indigenous knowledge of alternative forest resource extraction and marketing: Significance for community forestry planning and management. *Banko Janakari* 4 (1). Kathmandu.

Wallace, M.B. 1987. *Forest degradation in Nepal: Institutional context and policy alternatives.* Winrock International. Kathmandu.

USE, AVAILABILITY, AND MARKETING OF NON-TIMBER FOREST PRODUCTS IN EASTERN NEPAL

Jay B. S. Karki[1]

Abstract

The harvest of non-timber forest products as an important economic option is widely accepted by local authorities and overseas donor agencies in Nepal. Despite this interest little is currently known about the general use, availability, and marketing of these products. This study estimates the contribution of NTFPs to farm household economies in the districts of Udaypur, Saptari, and Sarlahi. Data were collected using structured questionnaires supplemented with Rapid Rural Appraisal techniques from 90 households in three villages. After highlighting the contribution of NTFPS to the village economies, the study examines the impact of commercialization of these forest products on the rate of deforestation and domestication. A multiple correlation analysis model is developed to identify the constraints on the domestication of NTFPs.

The importance of non-timber forest products (NTFPs) in Nepal's national and rural economy has been well documented by several authors (DeCoursey 1994; Shrestha et al. in press; Edwards 1994; Karki et al. 1993). Every year thousands of tons of NTFPs are collected from government forests and exported to different parts of the world (Bhattarai in press; Rawal 1994; Edwards 1994). In spite of the great importance that NTFPs play in the social and economic development of the rural people of Nepal, studies of these products have generally been descriptive rather than analytical. We still do not understand the social and economic factors that determine the judicious use of these resources. Recent evidence suggests that present NTFP extraction systems in Nepal are unsustainable (Malla et. al. 1993). Unless future conservation programs restrict present resource-use patterns, forest ecosystems will be harmed. Bhattarai (in press), for example, reported that 14 medicinal plant species have become endangered in Nepal because of heavy human interference in forest areas. Restrictions on the collection of NTFPs by forest communities, however, will eventually reduce the incomes of rural people unless alternative cash-generating opportunities are found. The severity of the economic losses suffered from a conservation program depend on the relative importance of forest-based activities in the rural economy. Hammett (1994) stressed the need for identifying, quantifying, and estimating the value of NTFP extraction in forest communities so that the harvest of NTFPs by those communities can be sustained.

[1]Lecturer, Department of Silviculture, Institute of Forestry, Pokhara, Nepal

This paper describes and assesses the economics of NTFP extraction in three districts of Nepal. The following specific questions are addressed: What types of NTFPs are generally collected by the farmers? What is the contribution of these NTFPs to the total income of the rural people, and what is their economic importance to different income groups? What is the role of marketing in deforestation or in the domestication of NTFPs? What factors are associated with the domestication of NTFPs?

Methods

Udaypur, Sarlahi, and Saptari Districts were selected for study. From each district one village was chosen for closer examination on the basis of how far the village was from forests and the availability of NTFPs. Data were collected in several stages from 1993 to 1994. Standard survey methods were supplemented by rapid rural appraisal techniques to obtain information on socioeconomic and marketing variables and the domestication of NTFPs. This approach allowed researchers to probe, discuss, diagnose, and understand "soft data" related to local marketing problems, attitudes, perceptions, and knowledge. A variety of data-gathering techniques were used including participant observation, informal discussions with individual informants, and group interviews. Researchers first attempted to establish a rapport with respondents before moving from less threatening to more personal questions. A checklist was used during interviews to check respondents awareness of the use of NTFPs and their prices. Information was collected from shopkeepers, traders, farmers, public functionaries such as village headmen (*Pradhan Panch*), and school teachers. In addition, secondary data were collected from district level governments and non-governmental organizations.

Background

Nepal has four physiographic zones, five development regions, and six climatic zones (Figure 1). The three districts studied are located in the Eastern Development Region. Udaypur District is located in the Inner Terai between the Mahabharat and Churia ranges (Figure 2).

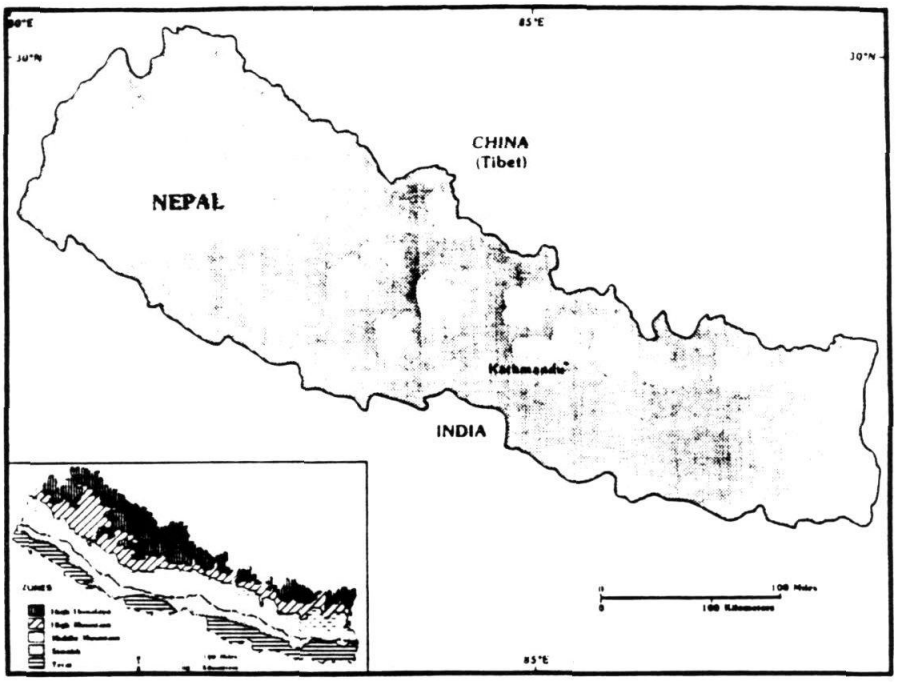


Figure 1 Map of Nepal with inset showing physiographic zones

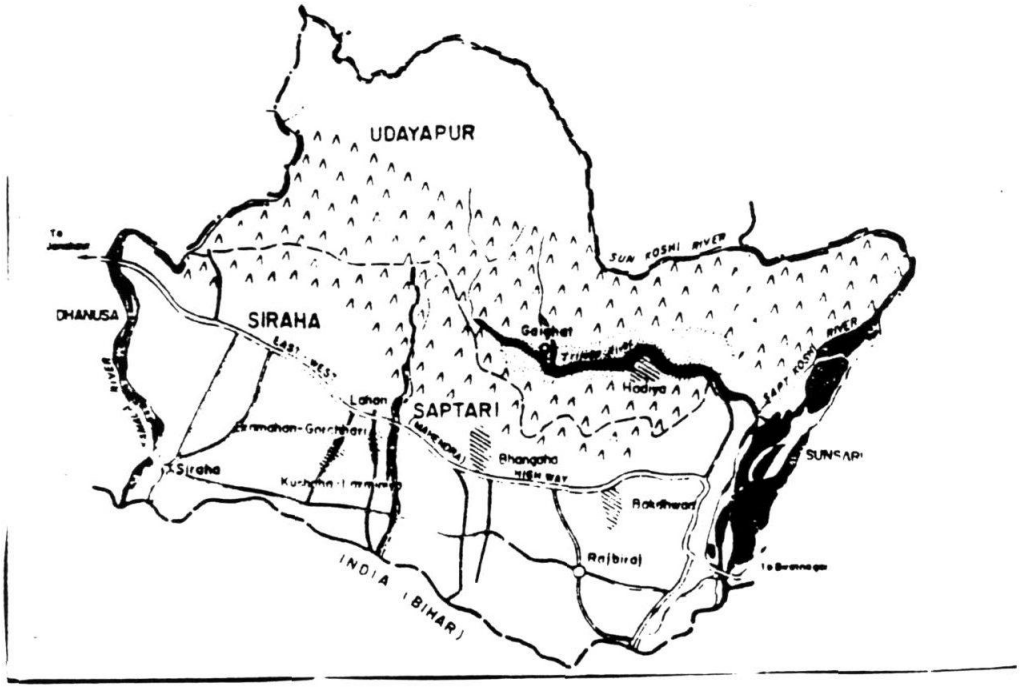


Figure 2 Map of Udaypur, Sarlahi (Siraha), and Saptari Districts and research sites

Hadia village is located between the well-forested slopes of the Churia hills to the south and the rich farmlands of the Inner Terai to the north. Approximately 70 percent of the Village Development Committee (VDC) is located in the Churia hills forest, with only 30 percent on flat land. Like most other villages in Udaypur, Hadia is fairly recently settled. The population is 8,564 people of which 4,261 are male and 4,303 are female. The total number of households is estimated to be 1,419, with an average household size of 5.9. This figure is quite close to the national average of 5.5 people per household. The literacy rate is 33 percent, less than the rate in the district as a whole (40 percent) but close to the national average (35 percent). The village economy is dependent on agriculture, but animal husbandry, labor migration and forest product extraction (including smuggling and poaching) are also important.

Bhangaha village lies to the south of Hadia between the Churia hills and the Terai. Forests and shrub land on the Churia hills dominate the northern part and account for approximately 30 percent of the total land area. The plains of the Terai dominate the remaining 70 percent. Approximately 4,058 people living in 641 households reside there, with an average size of 6.3 persons per household. About 27 percent of the total population is literate. The vast majority of people subsist by farming supplemented by animal husbandry, and the extraction and sale of forest products. According to available data, only four percent of the families of Bhangaha Village are self-sufficient in food all year round. The remaining 96 percent require additional economic resources to survive.

Khushaha-Laxminia village lies in the Terai, approximately 15 km south of the Mahendra East-West highway. The total land area is 483 ha. and the topography is uniformly flat. The population is 3,800 people living in 390 houses. Average household size is 9.7 people, which is very high in comparison to other villages in this part of the eastern Terai. Nineteen caste and ethnic groups live in the village. Twenty-five percent of the inhabitants of the VDC are literate, only one percent of whom are female. The people of Khushaha-Laxminia are agriculturists, but only three percent of the households are able to meet their own food requirements from farming. To supplement the farm economy the villagers engage in animal husbandry, pond fisheries, unskilled local and migrant labor and, to a lesser extent, the cutting and selling of firewood and smuggling of timber.

The residents of Khushaha-Laxminia have limited access to the forest, as their village, unlike Hadia and Bhangaha, does not encompass any part of the Churia hills. Access to forests is gained through a village north of the Mahendra Highway. The trek takes eight hours one-way, and forest users from Khushaha must plan on staying in the forest at least overnight. The Churia forest north of Khushaha is highly degraded. Nonetheless, some villagers make the trip periodically for both firewood and timber cuttingsFPs have undoubtedly been exploited for centuries in the hills and Terai of Nepal by indigenous tribes and immigrant settlers. Many villagers have long depended on forests and the extraction and sale of forest products for a large part of their subsistence needs. The landless and near-landless often collect NTFPs and sell them in the local bazaar or to middlemen. Sometimes they are paid by NTFP merchants to collect certain products while carrying official permits issued by the District Forest Office.

Karki et al. (1993) list many of the NTFP species extracted from the forests of the Churia range. Farmers report that, out of 74 species that produce different types of NTFPs, 53 percent are suitable for fuelwood, 35 percent for food, 27 percent for medicine, 24 percent for cattle fodder, 19 percent for construction and agricultural implements, 5 percent for ornamental, and 4 percent for religious uses. This general pattern of NTFP use is found in all three villages. It was noted that the majority of subsistence requirements are met by tree species, and some of the end products, namely fibre, ornamental and religious items, are entirely derived from tree species. Karki et al. (1993) and Subedi et el. (1992) also reported that farmers in this region know more than one hundred plant species that provide NTFPs. The IUCN (1991) reported that out of 700 recorded NTFP-producing species in Nepal, 45 percent belong to the Terai and 53 percent to the subtropical middle-hills zone.

The majority of farmers from Hadia travel frequently to the adjoining middle hills to collect NTFPs which are not common in the Churia range. They, therefore, have a far better knowledge of NTFPs than the residents of the other two villages which are situated on the plains of the Terai. This observation suggests the reason why trees are frequently grown by farmers in their private fields. Alternative NTFPs are available in limited quantities and their collection provides only seasonal income. Harvesting of NTFPs is done mainly by poor and landless villagers, for whom other options like farm labor provide insufficient income or are

of a seasonal nature. The harvester, or the merchant middleman for whom the harvester is collecting, must carry with him into the forest the permit for NTFP collection issued by the Divisional Forest Office (Messerschmidt and Hammett 1994; Karki et. al. 1993; Subedi et al. 1992). Smaller quantities of NTFPs are collected during the monsoon compared to other seasons. Few medicinal plants are gathered at that time. The summer, spring and autumn months witness the largest flow of NTFPs into village markets.

Fuelwood collection is reduced in the monsoon due to farming activities, and because it is difficult to collect and dry wood. Moreover, it is very uncomfortable to enter the forest at this time due to leeches and poisonous reptiles. Many landless people, who depend on daily farming wages, temporarily migrate to other areas in search of work during the monsoon. To avoid a shortage of fuelwood, collectors generally increase their fuelwood collection before the monsoon begins.

NTFPs are transported manually out of the forest to the house of the harvester or directly to the middleman's depot. The merchants collect them, pay the harvesters, and transport the products to the market. Sometimes the NTFPs are processed prior to being taken to the market. Besides the fee for the collecting permit, the merchant must also pay a tax to the office of the VDC in which the forest is located, and a duty at the India-Nepal border. Figure 3 outlines the flow pattern of timber and non-timber forest products. The extraction systems, however, are not formally organized.

In general, collection patterns differ according to forest access, NTFP density, season, household size, and tenurial right. Karki et al. (1993) reported that the number of collectors is higher in Udaypur than the other two districts. National data for 1993 show that NTFP collection in the Udaypur District alone reached a value of Rs 348,851, which was seven percent of the total recorded value of exports from the country (Malla et al. 1993). No specific figures were found of the value of the NTFPs extracted in the other two districts.

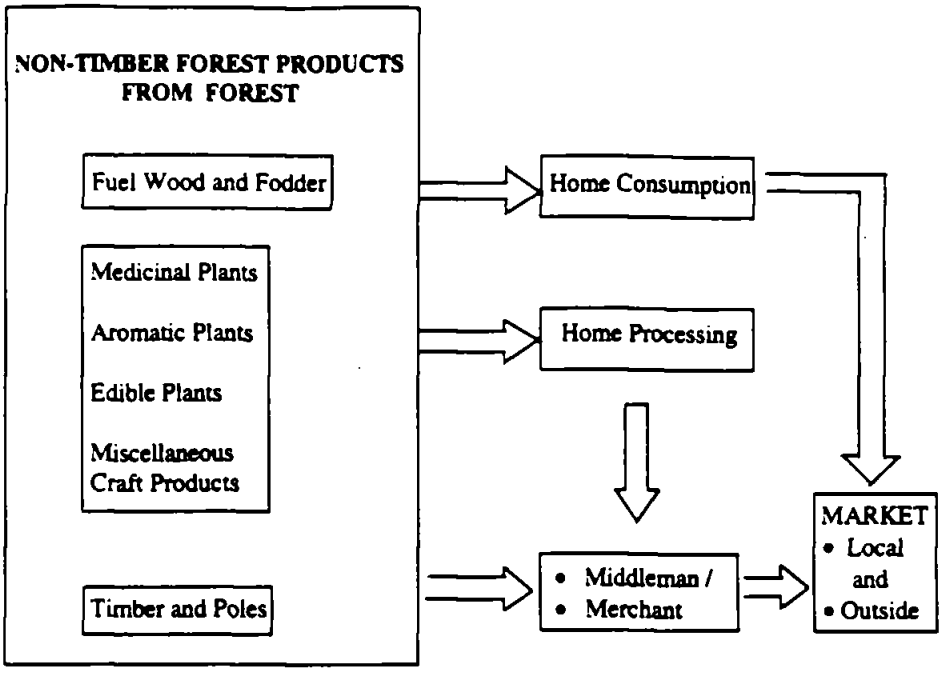


Figure 3 Pattern of flow of forest and NTFP products to home and market

Results and Discussion

NTFPs as a Source of Livelihood

A socioeconomic profile of the villagers showed that a majority (66 percent) of farmers in the three villages are not able to meet their food requirements all year round. More than 60 percent of the respondents owned less than 0.61 ha of land and earned less than Rs 6,500, or less than 43 percent of their total income, from agricultural products. This income is basically a contribution to the landless or small farm holders from the big farmers who allow them to cultivate their land on a sharecropping basis after rice cultivation. This provides an opportunity for these people to gain additional grain for subsistence (Messer-schmidt and Hammett 1994; Karki et al. 1993). A majority of farmers derive the rest of their required economic support from NTFP collection.

Figure 4 shows the contribution made by each activity within the farming system to total farm income. Sources of earnings were categorized as follows: grain, perennials, animals, NTFPs and other (labor, government services, business, etc.). It was estimated that the average income of the three villages was Rs 15,486 per year. Among the different

commodities, grain cultivation made the highest contribution to the economies of all three villages (48 percent), followed by other mixed sources such as government or semi-government jobs, business or cottage industries (23 percent), animal husbandry (6 percent) and perennials (5 percent). Agriculture accounted for 59 percent of farmers' total income.

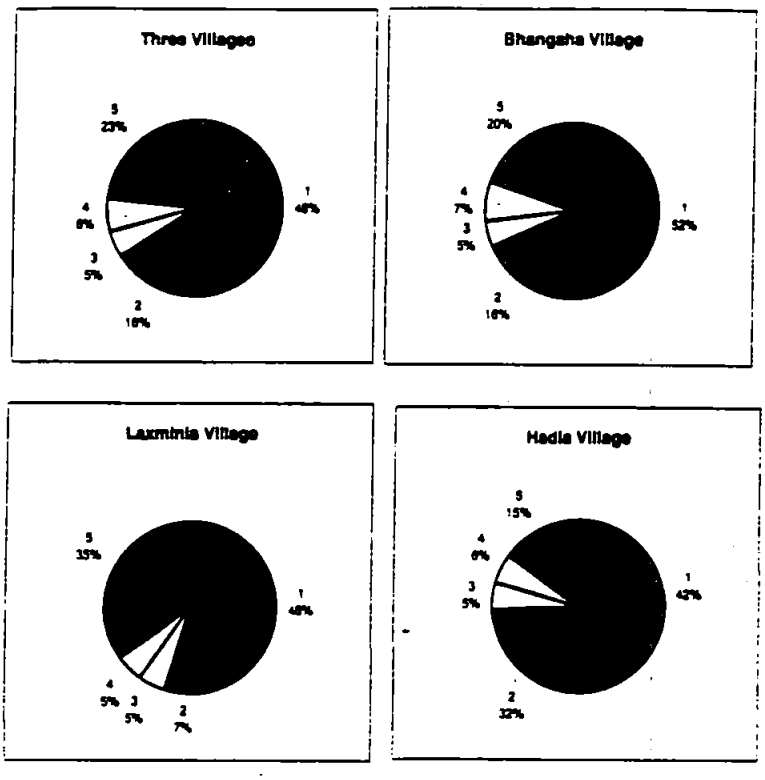


Figure 4 Contributions of various activities to farmer income
(1=agriculture, 2=NTFPs, 3=perennials, 4=animal husbandry, 5=other sources)

The income contribution of NTFPs, however, cannot be overlooked. The mean proportion of household income generated from forest products in the three villages was 18 percent. Products, in order of importance, were firewood, spices, medicinal plants, bamboo and roping material.

The contribution of NTFPs to total village economy is significantly affected by the distance of the village from the forest. NTFPs represent 32 percent of the income of villagers in of Hadia, 16 percent of villagers in Bhangaha, and only seven percent of villagers in Khushaha-Laxminia. A well stocked and accessible forest in Hadia makes it easier for

farmers to collect marketable amounts of products in a shorter period of time. Livestock are not reported by farmers as a source of income, but they are generally kept for draft power or for milking. These animals convert a large amount of fodder biomass into farmyard manure which is returned to the soil or used by farmers as fuel. Thus, the real value of NTFPs to farmers is certainly greater than the conservative estimate provided in this study.

Occupational strategies were also affected by ease of access to NTFPs. Villagers in Khushaha-Laxminia periodically switched from NTFP collection to migrant labor, shared or contract farming, and smuggling of forest products. But low-income farmers remained partially dependent on NTFPs. These findings validate the hypothesis put forward by Karki et al. (1993) that as the distance from the forest increases, the reliance of rural people on NTFPs decreases.

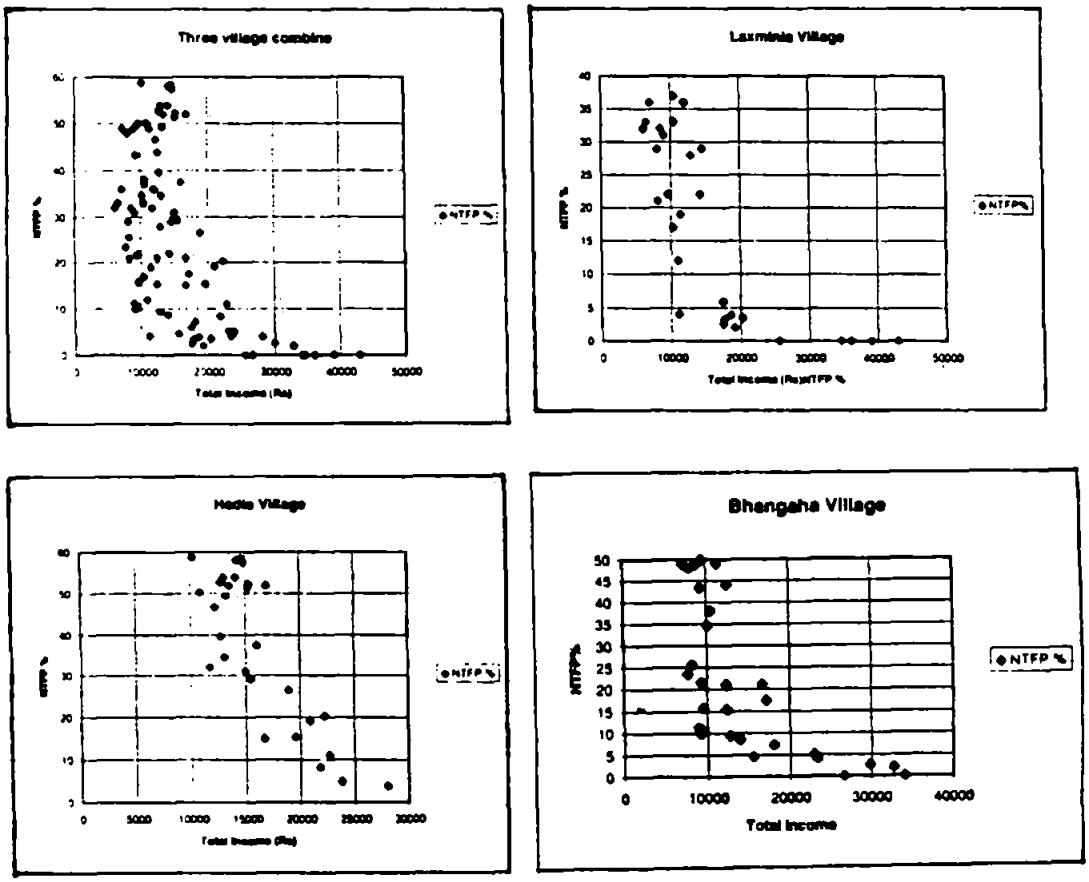


Figure 5 Contribution of NTFPs to total income

Figure 5 presents the relationship between total income and distribution of NTFP in different income groups. The behavior and income of rural people who extract forest products are often determined by social and economic factors over which they have little or no immediate control. The contribution of NTFPs to total income in the three villages declines as income increases. The contribution of NTFPs was highest in Hadia, followed by Bhangaha, and Khushaha-Laxminia. Richer farmers were less dependent on NTFPs for extra income. They only collect firewood for home consumption and fodder for their cattle. Their major income source was agriculture. These findings support the hypothesis suggested by Godoy and Bawa (1993) that richer farmers collect fewer NTFPs and that NTFPs play a more significant role in income generation among low-income farmers.

Conservation, Commercialization, and Domestication

Forest ecology. NTFPs sustainability depends on the integrity and stability of the forest resources. Over the years, farmers in the three villages studied have experienced a gradual decrease in the amount of NTFPs available. These farmers have their own indigenous methods of assessing the status of the forest and its productivity. Indicators of the availability of NTFP species derived from sample households are presented in Table 1.

These indicators reveal the present status of the forests in the three research sites. Respondents realize that exploitation of the cover-canopy has changed the ground flora, which, in turn, has led to a decline in the number of NTFP species. The low density of NTFP species has a negative impact on the ability of villagers to efficiently harvest many forest products. These impacts include high search and travel costs and reduced harvests of the most valuable products, such as *Kutki* or *Satawari*, due to their patchy distribution. In Bhangaha and Khushaha-Laxminia collectors of NTFPs mainly gather fuel wood, *sal* seed, and *Bhorlo* leaves. Other forest products are very limited in quantity and their collection is not very cost effective. Farmers in Hadia are already learning from the experiences of farmers in Bhangaha and Laxminia (another two districts), where deforestation has already affected income. The over exploitation of the forest leads to heavy erosion of ground flora, especially on the steep slopes of the Churia range.

Table 1 Indicators of NTFP availability as reported by farmers (N=90)

INDICATORS	RESPONSES (%)
Decreasing density of NTFPs	79
Increased collection and search times	75
Unavailability of many species	65
Extinction of NTFPs due to over exploitation	62
Decreasing economic returns from NTFPs	30
Others	15

Conservation status. According to forestry researchers (Shrestha et. al., in press; Messerschmidt and Hammett 1993; Edwards 1993), the major obstructions to conservation of NTFPs in Nepal include institutional constraints related to government policies, strategies and plans, legal rights and arrangements, incentives, development of skills, free access, and support from public administration. Based on their day to day experience, farmers perceive many of the same problems in the conservation of NTFPs (Table 2).

Table 2 Indicators reported by respondents

INDICATORS	RESPONSES (%)
Lack of incentives	92
Increased commercialization	89
Heavy deforestation of forest	87
Uncontrolled fire and grazing	76
No specific tenurial rights	66
Others	13

The main problem for conservation is the lack of incentives for the individuals who want to conserve these resources for long-term use. Increased commercialization, free access, and the non-specific tenurial status of collectors encourages collectors to over harvest. It was also found that a majority of NTFPs collectors are not professionally skilled in collecting herbs since it is not their main source of income. Access to NTFPs on public lands is subject to the payment of royalty but is otherwise open to all. Thus NTFPs are treated by collectors as free goods with obvious implications for their long-term sustainability. Respondents also indicated that if this scenario continues NTFPs will vanish from the forests within several years as has happened in other districts.

Respondents stressed that heavy commercialization of NTFPs and secular growth placed increased harvesting pressures on NTFPs. With recent advances in communication and transport, market forces are now largely responsible for the over exploitation of NTFPs. Revenue collection systems exist, but collectors can not distinguish collection from public lands, which is taxable, from collection on private or common lands, which is non-taxable. This provides ample opportunity for collectors to avoid paying taxes. Edwards (1993) reported that, since collection of royalties from collectors (as opposed to wholesalers) is not enforceable, this will also affect sustainable harvesting rates.

Market situation and infrastructure development. In the 1960s, the East-West Mahendra highway was not yet established, and villagers were isolated from trading centers. This restricted the marketability of NTFPs and many other village products. Small shopkeepers in villages had loose links with major traders in urban centers and were the major buyers of NTFPs. These shopkeepers collected existing supplies of NTFP, but they rarely induced collectors to supply more owing to high transportation costs and lack of information on outside demand.

After the construction of the East-West Mahendra Highway the situation changed completely. The development of the road system established a good communication network between buyers and sellers, which ultimately increased the collectors' awareness of the cash economy. Traders or their agents with knowledge of and links to wider markets penetrated the interior areas. Collection and marketing of NTFPs were no longer controlled by forces of local supply and demand.

The development of the market infrastructure strongly influenced the collection of NTFPs. The high prices of NTFPs changed the behavior of NTFP buyers and sellers. As collectors became more profit-oriented the collection of NTFPs accelerated and reduced stocks of NTFPs. The traders who formerly purchased only the supplies that were offered now induced villagers to collect more by advancing payments and by appointing village agents. This combination of factors induced over exploitation and obstructed government attempts to regulate the market for NTFPs. Indicators of the extent of these factors in the study area are summarized in Table 3.

Table 3 Indicators of changes in the market for NTFPs in selected villages during 20 years of time

DETAIL	HADIA		BHANGAHA		LAXMINIA	
	B	N	B	N	B	N
Paved roads	0	1	2	2	2	2
Earthen road	+	+	++	++	++	++
Regular bus service	0	<15	<15	<25	<10+	<20
Village NTFP shopkeepers/traders	5	11	10	4	9	0
Traders/agents giving advances for collection	2	9	4	7	4	0
Outside traders visiting villages	0	7	4	7	6	0
NFTPs covered by a contract system	0	x	x	x	0	0
District level processing center	0	0	0	0	0	0

Note: B denotes before, N denotes now, + denotes exist, ++ well organized, 0 does not exist, X exist and are in good contact with collectors.

The overall domestic market for NTFPs indicates that there is widespread demand for forest products and many potential income earning opportunities for local collectors. This market appears to be relatively stable in comparison to the export commodity market. Forest products, therefore, can potentially provide a steady source of income for the many people involved in their collection and sale.

Product price changes. The majority of NTFPs were sold without any processing or value added. Approximately 63 percent of the collectors are completely dependent on sales made in local villages and weekly markets. Thus, although these products eventually reach a very large market, the local market is very limited as far as collectors are concerned. Collectors who sell products like small handicrafts made of wood and bamboo have very limited access to outside markets. This limited access forces them to become dependent on middlemen. Their limited access to markets restricts them from controlling prices, inputs, and transportation.

In Udaypur, a consultative group pointed out three major factors which decreased the price of products on the local market. First, localized collection for localized markets creates surpluses. Second, local traders dictate the price of products. And third, local collectors sell such their products during the flush season while traders store and sell these same products in the off season. The consultative group also indicated that where collectors take money from

buyers in advance, conditions are worse. These collectors lose control of the price as well as the quality of the product and this lowers their incomes.

Table 4 shows the price of selected NTFPs at different times. Significant changes in price levels show that market forces play a role in deforestation. The increased marketability and processing of NTFPs has encouraged collectors to over exploit and disregard indigenous conservation practices. The system of advance payment to gatherers, increased frequency of trading transactions, improved links of local traders with wider markets, and better transportation facilities are a few of the concrete factors that have influenced the NTFP market situation in the research area. All these factors contribute in their respective ways to the over exploitation and degradation of NTFPs. Achet et al. (1993) reported that the price prevailing at the final level of trading went up substantially between 1987 and 1989 when the export of unprocessed NTFPs from Nepal was banned for a brief period. Prices were 70 percent higher than when their study was conducted; this sudden price rise caused farmers to collect more without considering the need for sustainable harvesting.

Table 4 Prices of selected NTFPs for different years*

PRODUCTS	GOVERNMENT REVENUE/kg			LOCAL PRICE/kg		
	1992	1994	Difference	1982	1994	Difference
Kutki	0.50	1.50	1.00	4.50	38.00	33.50
Satawari	0.40	1.50	1.10	6.00	35.00	29.00
Sinkauli	0.10	3.00	2.90	4.00	16.00	12.00
Tejpat	0.20	1.75	1.55	4.00	14.00	10.00
Jhyau	1.00	15.00	14.00	12.00	35.00	23.00
Majitho	0.40	7.00	6.40	15.00	40.00	25.00
Chiraita	NA			17.00	60.00	43.00
Fuelwood	NA			15.00	25.00	10.00
Bamboo	NA			10.00	19.00	9.00

NA not available
*NRs1 = USD 0.02
Source: Survey data

Domestication of NTFPs in three villages. The deforestation caused by the collection of NTFP resources can be partially minimized by cultivating these products as crops. It has been a common experience that once a product achieves commercial importance, its supply

from wild sources tends to be replaced by cultivated sources with a view to controlling product quality and cost. Rawal (1995), Karki et al. (1993) and Burbage (1981) have written about the domestication of medical plants on farm lands in different parts of Nepal, but the numbers are negligible, being the result of either a research center or plants planted on encroached forest.

The scenario was different in the three villages studied. It was found that the majority of respondents planted multipurpose tree species (MPTS) followed by bamboo and fruit trees. Nobody reported any medicinal herbs or shrubs in existing plantations. The number of plantations increased as the distance between farms and the forest increased. Achet et al. (1993) found that out of 17 major medicinal species, only three are cultivated. These three species are moderately available in the wild and have moderate market demands. However, domestication is negligible.

Farmers had very different perceptions about growing medicinal plants on their farm lands. Among the problems they encountered were a lack of knowledge regarding the growing and harvesting of NTFPs (82 percent), lack of planting materials (79 percent), lack of plantation areas (72 percent), production costs are higher than returns (65 percent), lack of ability to refine or process the medicinal or aromatic plants (42 percent), and lack of land (49%) for further plantation.

Modeling the socioeconomic determinants of NTFP domestication. To study the interrelationship between domestication of NTFPs and various socioeconomic factors the following multiple correlation analysis (MCA) model was developed:

Yij...n = Y + ai +bj + eij .....n

ai = Ai - Y - 1/wi Wij bj - 1/Wi Wik Ck
bj = Bj - Y - 1/Wj Wij ai - 1/Wj KCK
Ck = CK - Y - 1/Wk WiK- 1/wk Wi Kbj

Where,

Yij....n = The score of the dependent variables of individuals who fall in category of predictor A, category j of predictor B and etc.
Y = Grand mean on the dependent variable
ai = the effect on members in the (i)th category of predictor A
bj = the affect on members in the (j)th category of predictor B
eij....n = error term for individual
Ai = mean value of Y for cases falling in the k category of predictor
Ck = Mean value of Y for cases falling in the K category of predictor C
W = Number of cases weighed

The model was regressed with continuous independent variables as shown in Table 5. The model found terrain, geo-climatological location of NTFP eco-zones, labor, land ownership, total income, and distance to market contributed significantly to domestication of NTFP species.

The Terai showed the highest potential for the domestication of NTFP species. Easy access to forests in Hadia and Bhangaha made farmers reluctant to domesticate NTFPs. Labor availability was the another important factor in domestication. This indicates that NTFP domestication is a labor intensive technology. Farmers perceive that the domestication of NTFPs, especially herbs and shrubs, requires more care and special cultural practices. This level of involvement by farmers might affect their other farming systems. The dummy created for spatial availability of markets represented a highly negative correlation for those who sold their harvest in villages and nearby towns in comparison to those who sold at the farm gate. This indicates that the dummy was higher for those who marketed at the farm gate at an optimum price for the farmer. The relation of markets and market factors (i.e., optimum price and availability of a market at the farm gate) with NTFP yields reflected that market factors control yields as in competitive market economies everywhere.

Table 5 Socioeconomic variables of NTFP domestication through MRA model

VARIABLES	CO-EFFICIENT	STANDARD ERROR	SIGNIFICANCE
Intercept	5.47	1.52	***
Age of respondent	0.02	0.03	ns
Education	0.04	0.12	ns
Year of residence	0.03	0.02	ns
Labor available	29.22	2.7	**
Farm size	2.03	0.38	***
Land Ownership	1.66	0.49	***
Number of livestock	59.51	16.9	ns
Optimum output market			
same village	-1490.39	308.26	**
near market	-299.13	151.32	ns
Dummy for Terrain	1280.88	201.52	**
Mean : 15.04	CV= 15.92	R^2 = 0.75	F.V.= 30.7***

Lack of land ownership and tenure discouraged farmers from domesticating NTFP species. Small land holdings and dispersed parcels were the major constraints to domestication. Big land owners converted areas of up to 3 ha to orchards or pure timber plantations with inter-cropping, which limited the domestication of small NTFP species. Other factors like age, education, number of livestock and years of residence in the locality were found not significant to the domestication of NTFP species.

Conclusion

The study shows a high dependency of villagers on forest resources. About 18 percent of their total income comes from non-timber forest products, but the importance of NTFPs varies according to the distance between the village and the forest. The proportion of income from NTFPs near the forest is 32 percent and declines to 7 percent away from the forest. The utilization of NTFPs also varies in villages as the distance from the forest increases. A greater dependency on forest products was found in villages closer to the forest. However, NTFPs are not the panacea that some people would have them be and by themselves will not solve all the economic problems of rural people.

The extractive system, however, can be an important component of a broader land-use spectrum. These NTFPs are renewable and therefore, infinitely harvestable if properly managed. Marketing systems and commercialization of NTFPs has led to massive deforestation of the Terai. Domestication of NTFPs could be one solution, but factors such as land area, land ownership, annual income, labor availability, and market access are basic constraints on the domestication of NTFPs. Various management strategies and policy decisions can facilitate the development of successful extractive systems, but they need to be carefully selected so as not to cause unintended negative effects.

References

Achet, S.K., K.R. Amataya, P. Bajracharya, A. Sheak. 1993. Non-timber forest products in Nepal: The scope for sustainable commercialization, NTFP report submitted to New Era, Kathmandu, Appropriate Technology International Washington DC, USA.

Bhattarai, N.K. In Press. Some endangered medicinal plants of Nepal in *Cultivation and utilization of medicinal plants*, Council of Scientific and Industrial Research, Regional Research Laboratory, Jammu-Tawi, India.

Burbage, M.B. 1981. Report on a visit to Nepal: the medicinal plant trade in the KHARDEP are: a study of the development potential. Tropical Products Institute, London.

DeCoursey M.A. 1994. Healing forest and ailing economies: Non-timber forest products in Nepal, TRI News, Yale University.

Edwards, D.M. 1993. The marketing of non-timber forest products from the Himalayas: The trade between east Nepal and India, in *ODI Rural Development Forestry Network*, Network Paper 15b Summer 1993.

Edwards, D.M. 1994. Research into the collection and trade of Jaributi from the Mid Hills of Nepal: the Koshi Hills in *Proceeding Focus on Jaributi*, D.M. Edwards and M.R. Bowen (editors), FRSC Occasional Paper 2/93, FRSC, Babar Mahal, Kathmandu.

Godoy, R.A., and K.S. Bawa. 1993. The economic value and sustainable harvest of plants and animals from the tropical forest: Assumptions, hypothesis, and Methods, *Economy Botany*, 47(3):215-219.

Hammett, A.L. 1994. Non-timber forest products: Profits and panacea in *Proceeding Focus on Jaributi*, D.M. Edwards and M.R. Bowen (editors), FRSC Occasional Paper 2/93, FRSC, Babar Mahal, Kathmandu.

IUCN. 1991. Background papers to the conservation strategy for Nepal. Volume 2. Medicinal Plants. International Union for Conservation of Nature, Kathmandu.

Karki, J.B.S., R. Pokhrel, C.L. Das, K.M. Shrestha, T.P. Acharya, and I.C. Dutta. 1993. Tree and land tenure in the Churia Hills of Eastern Nepal: Studies from Sirha, Saptari and Udaypur Districts. A report submitted to the ChFDP, Kathmandu, Nepal.

Malla, S.B., P.R. Sakya, K.R. Rajbhandari, N.K. Bhattarai, M.N. Subedi. 1993. Minor forest products of Nepal: General status and trade. Report submitted to Forestry Sector Institutional Strengthening Programme, Component No. 2, Kathmandu.

Messerschmidt, D.A., and A.L. Hammett. 1993. Indigenous knowledge of alternative forest resources extraction and marketing: Significance for community forestry planning and management. *Banko Jankari* 1(4):32 - 36.

Rawal, R.B. 1994. Commercialization of aromatic and medicinal plants in Nepal, Paper presented in: Regional Expert Consultation Non-Wood Forest Products: Social, Economic and Cultural Dimensions, Nov. 28- Dec. 2, 1994, FAO.

Subedi, B.P., C.L. Das, and D.A. Messerschmidt. 1992. Tree and land tenure in the eastern Nepal Terai: A case study by Rapid Appraisal. *Community Forestry Note*, Rome, Italy: FAO.

Shrestha, G.L., R.B. Joshi, G. Amataya, and V. M. Sthapit. In press. Domestication and commercial cultivation of medicinal and aromatic plants (MAPs) in Nepal, in Proceeding of National seminar on Non-timber Forest Products: Medicinal and Aromatic Plants, Kathmandu, September, 11-12,1994.

FROM RESOURCE TO MARKET: NON-TIMBER FOREST PRODUCT DEVELOPMENT IN YUNNAN, CHINA

Zuo Ting[1]

Abstract

This paper is a preliminary study of non-timber forest product (NTFP) development in Yunnan, southwest China. The development of non-timber forest products is considered an alternative to timber-dominated forest development, aiming to reduce the degree of both deforestation and poverty. This paper indicates that in Yunnan there is a plentiful resource base of NTFPs and a long history of NTFP development. Even though NTFPs have substantial potential in both domestic and international markets, presently the marketing system is the most significant bottleneck in NTFP development. Several key factors influencing NTFP development are examined, including poor infrastructure conditions, input shortages, tenure instability, information delays, poor organization of farmers, and low capability of storage and processing. It is suggested as a conclusion that local government should make more and systematic efforts to increase the resource availability and market accessibility of NTFPs, and to improve the post-harvest and pre-market services.

NTFPs -- An Alternative to Logging?

In China, Yunnan is a forest-rich province. With 4 percent of total land area and 3.6 percent of total population Yunnan holds 7.8 percent forest area and 10.3 percent timber inventory. Indeed, Yunnan has been an important source of timber for China since the Ming Dynasty (1368-1644 A.D.). Most of the timber provided to other provinces has been unprocessed logs for industrial use, such as mine timber, railway ties and pulpwood. By the end of 1989 the timber logging industry in Yunnan had almost collapsed: many of the forest based enterprises (*shenggongqiye*) lacked raw materials, i.e., available trees, and had to move into another type of business. In the past 40 years more than half of the forests of Yunnan have been cleared. Ten of thousands of mountain families suffer from fuelwood shortage in this province called the 'Kingdom of Plants'.

Logging is not the only cause contributing to forest degradation, but it should take the major share of responsibility for forest degradation. Smil (1983) concluded that conversion to grain fields, state-run commercial logging, illegal private cutting (mainly for fuel) and fire have been the primary causes of the disappearance of China's forest. In Yunnan, the situation is a little bit different; three factors have caused significant changes in forest structure (Zuo 1994b). The first one has been the industrial demand for energy and construction materials,

[1]Deputy Director and Associate Professor, Institute of Rural Economy, Yunnan Academy of Sciences, Kunming, 650034, China

the second one has been agricultural expansion, and the third one has been a change in the structure of the rural economy influenced significantly by adjustments in the tenure system, the 'Greening Campaign' and market incentives. The logical, physical connection between timber logging and forest degradation seems simple:

- logging, by definition, causes the death of trees in their felling;
- people usually cut the larger trees, which in the process of removal also damages the surrounding smaller plants;
- logging over a large area will cause environmental problems, such as soil erosion, and changes in the hydrological conditions and in the micro-climate, which in turn will influence forest regeneration.

The important question then is primarily of an environmental nature: how do we protect the remaining and endangered 9.552 million hectares of forest? Again, at first glance the solution looks simple: eliminate cutting.

For the more than 30 million native people who have lived in and depended on these forests for generations, however, the forests provide their food, fiber, fertilizer, water, firewood, medicine, fodder, and shelter as well as an important source of cash income. To a certain extent, and for some groups more than others, the forests are the cultural basis of the society . For tens of millions of mountain people firewood is their daily and direct contact with a forest product. The average consumption of firewood per capita per year in the 1970s was about 0.65 cubic meter in Yunnan. Even though the government has made many efforts to reduce the consumption of firewood, such as through cookstove improvement (Smith 1993), in the predictable future the consumption of firewood virtually cannot be eliminated. Trees, forests and forest lands are thus the most significant resources of these people.

The second question then is of a developmental nature: how do we improve the welfare of native people using the remaining and endangered forest if cutting trees is no longer permitted? Thus we see that forest conservation is no longer the simple question we once thought. One answer that may hold promise is the development of non-timber forest products (NTFPs) as an alternative to timber harvesting.

Non-Timber Forest Products: the Current Situation

The Resource Base in Yunnan

There is about 13.52 million ha of forest which covers 37.9 percent (including 13 percent of shrub land) of total land area in Yunnan. The complexity of land forms and climate (Box 1) determines the complexity of forest in Yunnan. According to forest terminology, the forest in Yunnan can be classified into four main forest vegetation types and 17 forest vegetation sub-types (Figure 1). The four forest vegetation types are needle-leaved forest, broad-leaved forest, bamboo forest and shrub forest. The needle-leaved and broad-leaved forest are the dominant types, occupying 18.4 percent and 6.5 percent of provincial land respectively.

Box 1. Physical Characteristics of Yunnan

Yunnan extends from 21°09' to 29°15' north latitude, from 97°30' to 106°00 east longitude and ranges from approximately 76 to 6740 meters in elevation. The Tropic of Cancer runs across the middle of Yunnan. Changes of latitude and elevation result in the different climate types. Within the 394,000 km^2 land area there exist four climate zones: North Tropical, Subtropical, Temperate, and Alpine and Temperate. Recently, Yunnan, as well as northern parts of Laos, Myanmar and Thailand, has been call the 'roof ' of the peninsular Southeast Asia. Many important rivers originate from or pass through this province, including the Yangtze, the Pearl, the Red, the Mekong, and the Salween (cf. Figure 2).

According to usage, forests in China are usually classified as timber forest, cash or economic forest, firewood forest, protection forest and special-use forest. Timber and protection forest, the dominant uses occupy about 20.9 percent and 3.0 percent of provincial land area respectively. Within timber forest, mature forest occupies 10.7 percent of provincial land area. These forests provide the resource base for both timber and non-timber forest product production. Currently there are several tenure systems applicable to forest resources in Yunnan: state owned and managed, state owned and community managed, state owned and individual managed, community owned and managed, and community owned and individual managed. The last one is the most common.

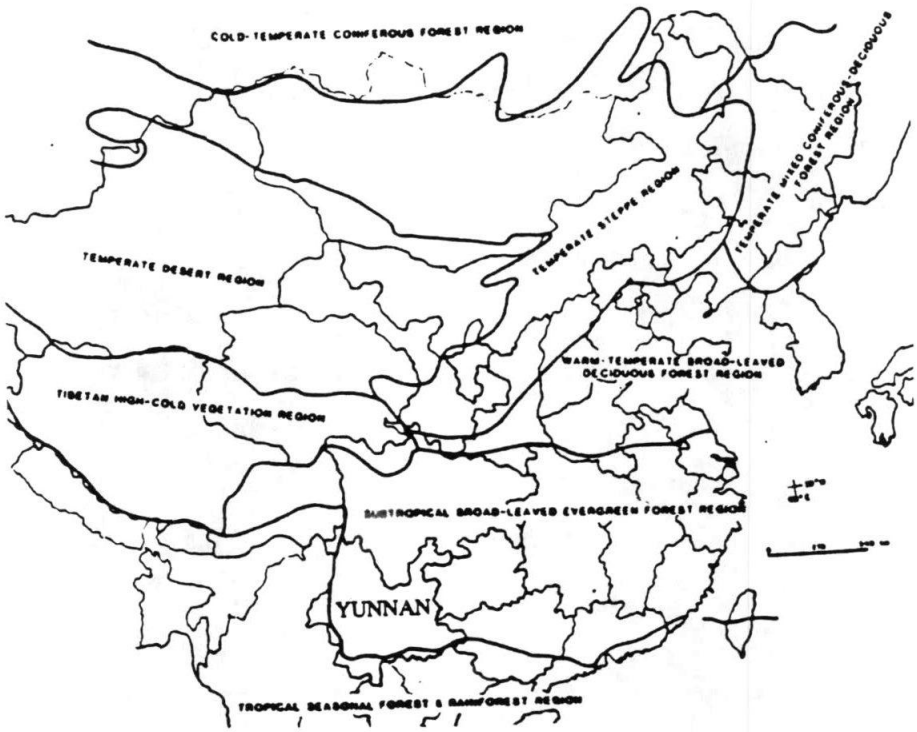


Figure 1 Vegetational zones of Yunnan

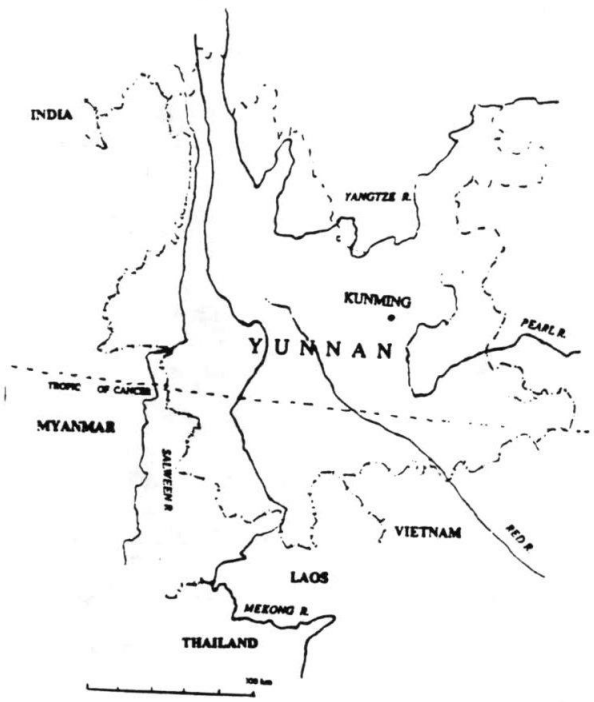


Figure 2 Yunnan and neighboring countries

The Availability of Non-Timber Forest Products

Because of Yunnan's diverse and plentiful forest resources, there are many kinds of NTFPs found in this region. The main species (excluding animal products) are listed according to their usages in Table 1. The primary commercial products of this group are given in Table 2 indicating production levels in 1992.

Walnut (Juglans regia) is one of the most economically important native economic species. Walnut grows almost everywhere in Yunnan. One obtains significant, long-term benefits from even one walnut tree; its productive life extends 60 to 80 years. In 1980s the area of walnuts in Yunnan exceeded 20 million hectares, including that of wild as well as cultivated walnuts. Besides local home consumption, walnuts are also exported to other provinces and countries. Oil tea (*youcha*, Camellia oleifera) are cultivated for the most part in southeast and southwest Yunnan. Cultivated area is about 100 million mu (approximately 7 million ha). Oil of *youcha* is edible and it is mostly consumed in local home use. Tung oil trees (Aleurites fordii) are a major cultivated crop in northeast Yunnan. Annual output of seeds is about 1,850 metric tons. Tung is also a species used in agroforestry. Tung oil a popular raw material for industries. *Youganlan* (Olea europaea) was introduced in 1964 from Albania. About 80 thousand trees were planted and produce 8 tons each year. *Youzhong* (Elaeis guineensis) are cultivated in tropical Yunnan. *Youzhong* oil is used for both home and industrial purposes.

There are about 20,000 ha of pure chestnut forest; the highest yield is about 4,000 tons per year. Chestnut, one of the oldest economic tree species with more than 2,000 years history of cultivation and utilization, is famous in China. In Yunnan, chestnut and walnut are used in special celebration days, such as in the mid-autumn day. Pines are the pioneer species of forest regeneration. Pine nuts, the most popular nuts in China, are sold in every town and city. They are also exported to foreign countries. Wild fruits are widely distributed throughout Yunnan. Some wild fruits have been domesticated and are cultivated by farmers. From the Chinese perspective, these fruits, although domesticated are also a type of non-timber forest product. The common cultivated fruit species in Yunnan include apple, pear, peach, persimmon, orange, banana, plum, pomegranate, shaddock, and grape, among others.

Table 1 Primary non-timber forest products in Yunnan

Product	Major Species
Wood Oils	*Hetao*, Juglans regia *Youcha*, Camellia oleifera *Youtong*, Tung oil tree, Aleurites fordii *Yougalan*, Olea europaea *Yuozhon*, Elaeis guineensis *Wujiu*, Sapium sebferum
Edible Nuts	*Hetal*, Walnut, Juglans regia *Banli*, Chestnut, Castanea mollissima *Songshu*, Pine, Pinus spp. *Yingxing*, Ginkgo biloba
Edible Fruits	*Yangmei*, Plum, Myrica rubra *Ganlan*, Canarium album Mihoutao, Yangtao *Shanzha*, Crataegus scabrifolia Common Fruits
Aromatic Oils	*Xiangzhang*, Cinnamomum glandalifeum *Bohe*, Mentha haplocalyx *Mujiangzi*, Litsea cubeba *Rogui*, Cinnamomum cassia *Anshu*, Eucalyptus spp.
Fibers	*Zongnushu*, Palm, Trachycarpus fortunei *Mumian*, Kapok, Gossampinus malabarica *Panzihua*, Bombax malabarica *Yehuosheng*, Colona floribund *Goushu*, Broussonetia sp.
Medicinal Plants	Too many to list here, cf. text for examples
Miscellaneous Edible Products	Edible Mushroom and Fungi Bamboo Shoot *Juecai*, Pteridium aquilinum latiusculum Roots Edible Plants
Latex, Rubber, and Resin Products	Rubber Tree, Hevea brasiliensis Pine Pinus spp. *Lishu*, Quercus spp. *Qieshu*, Lacquer tree, Toxicodendron vernicifluum
Flavorings and Seasonings	*Bajiao*, Illicium verum *Chaoguo*, Amomum tsaoko *Huajiao*, Zanthoxylum sp.
Beverages	Tea, Camellia sp. Kudingcha, Cratoxylon sp. Coffee, Coffee arabica

Source: *Yunnan shenglin* [Yunnan Forest], 1986

Table 2 Production volume of non-timber forest products in Yunnan, 1992

Varieties	Amount (ton)	Varieties	Amount (ton)
Rubber Latex	83,700	*Sharen* (Amomum villosum)	424
Pine Resin	24,700	Tung Oil Seeds	18,211
Walnut	40,500	Tea Oil Seeds	4,390
Chestnut	5,500	Shellac	548
Coffee	2,278	Processed Herbal Medicine	4,599
Aromatic Oil	142	Silkwork Cocoon	3,020
White Pepper (*Hujiao*)	97		

Source: *Yunnan tongji nianjian* [Yunnan statistical yearbook], 1993

Medicinal herbs from the forest are the traditional non-timber products traded in Yunnan, which are presently enjoying a boom. In 1992, the total export of forest medicines rose to USD 6.65 million, amounting to 1.5 percent of the total value of all export products in Yunnan. Many new kinds of medicine are being developed, especial the ethnic medicine in Yunnan (Pei 1988b).

Non-Timber Forest Products in the Local Economy

Above we have just discussed the major elements of the non-timber forest product resources. The potential for non-timber forest product development are substantial. Now throughout Yunnan the rural economy is at a transition stage, moving from the planned subsistence economy to the market economy (Box 2).

Box 2: Social Economic Characteristics of Yunnan

Yunnan is one of the most ethnically diverse regions in China. There are 22 recognized national minorities (each with a population of more than 1000) inhabiting Yunnan. Among the total 37 million population, ethnic people account for more than one third. Many of them have their special and unique culture, traditions, life styles and production systems, some of which now have been recognized suitable for the sustainable forest management. Currently studies of the indigenous forest utilization and management systems of minority people are made by many authors. Yunnan's economy is dominated and supported by agriculture, forestry, animal husbandry, and bioresource-based industries. Economically Yunnan is considered a backward province in China. There are 7 million people designated as poor people that fall below the poverty line set by the government, which accounts for 20 percent of total provincial population and 10 percent of total national population of poor people.

In China's planned subsistence economy, NTFPs were extracted either to meet the national industrial demand, such as the rubber production in southern Yunnan, or to meet local people's needs. The NTFPs for home use occupied a larger proportion as compared to those collected for marketing. Under these circumstances, NTFPs provide not only the basic necessities of life but the basis the cultural life and traditions of the local people.

The importance of particular plant on the cultural life of certain ethnic groups can be illustrated by the case of the Landian Yao. In southeast Yunnan live a branch of ethnic Yao, called Landian Yao. Landian is a kind of forest grass which is used by this ethnic branch as the dyeing material. They gather or plant and harvest Landian, process it by special method, and dye their clothes. The dyed clothes are dark-blue, and this color, as well as the Landian, has become a symbol of this Yao branch. Pei (1985) presents an interesting case study about the influence of the ethnic plant products — most of them are non-wood tree products — on people's cultural beliefs in Xishuangbanna, a Dai Autonomous Prefecture in South Yunnan.

In northwest Yunnan four villages in one county were studied in 1993-94. In these villages lived Naxi, Yi, and Miao ethnic groups as well as Han Chinese. Besides timber for shelters, tools, furniture and firewood, the forest produced and the villagers extracted many non-timber forest products (Table 3). In addition to the non-timber forest products listed, fodder and fertilizers were also commonly collected. Foliage and grass were collected to feed domestic animals, such as pigs, goats, cattle, and horses. Forest residuals, such as leaves and pine needles were also collected by the farmers for compost. In Yuhu village, grasses were collected to make brushes for markets. Heishui village is situated near a national forest park; villagers have began to benefit from the boom in forest tourism by renting their horses.

In market economies, the market is the most important factor in stimulating farmers' economic behavior. Begun in 1982, China's economic reform has aimed to establish a market-oriented economic system. Already markets have affected even the remote villages. Farmers have received certain benefits from these booming markets, and in this respect, non-timber forest products in particular have played a significant role.

Jiazi village is about 800 km from Kunming, the capital of Yunnan. It takes at least two days by jeep to reach Jiazi. Villagers here obtain money through selling mushrooms to middlemen. Some of the mushrooms are rare species and can be sold at good prices. One

kind of mushroom, called yangdujun, fetches about 200 yuan[2] (USD 25) per kilogram in county market. Sales of non-timber forest product have become an important source of cash income in their economy, contributing 15.3 percent of total cash income and exceeding cash income from agricultural crops (Zuo 1994a).

Table 3 Extraction of non-timber forest products by household in selected villages of Lijiang County, Yunnan, 1993 (in kg)

	Village			
Product	Heishui	Jiazi	Yuhu	Wenhai
Fruits	11.3	615.3	135.2	15.7
Tree pepper	4.0	0.1	0.2	n.a.
Medicinal herbs	40.0	1.8	0.5	4.3
Edible fungi	1.6	14.6	7.0	18.3
Pine nuts	1.5	1.5	2.1	0.5

Source: Zuo 1994a.

In southeast Yunnan prefectures, villagers benefit significantly from NTFP marketing. *Bajiao* (Illicium verum), *chaoguo* (Amomum tsaoko), *sanqi* (Pannax sanchi), and tung oil seeds are all famous and popular products (Zuo and Huang 1994). In Wenshan prefecture, the local government even holds a prefecture level *Sanqi* Fair and Festival to host businessmen from home and abroad. Wenshan is known as the 'Home of *Sanqi*'.

In the provincial macroeconomy, NTFPs have played a role as important as timber since the 1980s. In 1992, the value of primary NTFPs was more than 3 billion RMB yuan, compared to about 1.3 billion RMB yuan for timber. In that year the export value of herbal medicines (USD 6.56 million) exceeded that of timber (USD 6.31 million). NTFP industrial production values (estimated) and commerce also exceeded the timber industry. Table 4 shows value of forest products in Yunnan in selected years.

[2]Yuan (RMB) is Chinese currency unit; at the end of 1994 the exchange rate was about 8.4 yuan per US dollar (USD).

Sometimes 'non-timber forest products' are also called 'minor forest products'. As I understand, 'minor' in most societies reflects the physical or biological status of other parts of a tree in contrast to the major part of a tree, that is, the bole or the trunk. In China, when people refer to non-timber forest products[3] as 'minor forest products', 'minor' expresses not only the biological meaning but also the social and economic meaning. 'Minor' reflects the real influence in government policies between 1950-80. In essence, non-timber forest products development was neglected. In the decades of the Cultural Revolution (1966-76) non-timber forest product development was criticized as a residual of capitalism.

Table 4 Values of forest products in the provincial economy of Yunnan for selected years

Items	Value	
	million Yuan	million USD
A. Raw Materials, 1992		
timber	1,279	159.9
cultivated tea, silkworm cocoons, fruits	930	116.3
minor forest products	938	117.3
wild plants and animals gathered	1,216	152.0
B. Processing (ex. food & drink processing), 1986		
forest chemical products	19	4.7
pulp & paper	113	28.3
aromatic material	32	8.0
tea	102	25.5
herbal medicines	38	9.5
rubber	235	5.9
C. Exports, 1992		
timber	50	6.31
resin product	26	3.29
seasonings & aromatics	38	4.72
tea & coffee	75	9.41
herbal medicines	52	6.56

Source: Sec. A, C: *Yunnan tongji nianjian* 1993; Sec. B: *Yunnan shengqing* 1986.
Note: Official exchange rate of US dollar to yuan was approximately 4 in 1986 and 8 in 1992.

[3]In Chinese,'non-timber forest products' as a term is not commonly used. Related terms are minor forest products or forest by-products (*lin fu chan ping*), and economic forest products (*jawing gao lin mu*). In official statistics, minor forest products and economic forest products are separately calculated in different economic sectors. In this article, 'non-timber forest products' is broadly defined as all non-timber material products from trees and forest plants.

This situation was in contradiction to the real role played by non-timber forest products. Non-timber forest products were actually more important to peoples' lives than they realized.

One of the reasons to explain why the status of non-timber forest products is at odds with the role of non-timber forest products is the underdeveloped marketing system of Yunnan. Only through exchange, i.e., the market, can the villagers obtain cash income from non-timber forest products. Influenced by the planned economic system and physical conditions, marketing channels in Yunnan have always been a 'bottleneck'. It is not easy for even tens of millions villagers to overcome these constraints and obtain benefit from non-timber forest products.

Non-Timber Forest Products and Market Accessibility

Given Yunnan's rich resource base, increasing benefits from non-timber forest products depends on the market as the final and predominant factor. An accessible market for non-timber forest products consists of conditions such as acceptable transportation costs, profitable prices, sufficient demands and suitable quality standard. Market conditions include physical factors as well as economic and socio-political parameters.

Structure of the Marketing System in Yunnan

Markets generally are the main places for exchange activities. Fixed or permanent markets in Yunnan are based in cities or towns. In addition there are many 'flowing' or 'movable' markets, such as the periodic country fairs, roadside sales stands, and middlemen. In Yunnan there are three levels of markets (Figure 3). The weekly country fair is the grassroots level. Here villagers sell agricultural products, forest products, animals, and handicrafts. Buyers include village consumers, middlemen, or representatives of some enterprise. In many situations the country fair is a buyers' market for non-timber forest products such as industrial raw materials. In these cases, the buyers (generally associated with government enterprises) virtually dictate the prices.

County towns and prefecture cities are at the middle level of the marketing system. Nearer villagers may go these towns to sell their products directly. In these towns, villagers can chose their buyers. Here, there are many consumers of non-timber forest products: processing factories, trade companies, marketing cooperatives, among others. In some

counties, however, in order to protect local processing industry, local policies require that certain products be sold only to selected, governmental appointed companies

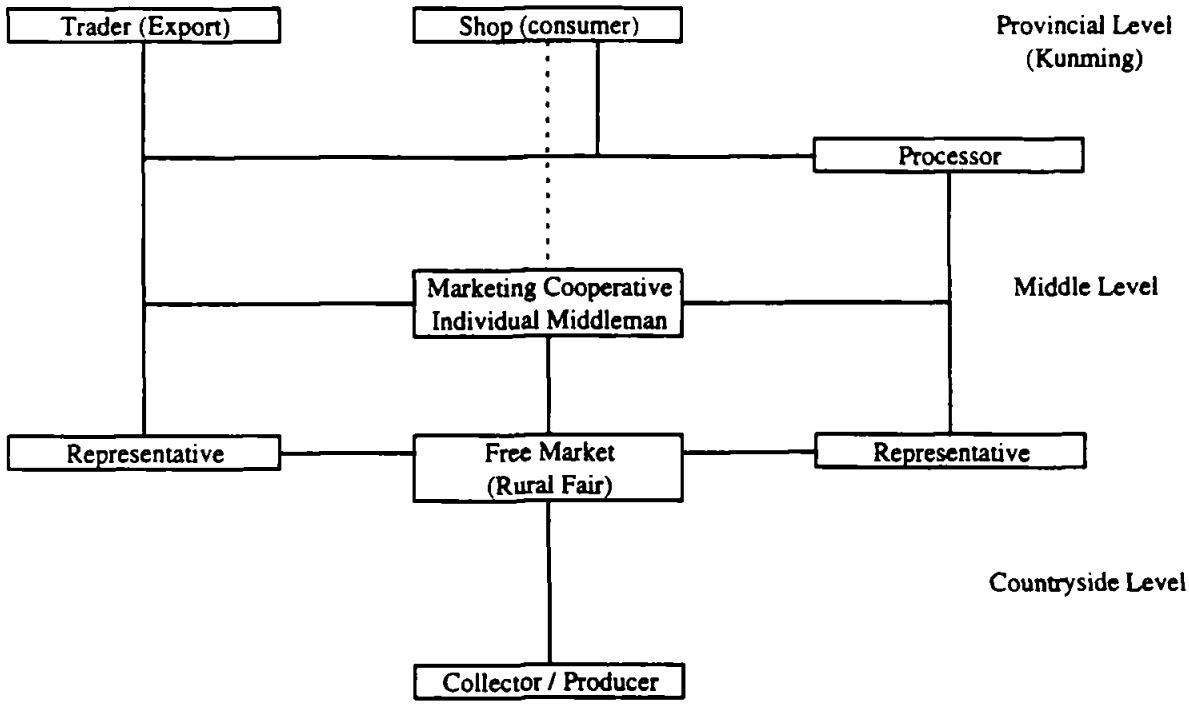


Figure 3 Non-timber forest product marketing in Yunnan

Kunming, the capital and economic center of Yunnan with 1 million population, is the highest level in this marketing system. For many non-timber forest products Kunming is the place where the final consumers exist. Almost all of the export companies for products coming from this region are concentrated in Kunming.

Influenced by the planned economic system, many vertical marketing channels exists. Marketing Cooperative[4] (*Gongxiao Hezuoshe*) is a unique one for non-timber forest products marketing. Marketing Cooperatives have been the main system in charge of purchasing minor agricultural and forestry products and distributing them to state companies, enterprises and

[4]There is a long history regarding the ownership of Marketing Cooperative. Now the Marketing Cooperatives is a semi-governmental organization. Marketing cooperatives exist in almost every township with branches in villages. In counties there is the Union on Marketing Cooperatives (*Gongxiao Hezuoshe Lianshe*), and in the province is located the Headquarters of Marketing Cooperatives (*Gongxiao Hezuoshe Zongshe*).

stores over the past 40 years. Governments often provided the purchasing funds before harvesting seasons and sometimes provided the subsidies when the selling prices were lower. Now many enterprises, such as wild fruit juice makers and exporters, have established wild fruit purchasing bases (called primary workshops), contracting with village extractors to secure prices, volumes, delivering times and so forth. Governments often act as guarantors of exchange activities or sometimes directly as the middlemen through state companies.

Market Potentials for Non-Timber Forest Products

Local markets. According to official statistics about half (in terms of economic value) of the non-timber forest products are directly consumed for home use, and the other half are sold (Yunnan Statistics Yearbook 1993). There is still much potential for marketing non-timber forest products even in local markets. In Yunnan, land forms are quite different in different villages. Accordingly non-timber forest products in different villages are also different. These products generally are complementary. Although in geographic terms mountains form the main body of Yunnan, but the many small valleys or basins (*bazi*) existing within the mountains are usually important local agricultural and economic centers. Upland people and lowland people often exchange their products. Case studies in Xishuangbanna (Pei 1988b) and Lanchangjing valley (Zuo 1993) have shown the existence of a significant trade in forest products and agricultural products between mountain and valley peoples.

The urban market for non-timber forest products is also substantial. Many non-timber forest products are consumed daily, and some, such as mushrooms, black-ear fungi, bamboo shoots, walnuts, pinenuts and various forest fruits, are favorite foods of the urban populace. Baskets, furniture and other materials made from willow, rattan, palm, bamboo are also popular. It is currently the fashion in urban areas, and likely a continuing trend, to use more natural products. Some newly emerging non-timber forest products such as wild flowers, in particular the wild orchid, are enjoying a booming market (including export market). With the trend of urbanization the demand for non-timber forest products will increase.

International markets. Non-timber forest products are an important part of exports in Yunnan. Large gaps exist between prices in the domestic and the international markets, which implies good potential for further development. Herbal medicines, for example, such as *xifengdou, zexie, banxia* and *baiyao*, show a price difference between domestic and international markets

of between two and fifty times. With the continuing of China's open door policy, many kinds of non-timber forest products from Yunnan will come to be known by foreigners and exports may be expected to increase accordingly.

Public policy priorities. With regard to many environmental problems, provincial government sectors have policies to limit timber sales and to develop non-timber forest product markets. The state-owned bank gives priority (in the form of low interest loans) to non-timber forest product developers. Meanwhile a policy of heavy taxation policy is implemented in timber production and marketing. According to our investigation in Jingdong County in 1991, the price of logs of *simao* pine (Pinus kesia langbianensis) in Kunming was 405 yuan per cubic meter, among which taxes and other fees accounted for 27.65 percent. Thus, production and transportation amounted to 67.90 percent, leaving a net profit was only 18 yuan per cubic meter or about of 4.45 percent (Li 1993). This policy also has encouraged many forestry companies to change the course of their business.

Steps in Developing the Non-Timber Forest Products

Socio-Economic Considerations

After thirty years development stagnation and fifteen years of developmental prosperity it is publicly recognized by government and other development agencies that regional economic development in Yunnan depends on not only the resource base but on market development. In Yunnan, where NTFPs are plentiful, and potential for developing the market is good. Indeed, it is surprising that Yunnan does not enjoy greater prosperity than other provinces given her more diverse and plentiful bio-resources. Official statistics also have shown that in rural Yunnan most of the areas designated as economically poor are located in places where forest resources are plentiful. The contrast between poor people and rich forests implies many problems in forest resource utilization. This phenomenon was described as "rich poverty" — a special term used by local development specialists. Thus, the development of NTFPs must take into consideration not only the biological and economic elements but the social aspects. The major determinants of NTFP development in Yunnan are social. These include instability of tenure, shortage of inputs, local traditions and customs, and forest conversion.

Tenure instability. Since 1949, forest tenure systems have been changed frequently. Each change in the tenure system resulted in altering the distribution of benefits. All the people living around the forest worry about losing benefits with yet another forest tenure 'adjustment'. Tenure becomes an issue as it affects the incentive for individual farmer to make long-term investments in both timber and non-timber forestry production (Menzies and Peluso 1991). For example, Heishui villagers in Lijiang, northwest Yunnan, are ethnic Yi whose ancestors emigrated into the forests on east side of Mt. Yulong from other villages in or outside of Yunnan. The earliest emigrants arrived to this area some 70 years ago. In 1980s the forests surrounding Mt. Yulong were designated the provincial nature reserve. In the forests where Yi villagers formerly extracted both timber and non-timber forest products exploitation is now strictly prohibited. Thus alienated from their forest the villagers no longer have any enthusiasm to care for this resource.

Input shortage. To obtain non-timber forest products the extractor needs a variety of economic resources, such as capital, labor, technology. To collect some products, such as pine resin, lacquer, shellac, requires a certain level of technology and capital, at least simple techniques and a small amount of money. Many other products, such as rare medicinal herbs, can only be found in deep valleys or top of mountains, and others are widely scattered in their distribution, with the result that it takes much time and labor to collect them.

Local traditions, institutions and customs. Each village in Yunnan has a special primary forest where many valuable products can be found. These special forests have been maintained over time as a result of village traditions and customs which include taboos prohibiting entrance into the forests.

Forest conversion and over-exploitation. For effective, long-term and sustainable NTFP development, rational extraction is important to enhance the welfare of native people while maintaining a heathy forest ecosystem. However, many kinds of NTFP extraction can be detrimental to forest maintenance. One example in south Yunnan is rubber. Since rubber (a kind of non-timber forest product) is an important raw material for many industries, rubber trees were introduced to Yunnan successfully in 1950s. With a tropical climate south Yunnan is the only suitable place for rubber growing. In order to plant rubber trees, tropical forests were cleared. In 1992, the total cultivated area of rubber trees exceeded 2.1 million *mu*

(about 140,000 ha), and harvested area almost reached to 1 million *mu* (nearly 67,000 ha). This would indicate that over the past 40 years, 2.1 million *mu* of tropical forest has been cleared to provide space for rubber trees.

Increasing Market Accessibility

Marketing is essentially a human activity. Access to the market is determined by many physical and social factors. In Yunnan, the significant factors in influencing market accessibility are infrastructure, information and organization.

Physical infrastructure. Mountains may be the heart of forest resource base, but they are also a hindrance to transportation. About 84 percent of provincial area is mountainous. Highway density is only 150 meters per square kilometer. Many of the highways are in only the most basic condition and cannot be used in seasons of rain and snow. Human and animal transport is the main method to move products from villages to periodic fairs or towns. Long distances and poor transportation conditions increase marketing costs. Market places are also important elements of marketing infrastructure. They need to be placed where exchange can be both convenient and safe. Local governments in Yunnan have given priority to improving market infrastructure as part of provincial development strategy.

Market information. To many ethnic people, the market system is new and dangerous. Some of them feel shy and are ashamed to bargain and sell. In fact price fluctuation is a risk for both buyers and sellers. In the final analysis the victims of market risk are most often the rural sellers, because they have the least choices. Witness what happened in both southeast Yunnan with *sanqi* and in northwest Yunnan with oranges: in the first year, the prices were high; in the second year, farmers were encouraged to produce and extract more products; in third year, because of the increased of supply, prices declined; and in the fourth year, returns to farmers were so poor that cut their orange trees and used them for fuelwood.

Organization. Individual sellers usually need to be organized to get an advantageous position in market competition. Some export companies are willing to do business in the non-timber forest products, but they have some restrictions. For example, a Japanese trade company with offices in Kunming is interested in non-timber forest products, but only under the condition that the business at any one time exceed USD 100,000. This scale of production requires the

organization of the suppliers. So far a well-organized suppliers' group has not been found: this makes it difficult for any rural seller to obtain benefits without collective support.

Improving Returns through Post-Harvest Activities

Besides those factors directly related to production and marketing, other activities in the post-harvesting and pre-marketing stage which can be important in improving farmers' returns. These often neglected aspects include storage, processing, packaging and advertising.

Storage. Storage is a necessary element in marketing. An example from northern Yunnan will illustrate the importance of storage facilities. Northwest Yunnan is a supply base of wild fruits such as wild plums. In harvest season or autumn the competition between sellers (plum extractors) is very keen, resulting in a sharp decrease in plum prices. In winter and spring, however, the plum prices are high due to the high demand of holiday markets. One strategy proposed in this prefecture was to establish a storage unit for plums in harvest season (low price season) and sell them in higher price season.

Processing. Processing is one way to increase profits. Villagers can get more benefits from selling processed products than from selling unprocessed products. Not all processing work can be done by local people. Basic processing, however, it should be encouraged as an developmental strategy that let more and more farmers involved in the simple, small-scale and capital-saving processing work. Local government should encourage investment in industries associated non-timber forest product development. Processing can also promote the consumption, because for many situations processed products are more convenient for consumers. In many counties, small-scale enterprises have been established to process local non-timber forest products. Major problems in these enterprises are lack of appropriate technology and poor management, which influence the economic effectiveness.

Packaging and advertising. To compete successfully in urban and international markets proper packaging and advertising are necessary. In a transition economy such as Yunnan, there are many problems to be solved and many lessons to be learnt about packaging and advertising.

Conclusion

In Yunnan, the non-timber forest products have their plentiful resource bases, including the human resource base — with a long history and much experience. Non-timber forest products also have good real and potential markets — both local and international markets. Non-timber forest product development in Yunnan can be an alternative to present timber-dominated forestry development to reach the goal of environmental protection and raise native people's living standard. However, non-timber forest product development depends on the operation of marketing system in Yunnan. Major problems of non-timber forest products marketing are the impediments between resources and markets. In the transition stage from subsistence and planned economy to market economy, many steps need to be taken mostly by local government to eliminate these impediments: bad infrastructure conditions, input shortages, tenure instability, information delays, poor organization of farmers, as well as the low local capability of storage and processing. Local government should make more and systematic efforts to increase resource availability, the market accessibility and to improve the post-harvest and pre-market service.

Acknowledgements

This paper was written at the Workshop on Community Management of Forest Lands, February 6 through March 17, 1995, organized by the Program on Environment, East-West Center, Honolulu, USA. Dr. Jefferson Fox, Dr. Deanna Donovan and Ms. Maureen DeCoursey and all the participants greatly contributed in bringing out the paper in the present form. Particularly, Dr. Donovan gave many comments and suggestions for the structure and outline of the paper, and proofread and edited the whole paper.

References

Li, G. 1993. Yunnan timber markets investigation. In *Social forestry in Yunnan*, ed. Zhao, Zuo and Xuan, 113-122. Kunming.

Menzies, N. and N. Peluso. 1991. Rights of access to upland forest resources in southwest China. *Journal of World Forest Resource Management* 6:1-20.

Pei, S. 1985. Some effects of the Dai People's cultural beliefs and practices upon the plant environment of Xishuangbanna, Yunnan Province, southwest China. In *Cultural values and human ecology in Southwest Asia*, ed. L. Hutterer, A.T. Rambo and G. Lovelace, 321-339. Ann Arbor, Michigan: Center for South and Southeast Asian Studies, University of Michigan.

——— 1988a. Plant products and ethnicity in the markets of Xishuangbanna, Yunnan Province, China. In *Ethnic diversity and the control of natural resources in Southeast Asia*. ed. A.T. Rambo, K. Gillogy and K. Hutterer, 149-142 Ann Arbor, Michigan: Center for South and Southeast Asian Studies and East-West Center, Environment and Policy Institute.

——— 1988b. The status of ethnobotany in China. Paper. First International Congress of Ethnobiology, Belem, Brazil, 19-25 July.

Richardson, S.D. 1990. *Forests and forestry in China: changing patterns in resource development*. Washington, D.C.: Island Press.

Smil, V. 1983. Deforestation in China. *Ambio* 12(5) 226-231.

Smith, K. R. et al. 1993. One hundred million improved cookstoves in China: how was it done? Environment Series No. 4, East-West Center, Honolulu, Hawaii, USA.

Yunnan shenglin [Yunnan forests]. 1986. comp. Yunnan Science & Technology Press, Kunming and China Forestry Press, Beijing, (in Chinese).

Yunnan shengqing [Yunnan encyclopedia]. 1986. Yunnan People's Press, Kunming (in Chinese).

Yunnan tongji nianjian, 1993 [Yunnan statistical yearbook, 1993]. comp. Yunnan Provincial Statistics Bureau, China Statistics Press, Beijing (in Chinese).

Zuo, T. 1993, Interaction between uplands and lowlands: an important factor to sustainable development in Lancangjiang River Valley. Paper. International Conference on Economic Development & Environmental Protection of Lancang-Mekong River Valley, Kunming.

Zuo, T. 1994a. Report of questionnaire survey in Heshui, Jiazi, Yuhu and Wenhai Villages of Lijiang Areas. Working report for Yunnan Academy of Social Sciences and University of California at Davis Project on Rural Development Study in Lijiang, Yunnan (in Chinese).

——— 1994b. Forest structure change in Yunnan, China since 1950s — two villages investigation, Yunnan Academy of Social Sciences. Unpublished.

Zuo, T. and Huang G. 1995, Community Forest Resource Management in Southeast Yunnan , working paper for Yunnan PRA Network (in Chinese).

PROGRAM DESIGN AND IMPLEMENTATION

NON-TIMBER FOREST PRODUCT DEVELOPMENT IN POLYARCHIC FORESTS OF WEST KALIMANTAN, INDONESIA

Andreas Graefen[1]

Abstract

Three years of study have shown that it may be possible to develop non-timber forest products (NTFPs) from polyarchic (species rich) forests if a comprehensive set of conditions are fulfilled. Product development requires demanding terms of financing, time, and communication, and involves considerable uncertainty regarding the long-term viability of these products. The development of non-timber forest products has to be seen in conjunction with other commodities in regional and national economic, political and social contexts. This paper proposes a broad based system of community forest development where NTFPs play a minor role and suggests an institutional and human resources framework for the development of these products.

Non-timber forest products (NTFPs) encompass all biological materials, other than timber, extracted from natural forests for human use (for example, foods, medicines, spices, essential oils, resins, gums, latexes, tannins, dyes, ornamental plants, wildlife [products and live animals], fuelwood and raw materials, notably rattan, bamboo, smallwood and fibers [De Beer and McDermott 1989]). It is widely recognized that NTFPs play a vital role in farm households adjacent to or in forest areas throughout the Outer Islands of Indonesia. Indonesian dipterocarp forests in general constitute an enormous species pool and indigenous knowledge of these forests encompasses a broad assortment of NTFP uses.

In discussing NTFPs it is important to differentiate according to forest type. Peters (1992) argues that it is easier to develop a market-oriented supply of NTFPs from oligarchic[2] (few species) forests that it is from forests with high species variability. Other examples of commercial NTFPs exist from managed forests. Indeed some of the major Indonesian NTFPs traded in significant quantities originate from managed and enriched forest garden systems Examples of NTFPs from managed forest systems include rattan from East Kalimantan (Peluso 1992a), illipe nuts from *tembawangs*[3] throughout West Kalimantan, and *damar* resins (*mata kuching*) from Krui, West Sumatra (Mary and Michon, 1987).

---

[1]Advisor Economics and Marketing Section, Social Forestry Development Project implemented by GFA-Hamburg on behalf of GTZ (German Technical Cooperation), Sanggau Kapuas, West Kalimantan, Indonesia.

[2]Oligarchic (Gr., oligo = few, archic = dominated or ruled by) forests contain relatively few species compared to polyarchic forests (Gr., poly = many) which are species-rich.

[3]*Tembawangs* are forest gardens created and managed by Dayaks for fruit, vegetables, medicines, firewood, and rubber. Species density can reach more than 110 species/ha, which is similar to the species density recorded by the SFDP for hill forests (Ramon 1993).

The basic hypothesis of this paper is that the development of marketable NTFPs from highly diversified polyarchic forests is difficult. This paper reviews the experiences of the Social Forestry Development Project (SFDP)[4] in Sanggau, West Kalimantan, regarding the development of NTFPs from clustered polyarchic forests. The paper discusses the screening process used for identifying NTFPs and reviews forest enterprises proposed by the project.

NTFPs in Sanggau, West Kalimantan

The project area contains considerable heterogeneity in relief, soils, and forest types. Natural forest cover approximately 28 percent of the total surface area of approximately 100,000 ha. Table 1 summarizes land use and vegetation cover in the project area.

Biodiversity in the area is also high, encompassing a total of more than 800 tree species with widely differing distributions. A total of 1,800 local forest products from 1,400 tree species were recorded during a forest inventory (Ramon 1993). Table 2 summarizes local uses of tree species found in the area (multiple uses of the same species are counted).

Approximately half of the forest products recorded are timber, construction wood, roofing, and walls. Calculations based on data collected by de Jong (1994) show that the extraction of NTFPs from *tembawangs* in the project area provides an annual income of approximately Rp. 350,000 to 450,000 in kind (fruit, vegetables, medicines, but not including combustibles, rubber and timber). The value of extracted timber, however, is more than 2 to 4 times this amount (Graefen and Syafrudin 1995a).

Production of a continuous supply of NTFPs from the project area of sufficient quantity and quality for marketing is hampered by several factors. These include the high biodiversity (species per ha) of these forests and their distinct seasonal, inter-annual fruiting.

---

[4]Sustainable village-based forest management is promoted in the Social Forest Development Project funded jointly by the Indonesian Department of Forest and the German Technical Cooperation (GTZ). The project is located in Sanggau Regency, West Kalimantan roughly between 0.5° and 0.75° Northern longitude and 110°30 and 111°75 Eastern longitude close to the equator and the Malaysian border. The local population is composed of approximately 3,100 Dayak families or approximately 17,000 people living on a surface of about 100,000 hectares. Semi-monetarized household economies are typical for the area, based on shifting cultivation, jungle rubber management, *tembawang*, and natural forest utilization. Non-timber product development constitutes only a minor component in this regional, inter-sectoral, participatory and integrated forest management approach. SFDP is process-oriented and targets institutional development combined with human resources development (SFDP 1994).

Table 1 Land use and vegetation cover in the project area (in hectares)

Vegetation cover/land use	Surface in ha
Natural forest	
Hill forest	8,263
Lowland forest	7,121
Kerangas (heath peat forest)	5,490
Swamp forest	6,374
Peat forest	375
Sub-total natural forest	**27623**
Other vegetation/land use	
Tembawang	4752
Jungle rubber, sago, other agroforest products	9,132
Ladang/swidden field	5,234
Alang-alang (imperata grasslands)	5,071
Secondary forest	47,765
other (settlements, wet rice etc.)	2,673
Sub-total other vegetation/land use	**74,627**
Total for project site	**102,250**

Kimman and Simanjuntak (1995)

Table 2 Forest produce categories and the percent of total forest product uses

Forest produce categories	Percent of total uses
Handicraft, weaving, furniture	1.9 %
Latex, resin, other exudates	2.4 %
Vegetables	6.6 %
Medicinal uses including poisons	11.2 %
Fruits, spices, edible oils	17.9 %
Other (edibles, combustibles, etc.)	7.4 %
Timber, construction wood, roofing, walls	46.4 %
Total uses	100.0 %

Ramon (1993)

Labor supplies in the area are limited and NTFP enterprises must fit into the current organizational patterns of this labor and show competitiveness in terms of labor productivity. Transportation costs are high and information about national and international markets is scarce. Finally, land use is subject to great uncertainty (e.g. village boundaries, state laws vs. customary laws, weak inter-village organizations, and weak linkages with other sectors).

Product Identification and Development Process

The capacity of the project and the local population to develop NTFPs is limited by factors of labor, expertise, finance, coordination, communication and time. Consequently, it is necessary to concentrate on a few products that it may be feasible to develop within a realistic time horizon and with the cooperation of the available institutions and actors. This project began with a pre-feasibility study consisting of a basic inventory, specific surveys to complete data sets on candidate NTFPs, and selection of promising NTFP candidates. The feasibility stage focused on market research and detailed business planning. The implementation stage consisted of several activities including training, mobilization of local communities, market tests, and extension activities (information flow, organization improvements, support for participation in trade fairs and exhibitions, widening business contacts with private enterprises willing to make commitments). All stages were accompanied by intense communication focused on rural communities, regional and state governments, and the private sector.

The project conducted a basic forest inventory over a one-year period including planning, sampling, and data entry. The inventory was hampered by the five local languages used in the area and the difficulty of accessing forest plots, particularly in the rainy season. From this inventory, a list of more than forty potential NTFP candidates was derived including Latin names, occurrence, density, market price (if available), and traditional/ potential uses (Graefen and Syafrudin 1994a). Approximately ten potential NTFPs were selected from this list on the basis of their availability in the natural forest. Specific rapid appraisals and interviews in villages close to the natural forest were then conducted along with surveys of local markets. This completed the data sets obtained from the forest inventory (Graefen and Syafrudin 1994b).

The screening process was facilitated by establishing a set of ecological, socio-economic and enterprise/market-oriented criteria to select NTFP candidates (see Table 3 below). Four commodities (i.e., bamboo, rattan, damar, and medicinal plants) were chosen as worthy of further study. The selection process involved the SFDP, potential investors from the local private sector, a local non-government organization (Yayasan Dian Tama) as a potential social engineer and mediator between local communities, actors from both the

private sector and government organizations, and outside experts on supply side and market prospects (Yayasan Dian Tama 1995). This process took about six months and the assistance of three of the project's permanent staff members, four outside experts, and several temporary staff members.

Table 3 Criteria for choosing NTFPs for product and marketing development

Ecological criteria	Socio-economic criteria	Enterprise/market oriented criteria
- availability in time and space	- accepted and known by people	- markets can be diversified
- easy access to harvest	- enterprises fit into cashflow and opportunity cost	- competitive in the market
- good natural regeneration	- income distribution broad	- easy to enter ready markets
- production can be increased through management	- respect of working calendar, labor force,	- quality and available skills
	- seasonality and gender issues	- investment risk (financial volume, price fluctuation, recovering period low)
- cultivable	- available management knowledge	- magnitude and volume of traded commodities
- direct link to conservation	- compatible with traditional law and culture	- supply sufficient in time and quantity
- available from waste	- income increasing	- market location/ mix
- fitting into reforestation	- adding value to village activities	- energy requirements and availability
- extraction does not destroy the environment	- job creation, market orientation	- flexibility of the system - commitment of parties

Source: Meeting of Biodiversity Conservation Network, Appropriate Technology Institute, Environmental Action Fund, Yayasan Dian Tama, Dian Niaga, Wil de Yong and Social Forestry Development Project, July 1994

While Table 3 is not complete, participants in the workshop felt it features the most important criteria. This screening did not consider fruit, wood bark, exotic animals, essential oils, and ecotourism. Fruit and essential oils are already treated under other research and development programs sponsored by the project. Medicinal plants and trees were not discussed due to the still unclear situation regarding intellectual property rights and the unusually long time frame needed to develop marketable phytopharmaca.

Rattan, Bamboo and Damar Product Development

The research and business development of bamboo, rattan, and damar have in common the fact that these products are not yet traded from this area although traditional uses are known. According to government regulations, the sustainable harvest of NTFPs whether from protected or from production forests, is guaranteed to local people throughout Indonesia for subsistence purposes. In the project areas villagers have traditionally regarded forests as a free good[5], particularly with regard to access and extraction of NTFPs. The recent commercialization of selected NTFPs, however, may focus the interests of different villages on managing common forest resources. Resource conflicts will then have to be settled within an organizational and legal framework.

Creating a Bamboo and Rattan Product Line

Bamboo (Bamboo spp.) and rattan (Calamus spp., Korsthalsia spp., Daemonorops spp., Plectocomia spp., and Rethispatha) are two locally-harvested and processed NTFPs that posses potential to be developed for marketing purposes. Both rattans and bamboos are not currently traded commercially and bear little, particularly rattan, economic value. The expected products from these raw materials are mats and bags. Specific designs will be solicited and the products marketed as semi-finished goods to handbag factories in Java. The finishing and marketing of these items will be organized there. This product line is based on several strengths and opportunities identified in the studies of supply, processing, and marketing conducted during the pre-feasibility and feasibility stage.

Approximately fifteen bamboo species and fifty rattan species occur in the project area with differing dominance patterns according to vegetation type. Bamboos suitable for weaving belong to the few species that have a wide distribution and high density in the project area. The area is rich in high quality rattans like *Sega* (Calamus caesisus) that provide excellent material for weaving strings. Only one third of the rattans, however, are currently used for wickerwork and interviews with villagers indicated that the resource base is likely to decrease (Graefen and Syafruddin 1994b). Farmers consider rattan superior to

---

[5]Recently eight participating villages decided to declare the remaining natural forest as a common, protected forest according to new *adat* (customary) laws (SFDP 1995).

bamboo for weaving purposes. One strength of local bamboos, however, is the unusually long length between the bamboo nodes.

Weaving is still an integral part of the daily activities of local women. Families and groups expressed a strong interest in improving the production and marketing of weaving products. This could provide a stable and regular income for these seasonally oriented farm/forest household economies. The labor intensiveness of rattan extraction could pose a constraint on the development of a weaving product. Other constraints include the low quality of current products, and the threat of over harvesting rattans even considering clumps which regenerate rather easily (Graefen and Syafruddin 1994c).

The bamboo/rattan handbag market in Indonesia is a steadily growing market having a volume of 200,000-250,000 pieces per year (1994), with prices ranging from US $10 to US $35. In general, however, products are of poor to medium quality with standard designs. The project has already established relations with a high quality leather manufacturer from Jakarta who is exporting handbags. Competition from other ethnic leather and bamboo/rattan bags industries is assumed to be rather low (Yayasan Dian Tama 1995).

Enterprise participants will consist mainly of more than 400 families and artisans who have already indicated their interest in establishing (through sub-contracts) permanent purchasing arrangements. Support and training is provided on a pilot basis through SFDP in cooperation with an NGO. The trade of semi-finished products is organized by a trading company with current rubber trading activities in the area. Manufacturing is done by an internationally recognized, Jakarta-based leather factory which intends to diversify and enlarge business operations (Yayasan Dian Tama 1995).

Variable costs play a crucial role regarding the feasibility of the product line proposed as they account for seventy percent of total cost. Variable costs include raw materials, other materials, and labor. Calculated prices for semi-finished products (up to US $3) compare favorably with current opportunity cost and payments in kind for wickerwork. The yearly family income derived from this activity could reach US $180 to US $360 plus a profit share depending on the output (assuming five to ten mats per month per family).

The development of this product line needs considerable start-up capital especially for hiring consults to improve technical skills and collection techniques. Other major costs

include investments and salaries. The first year of operations is expected to show a significant loss; the second year is expected to break even by achieving sales of 15,000 handbags; and the third year[6] is expected to yield a profit with a return on investment of more than 50 percent (Yayasan Dian Tama 1995).

In general, the transformation of local capabilities and arts into skills responding to modern markets should provide a positive influence in terms of local income generation and for perpetuating local culture. However, there remain considerable uncertainties regarding product quality, the management of major actors, groups dynamics, and accounting. Serious bottlenecks may arise with working capital if products prove to be slow sellers, and with sustainable rattan yields which may be not sufficient for attaining projected sales figures. The latter would require transporting rattan from other forest areas or cultivating it in gardens which is already being done by villagers on their own initiative without external advice.

Promoting Damar Resins

This project will promote true damars tapped from various dipterocarp species (e.g. Hopea spp. and Shorea spp.) which currently are neither valued nor traded from the project area. The raw resin will be channelled through a Pontianak-based enterprise directly to Singapore traders, eventually to Java, and after two to three years probably to the U.S.A. and Europe. Contacts for diversifying trade with import companies have already been established.

The project site harbors about fifteen tree species yielding damar of which seven are classified by villagers as relatively high quality damar resins. The frequency of trees varies according to forest types between 2 to 12 trees/ha (dominance was more difficult to estimate). A moderate estimate suggests a total potential of up to 800 tons of various quality damar per year at medium tapping frequencies[7]. Two species yielding *Tunam* (Shorea lamellata) and *Toncua* (Shorea spp.) have already been favorably reviewed by a trading company.

---

[6]Based on rattan vine and splitting characteristics as well as on mat size, cutting techniques, and handbag patterns, it can be assumed that about 30,000 vines or about 22 tons of rattan will need to be extracted in the third year. This quantity could be harvested annually on about 20 hectares of a rattan garden. It cannot be concluded, however, that if this much rattan was harvested from the natural forest that over harvesting will not occur. The project still lacks data on the growth and yield of local rattans.

[7]Tapping frequency is assumed to be approximately 4 times per year or every third month. About 3 kg damar resin can be harvested every 3 months without sophisticated techniques.

Besides widespread indigenous knowledge about species and damar properties as revealed in the rapid NTFP appraisal (Graefen and Syafruddin 1994b), villagers still retain knowledge on harvesting techniques and tools from damar tapping activities practiced approximately forty years ago (de Jong 1994). damar tapping fits into the farmer's work schedule and can provide a regular and stable income. Furthermore, damar tapping is in principle a sustainable NTFP harvesting technique and even timber can be processed from tapped trees although processing losses will be higher. Major constraints on damar tapping include the costs for finding suitable trees. Rising opportunity costs[8] could also hamper the exploitation of damar which is a laborious and relatively labor-intensive work.

The market for natural resins is small but relatively stable within the global resin market. Due to synthetic resins, prices for natural resins are depressed. Recently growing demands for paints and varnishes based on natural raw materials, however, constitute a promising market with prices two to four times higher than in the synthetic product market. "Pontianak damar" is an established trade name for damars derived from West Kalimantan. Current competition is low due to dwindling forests and new business opportunities that promise higher returns (e.g. oil palm plantations[9]).

Sales projections refer mainly to the tapping capacities of forest dwelling families. According to a rapid NTFP appraisal, each family involved could work about 4 days per three month period for damar tapping and collection. Tapping capacity is therefore based on an estimate of 40 trees per household, a transport capacity of 30-50 kg per day per family, and trees producing approximately 9-12 kg/year.

Farmers indicated prices (US $0.15-0.30/kg) which are compatible with prices calculated FOB ("Free on Board") in Pontianak. It is expected that within three years, annual

---

[8]Rubber which suits the poor Kalimantan soils and fits into the shifting cultivation system with low labor input constitutes by far the major cash income source for farm households in the project site (see also Dove 1993a). Thus, rising rubber prices as happened between 1994 and 1995 in West Kalimantan (April 1994 about US$ 0.40/kg, January 1995 about US$1.15/kg, forest gate prices) strongly affect incomes and local opportunity costs.

[9]For example, oil palm plantations can provide high incomes to participating farmers. Monthly net cash incomes range from US$ 200 to 350 which equals the average total annual cash income in the project working area (personal communication, Sanggau Regency 1994).

sales will be up to 100 tons of quality damar and 200 tons of lower qualities (this may require purchasing resin from other areas). Local community members will play a key role in the production and processing of resins. The enterprise will provide up to 200 families (seven percent of total families) with an additional income of up to US $100 per year. Support and training is already provided through a local NGO and SFDP. Trade is organized by a trading company with current activities in the area (Yayasan Dian Tama 1995).

Variable costs consist mainly of operating expenses and raw materials which are expected to range on average between US $0.15-0.20 and US $0.22-0.30 corresponding to grade. Investment costs including transportation, warehouse and grading facilities, as well as training are rather low as the start-up phase concentrates on trade. Calculations show a break even point in the first year, returns on investment of 23% in the second year, and returns of 48% in the third year of operations (Yayasan Dian Tama 1995). However, considerable uncertainty remains considering management capability, realistic estimates of extractable quantities, and changes in labor cost. The latter, in particular, would endanger a stable supply but is difficult to anticipate in a fast growing economy like Indonesia's. Finally a major bottleneck may arise concerning available working capital as turnover may prove slow.

Conclusions

Three years of experiences with species-rich forests in West Kalimantan show that numerous factors have to be met in order to develop potential NTFPs. Major parameters determining the success of potential forest-based enterprises include networks, specialized expertise combined with commitments to markets, flexible and responsive financing mechanisms for providing working capital, institutional and management development, and time. The institutional aspects of resource management have implications for the organizational and legal frameworks of forest management. Forest functions and land use issues are too often neglected. Finally, there is rarely enough time to develop non-timber forest products from a basic understanding of the raw material to the marketing of an innovative product.

Although rattan, bamboo, and damar enterprises are expected to have a considerable impact on the resource base, income opportunities generated at the village level will remain

rather modest compared to the total number of households. Data indicate that NTFP-derived income would only constitute an important side income for a limited number of households. Rising opportunity costs in non-forest sectors will require increasing the efficiency of forest-based enterprises by reducing the amount of walking, searching, and transport time required. Increasing the efficiency of NTFP production favors enrichment planting, managed production (i.e. domestication and cultivation), and local level processing.

NTFP development in polyarchic forests may prove possible but a comprehensive set of conditions must be met. The development of these products will require the input of many resources, and the long-term marketing potential of these products remains uncertain. Successfully entering the market is just the first step, staying in the market and providing high quality products at competitive prices is difficult as can be noted from experiences of Rainforest Crunch in the U.S. (Corry 1993).

The extraction of NTFPs from specific sites or from enriched or managed forests is important for the welfare of many forest communities. The development of NTFPs from species-rich forests, however, carries significant uncertainties. The desire of many people in Western nations to maintain biodiversity by giving it value does not agree with the reality of marketing NTFPs from Sanggau. This study suggests rather that the successful cultivation of NTFPs by domestication (e.g. rattan and medicinal plants) would be the most efficient means of increasing the income of smallholder households.

In Sanggau, non-timber forest products constitute a minor component of forest management. Timber is the major economic asset[10] in this area. Given that in dipterocarp forests timber tends to be of homogenous quality and can be harvested and transported easily, timber constitutes the source of income for this area with the greatest potential. Timber could constitute the major income source if people could obtain the right to manage forests sustainably. This right would be accompanied by the obligation to manage forests according to appropriate functions (e.g. protection, production, conversion) and professional management

[10]Preliminary calculations of timber production from the site show a potential of about 30.000 m^3 per year based on a rotation period of 35 years, an exploitation factor of 0.7, and a reduced impact exploitation system (Kimman and Sahala, 1995). In monetary terms this would mean a potential annual net income per family of about Rupiah 1,500,000 based on current forest gate prices (Graefen and Syafrudin 1995b).

plans. This would require a comprehensive institutional approach (see also Peluso 1992b, Browder 1992, Dove 1993b) based on human resources development, intersectoral cooperation, legal harmonization between state law and customary law, and ceding responsibility (i.e. rights and obligations) to local communities.

Acknowledgements

This working paper benefits from the work carried out under the Social Forestry Development Project (SFDP), jointly financed by the Ministry of Forestry Indonesia and the German Technical Cooperation (GTZ). Sincere thanks are directed to the long discussions and the teamwork carried out in particular with Mr. Edy Syafrudin, Mr. Rudy Utama and his staff of Yayasan Dian Tama, Mr. Thomas Fricke, Mr. Balachandran, Mr. Ernst Küster and many others who are supporting the project. The paper was supported by the East-West Center Honolulu, Hawaii, USA.

References

Browder, J.O. 1992. The limits of extractivism: Tropical forest strategies beyond extractive reserves. BioScience 42(8):174-182.

Corry, S. 1993. The rainforest harvest: Who reaps the benefit? The Ecologist 23(4):148-153.

de Beer, J. H., and M.J. McDermott. 1989. Economic Value of Non-Timber Forest Products in Southeast Asia. Council for the International Union of the Conservation of Nature: Netherlands.

de Jong, W. 1994. From the riches of the forests. Progress report. Pontianak, Indonesia. Unpublished.

Dove, M. 1993a. Smallholder rubber and swidden agriculture in Borneo: A sustainable adaptation to the ecology and economy of the tropical forest. Economic Botany 47(2):136-147.

_____. 1993b. A revisionist view of tropical deforestation and development. Environmental Conservation 20(1):17-25.

Graefen, A. and E. Syafrudin. 1994a. Potential non-timber forest products from the Participatory Forest Management Area (PFMA). Report. Social Forestry Development Project, Sanggau, Indonesia. Unpublished.

_____. 1994b. Hasil survey pemasaran produk non kayu di Kabupaten Sanggau [Survey results of marketing of non-timber forest products in Sanggau district]. Report. Social Forestry Development Project, Sanggau, Indonesia. Unpublished.

_____.1994c. Development of a bamboo and rattan product line (Indonesian summary by Johnny Utama). Paper. Social Forestry Development Project, Sanggau, Indonesia. Unpublished.

_____. 1995a. Dayak farming and forestry in West Kalimantan. Report. Social Forestry Development Project, Sanggau, Indonesia. Unpublished.

_____. 1995b. Presentasi singkat bidang ekonomi dan pemasaran proyek SFDP [Brief presentation of the Economics and Marketing Section of SFDP]. Paper. Social Forestry Development Project, Sanggau, Indonesia. Unpublished.

Kimman, P. and S. Simanjuntak. 1995 Ekspose rancangan rencana induk PKHP [Presentation of the draft master plan of the PFMA], Social Forestry Development Project, Sanggau, Indonesia. Unpublished.

Mary F. and G. Michon. 1987. When agroforests drive back natural forests: A socioeconomic analysis of a rice/agroforest system in South Sumatra. Agroforestry Systems 5:27-55.

Peluso, N. L. 1992a. The rattan trade in East Kalimantan, Indonesia.. Advances in Economic Botany 9:115-127.

_____. 1992b. The political ecology of extraction and extractive reserves in East Kalimantan, Indonesia. Development and Change 23(4):49-74.

Peters, C. 1992. The ecology and economics of oligarchic forests. Advances in Economic Botany 9:15-22.

Ramon, J. 1993a. Forest inventory in the Participatory Forest Management Area. Social Forestry Development Project, Sanggau, Indonesia. Unpublished.

_____. 1993b. Human and natural resources in the PFMA: Management options. Social Forestry Project. Sanggau, Indonesia. Unpublished.

Social Forestry Development Project. 1994. Indonesian-German technical cooperation - Project Summary. Paper. Sanggau, Indonesia. Unpublished.

_____. 1995. Hasil rapat lembaga-lembaga adat wilayah PKHP. [Results of the meeting on customary organization for the Participatory Forest Management Area], (This meeting focused on customary and state law with regard to organizational aspects and institutional building). Report. Sanggau, Indonesia. Unpublished.

Yayasan Dian Tama. 1995. Development of sustainable small-scale forest-based enterprises within the Participatory Forest Management Area (PFMA) model in Kalimantan, Indonesia. Implementation grant proposal submitted to Biodiversity Conservation Network. Pontianak, Indonesia. Unpublished.

BEYOND MARKETING: DEVELOPING THE PRODUCTS OF THE PHILIPPINE UPLANDS

Flora Leocadio[1]

Abstract

This paper discusses the work of the Upland Marketing Program which was developed to assist the upland NGOs and upland farmers in the development of markets for their farm and forest products. Organized under the auspices of the Upland NGO Assistance Committee and the organization of Philippine Business for Social Progress, the Upland Marketing Program developed a sympathetic approach to the development and marketing of upland products which has sought to promote economically as well as environmentally sustainable development. The lessons learned from this experience and the strategies and approaches developed for addressing upland problems are discussed.

> *"We brought with us one jeep load of calamansi* [small indigenous lemon] *to sell in the Metro Manila market, thinking we would get good prices. We were offered a price way below what we had already spent on transportation. Disappointed, tired, and disgusted, we dumped the calamansi."*
>
> Alangan Mangyan, farmer of Paitan, Mindoro Oriental

> *"Please find us buyers for our tiger-grass brooms."*
>
> Village leader of Don Mariano Perez, Quirino Province

> *"Rattan gathering is our life - what other livelihood can we turn to if you're saying that it is not sustainable?"*
>
> A Tagbanua leader of Palawan

> *"We sell our corn grains to the Chinese miller/trader in the town center at prices dictated by him (three to five pesos per kilo) and we buy milled corn for our consumption at prices way below what we earned from selling corn grains (from ten to fourteen pesos per kilo). Both ways, we have no say."*
>
> Community organizer, Malalag uplands, Davao del Sur

> *"We base our selling prices on what the 'viajeros' [traders] tell us."*
>
> Vegetable farmer of Cebu

> *"We are just collectors and agents for the 'damuo'* [lowlander] *who owns the vine license."*
>
> A Mangyan woman of Paitan, Mindoro Oriental

These are just some of the tales of woe that the Upland Marketing Team (UMT) of the Upland NGOs Assistance Committee (UNAC) and Philippine Business for Social Progress

---

[1]Program Director, Upland Marketing Program, Upland NGOs Assistance Committee (UNAC) and Philippine Business for Social Progress (PBSP), Manila, Philippines.

(PBSP) has heard from upland residents all over the country. Our challenge has been to respond to them in quickly enough. Although the mandate to the Upland Marketing Team (UMT) was to assist upland dwellers in marketing their produce and to develop their capability in marketing, the program director, after an initial round of field visits and consultations with UNAC's partner NGOs (non-governmental organizations) and POs (People's Organizations) all over the country, came to the realization that the UMP would need to do more than marketing. With a grant from Ford Foundation of USD 100,000 (for a two and a half-year period effective June 1, 1992 to December 1994) and administrative and management support from PBSP, the UMP became a one-stop shop for a steadily increasing number of upland producer groups who asked for assistance in the following areas:

- market information on agricultural and agroforestry products and handicrafts;
- technical assistance on financial systems and tools;
- training on specific marketing skills;
- basic business management;
- value-adding technologies;
- enterprise development;
- market links;
- product identification and development;
- product packaging;
- liaison with government agencies;
- markets for new products;
- feasibility studies and business plans; and
- rattan marketing.

That the UMP has been extended and granted fresh funding may be an indicator of the critical need for such an service and of the appropriateness and efficacy of its client-driven approaches and strategies. The strategies and approaches discussed herein were developed in addressing the marketing and associated development needs of upland communities over the last two and one-half years. These lessons learned from our experiences with the NGOs, upland communities, traders, buyers, consumers, trade associations, businessmen, corporations should be of interest to the policy makers, program and project planners and implementors, as well as field workers involved in the Philippines' National Community Forestry Program and the Social Forestry Program, donor institutions, NGOs and NGO networks.

Background

The UNAC (Upland NGOs Assistance Committee) is an unusual entity in that it has escaped stagnation in spite of a perceived handicap, namely, the lack of a legal personality — it is not registered with the Securities and Exchange Commission as either a foundation, a non-profit group, an NGO, a club, network or association. Now in its fifth year, UNAC continues to hold its marathon day-long meetings, workshops and planning sessions and recently established a full-time, full-service secretariat with a full-time coordinator and staff. The Department of Environment and Natural Resources (DENR) considers UNAC a partner and collaborator in its Upland Development Program.

In 1992, UNAC was part of a Forestry Working Group that analyzed and drafted provisions for the Forestry Code of the Philippines. This partnership has been by no means a blissful union — there have been times when UNAC has had to take a more forceful stance if it felt that it was worth it, as when it supported the move of six NGOs to terminate their participation in the ADB-funded LIUCP (Low Income Upland Communities' Program) of the DENR. It is to some DENR officials' credit that they recognize UNAC's policy advocacy work and the growing role of NGOs in Upland Development.

UNAC is composed of seven institutions of various disciplines and mandates. These are the University of Los Banos (UPLB), Philippine Association for Intercultural Development (PAFID), Philippine Partnership for the Development of Human Resources in Development (PHILDHRRA), Kalahan Educational Foundation (KEF), Philippine Uplands Resource Center (PURC), Structural Alternative Legal Assistance for Grassroots, Inc. (SALAG), and the Philippine Business for Social Progress (PBSP). UNAC focuses on three major areas of concern: land tenure, agroforestry, and marketing. The Upland Marketing Program (UMP) is an outcome of UNAC's national consultation in June 1991 where its forty-eight profiled NGOs[2] expressed the need for a marketing program because their PO (People's Organizations) partners in the uplands did not have any markets for their products[3].

---

[2]Upland NGOs that are listed and briefly described in a directory and that participate in UNAC's activities.

[3]These products cover a wide range and defy classification: upland rice, corn, root crops, bananas, vegetables - most of these organically grown , peanuts, rambutan, jackfruit, guavas, cashew nuts, *kaong* (Arenga pinnata), peppercorn, garlic, ginger, rattan poles and splits, vines, tiger-grass brooms, handcarved wooden

This marketing component was seen as a necessary part of UNAC's upland development framework which is based on land tenure and agroforestry. As one of the community organizers in that consultation expressed, "*What do we do while we're fighting for land tenure and what will we do with the land when we finally own it?*"

By the middle of the following year, Ford Foundation had said yes to the request for a USD 100,000 funding for the Marketing Program. The Program would be managed by and lodged at the Philippine Business for Social Progress (PBSP), one of UNAC's institutional committee members. PBSP's initial step towards operationalizing the UMP was the hiring of a program director with a development-cum-business management background. It became the director's job to define in clear and operational terms the objectives of the Program.

Experience of the Upland Marketing Program

The development of the Upland Marketing Program provided a valuable experience which may be applied to similar schemes in different areas. The essence of this experience can be distilled into 'lessons learned' and strategies adopted as a consequence.

Get the Right People

Successful marketing requires certain qualifications and skills. Having the 'right' people becomes even more important in upland marketing because one is dealing with a totally different environment, different cultures, and both different and difficult physical, economic, social, and political conditions. In addition, the marketing people need to deal with the people in the marketplace: the traders, the buyers, the corporate and institutional decision-makers, the consumers. The Upland Marketing Team is composed of three program officers, one administrative assistant, one part-time accountant-cum-bookkeeper, and the program director. Each has his/her own special expertise: one has a merchandising and marketing background, one is trained in research and process documenting, one is an organizational development and management person; the administrative assistant is also an artist and executes concepts for labels and products. However, all have common

---

products, mounted butterflies, handwoven cloth from abaca fiber, handicraft made of rattan, bamboo, and vines, accessories made of palm leaves, processed mountain fruits, honey, coffee, cut flowers, mushroom, lemon, handmade paper, handicraft from recycled paper and handmade paper, *kaong*, papaya, mango.

characteristics and qualifications that are valuable to the program: energy, zeal, ability to communicate well with both upland the dwellers and producers and the people at the market end, unimposing and sensitivity to the indigenous communities' ideas and feelings, a focused and results-oriented yet holistic outlook, enthusiasm and discipline. They are quick to recognize opportunities that would benefit the upland producers and to patiently explain and explore these with the latter.

Know the Real Situation

Strictly speaking the Upland Marketing Program's primary beneficiaries were the forty-eight profiled, upland NGOs. The Marketing Team felt they should work directly with the People's Organizations so asked the Committee to allow them to do so. This, however, affected the Program strategy, that is, to develop the technical capability of the NGO partners in marketing. It also radically increased the client or beneficiary base that would expect to be assisted by the Program. In fact, this made the Program more relevant and forced the Marketing Team to devote its time and energies in the field and in the prospective markets.

The lack of organized information was the first constraint that the Program encountered. It tried to resolve this by sending out survey forms in the Filipino language to the NGOs who were the assumed intermediaries for the Manila-based Marketing Team. Out of the forty-eight forms sent out, only eight responded. This highlighted the lack of a reliable and efficient communication system between the Center and the field. This finding was aggravated by the realization that there was neither enough time nor warm bodies to keep track of what and how much was being harvested from the forests. We also realized that the usual business terms of reference often do not apply. For example, the units of measurement commonly used in the field are more functional than scientific: a commonly available, recycled container, such as an old cooking oil tin becomes the standard unit of measure instead of kilograms. Thus, in working with rural people, one must be able to understand and work in their terms.

Focus Your Efforts

We decided to concentrate our efforts first on one broadly representative area as a pilot site. This was Paitan, a Mangyan resettlement area in Mindoro Oriental, Luzon. To

reach Mindoro Oriental requires travel of approximately eight hours by land transportation and ferry boat from Manila. The choice of pilot site was based on a number of factors:

- the NGO working in the area, the Mangyan Mission of Paitan (MMP), expressed the urgent need for marketing assistance;
- the area was representative of many other indigenous communities throughout the country;
- the People's Organization called the SANAMA[4] (Samahang Nagkakaisang Mangyan), wanted to link up with buyers of their products;
- there was a great diversity of products being harvested or produced and available for sale;
- the MMP had advanced funds to SANAMA and wanted to see results;
- other forms of assistance had been invested in the Mangyans' livelihood program but the projected monetary gains were not being realized.

Start with What the Communities Have

Most of the socio-economic interventions in the country focus on production and are usually the consequence of project proposals submitted to donor-institutions. These proposals are based on the perceived funding biases and agenda of the latter and project very positive bottom-line figures to ensure approval. The projects are characteristically commodity-specific and instruct the farmers to plant a certain commodity based on the information that this can be marketed at a profitable price. Usually, the choice of a particular product is a reaction to a successful venture of an individual or group - success being measured by the sales and profits he/they make from what are now commonly called 'high-value crops' (e.g., carrots, potatoes, lettuce, cabbage, beans, asparagus, cauliflower). The phrase has become anomalous - since majority of the upland farmers have jumped into the 'high-value' bandwagon, prices have inevitably plummeted as a result of increased supplies. The consequence is not difficult to imagine: the expected returns on investment are not there; the producers are not able to pay back the production loan and blame the agency that is helping them; the latter accuses the

[4]A federation composed of the eight Mangyan tribal groups of Mindoro Oriental in the island of Luzon.

farmers of being lazy and undisciplined; and worst of all, each of the parties involved feel that he has been exploited.

Recognize the Uniqueness of Each Community

Each community is one of a kind and has its own level of motivation, absorptive capacity, needs, and capability to manage change. In a consultative conference that UMP conducted which was participated in by four indigenous groups in Mindoro Oriental, a representative of one of the tribes challenged the elder of another tribe who emphatically stated that NGO interventions created tension in the community and that commercializing their surplus production would adversely affect their values. The former said that the others had no right to stop them from enjoying some of the things that money could buy, such as 'nice new clothes'.

To Market or to Eat: Aim for Self-Sufficiency

Agencies involved in marketing see marketing as no more than a tool to produce and gather more products for intended markets (traders, wholesalers, consumers). The need to ensure food self-sufficiency at the community level is overshadowed by the need to sell products for cash. Few consider developing and increasing their production capability to meet the food requirements of the community.

Another established fact is the "safety in subsistence" mindset which precludes all other considerations among small farmers. Farmers living on a subsistence level cannot afford to gamble, they need to see actual demonstrations of potential improvements.

Accept that Trade is Inevitable

The communities with whom the Upland Marketing Team works claim that with or without government and NGO intervention, trading goes on. There is a perpetual need for cash to buy what have become their basic necessities such as cooking oil or lard, sugar, salt, matches, oil for lamps, candles, milk and even instant coffee. A rapid and informal survey of the consumer cooperative stores in the upland communities revealed a wide array of instant consumables such as canned goods, such as sardines, instant coffee, soda, instant juice drinks, cookies, candies, bubble gum, and noodles. The trend seems irreversible — the lowlanders go up to buy whatever the highlanders have and the upland communities have become captive markets for their merchandise. The lowland traders and business people provide credit for

these groceries and dry goods and relationships beyond business begin to be forged. More insidious is the effect of this contact on the values of these communities, especially those of the children and the young populace.

Recognize Upland Producers can never Satisfy Mainstream Market Requirements Sustainably

Many institutional buyers, such as manufacturing companies, processors, exporters, and large stores, have expressed their refusal to deal with People's Organizations or cooperatives for a number of reasons. Foremost it must be recognized that marginalized groups, such as the upland dwellers, are not accustomed to the rules, written and unwritten, and standards that enable normal business to run efficiently and profitably. A long-term supply contract is therefore often impractical and similarly the enforcement of quality standards must be done painstakingly and in simpler ways. One handicraft manufacturer and exporter we approached to inform about available supply of rattan poles said:

> *"Please don't talk to me about these supplier groups. I have had a costly experience with them - I issued a Purchase Order for 3,000 poles to be delivered within 30 days and had even given a fifty percent advance. The poles were delivered after two months, most of them were stained and were smaller than the poles I had specified."*

He refused to pay the price originally agreed upon with the group's representative and this of course was the end of what would have been a supplier-buyer relationship.

The Strategy and Approaches Adopted

Building on the lessons learned from working with Upland NGOs and rural communities, a strategy was developed to address the problems identified. This strategy focused on four main elements designed to address problems in a holistic fashion.

The One-Stop Shop

The Upland Marketing Program, for optimum utilization of its limited resources and maximum coverage of its growing critical mass, positioned itself as a Marketing Resource Center with the following specific service components:

- trading/selling;
- training;
- market development;
- consultancy;
- market information and linkaging;

- market research and materials development;
- product development and promotion and market development.

A Commodity-Based Approach

Within the product bag that the Upland Marketing Team was being asked to market were a few commodities that needed more attention and more work than others for a number of reasons. One, majority of the indigenous communities and other sectors depend on these commodities. Two, there is continuing commercialization of these items. Three, these are potentially profitable products that could attract more business-oriented individuals or groups. Thus, we decided to focus on rattan, which best represented the desirable characteristics of the aforementioned group of products.

We conducted a consultative conference for representatives of the sectors involved in the rattan industry, including representatives of fourteen indigenous cultural communities (ICCs) in Luzon. The rest of the participants were DENR representatives involved in forestry research, forest products development, rattan licensing; upland NGOs; rattan handicraft and furniture manufacturers (3); and donor institutions such as USAID, Ford Foundation, the Foundation for Philippine Environment, and OXFAM-UK. Among the various concerns that emerged from the three-day conference/workshop, the issue of forest charges was considered the most important and the most urgent. What ensued were a dialogue with DENR Secretary Angel Alcala and his assistants and a study on the market dynamics and pricing of rattan. The objective of the latter was to validate ICCs' argument that the forest charges made rattan-gathering unprofitable for them especially with the associated proliferation of 'cash points'[5].

The dialogue with the Secretary did not quite accomplish the expected result, namely, a review of government policy on the forest charges for rattan. We held a second consultation to present and discuss the results of the study. This time, the first group was expanded to include more agencies and more ICCs. One outcome of the conference was an invitation from the Biodiversity Conservation Network (a joint USAID-WWF-Nature Conservancy program) to present a proposal to expand UMP's rattan project in the pilot area.

---

[5]Checkpoints manned by representatives of the Philippine national Army, the Provincial Military Command, and officials of the DENR who unofficially collect 'grease money' from NTFP gatherers and traders.

The conference also underscored the need to secure DENR acknowledgment of policy and operational lapses with regard to non-timber forest products, especially rattan and vines[6].

Since then, we have established a Rattan Coordination and Information Desk (RCID) which serves as the Rattan Cutting Contractors' (RCCs) forum. The RCID publishes a monthly newsletter in Filipino and has a readership of 119 RCCs/ICCs. The leaders of these groups have been writing to us expressing appreciation over the information they get from the newsletter and they in turn tell us about their activities, their plans and ideas, and their problems. They also see the RCID as a bridge between them and the DENR bureaucracy. The program officer in charge of the RCID has written a position paper on forest charges in collaboration with the RCCs. We have been invited to collaborate with the University of the Philippines at Los Banos (College of Economics) on a country case study of the socio-economic impact of rattan, sponsored by the International Network of Bamboo and Rattan. We were identified as the NGO partner because of our work and critical mass on rattan.

Another issue that the Rattan Cutting Contractors wanted addressed was the lack of appropriate harvesting technology for rattan. A study on the existing rattan harvesting methods and techniques pegged wastage during harvesting and trimming into standard lengths at an average of 10.11 meters or 32.76 percent of the total merchantable length that actually would have been gathered. We brought a technician of the Department of Science and Technology to two rattan producing areas in Northern Luzon. The technician made a prototype of a harvesting tool based on the suggestions and recommendations of the rattan gathering groups. The tool is now ready for fabrication.

---

[6]For example, the computation of forest charges was based on rattan market prices provided by the manufacturers and exporters. The Rattan Cutting Contractors (RCCs) were not consulted nor did they know how these charges were decided until copies of the Administrative Order were circulated. These figures then became the basis of the legislation on the amount of forest charges to be collected. Another issue is the inconsistency in the amount of forest charges that are being collected on harvested rattan poles and splits — it was discovered that some groups were being charged more simply because the local DENR office never received the order from Central Office regarding the exact amount! The policy states that the minimum length of rattan canes that can be harvested should be 25 meters, but the government representatives at the community level do not have control over the implementation of this regulation. There is also no clear policy on grading standards and no regular analysis and evaluation of the performance of holders of rattan cutting licenses.

Trading Center

The difficult conditions faced by upland producers are outlined in Table 1. Under these circumstances, it is easy to understand why the producers become dependent on the traders or middlemen. Thus, the idea of a trading center came from the villagers in the pilot community themselves - we discussed the concept in an intensive community workshop which was attended by officers and leaders of the various *barangays*[7], community organizers, and representatives of the NGOs in the community. The workshop participants developed the concept of the trading center — its structure, financial systems, resource requirements, policies, and operating systems and procedures. We provided the necessary technical input and information and the subsequent training sessions on basic management, inventory management, accounting and bookkeeping, marketing skills, quality control, product development, costing and pricing, and business planning.

Table 1 Conditions faced by upland producers

• lack of customers	• small quantity of output per producer	• lack of funds
• lack of transport	• low prices to producer	• lack of storage
• dependence on buyers	• large supply in overall market	• lack of liquidity
• isolated location	• price fluctuations	• volatile markets
• physical sales risk	• little market transparency	• insecure income

The trading center's most important function is the buying of the products for cash at prices better than those offered by the traders and middlemen. It also functions as an assembler, consolidator, and quality controller and has stabilized prices of agroforestry and non-timber forest products in the area. The center also serves as a link between UMP-Manila and rural communties, supplying information on market trends, requirements and orders.

Marketing Arm

The Upland Marketing Team saw that there were groups that were already producing marketable consumer items. One such group is the Kalahan Educational Foundation (KEF) in Imugan, Nueva Viscaya. The Ikalahans gather forest fruits *(guava, santol, dikay, dagwey)* and flowers (roselle and hibiscus) and sell these to the community-owned fruit processing plant.

---

[7]A barangay is the smallest administrative unit in the Philippines, roughly equivalent to a village.

The plant processes these into jams, jellies, and marmalades; bottles and packs them under the 'Mountain Fresh' label; and transports these to KEF's Manila Office. The Manila Office also serves as a warehouse and sales office.

The KEF and the UMP entered into an cooperative agreement according to which the latter was to open and develop new outlets for 'Mountain Fresh' products and to generate more orders and sales. KEF pays UMP a twelve percent royalty on sales which is plowed back into the program's trading funds. The UMP program officer in charge of the marketing of Mountain Fresh has also set up the inventory and sales/orders tracking systems and has trained KEF's Ikalahan staff to use these tools. These tools have helped greatly in regulating the production as KEF's Manila Office is now able to give an 'early warning' signal to the mountain communities when stock levels in the supermarket outlets run low. Purchase orders are given by the supermarket's purchasing officer to the KEF staff who schedules regular visits to the outlets. The UMP person has also trained her on merchandising and dealing with the purchasing officers and/or managers and other supermarket personnel. We conducted taste tests in the leading supermarkets which yielded useful information on acceptability, taste preference, and the age groups that should be targeted. We give regular feedback and recommendations to KEF so that there is continuous product and systems development. Based on year-end financial and sales reports on 'Mountain Fresh', sales increased by 95 percent since the time the UMP became KEF's marketing arm.

This marketing arm arrangement has encouraged other producer groups to do like KEF. The latter has agreed to franchise their fruit processing technology to other upland groups who want to add value to the non-timber forest products that they abound in their forests and mountains. KEF's chemist, Tim Rice, went to Paitan (the UMP's pilot area) in Mindoro Oriental to train the women's group there on the processing of calamansi into concentrate and marmalade. The group now produces calamansi concentrate in bottles while the Upland Marketing Team develops packaging (label concept and brand name) and helps them obtain the necessary licenses and approval from the Bureau of Food and Drugs. The processing of calamansi, which absorbs the over-supply of the fruit, is expected to provide a price cushions for calamansi farmers during the peak harvest season when prices often fall from a high of one hundred fifty pesos per basket (20 kilos) to a low of twenty pesos per

basket. We have established a market niche for the concentrate which can absorb the current weekly production of 300 bottles. Meanwhile other NGOs and upland producer groups have approached us for assistance in developing markets and marketing strategies for processed and/or semi-processed non-timber forest products in their areas (e.g., wild berries in the forests of Northern Luzon; vines in Palanan, Isabella; citronella in Cebu).

Conclusion

The Upland Marketing Program has become an accessible forum for the marginalized upland dwellers with their diverse concerns. The diversity of problems facing upland producers challenged the Upland Marketing Team to do more than find markets and buyers for upland products. In some cases the Team has had to introduce and support concepts of ecological, economic and socio-political sustainability in the context of both production and the marketing these products. The lessons and the corresponding approaches and strategies discussed here are based on the principles of community organizing and people empowerment and attempt to take into account the fragile nature of upland ecosystems. Marketing within this framework becomes a sensitive function and a potent means for promoting the long-term stability of the uplands. The longer term goal is self-sufficient communities, capable of making their own decisions, sustainably managing and harnessing upland resources, including the forest, enjoying land and food security, and, ultimately, economic stability.

Although the Department of Environment and Natural Resources also recognizes these basic principles as appropriate to upland development and has acknowledged the important role that NGOs can play in development of the Community Forestry Program, there are still many gaps to fill. One of the significant findings of the current pilot Community Forestry Program (CFP) in the Philippines was that certain areas of competence have to be further developed within the government and other assisting support organizations. The areas of competence which need to be urgently upgraded include economics, business administration, general management, community organizing, as well as the technical disciplines of forestry, agroforestry and small-scale forest products processing technologies (DENR 1994). In this context the UNAC/PBSP Upland Marketing Program has a role to play. Indeed, the lessons, approaches and strategies discussed here could be applied successfully to non-timber forest

products development in the context of community forest development. Finally, it would be well to recall the conclusion of the Executive Summary of the report entitled "Upland Philippine Communities: Guardians of the Final Forest Frontiers":

> "*While the Philippines has drafted some of the most progressive community-oriented resource management policies in Asia, they will have little impact on the larger issues of upland resource degradation unless the government can move quickly and decisively to channel its policies to empower poor tribal and upland migrant groups. These communities undoubtedly hold the key to the solution of access controls and participatory management. Yet they desperately need strong, supportive leadership and action from a government committed to enabling their role as guardians of the forest.*"

References

Anon. 1993. Upland Philippines Communities: Guardians of the Final Frontiers. Southeast Asian Sustainable Forest Management Network.

Department of Environment and Natural Resources (DENR). 1994. National Community Forestry Implementation Plan: Background, Issues, Options and Planning Directives. Community Forestry Program Assessment and Planning Project, CMLOA Project Office, Community Forestry Program, DENR, Manila.

NON-TIMBER FOREST PRODUCTS IN SOUTHWEST SICHUAN, CHINA

Lin Ling[1]

Abstract

Recent changes in China's economic development policies have led to more emphasis on income generation, people's participation, and agency coordination. In the forestry sector, community-based strategies are being devised to incorporate people's needs with environmental protection and forest productivity. The results of a Community Forestry Assessment (CFA) indicate that improvements in marketing and tenure of non-timber and homegarden products can help alleviate poverty in remote areas.

To meet today's need for cash, rural people throughout China are searching for new sources of income, especially in the impoverished mountain regions of southwest Sichuan. Here, many ethnic minorities have lived for centuries at the subsistence level or lower, and are critically dependent on forest resources for their personal use as well as a source of meager income. In recognition of the links between people's needs and forest conservation, the government has recently begun to experiment with a new integrative strategy that is grounded in local environmental and social conditions: community forestry.

To better understand these links, a multi-disciplinary team was formed with researchers from the Sichuan Forestry Department and other government agencies to conduct rapid appraisals in the region. This paper describes the results of one such study, a Community Forestry Assessment (CFA) conducted in three villages of Buto County in southwest Sichuan (Figure 1). This region, comprised primarily of Yi minority people, is classified as a poverty area by the state. The objectives of the study were to gather baseline data on the relationship between forests, trees, and people in this region, to identify ways to alleviate poverty through forest and homegarden enterprises, and to improve forest productivity and management through people's participation. This paper emphasizes one aspect of the study: the utilization and development potential of non-timber forest products (NTFPs).

After describing the relevant results of the CFA, the opportunities and constraints of rural development through NTFPs is examined, including marketing, productivity, and land tenure. The CFA revealed that stable land and tree tenure were key factors in sustainable use

---

[1] Lin Ling is a program officer and forestry engineer with the Yangtze River Shelterbelt Afforestation Program (YSAP), Department of Forestry, Sichuan. Office address: No.15, Renminbelu, Chengdu 610082, Sichuan, P. R. China.

of NTFPs, and that improvements in marketing could help rural people to develop new income sources from non-timber and homegarden products.

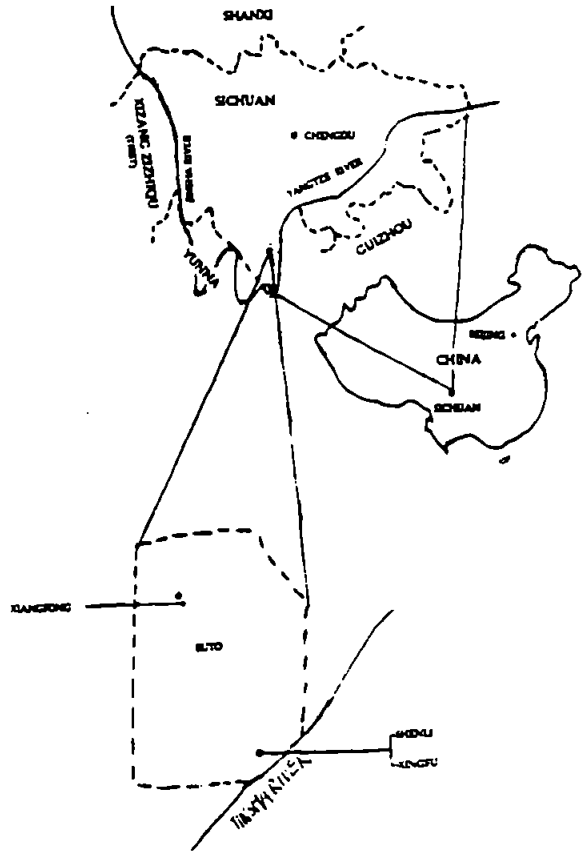


Figure 1 Map of the study area
Source: author

Background

China's economic reforms, begun in 1982, caused many changes throughout the country. At the national level, policies shifted away from centrally-planned communism towards more market-oriented socialism. As a result, income generation has become a major objective in government policy and continues to play a key role in project planning, implementation, and evaluation. People living in rural and remote areas are also changing due to greater interactions with cash economies. All Chinese -- from government officers to rural peasants -- are under great pressure to adapt to new economic conditions. These changes are strongly reflected in natural resource utilization and management strategies.

In the past, most forestry projects were planned and executed without the input of local people. Project planners dictated what tree species should be planted and where, their choices based solely on ecological criteria. But what kinds of forest products do local people need? And how can long-term ecological benefits be integrated with people's immediate needs? In 1989, the Yangtze Shelterbelt Afforestation Program (YSAP) was launched with the overall goal to establish over five million hectares of plantation forests in this region. Recognizing the need to involve local people, studies such as this one have been undertaken to close the gap between watershed protection and people's need for cash. Field staff and policy makers are also experimenting with bottom-up approaches based on local conditions and people's participation.

Change can also be seen in the government's approach toward poverty alleviation and rural development. In the past, the government gave funds and food directly to rural people in order to alleviate poverty and help them to meet their urgent needs. This type of assistance, however, had only temporary value; in many cases, it discouraged local initiative and strengthened people's reliance on government hand-outs. Now government funds for poverty alleviation must go though projects which are designed to improve people's economic independence in the long run. Local people are encouraged to participate in self-help activities to meet both their immediate needs and improve their livelihood into the future.

Project planning and implementation have also changed. Traditionally, all government offices operated in an independent and often uncoordinated fashion. This commonly resulted in overlap, duplication, contrary action, and inefficient use of resources. Now more projects are planned and carried out in an integrative fashion. In Sichuan, for example, the Sichuan Forestry Department (SFD), the Academy of Social Sciences (ASS), and the Provincial Office of Poverty Alleviation (POPA) are cooperating on community forestry projects. The Ford Foundation and the Regional Community Forestry Training Center (RECOFT)[2] are providing funding, technology, and training. Buto County is one of three areas proposed for a pilot community forestry project.

---

[2] The Regional Community Forestry Training Center is located in Bangkok, Thailand

Site Description

Biophysical Conditions

Buto County is located in the Liangshan Yi Minority Autonomous Region of southwest Sichuan. It occupies 1,685 km^2 total land territory. The elevation ranges from 535 meters(m) in the Jinsha River valley to 3891m on top of Abuzelu Mountain. Most of Buto County enjoys a temperate climate, with an average temperature of 10.1 C and an annual rainfall of 1102 mm (Buto County Book, 1980). The Jinsha Valley, however, is sub-tropical, falling below 1500m in elevation. Vegetation and forest type varies, but the majority falls within a sub-class of broadleaf evergreen forest. Distribution of plant species is shown below (Table 1).

Table 1 Distribution of vegetation in Buto County, Sichuan

Type (elevation)	Climate characteristics	Representative species
scattered trees and grass (below 1000m)	sub-tropical; hot and dry	**Tree** Bombax malarabicum, Sapindus *sp.* **Shrub** Phyllanthus emblica **Grass** Heleropogon contaortus, Imperata cylindrica, Eulalia speciosa
broadleaf evergreen forest (1000-1800m)	sub-tropical - montane; seasonal rainfall	**Tree** Cyclobalanopsis glaucoides, Fagus longipetiolata, Castanopsis delavayi **Shrub** Coriaria nepalensis **Grass** Eulalia specioaa
mixed coniferous-broadleaf forest (1800-2600m)	temperate; cool and wet	**Tree** Betula *sp.*, Alnus cremastogyne, Toxicodendron verniciflum, Populus bontii, Ligustrum lucidum, Pinus yunnanensis, Pinus armandii, Cryptomeria fortunei **Shrub** (unknown) **Grass** Leontopodium *sp.*
mixed coniferous forest and shrubland (2600-3190)m	temperate - sub-alpine; low temperature and rainfall	**Tree** Pinus yunnanensis, Pinus densiflora, Abies *sp.*, Picea *sp.*, **Shrub** Rhododendron *sp.*, Sinarundinaria nitida **Grass** Trollius *sp.*

Source: Buto County Book, 1980

Over the past several decades, forest coverage has changed dramatically. Before 1958, over 20 percent of the county was covered in forest. In the following years it was reduced by half, to 10.85 percent in 1975. Forest loss was the result of a massive forest fire in 1959 and the activities of the Cultural Revolution between 1966 and 1975. At present, forests cover an area of 24,933 hectares, 14.8 percent of the total county. This includes 53.7 percent

plantation forests, comprised primarily of Pinus yunnanensis. Natural forests make up 43.3 percent dominated by Quercus spp.

Socio-Economic Conditions

The population of Buto County is 130,843 (Buto County Book, 1980), comprised primarily of Yi minority people. Yi people still maintain a traditional lifestyle and are dependent upon the forest for a variety of purposes, both cultural and economic. Local people in Xiangfong Village reported that forty years ago there were very few families in the area: forests were extensive, and hunting and collecting forest products were important activities. Many natural products, including animal furs, were sold in cities for cash. Today, houses, farm tools, and furniture are still made from wood from nearby forests. Each home also has an open-fire stove, consuming large amounts of fuelwood.

Yi people are known as a fire clan in China because of the famous Torch Festival they hold every year sometime around August. Thousands of people dressed in beautiful costumes gather in a large square for the celebration. During the day they partake in traditional games such as animal fights and horse racing, and at night they dance. The dancers sing as they move around a big fire, each of them holding a torch. The dancing depicts their historical stories about hunting, farming, forestry, and other aspects of their culture. This is increasingly becoming a popular tourist attraction.

The main source of income is agriculture and animal husbandry. Over 65 percent of the total annual income is derived from agricultural produce. Some industries have recently moved into this area and almost all of them use raw materials available nearby and make products for local consumption.

Methods

The CFA was conducted over two weeks in 1994, in August and November. The research team was comprised of representatives from the SFD, ASS, and POPA, and was supported by The Ford Foundation. The CFA covered three villages: Shenli and Xingfu, located in Longtan District 60 kilometers from the nearest urban area, and Xiangfong, only 2 kilometers from the nearest city in Tiemuli District. Based on a training conducted by RECOFT earlier in the year, data on forest use and management was gathered using seasonal

calendars, land use maps, transects, time lines, semi-structured household interviews, and field observation. A representative seasonal calendar and land use map are included in Appendix 1a and 1b.

Results

Land Use Patterns

Land use patterns in all three villages are similar. Corn, potato, buckwheat, and tobacco are grown in the upper fields and constitute the main agricultural products. Paddy fields are sometimes planted in the lower regions of Shenli and Xingfu Villages, but they are not common. The forests are comprised of open-canopy secondary oak forests and pine plantations. All three villages have official collective forests which are used by villagers for fuelwood and other NTFPs.

The YSAP has been operating in Shenli and Xingfu since 1991. Thirty-six hectares of eucalyptus trees and 15.7 hectares of tong oil trees have been planted in Shenli; 48 hectares of eucalyptus trees have been planted in Xingfu. In these areas, forest department staff selected the species to be planted. Villagers did not participate in these decisions, although they have been involved in other plantation activities. Eucalyptus is not indigenous but introduced by YSAP as a quick growing multi-purpose species. The local YSAP officer reported that eucalyptus oil has a market in Yunnan Province, but no links had been established and little was known about the marketing process. The tong oil market used to be strong in Sichuan, but has diminished over the years.

Forest and Tree Management

There are several land management models that encompass trees and forests in the three villages studied. These include homegardens, responsibility and private hill forests, and collective forests. Each category includes various NTFPs and has different tenurial rights. Private and contract farmland, distributed by the government for the sole purpose of agriculture, has very few trees due to concerns about potential shade and pest problems.

Before describing these models further, a brief outline of China's land tenure system is presented in Table 2. In short, all land in China is owned by the government but has different use rights according to who uses the land and for what purpose.

Table 2 Land tenure in China

Government Land			
Farm	Forest	Uncultivated	Other
government	government	government	government
collective	collective	collective	collective
private	private	responsibility	--
responsibility	responsibility	--	--

Source: author

Homegardens. Yi people, like all Chinese farmers, commonly plant trees and other types of useful vegetation near their homes. These homegardens often have a high diversity of species with commercial value. Upper and median-income households tend to have well-managed homegardens; poor households have few trees to none. The law states that a homegarden is owned by the farmer who has obtained an ownership certificate from the county Land Management Bureau. The owner has full authority to make land use decisions and is entitled to all benefits from the garden. The homegarden is managed and maintained by all family members.

In addition to consuming homegarden produce at home, families sell their goods in local and regional markets. They receive market information from local markets, middlemen, the forest department, newspapers, radio, and TV. Fresh fruits are sold in local markets, typically by female members of the household. Dried products, such as Chinese pepper (Zanthoxylum sp.) and all parts of the tooni tree (Eucomia ulmoides) are collected by middlemen who come to each household. In some cases the farmer markets these products in the large cities himself. Chinese pepper is a traditional seasoning in Sichuan and has a stable market in the province and overseas. The bark and seed of tooni have a long history of use in Chinese medicine, and the leaves, roots, and stem are used for soft drinks, particularly the 'toon tea' which is exported to Japan.

One household in Xingfu Village has an exemplary homegarden management system. In 1983, the father retired from the army and started to plant trees around the house and actively manage them. Now there at least 150 trees, over half of which are productive. The homegarden has subsequently become an important source of income and food. The range of species, use, and estimated income are listed in Table 3.

Table 3 A Xingfu homegarden: product diversity, use, and estimated income, 1994

Tree Species*	Number of Mature Trees	Use	Income
Peach	25	Home Market	Y 200 (US$ 25)
Plum	7	Home	--
Pear	5	Home	--
Chinese Pepper	157 (97 bearing)	Market	Y 540 (US$ 61)
Total	194	--	Y 740 (US$ 86)

*Other species at immature stages include tooni, mulberry, walnut, cherry, persimmon, grape, apricot, cypress, poplar, tung oil.
Source: CFA field notes

Responsibility and private hill forests. In theory, the local government issues certificates to each rural household to manage a parcel of collective hill land, known as 'responsibility' land. Trees on those lands are not allowed to be cut without permission from the local government or forestry station; fuelwood and other NTFPs can be collected freely. In practice, however, the situation is quite different. In the three villages studied, there are no more forests on responsibility hill land. Trees have been felled extensively because the villagers do not have secure rights to them and therefore have no incentive to protect them. Replanting is difficult because villagers have no stake in future forests; they are afraid that once reforested, the lands will be given over to other uses.

Collective forest. In China, most forests are managed by community-based collectives. In the three villages surveyed, natural forests and plantations (including YSAP plantations in Xingfu and Shenli) are managed by village committees. Forest rangers are elected by villagers or appointed by the committee. They receive subsidies from the county forestry department and food from villagers.

Villagers mainly use these forests to collect fuelwood before the winter season and to graze their goats, sheep, cows, and horses during the summer. Trees are not allowed to be cut by villagers without permission from the county forestry department, but NTFPs and fuelwood can be collected freely. Yi people collect bamboo to weave into traditional mats that are used when killing wild pigs. A fern (Pteridium aquilinum) is used as a special fuel to roast the pigs. These two products are collected from natural forests and sold in the market. In each village, a few households collect medicinal herbs and mushrooms.

Local Marketing of NTFPs

To understanding the marketing process for NTFPs more clearly, the study team accompanied villagers from Xiangfong to a ten-day regional market. Farmers transported their produce by foot, pushcart, bicycle, and local bus. Main products included corn, pig, goat, sheep, chicken, egg, dried fern, and bamboo mat. Ferns are collected and marketed mostly by women; village carpenters produce furniture and handicrafts. About 30 percent of the market produce had its origin in the forest. A list of commercial NTFPs observed is included in Table 4.

Table 4 NTFPs in Buto County Market, November 1994

NTFP	Buyer
dried ferns	local people
Chinese pepper	middleman/local people
bamboo mat	villagers
walnut	middlemen/local people
fruits of *Phyllanthus emblica*	local people
handicrafts	local people/tourists
wooden furniture	local people

Source: CFA field notes

The biggest buyer of corn was a wine factory which belongs to the county government. Ferns and bamboo mats were bought by people living in urban areas or from villages where there are no natural forests. Some villagers from Xiangfong also bought mats, ferns, and bamboo. Local people have also started selling handicrafts at the Torch Festival, many of which are made from NTFPs.

Discussion: Issues and Opportunities in NTFP Development

The CFA yielded many new insights into the relationship between people and forests in Buto County. Four major issues affecting NTFP use and development were identified: forest degradation, unstable tenure, lack of market information and extension services, and uncoordinated project planning and implementation.

Forest Degradation

NTFP resources in this area have declined due to forest degradation brought about by over-harvesting of fuelwood and bamboo. Livestock grazing has exacerbated these problems

by destroying regeneration. Local people reported that ten years ago they only needed a half-hour to walk to the place for collecting fuelwood, bamboo, and other forest products; now they spend over two hours each way due to the reduction in forest cover. Some NTFPs have became very hard to find, such as mushrooms and medicinal herbs.

One possible solution to this problem is to change the forest management strategy. The secondary oak forests occupy a comparatively large area and play an important ecological role in soil and water conservation, yet local people derive little economic benefits. During the CFA, villagers stated that if given the opportunity, they would make contracts with rural collectives to manage parts of these forests. Management would involve cutting down old oak trees, using them to cultivate a valuable arboreal fungus, and planting multiple purpose trees. The government, however, still worries that villagers will cut down all trees and not replant if given this new land use right. Experimental projects are currently being designed to increase cash income from these forests and to involve local people in management.

This issue is also applicable to other parts of Sichuan as well. In Yantin County, for example, another poverty area not far from the capital of Chengdu, the hills are covered with well-stocked plantation forest. These forests are closed to public use and local people receive little economic benefits. To make these forests useful in terms of ecology *and* economy, land management practices will need to change to accommodate some local uses. Pilot projects are currently being set up which will select a few voluntary households to receive pieces of land to manage under contract with the local government. People will be allowed to thin the forests and plant economic species. It is hoped that the experience of this project can help to improve forests throughout Sichuan.

Unstable Tenure

Frequent changes in land use rights preclude long-term investment in forest and trees by villagers. Land rights change due to shifts in government policy and migration. In the case of migration, families moving in or out of villages entail an adjustment in local land distribution by the village committee; as a consequence, long term projects such as tree planting are minimal. Insecure tenure also constrains people's participation in plantation and other forestry programs for similar reasons. Even though many villagers have participated in YSAP plantation activities, benefit sharing and unclear use rights remain problematic issues.

In the study area, private land and collective forest rights are well defined and respected. On uncultivated hill land, however, there are some problems. In the past, to encourage local people to plant trees, the government issued a policy to distribute use right certificates to local people. Unfortunately, some local governments did not observe this regulation. As a consequence, local people continue to worry that the land will be returned to collectives again and they will lose their individual right to trees and tree products. Subsequently, tree planting has been minimal. Some households planted trees without certificates, however this is an informal ownership which is not backed by law.

Two strategies could be employed to help rectify this problem: 1) issue use-right certificates to stabilize tree and tree product ownership and 2) permit the rental of collective land. Local governments should carefully study informal tree ownership and issue certificates to formalize customary uses. In private and responsibility hill lands, local governments and the communities should jointly demarcate use boundaries, after which certificates can be issued to the relevant households.

In another part of Sichuan, some people rent uncultivated lands from collectives to use and manage themselves. Rentals can be used to improve land management and provide greater economic opportunities to local people. For NTFP development in poverty areas, the size of forest management units should be appropriate for the size of the household.

Lack of Marketing Information and Extension Services

Several NTFPs with good markets in Sichuan are suitable for producing in the three villages studied. These include arboreal fungus, walnuts, silkworms, and tooni tree products. One reason for the poor development of these products at present is the lack of market information and extension services for local people. In some cases, poor information has led to villagers planting or collecting the wrong products, resulting in a significant loss of time, energy, and capital. Markets also come and go. Eucalyptus and tong oil, for example, had good markets in the past, but have since disappeared. Local people responded by removing these species on both private and customary lands and replanting with other useful vegetation.

The study team held discussions with a wide range of individuals from various communities to determine what extension and marketing services were needed to improve NTFP management, and which agencies working in the area could provide them. In Xingfu

and Shenli Villages, for example, mulberry trees have been planted as an intercrop and some villagers are starting to raise silkworms. They have limited experience with this enterprise, however, and need training, tree seeds, and cocoons.

Uncoordinated Project Planning and Implementation

The Agriculture Department, Animal Husbandry Department, and Forest Department all have projects in the area which operate independently. A comprehensive program in NTFP development must involve all these agencies so that efforts will not be duplicated or counter-productive. NTFP development offers agencies an opportunity to work together towards a better understanding of the rural situation, and to build partnerships for rural development in the region.

Conclusion

Although people living in China's remote areas have been selling cultivated and wild species for years, policies to improve marketing and income generation have only recently been considered. Field foresters and policy makers need to put effort into working with local people to understand the socio-economic context of NTFP use, including relationships with outside markets and marketing systems. The CFA helped the study team to understand these relationships better, particularly the links between NTFPs and poverty. As NTFPs are mainly collected and traded by poor people, developing this sector offers a way to increase their income and self-worth.

Rural development and forestry projects designed to increase local people's annual income through technical improvements need also to consider tenure issues and marketing assistance for non-timber and homegarden products. This will not only help alleviate rural poverty, but enhance people's participation in rural development and forestry projects.

Acknowledgements

I wish to deeply express my thanks to Ms. Maureen DeCoursey for her help in organizing my paper and for the useful discussions about my project in Sichuan. I am also grateful to Dr. Deanna Donovan and Dr. Jefferson Fox for their lectures and comments during the workshop. Thanks also to Dr. Katherine Warner and Mr. Cor Veer of RECOFT who have assisted the Sichuan Forestry Department in many ways and supported the CFA. Finally, I am grateful to

The Ford Foundation for giving me the opportunity to participate in the Workshop on Community Management of Forest Lands at the East-West Center in Honolulu, Hawaii.

References

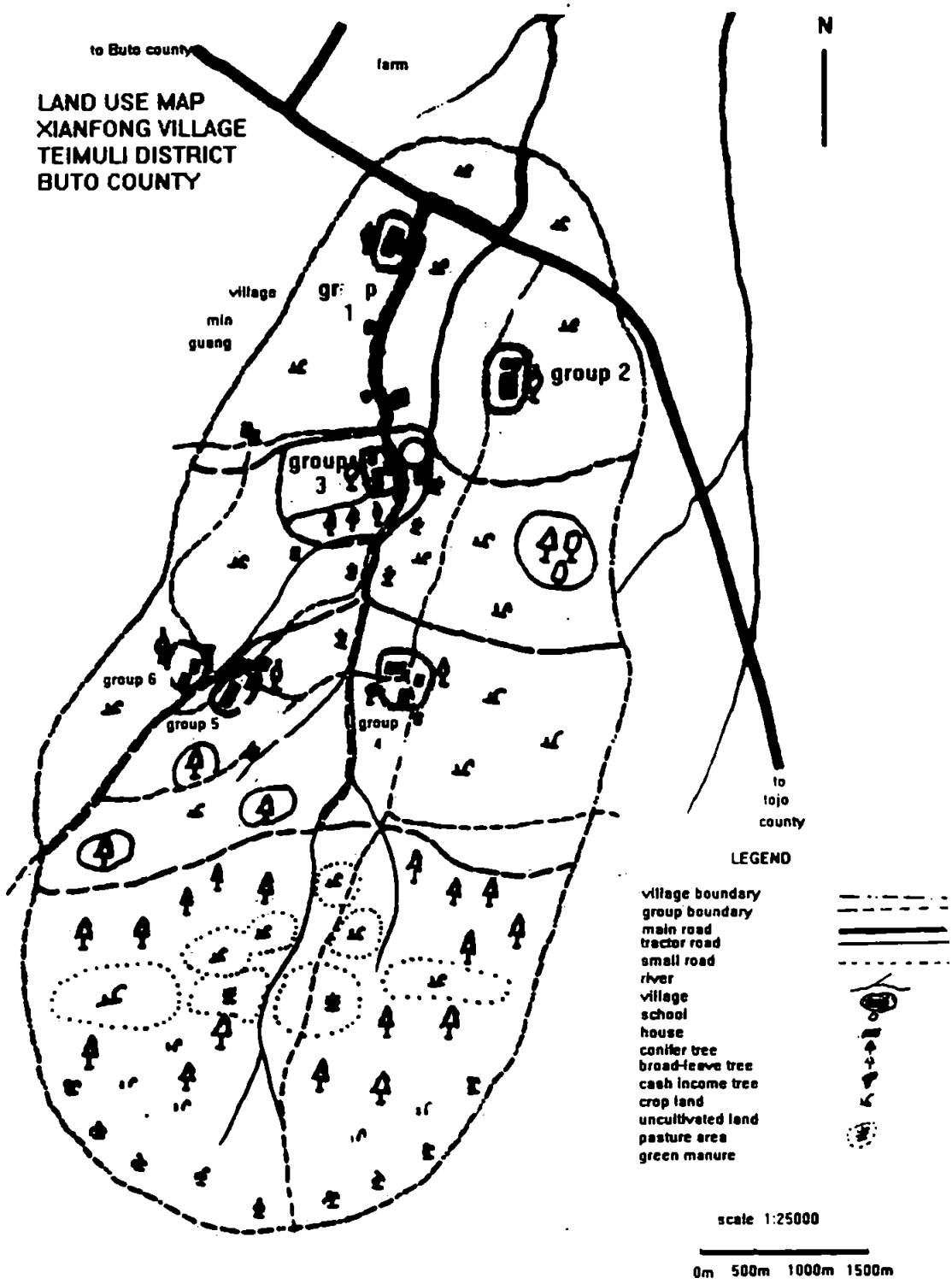
Buto County Book [Buto Xianzhi], 1980. Government document. Liangshan Yi Minority Autonomy Prefecture, Sichuan.

Appendix 1a
Seasonal calendar, Shengli Village, Buto County, 1994

CROPS	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
corn	::::::::::##########******
tobacco	:::::::########VVVV#########*****@@@@
rice	:::::::########VVVV ###################*****
wheat	################******* ::::::::######
buckwheat	:::::::##########******
potato	VVVV#######################*****
NTFPs	>>>>>>>>>>>>>

seeds	::::::::::::::::::::	planting	vvvvvvvvvvvv
managing	###########	harvesting	**********
roasting	@@@@@@	collecting	>>>>>>>>>>

Appendix 1b
Landuse map, Xiangfong Village, Buto County, 1994



USING *TSI* (TREE STAND IMPROVEMENT) TO ENHANCE NON-TIMBER PRODUCTION IN NEPAL'S COMMUNITY FORESTS

Thakur B Karkee[1]

Abstract

The major issues, socioeconomic and biotechnical, in community forestry development are discussed. Fuelwood, fodder and poles are found to be the main non-timber forest products that people preferably expect from the community forests. The well-protected community forests are often found to be well stocked. So, if the socioeconomic issues could be minimized, there are tremendous opportunities for potential intensification of those forest resources. This paper concludes that the application of silvicultural treatments in the community forests is necessary to develop the full potential of those resources. Tree stand improvement (TSI), originally timber stand improvement, techniques can be applied to optimize the productivity of all the resources according to people's needs from the forests. Kharchyang-Azingare community forest user group has adopted TSI techniques with the objectives of tree management and conservation of endangered species in their forest. The result is satisfactory and replicable to other community forests too. The Institute of Forestry and the Division of Research of the Department of Forest, Nepal faces both a challenge and opportunity in identifying appropriate silvicultural regimes. The selected regimes will enable people to choose alternatives to optimize their resources according to their needs.

On the whole the community forests (CFs) in the mid-hills of Nepal appear well managed. People have devised their own rules and regulations for protecting, harvesting and distributing the forest products. These rules and regulations vary from forest to forest depending upon the demand and supply for various products, and species diversity and abundance. The main non-timber forest products (NTFPs), fuelwood, fodder and poles, are the items needed daily by the people. In addition, people collect foliage, livestock bedding material, leaf litter and several products with medicinal and food value.

The successful management of CFs does not necessarily mean that people have fulfilled their daily needs for forest products. Studies have shown that most of the community-managed forests are well stocked. Some CFs are found to be deficit in fuelwood and fodder but are surplus in poles and timbers. The protective type of management plan which is common, however, may have prevented people from receiving full benefits of forest production. People, mostly the poor and mostly, have difficulty in getting access to products they need most. For fuel they must rely on nearby Government forests or agricultural residues, which may have an alternative value as manure or fodder.

Revision of management plans and application of some silvicultural techniques may be essential to enhance the productivity of the CFs, especially with regard to the most needed

[1]Lecturer, Institute of Forestry, Pokhara, Nepal

products, such as fuel and fodder. Tree stand improvement (TSI) techniques (originally timber stand improvement) can address the need and create more favorable conditions for tree growth. It allows people to manage the existing forest stock for better yield and to conserve understory forest plants with medicinal, food or other values.

The user groups are now looking for technical assistance to increase the productivity of their forests. Various, tested silvicultural techniques under the TSI could provide alternative means for the farmer to enhance the productivity of the forest. Application of TSI challenges forestry professionals. They need to analyze CFs' management plan for appropriateness and to assist villagers in modifying and updating the plan to meet their objectives. The analyses of management plans may demand more inventory data. They may even have to identify the market for forest products if required. Recommendation of a suitable silvicultural regimes may require additional research and training.

This paper examines the implications of the findings that most of the community forests, legally gazetted or under traditional management, have passed the protectionist stage of forest management. Thus, the immediate aim here is not only is to evaluate the existing situation of CFs but also to elaborate the potential role of TSI in CF development.

Background

Community forestry has been practiced in Nepal for over 14 years with the objective of meeting the forest product needs of the people on a sustainable basis by developing and managing their common forest resources. Although officially unrecognized community forests following indigenous management systems have also existed for a long time. The Nepal Master Plan for the Forestry Sector (1988) acknowledged community forestry as an effective strategy for restoring and managing the hill forests. Recently, it has been applied in the Terai region as well. The initiation of community forestry had at least two rationales: people's dependency on forest resources and Government's unclear policy in forest land use.

The forest resources have always been a very important component of the household economy of rural people. People have relied on forests for fuelwood, fodder and livestock bedding material, medicine and even food. People in nearby towns have earned ample amounts of money from forest products marketing. A sole dependence on the forest in many

cases has resulted in severe depletion of forest resources. The government's decision to nationalize the forest land in 1957 and the subsequent policing role of the Department of Forest (DoF) could not change the people's habit of relying on forest resources. Moreover, the scarcity of daily needed forest products, which previously were more readily available, and a rising global consciousness regarding the negative affects of deforestation, forced both people and government to think more seriously about forest protection.

The concept of forest management by local people with the technical assistance of the DoF evolved in the mid-70s. Forest user groups (FUGs) were formed, that management plans were formulated and the forest adjacent to the community were handed over to them. Most of the forest area relinquished was shrub lands and severely degraded. Consequently, protection oriented management plans were formulated with the primary objective of re-establishing the vegetation in two to five years. Full implementation of community forestry precepts in most CFs has taken almost a decade. Most management plans, however, are still the protective type (Ladely and Karkee 1994). More and more it is being recognized that some modifications may be required.

Recent studies (Dahal 1994, Karki et al. 1994, Ladely and Karkee 1994) have shown that despite the deficit situation of fuelwood, fodder and poles, the status of effectively protected CFs is good. Ladley and Karkee (1994) also presented optimistic data showing that some FUGs are able and willing to pay professional foresters for technical assistance. Some communities with forests containing a large volume of timber are found to be running short of fuelwood, fodder and small poles. Some forests are so densely stocked that some silvicultural treatment would be beneficial to regulate forest production and release space for the production of other non-timber forest products that the communities also require. Generalization of these results, however, needs to be supported by more research.

TSI has been applied in tropical forests for over 15 years, primarily in the context of timber stand improvement, to increase the productivity of valuable Dipterocarp species and to conserve forest biodiversity (Heyde et al. 1987). In Nepal, recognition of TSI has taken place only recently. Some permanent trial plots were established to test the performance of different silvicultural regimes so that foresters could suggest some alternate ways of forest management to the FUGs in the middle hills and the Terai (Tamrakar 1993 and 1994,

FMUDP 1994). With the advancement of community forestry from a protection to a production forestry approach through the application of TSI techniques, people will have opportunity to enhance the production potential of their forests according to their needs.

One method of increasing production is to intensify wood management. Most of the forests in the mid-hills of Nepal are of the Schima-Castanopsis type and are exploited primarily for fuelwood, fodder, and small poles. TSI is one method to enhance the productivity of the forest for such products as required by the communities. Simultaneously, people could include in the selective process species that have medicinal and food value and allow them to regenerate and grow. This approach could also help communities to maintain biodiversity in their forests.

Community Forestry at a Crossroads

Community forestry is changing its orientation from protective to production forestry. In protective forest management, the role of the Ranger arises only during the formulation of the management plan, basically because of the requirement to include inventory data in the plan. The FUG committee discusses and decides most of the social issues. In emphasizing production in forest management, role of the Ranger and the FUG committee will be more demanding. The Ranger must apply appropriate silvicultural regime to increase the biomass of the desired species and monitor growth, whereas the members of the FUG should have knowledge of simple silviculture. The questions then arise: Do rangers possess sufficient knowledge of silviculture and inventory techniques? Are FUG members capable of comprehending the silvicultural and inventory information? A critical review of the existing community forest management situation is important.

About 1,900 forest user groups (FUGs) have been formed and 90,000 ha of national forests have been handed over to the FUGs. The government's Eighth Five-Year Plan (1992-1997) has the ambitious goal of forming 5,000 FUGs and handing over 252,000 ha of forest land to the forest user groups (NPC 1992). The government's interest in handing over patches of forests that have been traditionally used by the people to the people is to give them the responsibility for protecting and managing as well as utilizing the forest. The benefits are to go to the people so that they can use the resources thus generated in development activities.

Success in community forestry can be anticipated only if the demand and supply situation of forest products is balanced and fairly distributed. Only the better management planning can achieve this target. People's awareness of community forestry goals and technical support from the forestry professionals are important factors to the success. The existing situation in community forestry has raised several issues that can be broadly categorized into two areas: socioeconomic and biotechnical. Before examining the need for a production forestry approach, a brief review of these issues is essential.

Major Socioeconomic Issues

At the village level. Community forest management is a collective effort in managing forest resources. Only the true users of the resource can contribute in strategic planning. Identification of true users is an important issue in effective forest management planning. Pandey et al. (1993) categorized three kinds of users in the villages: (a) those who are the members but rarely need forest products, (b) those who do not use the forest directly but want to protect it for environmental reasons (e.g., sources as of drinking water), and (c) those who depend on forest products for daily needs and livelihood. Often, people from first two categories come from the group of local elite and assume most of the committee member seats on the FUG. These people may also be members of local political organizations. Such circumstances often permit them less time for designing the forest management strategy. As a consequence the plan prepared by a FUG dominated by the elite generally is more protectionist. Sometimes, the actual forest users have membership in more than one FUGs because of land holdings in different locations. Studies indicate that this situation can result in such FUG members being passive in one or the other of the forest management groups (Dahal 1993). Thus, the FUGs become ineffective.

Women, economically disadvantaged groups and artisans are the real forest users. Only with their involvement and input can the strategy formulation reflect the real demand and supply situation for forest products. The involvement of these groups in FUG committees and in the decision-making process regarding forest management is generally the least. The reasons are several: either they have no time to attend the meetings, because of their responsibilities for cooking and other household chores or of their involvement in income-

generating activities, or their opinions are not solicited as a part of the process (Baral 1993, Ladely and Karkee 1994).

The concept of community forestry is poorly developed in many villages although indigenous management of forest lands has existed in some villages in the context of either communal or clan forest for a long time. People compare FUG management areas with political boundaries, that is, village development committee (VDC) boundaries or ward (smallest unit of the VDC) boundaries. Some villagers have divided the continuous patch of forest according to the ward boundaries. As a result it may seem more to be village or ward forest rather than a user-group forest.

Village development should be the ultimate goal of any political group existing in the village. The tradition of opposing any activity carried out by the opposite political party is very counter productive and should be avoided if the activities proposed are for the overall development of the village. The role of extension agents and foresters should include counseling people as to their common interests. Identification of issues, conflict resolution prior to the formation of FUGs.

Knowledge transfer is a very important issue because training of each individual FUG member is impossible. The DoF and several other organizations with related activities have organized on-site training, observation tours to visit demonstration plots, and workshops to encourage villagers to protect and manage the forest effectively. The knowledge of individual farmers has to be spread among the FUG members so that the knowledge gap between the farmers can be reduced. Often a knowledgeable farmer can transfer his knowledge more effectively than any outsiders. The mobilization of local farmers as para-extensionists is essential for successful community forest development.

At the national level. Across the country and in the capital questions have been raised regarding the users right in the community forestry (Kanel 1993 and Dahal 1994). The 1993 Forest Act, the latest legislation relating to the forest lands of Nepal, has recognized the function of user groups. However, the situations remain unclear regarding the ownership right, right of the individual in selling and buying the share benefits and many other aspects. Similarly, whether a DFO can approve a FUGs decision to fell trees is not clear. The past policing role opposed to the current extension role of the ranger in forest management has

created a public relation problems. Initiation for eliminating the problem should come from the DoF level.

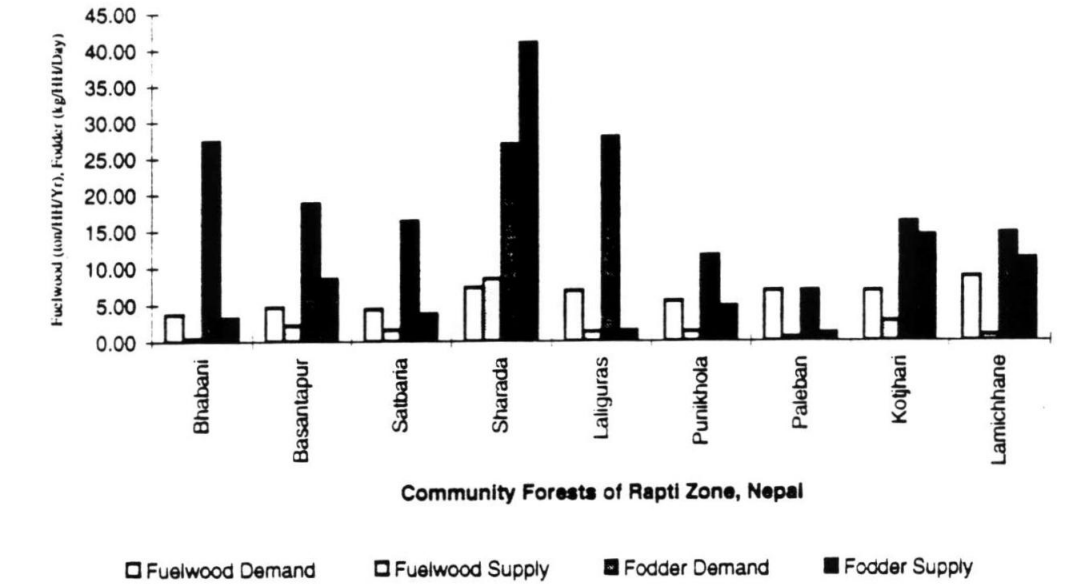
Apart from the community forests whose management have been already approved, several other forests under indigenous management systems are awaiting approval of their management plans. The number of rangers required for assisting the communities in preparing management plans and for subsequent technical support is still not clear. Moreover, the knowledge of most rangers regarding community forestry concepts, management planing and conflict resolution needs to be updated.

Major Biotechnical Issues

Current availability of non-timber forest products. Fuelwood contributes about 76.3 percent of total energy consumption in Nepal. Of this, households consume about 96 percent and the remaining 4 percent goes to the industries. About 30.9 percent of the total energy consumption comes from the agricultural residues: leaves, rubbish, corncobs, rice husks, rice, wheat and soya straw, and bamboo and cow dung (WEC 1986). The annual fuelwood and fodder consumption alone, estimated respectively to be about one cubic meter per person and 2.8 kg total digestive nutrient per livestock unit, reflect the heavy pressure on forest resources.

Several studies have recently been published, Karki et al. (1994) regarding the Western region, Dahal (1994) regarding the Eastern region and Ladely and Karkee (1994) regarding the mid-western region, which examine the biomass conditions and regeneration potential of CF in Nepal. The situation of fuelwood and fodder in different CFs is shown in Figure 1. It shows that supply of daily fuelwood and fodder requirements in most of the community forests is in deficit as compared to demand. The demand of fuel and fodder not met from the forest is fulfilled from the agricultural sector. Poles which are considered generally as annual requirements, however, generally exceed demand.

Biomass increment per ha per year is summarized in Table 1. It shows that average annual fuelwood accumulation per ha in the CF is estimated to be 2.5 tons varying from 0.5 to 4.3 tons per ha in different community forests. Similarly, average annual fodder increment found to be 3.2 tons per ha ranged from 0.5 to 5 tons per ha. An estimated 2.5 tons of fuelwood and 3.2 tons of fodder can be removed from the forest annually on average in a system of sustainable forest management. The actual quantity removed also is determined by



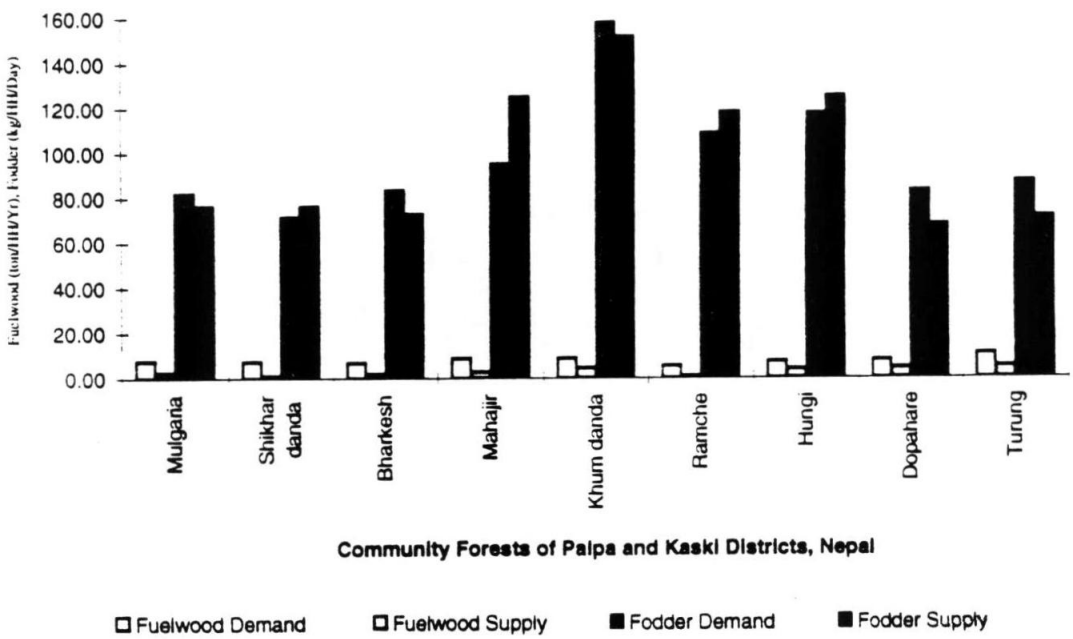


Figure 1 Demand and supply situation of fuelwood and fodder in selected community forests of Nepal

the forest size, species composition, population size and demand. Only some forests are capable of producing timber. These results are based on the control situation for which the management plans were mostly protectionist. Consequently, there appears to be considerable scope for increasing yield in CF by introducing an appropriate silvicultural regime.

Table 1 Annual accumulation of fuelwood, fodder and poles per ha in selected community forests, Rapti Zone, Nepal

Name of Community Forest	Fuelwood (ton/ha)	Fodder (ton/ha)	Poles (stems/ha)
Bhabani	0.9	2.4	57
Basantapur	1.8	3.2	61
Satbaria	0.5	0.5	38
Sharada	4.3	7.6	87
Laliguras	3.6	0.8	7
Punikhola	3.8	5.0	44
Pale Ban	3.6	2.4	71
Kotjhari	2.5	4.7	128
Lamichane	1.1	1.8	67
Average	**2.5**	**3.2**	**62**

Note: Average of fuelwood/poles calculated according to age of the stand.
Fodder calculation based on three-year rotation period.
Conversion rate (volume to weight):
one *bhari* (headload) of fuelwood = 30kg
one *bhari* (headload) of fodder = 20kg
Source: Baseline survey of the community forest situation in the Rapti Zone, Nepal, 1994, USAID.

Regeneration potential. Stocking per ha in the CFs of Palpa District of Mid-western Development Region and Kaski District of Western Development Region of Nepal is shown in Table 2. It shows that average number of stems (one inch diameter or more) per ha was 1744.3 in Palpa varying from 450 to 2450 stems per ha in Mahajir and Ramche community

forest, respectively. The stocking in two community forests of Kaski Districts was 1488 and 3235 stems per ha in Turung and Dopahare community forests, respectively.

Table 2 Stocking and biomass in community forests of Palpa and Kaski Districts, Nepal

Location and name of community forest	Stocking level (stems* per ha)	Total biomass (ton/ha)
Palpa District		
Mulgaira	1950	108.2
Shikhar Danda	1720	68.4
Bharkesh	1900	65.1
Mahajir	450	46.6
Khum Danda	1720	58.2
Ramche	2450	87.2
Hungi	2020	71.2
Average	**1744**	**72.1**
Kaski District		
Dopahare	3235	184.6
Turung	1488	130.9
Average	**2361**	**157.8**

*Greater than one inch dbh
Source: Sustainable management of common resources: an evaluation of selected forest user groups in western Nepal, ICIMOD, 1994.

The stocking and consequently biomass per ha is higher in Kaski District. The variation in CF stocking and biomass levels within a given District and between different Districts may be mainly attributed to the size of forest area, number of years managed and location. Though the data were derived from some plots of limited forests, the results

indicate that the regeneration potential of community forests is substantial. The clear need primarily is for silvicultural treatment to improve yield of the products desired.

Field Research and Trials

The socioeconomic data of the village was collected using semi-structured interview technique. An interdisciplinary team of sociologists, silviculturists, community forestry and inventory experts of the Social Forestry System Study Group (SFSSG) of the Institute of Forestry (IOF) Nepal was involved. Data regarding the decision making, species selection, distribution and technical aspects of TSI program were collected. The research team was also involved in user group (UG) meetings and TSI activities on site.

The Study Area

Kharchyng-Azingare Community Forest, the area selected for study, is only about one hour walking distance from Pokhara city, Kaski District of Nepal (Figure 2). The forest area examined extends in an east-west direction on a north-facing slope. It covers about 38 ha of land in a predominantly Castanopsis/Schima natural forest. The forest has been managed over 20 years with occasionally severe depletion in times of political turmoil and dispute with urban people. The user group in this area is a heterogeneous community, consisting of 55 households, predominantly Brahmins (Hindu caste). Other castes include Chhetri, Bhujel and Kami (blacksmiths). Most of the people are farmers. The Bhujel and Kami are involved in house construction and local artisan activities as well.

The TSI Design

The forest was divided into four blocks, according to the species composition and the convenience of harvesting for TSI purposes, three blocks with 10 ha each and one block with eight ha. TSI program was sponsored by FINNIDA Project. The DoF has provided technical assistance for the program. The SFSSG has started working closely with the farmers for forest management.

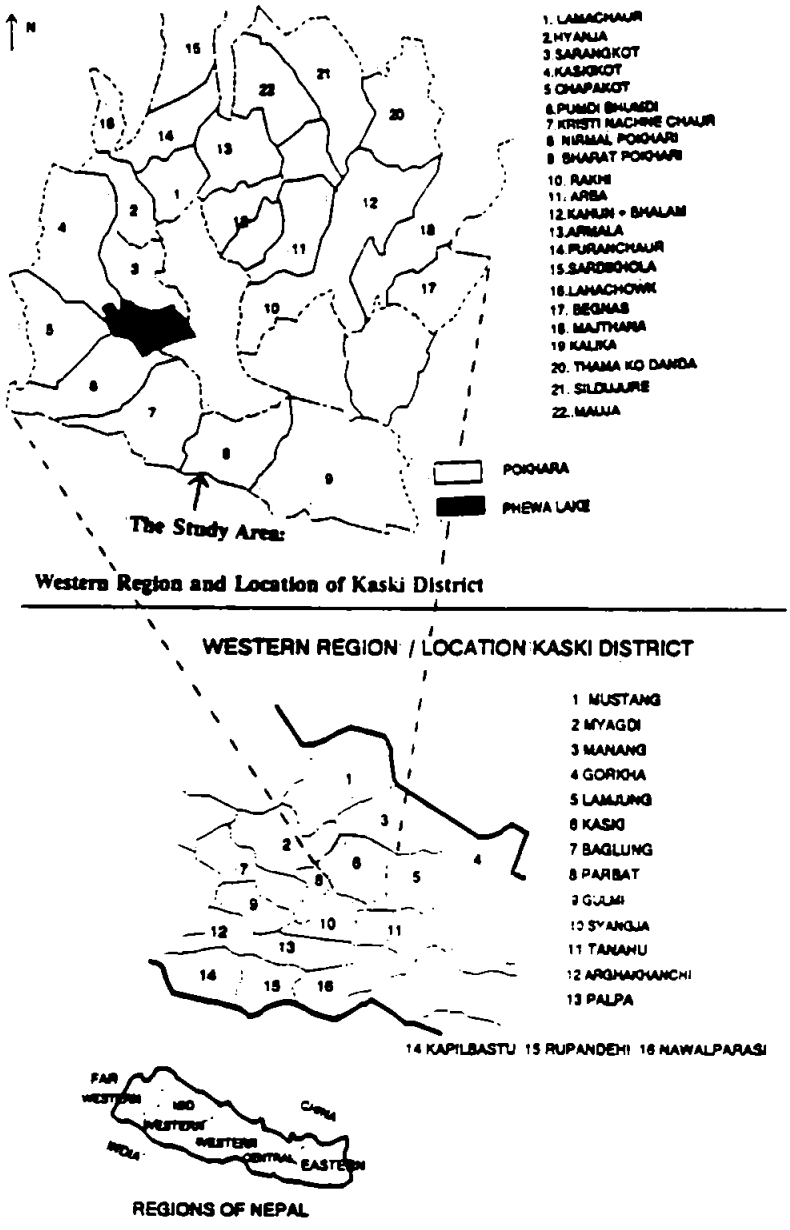


Figure 2 Study area

TSI: A Production Forestry Approach

TSI may be defined as an intermediate tending operation past the sampling stage designed to regulate the growth of the pre-selected crop trees by cleaning and liberation felling (Heyde et al. 1987). The objective of TSI is to improve the stand in terms of structure and dimensions vis-à-vis management objectives. Stocking density determines the growth of a tree. Common density indicators are the basal area or stems per ha. Intermediate tending operations therefore intend to maximize increment of crop trees by lowering the total basal area or stems per ha of the stand. In Nepal, quantitative information on management options for natural forest is rarely available. Tamrakar (1992, 1993) reported that some demonstration plots have been established by the Forest Research Division under the Department of Forest to illustrate management options to the people so that they can select an alternative according to their needs.

The demonstration plots were laid out in a natural *Schima/Castanopsis* forest in 20×20m plots. Measurements were taken in 15×15m plots. The objective of the study was to provide quantitative information on the availability of fuelwood, fodder, poles and timber that can be harvested over time under different silvicultural regimes. Six silvicultural regimes tested were: control, simple coppice system, phased coppice system, coppice with standards regular system, coppice with standards irregular system and high forest system. The results showed that if the objective of the forest is to produce maximum fodder, simple coppice system is better. If the objective is to produce high fuelwood and fodder as well, phased coppice system and coppice with standards regular are better. If the objective is to produce poles and timber, high forest system is recommended. Total biomass production was highest from the phased coppice system after five years in Nagarkot (83.5 green tons per ha) and coppice with standards regular in Khalti (96.6 green tons per ha). Phased coppice system was not applicable in Khalti. The least production of biomass was obtained from the control plots, 51.9 and 37.8 green tons per ha respectively, in both sites.

The investment of time and funds for over 14 years in community forestry management has now led most of the CFs from a goal of only the protection of the forest to optimization of forest products. Forest management planning is essential to manage forest growth so that an even, periodic flow of products can be harvested. Common procedures

required to regulate forest output are the determination of length of rotation and annual allowable cut (AAC).

The minimum limit of rotation is set by technical (size) and financial (return) standards. Short-term objectives of CF management are to obtain daily needed forest products on a regular basis; long-term objectives are to produce poles and timber. Financial rotation is applicable in commercial forests where decisions have to be made according to the financial considerations. Most of the CFs are maintained only to meet the short-term needs, i.e., fuelwood, fodder, poles, foliage and leaf litter. Accordingly, a rotation based on technical criteria, that is, the potential yield of above products may be the best choice in CF management.

The demand should be adjusted to the AAC from the forest. The AAC helps people to decide what to harvest, including what species and what grades; where to harvest, that is, in which management blocks; when and how much to harvest. The final harvesting decision in CF is determined by management objectives set within the goal of sustained yield .

TSI in the Kharchyang-Azingare Community Forest

The 38 ha forest of Kharchyang-Azingare is divided into four blocks for rotational harvesting. The harvesting cycle of a plot thus is in every four years. Ultimately the FUG committee decides about the harvesting. If there are not sufficient trees to be harvested, according to the information provided by the forest watcher, they do not harvest trees in that year. Collection of dried and dead branches and twigs, however, is permitted year round.

TSI in the Kharchyang-Azingare CF has provided an opportunity for the people to re-examine their objectives with regard to the management of their community forest, previously under a protectionist system. It has illustrated alternatives to the present management system which will enable the community to better manage their forest according to their needs, especially for NTFPs. An increase in the production of products for daily use, i.e., fuelwood, fodder and poles, however, has not ruled out the management of the forest for other NTFPs or for timber. People have maintained some trees for timber trees and also allowed forest plants with medicinal and food value to regenerate.

Management for NTFP

People traditionally harvest fuelwood and fodder in January to March, the winter season in Nepal. Farmers feel that if cutting is done in winter, which is the plant's dormant season, the trees grow faster and sprout more readily in the spring. It is also time when there is little agricultural work. People also possess knowledge on how to cut trees. They know that the stump should be cut at an angle so that water runs off freely; this allows for earlier shoots. The FUG committee chairman mentioned that there had been a discussion between him and a Ranger about the cut stump angle. One Ranger said that the trees should be chopped so that the cut stump had a flat top and the Chairman said that it should be chopped at a slant. Another Ranger supported the Chairman's opinion so, the first Ranger came to the Chairman's house and apologized for his erroneous advice.

TSI in Kharchyang-Azingare forest has two main objectives: tree management for enhanced biomass production and conservation of endangered plant species in the community forest. They always emphasize that their first priority is management for non-timber forest products, specially, fuelwood, fodder and poles, because these are the essential needs of the people. People mentioned that their forest is very small and income from the other forest products, such as medicinal and aromatic plants may be insignificant.

TSI as tree management includes selecting the best shoots, cutting diseased and dead trees or branches, thinning and pruning, and removing unwanted trees. Unwanted trees are those whose growth rate is low or thorny. CF managers always give priority to *Schima* and *Castanopsis* species as these species are considered good for fuelwood, fodder and poles. Very few important timber species exist in the CF.

The TSI contribution in terms of conservation of endangered species in Azingare-Kharchyang community forest is to create conditions to permit plants with medicinal and food value to regenerate and thrive. In earlier days the forest was considered rich in NTFPs, such as Cinnamomum tamala which is now only available on a scattered basis. Plant species, such as Terminalia chebula, Spondias mangifera, Elaeocarpus spp., Syzygium cumini, Termminalia belerica and Phyllanthus emblica that possess both medicinal and food values were also abundant earlier and had great demand in the nearby city of Pokhara. People know the value of these traditionally used species. In the past villagers used to supply these products to their

friends and families in town. Pressure from the town in terms of illicit collection of fuelwood, fodder and medicinal and food plants, however, has destroyed most of their forest. Now, these species are very scarce in the forest. The FUG committee bans to the cutting and transport of these species to town. One important objective of the TSI program therefore is to conserve these species, improve conditions favorable to their growth and thus rehabilitate the forest so that the forest ecosystem could be enhanced in terms of a variety of useful products.

Conclusions

Providing socioeconomic issues can be minimized in forest management, the community forest resources appear to have significant opportunities for development. The deficit of fodder and fuelwood in most of the CFs together with the surplus of poles and timber implies that need identification was not properly done initially and accordingly that operational plans were not well-formulated. The objective of community forestry is to fulfill the daily forest products needs of the people. To bring forest resources into their full potential, silvicultural treatments are essential. TSI methods could be applied to all forest resources to optimize productivity according to people's needs.

Community forestry is shifting its orientation from protection to production. The management for production involves the application of silvicultural treatments that provide the best mix of product alternatives to the farmers according to their needs and forest types. The job of the professional foresters is to help the farmers in determining what, when, where and how much to cut. Results of some trial plots showed that maximum fodder can be obtained from the simple coppice system; maximum fuelwood and fodder can be obtained from the phased coppice system or coppice with standards regular; and maximum poles and timber from the high forest system. Generalization of these results may be premature, however. The development of a database incorporating the results from additional trials is an important step in assessing the suitability of various silvicultural regimes.

The indigenous knowledge of the farmer with respect to the usefulness of forest products, both timber and non-timber, is significant. Farmers have knowledge of the appropriate season for harvesting and methods for tree management. They recognize the

value of NTFPs and have taken steps to conserve them for both local use and market potential. The applicability of the indigenous knowledge, however, remains to be tested.

The people's demand now for assistance in applying silvicultural regimes to optimize their forest resources is in reaction to the former protectionist orientation of forest management. The earlier protectionist type of system was in part due to the domination of the FUG committees mainly by the male members of the community and by the elite families, in other words not the true users, and in part due to the type of forests — generally badly degraded — which have been handed over to communities. It is realized now that for successful community forestry it is essential that the people who are directly involved in forest use should participate in formulating management strategy for the community forests.

The community forestry concept has been molded by a historical organization of forest management on a ward, village or clan basis. Forest management knowledge gained by farmers as a result of specialized training being seldom shared among the farmers themselves has created a certain superiority for one group and increased the knowledge gap among farmers. The formation of an increasing number of FUG shows the continuing interest of the people in forest management. The deficit of fuelwood and fodder as compared to a surplus of poles and timber shows that the management plan of some forests has been inappropriate to address actual user needs. In such circumstances, the role of professionals is critical in assisting in the delineation of forest management plan objectives. The knowledge of Rangers should be updated in terms of community forestry concepts, conflict resolution and application of silvicultural regimes.

Figures for biomass accumulation and stocking per ha, even on the control sites, in community forests are encouraging. The results of such trials provide information about management alternatives which assist the farmers in formulating management plans better able to meet their objectives. TSI is a silvicultural practice that can reduce over stocking and stimulate plants to grow faster. One way of using TSI may be for tree management that optimizes the production of NTFPs, especially those meeting daily needs, such as fuelwood, fodder and poles. The management of CFs for daily needed forest products does not preclude management for timber or other NTFPs that have medicinal and food value as well as marketing potential.

Some community forest user groups have adopted the TSI in their forests and are satisfied with the results. The knowledge of farmers about commonly used forest products and other products of medicinal and marketing value should be utilized. What community forest user groups need now are improved professional forestry services so that they might enhance their resource, both in diversity and productivity.

The NTFP, fuelwood, fodder and poles, are the main items that people are always seeking from the forest. The existing consensus of the community forest management is to optimize those products. TSI is the important silvicultural tool which all FUGs can adopt to regulate their overstocked and under-productive forest resources.

More responsibility for information dissemination, conflict resolution and solving socioeconomic problems in the CF should be shifted to the FUG committees as some FUGs are developed as model committees. The role of DoF should only be in technical support and legal issues.

People's knowledge about the species, harvesting practices and seasons is substantial. However, the significance in scale need to be tested. Combining indigenous technical knowledge and TSI could definitely lead to the better management of forest resources. TSI, thus, provides opportunity for government and forestry research institutions to work together with communities to refine silvicultural techniques in order to enhance the production of diverse forest products according to the peoples' demand. Research organizations of Nepal, such as the Institute of Forestry and the Division of Research of the Department of Forest, should be actively involved in research as they possess diverse expertise in the fields of forestry and natural resources.

Acknowledgements

The author is grateful to Dr. Deanna Donovan, Research Fellow, East-West Center, Honolulu, Hawaii, USA and Mr. Jay B.S. Karki, lecturer, Institute of Forestry, Pokhara, Nepal for assistance in the preparation of this paper. Sincere appreciation also goes to Dr. Madhav B. Karki, Coordinator, FORD/IOF Project, Nepal for providing opportunity to attend Workshop on Community Management of Forest Lands of the East-West Center Program on Environment. Thanks are also due to the Forest User Group members of Kharchyang-Azingare Community Forest, Kaski District, Gandaki Zone, Nepal for furnishing information regarding the tree stand improvement and community forestry.

References

Baral, N. R. 1993. Where is our community forestry? In *Banko Janakari: A Journal of Forestry Information for Nepal* (Forest Research Division, Department of Forestry and Plant Research, HMGN) 4(1):12-15

Dahal, D. R. 1994. A review of forest user groups: case studies from eastern Nepal. ICIMOD, Kathmandu, Nepal.

FMUDP. 1994. Proceedings of the Terai National Forest Management Seminar. Working Paper No. 9. Forest Management and Utilization Development Project (HMGN/FINNIDA), Kathmandu.

Heyde, B. v.d., A.Z. Hernandez, H.J. Weigelt, L.V. Yambao, J.B. Weingart, J.E. Bascos, and R.A. Abalus. comp. 1987. *TSI field manual.* 2nd ed. Manila: Bureau of Forest Development and Deutsche Gesellschaft fuer Technische Zusammenarbeit GMBH (GTZ).

Karki, M., J.B.S. Karki, and N. Karki. 1994. Sustainable management of common forest resources: an evaluation of selected forest user groups in western Nepal. ICIMOD, Kathmandu, Nepal.

Ladely, John. C. and Thakur B. Karkee. 1994. Baseline survey of the community forestry situation in the Rapti Zone, Nepal. Draft Report. USAID, Washington, D.C.

Master plan for forestry sector, Nepal. 1988. Ministry of Forests and Soil Conservation, Kathmandu, Nepal.

National Planning Commission (NPC). 1992. *Eighth Plan, 1990-1995.* Kathmandu: The National Planning Commission Secretariat.

Pandey, T. R., R.B. Chhetri, and M.C. Nurse. 1993. Methodology for implementing community forestry in bazaar areas: the case of Nala, Kabhrepalanchok District. *Banko Janakari: A Journal Forestry Information for Nepal* (Forest Research Division, Department of Forestry and Plant Research, HMGN) 4(1):42-45.

Tamrakar, P. R. 1992 and 1993. Management system for natural *Schima/Castanopsis* forests in the Middle Hills of Nepal. *Banko Janakari: A Journal of Forestry Information for Nepal* (Forest Research Division, Department of Forestry and Plant Research, HMGN) 3(2):3-11 and 4(1):57-62.

A RECIPE FOR SUCCESS: WOMEN AND NON-TIMBER FOREST PRODUCTS IN SOUTHWEST BENGAL, INDIA

Sumita Ghatak[1]

Abstract

In India, women often depend on a wider range of non-timber forest products than men, and have greater knowledge of their ecology and uses. Yet policy makers, project implementors, and rural development experts have overlooked the role of women in NTFP development. This paper describes the relationship between women and NTFPs in southwest Bengal. Within the framework of Joint Forest Management (JFM), constraints to women's involvement and recommendations to overcome them are examined. It is argued that women's involvement will enhance their self-reliance, increase the potential for JFM success, and improve forest conservation.

Non-timber forest products (NTFPs) have long been a major component of forest utilization in India. In southwest Bengal, villagers have collected, processed, and marketed different NTFPs for centuries, both for personal use and as a source of income. These include leaf plates and edible oil from *sal* (Shorea robusta); hand-rolled cigarettes *(beedi)* from *kendu* leaves (Diospyros melanoxylon); alcoholic beverages and edible oil from *mahua* (Madhuca latifolia), and numerous fruits, mushrooms, medicinal plants, and grasses. Recent studies by Malhotra (1992) indicate that NTFPs play a vital role in the health and viability of both forest ecosystems and the human communities that are dependent upon them. NTFPs are especially important during the lean periods of the year, and in areas where few economic options exist.

Until recently, policy makers, foresters, and rural development experts in India commonly overlooked the role of NTFPs in village life, especially the role of women in NTFP collection, utilization, and management. Throughout rural India, it is now an accepted fact that women are the primary users of forests (Chen 1993). In addition to fuelwood, they collect a range of NTFPs which play important roles in their livelihood strategies. This is especially true for the very poor, such as scheduled castes and tribals. Women may also depend upon a greater number of products than men in the same localities, and therefore may have greater knowledge of the properties, growth patterns, and potential uses of non-timber species (Venkateswaran 1992). Kaur (1991) showed that in India, women's employment in

---

[1] Assistant Conservator of Forests, West Bengal Forest Department

forest-based enterprises is approximately 571,851 million 'woman-days' per year, of which 90 percent is comprised of small-scale enterprises based on NTFPs. The same study showed that two of the main NTFP cash-earners in India, sal seeds and kendu leaves, are collected primarily by women.

This paper describes the relationship between rural women and NTFPs in southwest Bengal, India. In the context of the state-sponsored program of Joint Forest Management (JFM), women's current and potential role in NTFP management and development is examined. It is argued that policy makers and field foresters must acknowledge and incorporate women's issues in NTFP development not only because of their long history of NTFP use, but also because of the opportunity it presents to improve women's economic status (and that of the family) and increase women's participation in JFM activites.

The perspective presented is based on the author's field experience as a forester in southwest Bengal for the past three years. The study area covers three districts -- Midnapore, Bankura and Purulia. Supporting data is derived from a literature review and culled from general participatory/rapid rural appraisals conducted by the author and other forestry professionals in the region.

Background

The Setting

The study site comprises the latteritic plains of eastern Midnapore, Bankura, and Purulia districts and the undulating hills to the west (Figure 1). Forest areas are located in disjunct patches surrounded by agricultural fields and villages.

Virtually all Shorea forests in southwest Bengal are owned by the government and are classified as Dry Deciduous Sal Forest with site quality III to IV. Regeneration is poor to non-existant. Common associated species are listed in Table 1. These forests are presently managed on a participatory basis with local communities through a program known as Joint Forest Management (discussed below).

Subsistance agriculture is the main occupation. About 80 percent of total population are small farmers, many of whom are land-poor. There are also many landless people. Most of the agricultural lands are rain-fed and productivity is very low. There is no major industry.

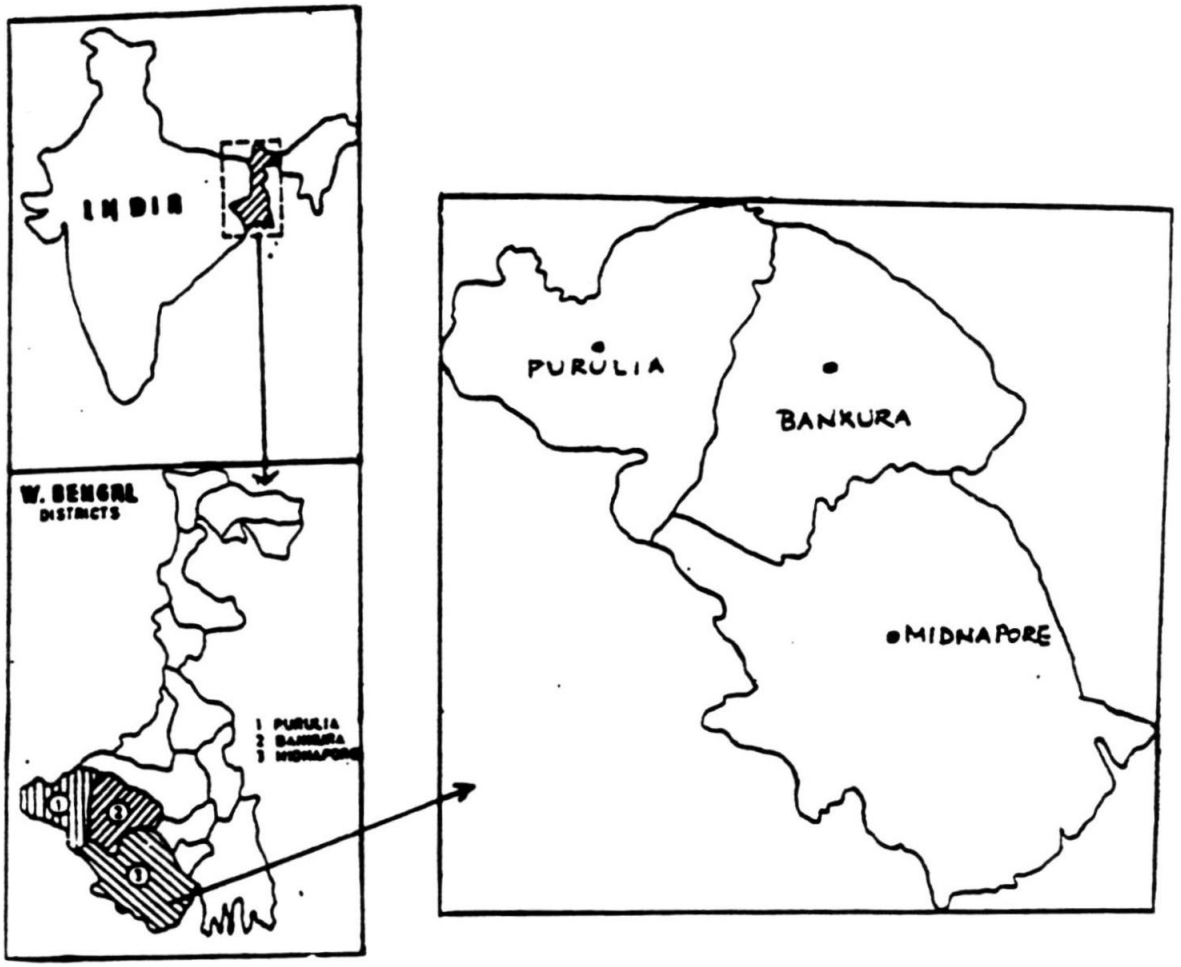


Figure 1 Map of the study area

Table 1 Common forest species in southwest Bengal

Local name	Latin name	Type
Amlaki	Emblica officinalis	tree
Asan	Terminalia tomentosa	tree
Asta	Careya arborea	tree
Bahera	Terminalia bellerica	tree
Bhela	Semecarpus anacardium	tree
Dhau	Anogeisus latifolia	tree
Haritaki	Terminalia chebula	tree
Mahua/Mahul	Madhuca latifolia	tree
Peasal	Pterocarpus marsupium	tree
Pial	Buchananica latifolia	tree
Sal	Shorea robusta	tree
Bainchi	Flacourtia sp.	shrub
Bhurru	Gardinia gummifera	shrub
Dhadki	Woodfordia fruticosa	shrub
Kurchi	Holarrhaena antidysenterica	shrub
Parashi	Cleistanthus collinus	shrub
Atarai	Combretum decandrum	vine
Alu	Dioscorea sp.	vine
Ramdatoon	Smilax sp.	vine

Source: author

Local communities, especially those members with few productive assets, are compelled to depend on forestry and allied production systems, such as tusser silk and lac culture.

The local community is composed of tribals (mainly Santhal), scheduled castes, and others. Table 2 shows caste composition among forest user groups in the three districts.

Table 2 Caste composition of forest user groups in West Bengal

District	Scheduled caste (%)	Scheduled tribe (%)	Other castes (%)
Midnapore	14.70	31.00	54.30
Bankura	30.29	26.96	42.75
Purulia	13.80	47.23	38.97

Source: West Bengal Forest Department

The Evolution of Joint Forest Management

Up until the 1930s, these districts were covered with natural sal forests. The forests were under private ownership by local landlords known as *zamindars*. With the enactment of the Estate Acquisition Act in 1953, all forests were taken over by the state forest department for scientific management. Over the following decades, growing demographic pressures on forests, especially for fuelwood and fodder, caused the once-luxuriant forests to become degraded shrubland. The conventional system of management practiced by the forest department was found to be grossly inadequate, even to protect the young sal bushes. Beginning in the late 1960s, a constant tussle between the staff guarding the forest and the people dependent upon it ensued. The forest department began to look at local issues more closely, and realized that without people's participation, sal coppice forests had no future (Palit 1993).

In 1971, the West Bengal Forest Department initiated a pilot program of participatory management in Arabari Village of Midnapore District. Once it proved successful, this approach was formalized into a state-wide program called Joint Forest Management (JFM). JFM is based on local participation in forestry: villagers and foresters share the responsibilities of management as well as the benefits. Under this program, forest-fringe dwellers have worked in cooperation with the Forest Department since 1989.

Forest Protection Committees and Benefit Sharing

Villagers living adjacent to forests may opt to become members of official forest user groups, referred to as Forest Protection Committees (FPCs). In the study area, the participation of the villagers in FPCs is almost 100 percent. Each FPC has one nine-member executive committee which includes two members from local government institutions and six elected or nominated representatives; the local forest beat officer serves as member-secretary. Since 1989, about 2400 FPCs have been formed and are working in this area.

FPC members help government forest staff in all protection activities, earn income from forestry labor, and take part in management decisions concerning their local forests. They are entitled to collect dry twigs and leaves, grasses, and all other NTFPs (except cashew nuts) free of cost. They also receive 25 percent of net sale proceeds from cashew nuts each year; one-fourth of the produce obtained as an intermediate yield from coppicing, multiple shoot cutting, and thinning; and 25 percent of net sale proceeds from timber harvests. Sal seeds and kendu leaves are marketed through the West Bengal Tribal Development Co-operative or the local office of the Large-Scale Multipurpose Society (LAMPS).

Women's Involvement in JFM

Early JFM surveys conducted by the forest department showed that women were dependent on a wide range of naturally occurring forest species. They also spent much more time in the forest than men, mainly to collect fuel, fodder, and other NTFPs. Thus, incorporating women into JFM would be a key factor in the viability of the program. Based on these conclusions, the government decided to involve women directly in JFM. In 1991, an order was issued providing 'joint membership' for husband and wife. Women became official members of FPCs, with all the same rights and decision-making power as men. The majority of FPCs in the study area mixed, however twenty-four are comprised exclusively of women.

NTFPs in Southwest Bengal

General Overview

According to Malhotra (1992), an average of two insects and seventy-one plant species are utilized by FPC members in southwest Bengal. He also found that different parts of one species can be used for different purposes: sal, for example, can be used for plates

(leaves), incense (dammar), and oil (seeds). About 67 percent of all NTFP species used, however, are collected for one part only.

In addition to food, fodder, and fuel, NTFPs are used for a variety of purposes in the study area. In the past, medicinal plants were collected in small amounts when required, generally by the *kabiraj* (medicine man), local midwives, and villagers. Recently, however, some FPC members have started to collect these plants on a commercial basis, especially Andrographis paniculata, the bark of Symplocos racemosa, and the fruits of Emblica officinalis. Many household items continue to be made from NTFPs: *kharang* grass (Aristida sp.), for example, is used to make brooms, and sal leaves are used for plates. Both are harvested in large quantities and sold in local markets as well. NTFPs with ritual and ornamental value are also collected, mainly by women.

Socio-Economic Factors

There is wide inter- and intra-variation in the numbers and quantities of NTFPs used by local people. Malhotra (1992) showed that tribal groups are more dependent on NTFPs than caste populations: the proportion of NTFP income to the total family income is about 22 percent for tribals, whereas for castes it is only 13 percent. In addition, the dependence of caste households on forest fuels and fodder is half that of tribals. Tribal groups, principally composed of impoverished marginal farmers and wage laborers, show greater overall dependency on NTFPs.

A case study conducted by the Society for Promotion of Wastelands Development (1992) showed that in West Bengal, approximately 20 percent of the total annual family income comes from NTFPs. Malhotra (1992) reported that on average, each FPC in West Bengal derived an annual income of IC 2299.00 (USD 73.00)[2] per hectare from NTFPs.

In southwest Bengal, a total of 136,720 hectares of forest are currently under FPC protection. All things being equal, it can be projected that the total annual income from NTFPs in this region could be on the order of IC 314 million per year (USD 9,968,254.00). In this area, income generated from NTFPs is mainly from the sale of sal and kendu leaves. In some areas, FPCs manage for *sabai* or *babui* grass (Eulalopsis binata) which is used for

[2] One US dollar is equivalent to IC 31.5

making rope that is sold in local and regional markets. Table 3 shows current price trends of important NTFPs in southwest Bengal.

Table 3 NTFP price changes, 1991-1994*

NTFP	1991	1994
sal leaf plates	Rs. 15.00 per 1000	Rs. 20.00 to 25.00 per 1000
mushrooms	Rs. 20.00/kg	Rs. 30.00 to 35.00/kg
sal seeds	Rs. 1.25/kg	Rs. 1.50 to 2.00/kg
kendu leaves	Rs. 4.00 per 1000	Rs. 8.00 per 1000
tusser cocoons	Rs. 0.50 per piece	Rs. 1.00 to 1.25 per piece

*IC 1.00 = USD 0.03
Source: Malhotra 1992

Men's Bonus, Women's Burden: Gender Issues in NTFP Use and Development

The Facts

Researchers in West Bengal (SPWD, 1992) reported the following findings on NTFPs:

- gathering is done in the proportion of three females to one male.
- processing is done exclusively by females.
- marketing is done in the proportion of two females to one male.
- 71 species are collected exclusively by females, 23 by males, and 10 by both.

Tables 4 and 5 show some relationships between gender, NTFPs, and economic activity in West Bengal. Table 4 uses broad categories based on end-use and refers to gathering only. Table 5 lists NTFPs specific to southwest Bengal, and shows gender divisions within the different economic activities: collecting, processing, and marketing. Use patterns for these NTFPs are described briefly in the following section.

Table 4 NFTP gathering by gender

NTFP	Gathered by:	
	Female	Male
fuel (dry twigs & leaves)	38	4
fodder for goats	3	3
structural	2	2
religious	4	1
ornamental	2	0
medicinal	2	14
minor household articles	3	0

Source: SPWD, 1992

Table 5 Commercial NTFPs in southwest Bengal

C=collecting P=processing M=marketing
F=female M=male

NTFP	C	P	M
Sal leaf plates (Shorea robusta)	F	F	M
Sal seeds (Shorea robusta)	F	F	M
Kendu leaves(Diospyros melanoxylon)	F	F	M
Mahua flowers (Madhuca latifolia)	F	F/M	F/M
Kharang grass (Aristida sp.)	F	F	M
Khajur leaves (Phoenix sp.)	F/M	F	M
Kurkut (ant larvae)	F/M	-	M
Sabai grass (Eulaliopsis binata)	F/M	F/M	M
Mushrooms	F/M	F	F/M
Tussar cocoons	F/M	-	M
Lac	F/M	F/M	M
Medicinal plants	F/M	-	M

Source: author

Women's Products

Making plates from sal leaves is the most important income-generating activity based on NTFPs in southwest Bengal. Sal plates are used in all festivals and ceremonies, and have had a steady local market for centuries. Women and children gather sal leaves when going to the forest for fuelwood. When they return home, they stitch the leaves into plates using the leaf rachis of *minjiri* (Cassia siamea) and *neem* (Azadirachta indica), and leave them to dry in the sun. The plates are then bundled together and sold in the market by the women's husbands, fetching a price of approximately IC 25 per 1000 plates (USD 00.79). A higher quality plate is composed of two roughly constructed plates that are joined using a simple hand-held machine. Double plates can fetch up to IC 200.00 per 1000 plates (USD 6.35). Sal plates are biodegradable and cost effective, and the demand continues to rise, both regionally and throughout the country (Deb, 1990).

Sal seeds yield an edible oil, and the oilcake is used for cattle feed and fertilizer. Sal seeds are collected and decorticated by women, then marketed through the local office of LAMPS (Large Scale Multipurpose Societies) or sold directly to local factories. The majority of seeds collected from this area are sold to local factories. Seeds are also used as a barter good for procuring daily necessities, even though private trade is technically illegal.

Madhuca latifolia (*mahua*) is a tree with multiple uses. The flowers are used for making country liquor and as food in lean seasons, the fruits yield an edible oil, and the oilcake is used as fertilizer. Women generally collect the flowers and fruits and perform all the preparatory tasks for making liquor. Distillation is done by men, and they both share the responsibilities of marketing. Mahua liquor is especially important to local tribals.

Kendu leaves (Diospyros melanoxylon), used for making the hand rolled cigarettes called *beedis*, are collected both by men and women, after which they are dried, bundled, and marketed. Marketing is done mainly by men. In West Bengal, LAMPS, under license from the Tribal Development Corporation, has a monopsony on kendu leaves; all collectors must sell to them.

In west Midnapore District and southwest Bankura District, rural people collect ant larvae, or *kurkut*, which is used both as human food and fish bait. The price is approximately IC 25 per kilogram (USD 00.67) in local markets. Poor women, especially Lodha tribals, claim that even though kurkut is a preferred food source, they cannot obtain it in sufficient quantity due to competition with men from a neighboring non-tribal group known as *Mahatos*. The men collect it as a source of extra income (fish bait). Thus, kurkut utilization in this region involves three interwoven conflicts: tribal *vs* non-tribal, men *vs* women, and subsistence *vs* surplus.

Women FPC members in parts of Bankura District (north) report that they collect a grass called *jun* which is used for securing Piper betle vines. (The leaves of this vine are used to make India's well-known snack and stimulant, *pan*.) There is no local market so the women have to sell it to middleman at the low price of IC 2.00 per kilogram (USD 00.06); the actual market price is about IC 8.00 (USD 00.25) for the same quantity.

In Joypur and Bishnupur Ranges of the same district, women make necklaces from the hard fruit coat of Aegle marmelos (*bel*), a small tropical tree. They can earn up to IC 20.00 per day (USD 00.63) from this activity. Women collect mature fruits and boil them in water. The endocarp is taken out, and the hard fruit coat (pericarp) is dried. The pericarp is made into the small beads used to make the necklaces. Unfortunately, bel trees growing in the forest have low abundance and density; the fruits are sold also commercially in more well-established trades in food and herbal medicine resulting in a shortage of supply. In response

to requests from women FPC members, local forestry staff are investigating the potential for bel to be grown in plantations and are searching for suitable varieties. They are also providing training on jewelry design.

A number of women in all three districts make brooms and mats from the leaves of wild date palm (Phoenix sp.), locally called *khajur*. Leaves are collected by men and women, however construction is typically done by women alone. Both men and women are involved in marketing. A standard-size broom and mat can earn an average of IC 5 (USD 00.16) and IC 30 (USD 00.95) respectively. Not all FPCs in this regions are involved in this enterprise, however, and outsiders use their forests to collect the leaves. Minimal local involvement can be attributed to the lack of a local market, technical know-how, and awareness about the market potential. *Kharang* grass (Aristida sp.) is also used for making brooms. Women collect the grass and construct the brooms, but men do the majority of marketing.

Tusser silk cocoons are found naturally throughout the area on sal, *alan* (Terminalia tomentosa) and *arjan* (T. arjuna) trees. The cocoons yield silk threads used for costly dress materials. Men traditionally collect and market the cocoons, but in the Ranibandh and Jhilimili area, women cultivate alan and arjan trees in plantations and rear the silk worms themselves. The West Bengal Forest Department (WBFD) has initiated programs to involve more women in tusser cultivation; the rearing of silk worms complements the reproductive role of women in society in addition to being an economically productive activity.

In drier areas, cultivation of *babui* or *sabai* grass (Eulalopsis binata) on private wasteland is becoming popular in response to a growing market. Sabai grass is used for rope, paper pulp, and fodder. Men use the rope in the construction of sofa sets and chairs with bamboo frames; women weave it into door mats, fashionable bags, and other decorative items. Buyers includes LAMPS, local businessmen, and buyers from other states like Orissa and Bihar. In terms of production, men do the plowing and weeding; both harvest and process it into rope. Women stretch the rope onto a wooden frame for drying, and smooth the rough surface by rubbing it on a tree. The quality of rope is determined by its finishing: thinner ropes fetches a better price.

In some areas, villagers have illegally cleared small patches in government forests or planted in existing gaps because financial returns from sabai are so attractive. The forest

department has responded by planting sabai grass as an intercrop in plantations of Madhuca latifolia (mahua), Alstonia scholaris (chhatiyan), Terminalia sp. (arjun, alan), and Buchania latifolia (pial). FPC members get 100 percent of this intercrop free of cost. This strategy has been shown to work well for encroachment recovery also.

The Rural Development Corporation (RDC) believes there is good market potential for sabai handicrafts nationwide, and that a sufficient supply of the raw materials is available in this region. However, the lack of awareness among FPC members on value-addition and product diversification remains a constraint for commercialization. To rectify this, RDC and the Indian Institute of Technology, in collaboration with the forest department, recently started a training program for FPC members to improve sabai handicraft production.

Poffenberger and Malhotra (1989) reported that women in West Bengal can earn between IC 2500-3000 per year (USD 79.00-95.00), or IC 7-10 per day (USD 00.22-00.32), from one hectare of mixed sal forest after three to four years of protection. The reader should keep in mind, however, that this income is supplementary and depends greatly on whether women market their products themselves or not.

Involving Women in NTFP Development: Constraints and Opportunities

The key constraints to involving women in NTFP development are:

- limited access to markets, value-adding technology, training, and credit;
- lack of decision-making power, and
- foresters' lack of awareness and skills to elucidate women's knowledge, needs, and preferences, and to incorporate them into interventions.

Limited Access to Markets, Value-Adding Technology, Training, and Credit

Even though women are the principal gatherers and processors of all important NTFPs in southwest Bengal, marketing is done almost exclusively by men. Any income earned goes into male pockets. In rural areas, this money is commonly spent on liquor, gambling, or other forms of entertainment; families derive little benefit. Women, on the other hand, tend to transfer more of their income into the family budget. As suggested by Molnar and Schreiber (1989), if forest produce goes primarily to men's cash-generating enterprises and exacerbates shortage of products required by women for subsistence or market-oriented activities, the net

income accruing to the household may decline rather than increase. This situation applies to southwest Bengal. Here, women's direct involvement in marketing could increase the welfare of their households, but they have access to local markets only, if any. Like other places in India, they can neither store products nor do they have the means to transport their goods to outside markets; they are forced to sell them locally at whatever price is offered (Kaur, 1991).

All villagers could benefit from marketing assistance; however, a formal marketing system might be especially helpful to women in that it offers a way to bypass male hegemony and market products directly. FPC members, male and female, could be organized into societies or village groups to improve their bargaining power, especially if the volume of merchandise increases. One FPC cannot fulfill the whole demand of a market, so contiguous FPCs could cooperate for greater market capture. Forests may improve from more coordinated management. This strategy is appropriate for all commercial NTFPs and would be particularly helpful to women.

Only LAMPS is entitled to trade sal seeds and kendu leaves, but they are not well established in southwest Bengal. Long payment delays force villagers to sell their products at low prices to unauthorized middleman. The Forest Development Corporation could assume the role of intermediary in areas where LAMPS activities are weak or lacking.

Women may also be unaware or unable to take advantage of value-addition techniques that could give them higher returns. For example, double sal plates made using a hand machine earn approximately ten times more than single plates made by hand stitching. The lack of machine and technical know-how forces women to sell roughly constructed plates at low prices. In addition, the number of males producing machine-made sal plates is increasing, taking a greater share of income away from females.

In collaboration with local NGOs, the forest department arranges on-going training programs for FPC members on value-addition, product diversification, and other forest-based activities like beekeeping and mushroom culture. The number of women trainees, however, continues to be very low because women are afraid of traveling alone and staying away for few days, upsetting their family routine. Executive committees also commonly overlook women when it comes to selecting particpants. These problems could be overcome by selecting more than one woman from each FPC for training, and having trainings of short

duration that are held nearer to villages. Training programs, however, should be sensitive to the fact that mechanization and technology improvement has decreased or eliminated women workers throughout the world. For example, when agriculture was mechanized, the role of women shifted from primary producers to subsidiary workers (Shiva, 1988).

Credit programs typically target men, the traditional household head in patriarchal societies like India. An FAO study from Karnataka, however, identifies the lack of credit as a major obstacle women face as well, especially in processing and marketing NTFPs (FAO, 1990). Women require monetary assistance to finance marketing ventures and to purchase, install, and maintain processing units and other value-adding technologies.

Funds for women are available through the Development of Women and Children in Rural Areas (DWCRA) and other organizations, but many women cannot take advantage of these programs due to the remoteness of their villages and the limited awareness of outside agencies. Rural development and other social service organizations also commonly overlook forest-based enterprises as a potential income source for women. In some areas of Bankura District, the forest department is financing value-addition technologies for some NTFPs, but resources are limited. The Rural Development Department and/or local NGOs could be encouraged to act as local creditors for women. Women FPC members could also be organized and registered as societies under the Society Registration Act, which may help them in obtaining bank loans. This is a promising strategy, encouraged by recent studies which indicate that rural women have a better reputation in loan repayment than men (FAO 1991).

In sum, women's limited mobility, extensive work load, and subordinate position in society and family work together to preclude them from participating in training, extension, credit programs, and other services meant for them.

Lack of Power in Decision-Making

Even though women in southwest Bengal are joint members of FPCs by law, both women and men are not fully aware of this fact. The forest department is trying to increase community awareness through meetings, training programs, and study tours; however, when a decision needs to be made, voting rights are limited to one per family. Under these circumstances, women's opinions are rarely considered, and voting is dominated by males. For meaningful participation of women in JFM programs, there should be two votes per

family, backed up clearly by Government Order. This, in addition to increasing the number of women on FPC Executive Committees, will help to minimize gender discrimination by strengthening women's input in forest management decisions and improving their chances to participate in trainings.

Foresters' Lack of Skills to Elucidate Women's knowledge, Needs, and Preferences, and to Incorporate Them into Interventions

Though foresters in southwest Bengal are trained to work with villagers and manage forests according to local requirements and technical information, there is a lack of understanding and skills needed to enhance women's participation in forestry programs. All field foresters are male and sometimes they fail to understand women's problems. There are several social and cultural constraints which limit their interactions as well. Skills development training is needed to improve understanding of women's issues in the context of forest conservation and utilization. Increasing the number of women in field positions would also help.

Basic information on NTFPs and society is also lacking. To overcome this, the research wing of the forest department could initiate studies on resource availability, productivity, quality requirements, harvesting, and silviculture of major NTFPs. They could also investigate the impact of NTFP enterprises on women and rural economies. The newly formed Marketing Cell could search out new market opportunities for local NTFPs and disseminate market information on a regular basis.

Conclusion

While there is a dearth of information on the relationship between women and NTFPs in India, past forestry research demonstrates that since women are the primary users of the forest, they perceive and suffer the negative consequences of deforestation more readily. As such, they tend to be more conservation-minded than men (Chen 1993). Shiva (1988) argues that women are 'naturally' closer to forests and preservation is part of the 'feminine' ethos. Women also depend on forest products in a much more immediate sense for the welfare of their families. These findings imply that women may also have important knowledge about the ecology, use, and properties of different NTFPs, but unfortunately no research has been

undertaken on this topic as yet. International workshops continue to emphasize the need to develop the NTFP sector, yet none have addressed the current or potential role of women.

In India's JFM program, it is high time to incorporate women's knowledge and perspective in NTFP development and management, not only because of close ties between women and nature, but for practical and ethical reasons as well. Their long history of use is reason to suspect that female FPC members may have special information that could be useful in developing sound management plans. Because of their low status, women also deserve special assistance to increase their decision-making power in forestry activities and enhance their personal economic independence. This could be achieved through small-scale forest industries based on NTFPs. As women's position improves, they may be more motivated to protect forests within the framework of JFM.

There are good opportunities for organizing NTFP activities such as sal plate making, tusser cultivation, and broom and mat weaving into exclusively female industries. But this should not be undertaken without thoroughly assessing possible socio-economic and gender-related impacts: programs designed to help women can result in increasing their work load without increasing their control over the product of their labor.

To conclude, involving women in NTFP development can have three positive effects:

- the condition of women will be improved;
- the sustainability of the JFM program will be improved;
- and ultimately, the condition of forests will be improved.

Acknowledgements

I would like to thank Dr. Deanna Donovan and Ms. Maureen A. DeCoursey of the East-West Center, and Mr. J. B. S. Karki from the Institute of Forestry, Nepal, for their thoughtful advice in writing this paper. I would also like to extend my thanks to Mr. D. K. Basu and Mr. A. K. Jha, Deputy Conservators of Forests, and Ms. L. Ray, Asst. Conservator of Forests, West Bengal, India, for their help in conceiving the original ideas for this paper.

References

Chen, A. M. 1993. *Women and wasteland development in India.* Issue paper on Women and Wasteland Development in India. Sage Publications. New Delhi.

Deb, Debal. 1990. *An estimation of the possible effect of community leaf harvesting on the productivity of sal forests in West Bengal.* Working Paper, Indian Institute of Bio-social Research and Development. Calcutta.

Food and Agriculture Organization (FAO). 1990. *Secretariat note of committee on forestry -- women and forestry.* Item No. 5 of the Provisional Agenda, COFO-90/4, June. Food and Agriculture Organization of the United Nations. Rome.

----. 1991. *Most farmers in India are women.* Food and Agriculture Organization of the United Nations. New Delhi.

Kaur, R. 1991. *Women in forestry in India: Policy, research and external affairs.* Working paper, Women in Development Program. World Bank. Washington D.C.

Malhotra, K. C. 1992. *Joint forest management in West Bengal: Study on non-timber forest produce (NTFP) and FPC structure and performance in Jamboni range, Midnapore district.* Working paper, Indian Institute of Bio-social Research and Development. Calcutta.

Malhotra, K.C. and M. Poffenberger. 1989. *Forest regeneration through community protection: The West Bengal experience.* Paper presented at the Workshop on Forest Protection Committees. Forest Department, Govt. of West Bengal.

Molnar, A. and G. Schreiber. 1989. *Women and forestry: Operational issues.* Working paper No 184. The World Bank. Washington, D. C.

Palit, S. 1993. *The future of Indian forest management: Into the twenty-first century.* Working paper No. 2, National Support Group for Joint Forest Management. Society for Promotion of Wastelands Development and the Ford Foundation. New Delhi.

Shiva, V. 1988. *Staying alive: Women, ecology, and survival in India.* Kali for Women. New Delhi.

Society for Promotion of Wastelands Development (SPWD). 1992. *Joint forest management: Concept & opportunities.* Proceedings of the National Workshop held at Surajkund. Society for Promotion of Wastelands Development, New Delhi.

Venkateswaran, S. 1992. *Living on the edge: women, environment and development.* Friedrich Ebert Stiftung. New Delhi.

PRODUCT DEVELOPMENT

LAC: PROMISING FOREST AND AGRO-FORESTRY PRODUCT IN THAILAND

Nuchanart Nilkamhaeng[1]

Abstract

This paper discusses the lac cultivation in Thailand. Lac, an important non-timber forest product, could be developed as an important additional source of livelihood for the rural communities. The revenue from lac cultivation could not increase and improve the socio-economic status of rural communities but lac cultivation also promote sustainable conservation of the forest lands for posterity. In addition lac cultivation promotes tree planting as host trees are required for the lac insect. In broader terms lac cultivation could strengthen the employment opportunities and promote national economic development.

Timber is still the most important forest product in Thailand, although domestic supplies are now insufficient to meet additional needs. Non-timber forest products (NTFPs), also known as non-wood forest products or minor forest products, however, can be highly valued in the daily life of the rural people who both consume and sell these goods. In the past, NTFPs were ignored by the policy makers and almost all of NTFPs were consumed domestically. When logging was banned in 1989, NTFPs began to play a more important role. There is a wide diversity of NTFPs in Thailand and these are classified into two categories: protected and non protected. Protected NTFPs include wild orchids, aromatic wood (Dracaena loureirei Geegnep.), agarwood (Aquilaria sp.), Mansonia gagei, Drumm sappan (Caesalpinia sappan Linn.), charcoal, yaang oil (*gurjan*), various barks (Castanopsis spp., Walsura spp., Hopea spp., Cotylelolium melanoxylon Pierre., Persea spp., Litsea spp., Shorea spp., Artocarpus spp., Cinnamomum spp., Platycerium spp.), gums, resin (gutta percha, Pentace spp., *jelutong*, lacquer, resin, oleoresin), some ferns (Platycerium spp., Osmanda spp.), rattans and talipot (Corypha umbraculifera) (Subansenee 1991). In Thailand NTFPs are both imported and exported. In 1992, the value of exports was 414.4 million baht (USD 16.5 million) while the value of imports was 279.5 million baht (USD 1.1 million).

Lac, a resin and one of the most important of the non-protected NTFPs, is an important source of cash income for the rural people. In the last ten years the production of lac products has fluctuated greatly because of unfavorable weather conditions, insufficient lac host trees, and unstable market prices. In 1991, the production of stick lac (the unprocessed form of the resin as collected from the tree) was about 5,900 tons while the total exports of

[1]Scientist, Non-Wood Forest Products Development Sub-Division, Forest Products Research and Development Division, Royal Forest Department, Bangkok 10900, Thailand

lac products were 3,692 tons (about 107 million baht, or USD 4.3 million) and the imports were only 4.8 tons (about 0.6 million baht, or USD 24 thousand). Thus, most lac products in Thailand are exported and generate high financial returns. Lac cultivation, generally an activity requiring tree cover, should be encouraged not only to increase rural people's incomes, but to promote tree planting and protection and sustainable management and conservation of forest lands.

Background

Lac is the resinous secretion of the lac insect which is essentially plant louse, the most common of which is Laccifera lacca Kerr., of the family Lacciferidae. The lac insect is a very small, indeed minute, red insect — smaller than the human hair louse. The complete metamorphosis from egg to larva to pupa and adult takes place within six months. Thus, there can be two generations during a single year, one maturing in May-June and one in November-December (Watt 1908; Burkill 1966; Subansenee 1986; 1988). Most of the time, the lac resin is harvested only once each year generally in the period September to December.

The lac insect is very prolific with each female producing about 200 to 500 eggs. When the larvae emerge from the shell of the dead mother insect, they swarm on the twig searching for suitable feeding places. After feeding, they secrete resinous matter to cover themselves. The male insect is of two types, the winged and wingless. The mature male emerges from its cell, mates with the immobile, mature female in the female cell and then dies in two to three days. The fertilized female redoubles its secretion rapidly laying several hundred eggs within six months, before dying exhausted. (When the female dies there is more resinous matter available which is collected and used for varnish making.) The second generation grows more slowly. The larvae take two to three weeks to swarm to the new feeding place.

In the mid-1800s, the lac was used for dyeing and for medicinal purposes. Lac dye is good on silk and is resistant to light, acids and alkalies. It produces orange, pink to crimson dye, depending on the duration of the dyeing period, and gives purple dye when used in association with indigo. The dyes were important up to the time of the wide-scale use of

aniline dyes. For the lac used for medicinal purposes, there is a species of Tachardiella in Mexico, which secretes resin used by the Mexicans to cure stomach ailments (Burkill 1966).

In the past, the lac was collected only in the natural forest. Since the utilization of lac resin expanded in the 19th century, the demand for lac resin has increased. Cultivation of the semi-domesticated lac insect is now found in India, Thailand, China, Myanmar, Laos, Cambodia and Indonesia. Thailand is the second largest lac producing country after India. Lac is produced only in the northern and northeastern regions which produce about 84 percent and 16 percent respectively. Lac is produced on the remnant trees and shrubs on farmlands and in the natural forests where there is a great number of lac host trees. Certain tree species that have been found to nourish the lac insect better than others have become commonly used as lac host trees[2]. In India, the best known are Butea frondosa, Ficus religiosa, Schleicher trijuga, Shorea robusta, and Zizyphus jujuba, all indigenous trees species (Watt 1908). In Thailand the major lac host tree is raintree, Samanea saman, on which the lac is highly productive, yielding annually as much as 390 kg per *rai* (2,437.5 kg/ha). Other lac host trees which stimulate production are Zizyphus maretiana, Albizzia lucida, Combretum quadrangulare, Acacia decurrens. All except the last are forest species in Thailand.

As a result of the 1989 logging ban which reduced log supplies and boosted wood prices, host trees, such as Samanea samam Kerr., were cut down for wood-carving and other uses. Thus many host trees important for lac cultivation were lost. Hence it is now necessary to plant lac host trees to increase the productivity of lac.

---

[2]Mostly the Leguminosae tree species are good lac host trees. The appropriate age of the tree depends on the individual species. Usually, the lac insects are introduced after the third or fourth year of planting. For example, for Samanae saman and Zizyphus mauretina, the suitable age is about 5 years; for Acacia decurrens, the age is about one to two years. The basic requirements are maximum branches and leafy biomass. Presence of this lac insects reduce the growth and form of the trees. Although this may reduce the value of the tree for timber, the branches and rest of the woods can be used as fuelwood.

Lac Production[3]

The farmer plays the primary role in lac cultivation. Although lac cultivation may appear at first relatively simple, it requires knowledge, skill, and experience. The productivity of the lac insect varies not only with the host tree, its food source, but also weather conditions. The returns to lac cultivation will depends on the skill of the farmer in harvesting, processing and storing the products.

Appropriate Method for Selection of Brood Lac

Brood lac to be used for infection must be healthy and not infested with any pest. Lac should be left on the host tree until the lac insect is ready to swarm. It is very harmful to cut the lac before or after it matures. Premature cutting of the lac is very harmful because the female insects are cut off from their food supply and the female becomes weak. Late cutting is also harmful because the young larvae will be lost. The most appropriate time for cutting brood lac is when, upon examination, on the area of the orange yellow spot of the female lac cell cracks in the encrustation are visible.

Preparation of Lac Host Tree

If the host tree is big or medium-sized, such as the raintree, the tree should be pruned one to two years before inoculation. To be suitable for lac insects the age of the branches should be one to two years old. Before lac inoculation, it is important to remove all dead branches and control any ants.

Method of Inoculation

The brood lac selected should then be cut into a length of about six inches and tied with a string at the end of the twig and covered with a straw basket. Brood lac should be tied onto the tree longitudinally, vertically, or laterally as near as possible to the branch on which the young are to settle. Leave tied to the tree about one week, then move the brood lac to another branch. The brood lac should be left on the tree not longer than three weeks before removal. Be careful to avoid over infection. The lac insect will complete its life cycle

---

[3]The information used in the preparation of this paper was gathered from a review of the literature on lac cultivation and from interviews with staff of the Royal Forest Department working on non-wood forest products development.

within six months. Then the lac can be cropped or left on the tree for self-infection six months more and cropped when it matures. The pruning or pollarding of the host trees should be done every three years.

Harvesting Techniques

Lac is cropped from trees both for use as brood stock and for use as industrial raw material. The method of collecting is different and depends on the purpose, i.e., for brood lac use (as described earlier) or for industrial use (when the insects complete their generation). When the lac completes its generation, the lac encrustation can be pulled off from the host twig with ease. How the lac will be used will determine the method of collection, as follows:

- for varnish, lac should be cut just after or before swarming is due to occur;
- for dye, lac should be collected before swarming, because at this point the lac cell contains all of the dye.

Storage

After lac is cut it should be scraped from the twig as soon as possible by using sharp knives. To avoid 'blocking', lac should be spread on a clean floor, and air dried away from direct sunlight. The lac may be spread in layers about four inches deep to prevent it from sticking together when freshly cut. The lac may be raked over once a day until it is dry, then raked once in three to four days. If the lac has already blocked, it should be broken at once. Blocky lac not only makes processing difficult but adversely affects chemical and physical properties which will reduce the price. Because lac can deteriorate in storage, it should be stored in a cool, ventilated room be fumigated with carbon bi-sulphide against insect attack.

The productivity of lac depends on the size and species of the lac host tree, as mentioned above. Some host trees provide good nourishment for lac insects and make them highly productive. For example, a small, medium, and large Samanea samam can produce respectively ten, sixty, and one hundred kilograms of lac resin per tree. And if the tree is mature, it can yield 100 to 300 kg per tree annually. In addition to the size and species of the host tree, lac productivity depends on the weather conditions and predation of lac insects by enemies such as ant and white lacworm (Eublemma amebilis, Moore). The most serious problems and obstacles encountered by the farmer in successful lac cultivation are:

- *extreme weather conditions* — high temperatures, extreme fluctuations in humidity and rainfall affect the metamorphosis of lac insects. If there is a long hot season, the lac resin will melt which impairs the respiration of lac insects and kill them. Thus, the whole lac products may be lost as well as the brood lac. This causes the farmers to abandon lac cultivation.

- *poor quality* — the quality of products may be lower than the industry's or exporters acceptable standards due to premature harvesting, impurity in the stick-lac, the improper storage of stick lac, and incorrect drying.

- *lack of skills in lac cultivation* — there is no appropriate technologies for improved lac cultivation.

- *market volatility* — unstable prices for lac cause high variability in production which further contributes to market volatility.

- *lack of lac host trees* — when the market price for lac declines Samanea saman, the major lac host tree, is cut down for carving, furniture, and utensil making. Thus, if and when the rural people become interested in lac cultivation again, the lac host tree and brood lac necessary to expand cultivation are not readily available.

Investment Requirements

There are two main categories of investment with regard to lac production. Both relate to investment in securing suitable lac host trees, such as raintree. Thus the two alternatives are:

- investment in a raintree plantation, either a small number near the house or in the field and large plantation;
- investment of renting a tree.

A study on the costs and returns for both categories of lac production (see Table 1 and 2) was conducted on 1989. It revealed that for plantation investments, the cost from lac cultivation is about 3,700 baht/rai (approximately USD 925/ha) and the profit is about 3,000 baht/rai (approximately USD 750/ha) per year. For rental option, the cost of lac cultivation is about 370 baht (USD 15) per tree and the profit of lac cultivation is about 150 baht (USD 6) per tree. An analysis of return on investment was also made on these categories. The result of the analysis showed that the payback period for lac plantation investment was about nineyears, while in the rental system the payback period was about four years . The revenue

in a raintree plantation except from lac cultivation is from selling wood which shows in Table 3. (Rienukul 1989; Subansenee 1993).

Table 1 Annual cost and return from lac cultivation per hectare of raintree plantation (in US dollars)

	age of trees (years)			
	6	9	12	15-27
1. Cost	903.19	910.27	922.27	922.27
2. Average production (kg)	1,868.12	2,056.88	2136.25	2,256.25
3. Price per kg	0.75	0.75	0.75	0.75
4. Revenue	1,401.09	1,542.66	1,602.19	1,692.19
5. Profits (net)	497.90	632.39	679.92	769.92
6. Cost per kg	0.48	0.44	0.43	0.41
7. Profit per kg (3)-(6)	0.27	0.31	0.35	0.34

Souce: Samra 1989

Table 2 Annual cost and returns from lac cultivation on rented tree (in US dollars)

	Year	
	2nd-6th	7th-11th
1. Cost	14.82	15.02
2. Lac production per tree (kg)	28.20	28.20
3. Price per kg	0.75	0.75
4. Revenue (2)x(3)	21.15	21.15
5. Profits (net) (4)-(1)	6.33	6.13
6. Cost per kg	0.52	0.53
7. Profits per kg	0.21	0.22

Source: Samran 1989

Table 3 Net returns from joint production of lac and wood in raintree plantation (USD)

Net Return

	Year				
	6th	9th	12th	15th-27th	30th
Lac cultivation	501.46	636.50	684.39	524.63	524.63
Smallwood & timber	79.82	156.94	265.69	---	12,342.20
Total	581.46	843.44	950.08	524.63	12,866.83

Source: Samran 1989

The Processing and Products of Lac Resin

There are six main products produced from lac resin in Thailand. They are:

(1) **stick lac**, the resin encrusted twig, as collected from the tree and separated from the twigs either by breaking by hand or by scraping with a knife;

(2) **seed lac**, a product is obtained by washing crushed stick lac;

(3) **shellac**, thin flakes formed by stretching the fuse resin which has been freed from infusible materials by melting;

(4) **bleached lac**, produced with hypochlorite solution.

(5) **brood lac**, healthy freshly cut lac with fully developed larvae still inside mother cell;

(6) **lac dye** , an edible dye extracted from the shell of the lac insect and used in. It is used for coloring food and dyeing wool, cotton and silk.

Stick lac is the only product produced by farmers. All other lac products are lac products are produced by industry. The technical aspects of the various production methods is described below.

Seed Lac Processing

After scraping the lac from the twig, the collector should remove any dirt, stick and any other visible impurities by hand. Then the stick lac is crushed using a mechanical lac crusher. The stick lac is now ready for the washing process. Crushed lac is placed in a cement tank covered with water and washed. Lac can be washed with plain water or water with soda ash which is added to make it clear. Then the water containing the lac dye is allowed to run off. This process is repeated three or four times until most of the lac dye has been removed. The material remaining, seed lac, is dried on a shaded cement floor.

Shellac Processing

Seed lac is converted to shellac by a steam process. The seed lac is placed in the sieve, under which is a tray into which the shellac will pass after being melted by a steaming process of about 40 to 50 pounds per square inch of pressure for 1.5 hours. This material is called shellac. After removing the hot shellac tray from the steamer, place the tray in water and pull off the shellac from the tray. Flake shellac can be made by heating shellac over a

fire (if a yellow color is needed, mix with a yellow arsenic sulphide). Then the melted shellac is transferred through the cooling rollers of the sheeter and passing along a belt conveyor to obtain a sheet of shellac. Dry the shellac by air heater. Break into small chips and keep in an air conditioned room at a temperature of 10 to 20°C.

Bleached Lac Processing

To produce bleached lac, seed lac should be dissolved in a hot solution of soda ash at a temperature of 70 to 80°C and boiled for about one hour. After all the lac is dissolved, the lac solution is filtered through a nylon cloth in order to remove impurities and allowed to cool. Add the bleach liquor until the lac solution is fairly well bleached. The diluted sulphuric acid is in fine granules which are filtered through a muslim bag and thoroughly washed in cold water. The precipitated bleached shellac is squeezed dry, crushed into powder and kept in a cool place. It is used in colorless polishes and nitrocellulose lacquers. Shellac and bleached lac production, both of which are technically complex and capital intensive processes, are only done by the industry. Seed lac is produced for the most part by industry at present, but it can also be done by the farmers[4]. Increased processing by farmers would improve the profitability of the enterprise. The price received for seed lac is about two times more than that of stick lac. Moreover, the shelf life of seed lac is longer than that of stick lac. The farmer can sell seed lac directly to the shellac manufacturers.

At present, lac is used to produce mainly varnish and dyes. It can also, however, be used to provide a protective coating for some fruits before these are exported. It is also used to coat chocolates and water-resistant paper products. Monitoring the quality of lac products is especially important if it is to compete successfully in international markets.

In Thailand, lac products are graded A or B by the Industrial Standards Institute and the Royal forest Department in Thailand according to the quality of the products. These grading standards are applied to both the export and domestic markets. Stick lac has not been graded by types of host trees. Generally most lac is acceptable for manufacturing if the age of stick lac is not more than two years. The factory will test the quality of stick lac by

---

[4]The stick lac can be crushed using a hand-crusher, then washed with plain water (three to four times until the filtrate is clear) and finally dried.

breaking by hand and burning with a flame, then stretching the resin out. If the stretched resin is light yellow, it means that the stick lac is freshly cut. If the color is dark red, the lac was cut within one to two years. If the lac has no resin at all, and burns when heated, it means that lac is too old. The price offered the producer thus depends on the age of the lac: the older the lac, the lower its price.

The Marketing Process

The major area of lac cultivation in Thailand is in the north which produces about 84 percent of the lac crop. Lac cultivation in Thailand is done by farmers with more than 50,000 families involved in stick lac production. The government produces only small amounts of lac mainly for lac research and extension work. There are about twenty lac factories in Thailand. Almost all of the industries are situated in northern area of Thailand with only one to two industries in the northeastern area. When the products are harvested, there are middlemen, collector and lac industry agents who purchase stick lac directly from the farmers (Figure 1). They fix the price of stick lac depending on quality and quantity of products and the current demand in the market. After collection the stick lac is sent to the factory for processing. The final products are distributed in the domestic market by middlemen; some are bought by end-users and some are exported by export agencies or directly by the factory. The problem of lac marketing lies in the instability of the market prices and the quality and quantity of the products.

Most of lac products that are consumed domestically are stick lac which are purchased by middlemen, collectors, and industry agents and sent to lac processing industries. The demand of the domestic market is about 10 percent of the whole production; thus about 90 percent is exported. The foreign markets are USA, Japan, China, India, Singapore, Hong Kong, UK, Germany, Netherlands, Denmark, Italy, and France. The exported lac products are mainly in the form of seed lac and shellac.

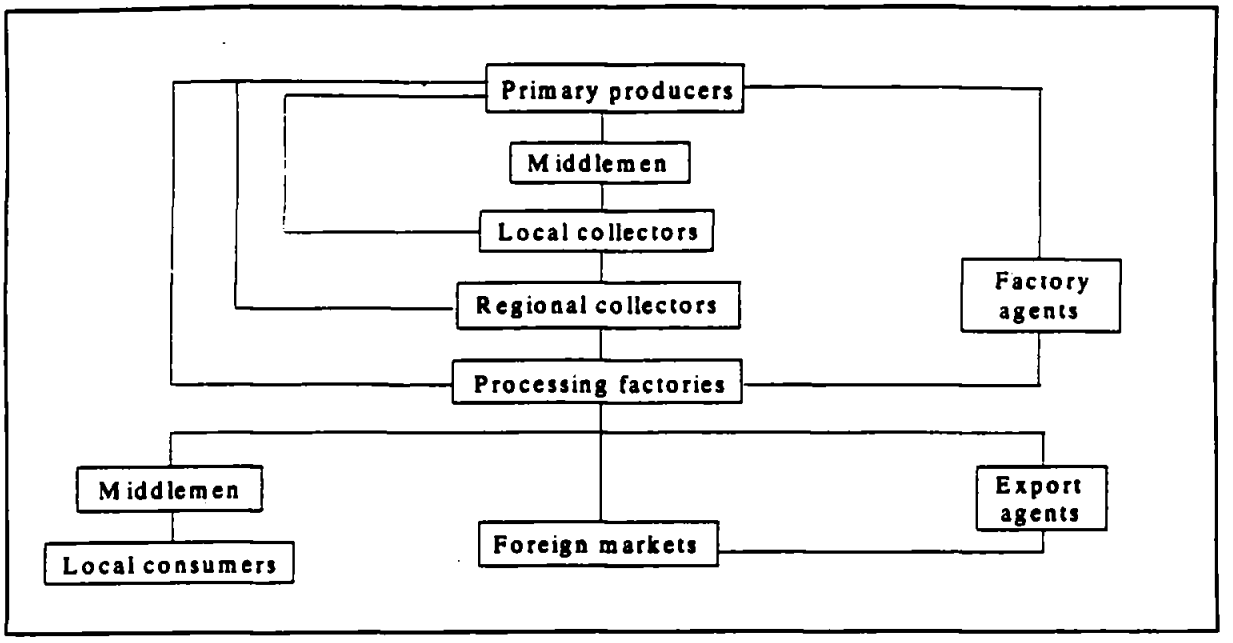


Figure 1 Lac Marketing in Thailand
Source: Office of Agriculture and Cooperatives

Analysis of Problems

The rural communities in the north and northeast area of Thailand still cultivate lac. Some have plantations of lac host trees for lac cultivation and others cultivate the trees near their houses. The farmers who do not own land rent trees from other farmers. The quantity of stick lac produced fluctuates in accordance with market price fluctuations. The price of stick lac within the last ten years ranged from 6.50 to 80 baht/kg (USD 0.26 to 3.20/kg). When logging was banned, lac host trees were cut down for wood carving and other uses. As a consequence it now has become necessary to promote plantation of lac host tree to support lac cultivation. The Royal Forest Department has a Non-Wood Forest Products Development Sub-division that assists the farmers by providing the needed support in technology improvement and dissemination, training, and provision of both good brood stock and host tree seedlings. There are four experimental stations, one in the north and three in the northeast to assist the farmers and conduct studies on the development of lac cultivation. Lac prices may be improved if the rural people join together to establish a small-scale enterprise and determine the price of their products before they sell. If lac cultivation is effectively promoted, it could become a good source of income for the rural people.

Lac farmers' main problems and potential solutions to them are summarized below.

- *Few host trees.* The farmers should have alternative sources of income during the initial stages of lac cultivation so that are able to reserve the host trees for lac cultivation. The age of the suitable branches is one to two years. If the lac cultivation is not effective, the tree should be pruned so that it will produce new branches for cultivation.

- *Lack of skills for lac cultivation.* The Royal Forest Department has extension workers who can be tapped by the farmers for assistance.

- *Extreme weather conditions.* To avoid the adverse affects of hot temperature, the farmers should establish new plantations in the waterside areas.

- *Poor quality.* Both the brood lac and lac host tree should be selected for best quality. There should be no premature cutting of the resin. Extra care should also be exercised so that there are no impurities when the lac is scrapped from the twigs. After being scraped from the twig, the lac should be dried immediately in the shade so that it does not become blocky.

- *Market volatility.* Production should be more consistent to avert price fluctuations. This can only be done through a well-planned management system that will address the production as well as marketing problems.

Lac cultivation can be an additional source of income for farmers and their families, complementing the traditional land and labor demands of rice production. To develop and improve the promotion of lac cultivation effectively, the rural people, the middlemen, the lac industry, and the government should all work together. Each of these sectors has the following responsibilities:

- *the farmers* — before they decide to cultivate lac they should be aware of the problems and know the solutions applicable;

- *lac industry* — generate employment and products for industry and export;

- *export agents* — promote the development of the lac industry in the country and provide information to the producers on market requirements;

- *the government* — monitor the development of the industry and study the marketing aspects and the problems in lac cultivation to develop a program that will enable landless farmers to benefit from lac cultivation, recognizing the secondary benefits of enhanced tree cultivation and forest protection.

Conclusion

The conservation of forest lands is not only for this generation of people but for posterity. Lac cultivation, if neglected now, will lose not its only market but its income-generating potential for rural communities and the nation as a whole. There is a need for a comprehensive study of lac production, processing, marketing, and promotion. The Thai Forestry Sector Master Plan cites lac as one of the important NTFPs that can play a key role in alleviating rural poverty; the government should therefore take the lead in addressing the constraints to lac cultivation and developing the industry through host tree plantations and better forest management. These steps could help to conserve the forest for the future.

References

Burkill, I.H. 1966. *A dictionary of the economic products of the Malay Peninsula.* Vol.II. Kuala Lumpur: Ministry of Agriculture and Cooperatives. pp. 1311-1315.

Rienukul, S. 1989. Cost and return on investment of lac cultivation. Master's thesis. Chulalongkorn University, Bangkok, Thailand.

Royal Forest Department. 1993. Thai forestry sector master plan: Vol. 6 Subsectoral Plan for Production and Utilization. Ministry of Agriculture and Cooperatives, Bangkok.

Royal Forest Department and Department of Agricultural Promotion. 1991. A handbook of cultivation and utilization of lac. Ministry of Agriculture and Cooperatives, Bangkok.

Subansenee, W. 1986. Stick lac production/development in Thailand - a case study. FO: RAS/ 78/010. Forest Industries Development Group, Asia Pacific Region. Kuala Lumpur.

———. 1988. Natural dye from plants and animals in Thailand. Royal Forest Department, Bangkok.

———. 1991. Important non-wood forest products in Thailand. Paper. Regional Expert Consultation on Non-Wood Forest Products in the Asia and the Pacific Region, Food and Agriculture Organization, Bangkok.

———. 1993. Economic value of Albizzia saman. In *Proceedings of the International Workshop on Marketing of Multipurpose Tree Products.* Bagiuo City, Philippines. pp. 229-235.

Watt, Sir George. 1908. *The commercial products of India.* New York: E.P. Dutton and Company.

DAMAR TRADING IN SOUTH SUMATRA, INDONESIA: WHO BENEFITS?

Wahyu Kisdwiutomo[1]

Abstract

Mata kucing damar, a plant resin used for making paints and varnishes, has been traded from the Pesisir region of South Sumatra for centuries. This paper describes the trading chain from farmers in Pesisir to exporters in Tanjung Karang (South Sumatra) and Jakarta, and discusses the role of damar in household economies. There has been little effort to develop new markets or trading links in Pesisir and the community considers current trading patterns to be fair. Farmers' profits, however, would be greater if they could shorten the trading chain. In order to increase to increase their income from damar, the community needs to organize itself. The purpose of this organization should be to develop their bargaining strength in damar trading and to solve other problems they face.

Mata kucing (cat eye) *damar* is a plant exudate (resin) from Dipterocarpaceae trees. It can be collected from Shorea javanica, S. lamellata, S. rotinoides, S. virescens, Hopea dryobalanoides, H. intermedia, H. globosa, and H. myrtifolia. *Mata kucing damar* (which I will simply call damar) is a high quality product used mainly as a raw material for making paints and varnishes. In international trade this product is either called Damar Batavia (the Dutch name for Jakarta) or Damar Singapore, after the ports from which it is exported. Since the 10th century Chinese traders have imported damar from Malaya (Malaysia) for caulking ships. In the 16th century, European traders, including the Dutch, began importing damar for their varnish industries (Sidiq 1978 cited by Agustina 1994). During the Dutch colonial period, damar from Pesisir, South Sumatra, became popular for its high quality. After Indonesia gained its independence, local traders in Pesisir continued to sell damar to buyers in Jakarta. Today, Pesisir produces more than 10,000 tons of damar yearly. This paper describes the chain of damar trading from farmers in Pesisir to exporters in Tanjung Karang (South Sumatra) and Jakarta, and discusses the role of damar in household economies.

Pesisir

Pesisir is located along the western coast of South Sumatra in West Lampung District and is comprised of three subdistricts--North Pesisir, Central Pesisir and South Pesisir. The area of each subdistrict is 192,736, 18,580 and 53,853 hectares, respectively. The population of each subdistrict is 17,795; 42,555 and 43,056 people, respectively. The topography rises

[1]Researcher, Lembaga Alam Tropika Indonesia (LATIN), Bogor, Indonesia

from the Indian Ocean to the top of a local chain of mountains with altitudes up to 1,200 m above sea level. The climate is humid, with 3,000-3,500 mm rainfall per year. Located near the equator, rainfall is constant throughout the year. Average temperatures are above 25^{0}C.

The small town of Krui is the heart of the Pesisir region. Krui lies 32 kilometers from Liwa, the capital of West Lampung District, and 297 kilometers from Tanjung Karang, the capital of Lampung Province. Good roads connect most villages in the area to these major cities. Three cropping systems prevail in this area. Along a narrow coastal strip can be found irrigated rice fields. This coastal strip is less than 2 km wide except for along major rivers where it can run 5 to 10 km inland. The slopes of the hills along the coastal strip are covered with perennial damar forest interplanted with fruit plantations. This strip runs up to 15 or 20 km inland. Natural forest are found on the hill slopes above the damar forests.

Damar cultivation in Pesisir started in the 19th century and today many 100 year old trees are still alive and productive. In the 1930's, villagers started mass planting of damar trees. In those days the price of a kilogram of damar was approximately equal to the value of 8 kilograms of rice. This was the economic incentive that caused the community to start damar plantations or gardens.

Today there are approximately 20,000 ha of damar gardens in the Pesisir region. Half of this area is covered with immature trees. The Pesisir community manages an artificial ecosystem with similar ecological features to a natural forest. These include high vegetation density, a wide range of flora, and different stages of vegetation canopy. Despite widespread cultivation in Pesisir, villages in the foothills have not been flooded, and the hydraulic network has not been degraded. These facts indicate that the damar gardens are sustainable and are protecting the soil on the fragile slopes. Damar gardens also provide products that are usually gathered in the forest such as fruits, timber, firewood ,and other materials. Apart from woody species, numerous herbaceous plants provide vegetables, medicinals, and various other materials (Mary 1987). The ecosystem, however, is dominated by Shorea javanica trees which produces damar.

Damar in Household Economies

Damar resin provides approximately one-third of the household incomes of the 6,500 households in Pesisir (approximately US$400/family/year). When other products from the damar gardens, (i.e., fruits, coffee, pepper, and timber), are included these gardens provide approximately 70% of household income. Clearly damar gardens plays an important role in household economies in the Pesisir region. Farmers arrange the temporal collection of damar to provide cash for meeting daily needs such as rice, meat, fish, oil, kerosene, and cigarettes. Average daily consumption requires an income of approximately Rp 3,500 (Levang and Wiyono, 1992). Special occasions such as weddings, religious celebrations, and schooling require extra income. Households can meet these needs by selling or renting their damar gardens. Today, however, the real income of households is decreasing because of inflation (higher prices for daily needs) and devaluation of the exchange rate.

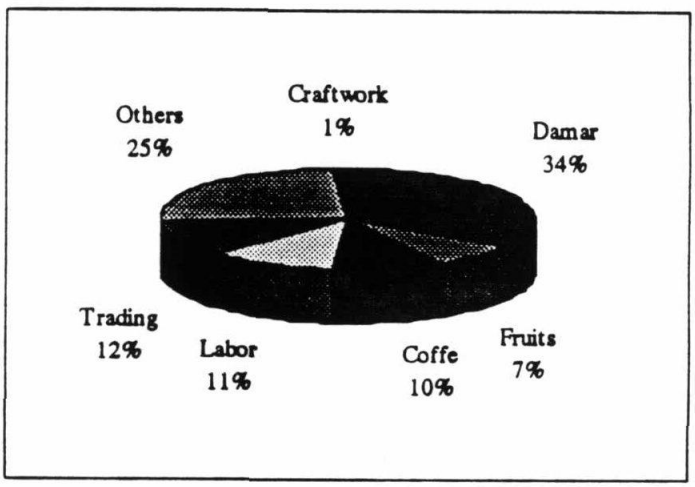


Figure1 Source of income for households in Pesisir

Trade

In international markets damar is classified as a free commodity, in other words it is traded without a quota or other requirements. Any exporter (company) having market access and capital is free to market damar. The trading chain of damar in Pesisir was studied in 1984 (Bourguiois) and again in 1994 (Dupain; Agustina). During this 10 year period, the trading chain remained stable (see Figure 2).

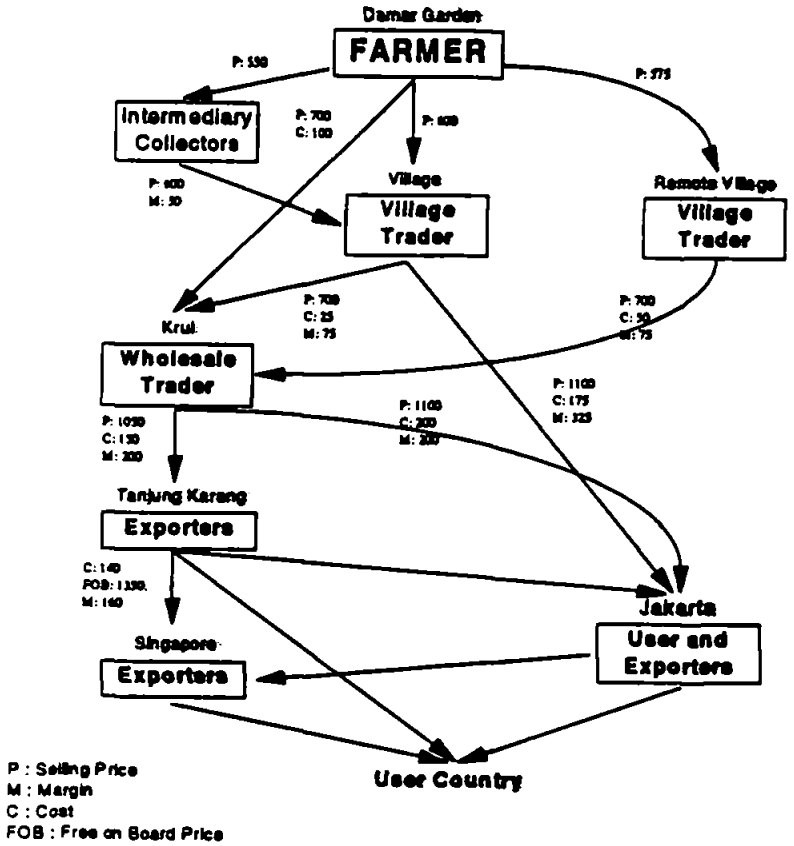


Figure 2 Damar trading chain in Pesisir

This chain generally prevails throughout the damar producing region. It can be noted that each agent is free to sell damar to any other agent. No strong relationship binds a seller to a buyer. But farmers generally sell their products to specific village traders or intermediary collectors with whom they have good relationships. Farmers with gardens near the village, sell their product to village traders. Farmers with gardens far from the village, generally sell to intermediary collectors. While the price they receive from the intermediary collectors is slightly lower, they save on the time and labor needed to transport their product to the village.

Village traders and intermediary collectors pay cash to the farmers. Because farmers are often in need of cash, they frequently conduct their business with village traders who are willing to advance them cash. Intermediary collectors are usually farmers that have saved sufficient capital to invest in buying resin from other farmers, or they are branches of the

village trader. The village trader provides capital for the intermediary collector and they share the profits. Besides earning profit, intermediary traders receive a wage for transporting the resin from distant gardens to the village trader's warehouse.

Krui is the major trading center and villages can be classified as those near Krui and remote villages. Almost all village traders sell their damar to wholesalers in Krui (there were 8 wholesalers in 1994). A few village traders, however, sell directly to dealers in Tanjung Karang or Jakarta. The wholesalers pay cash to the village traders. Again the price is slightly less in remote villages because of transportation costs. In order to guarantee their damar supply, wholesalers lend capital to village traders. The loan is repaid in the form of damar and no written agreements are required to document the time frame of payment. Sometimes village traders who have borrowed from one wholesaler sell their product to another wholesaler. But this does not usually worry the lender, because they trust village traders to pay them back in the long term. Agustina (1994) hypothesizes this system developed because demand is greater than supply and wholesalers are willing to carry some risk in order to purchase damar.

Wholesalers do most of the damar processing (grading and packing). Damar quality depends on color and size (bigger lumps and clearer color make for higher quality). Several grades of quality exist. But these grades are not consistent for every wholesaler and seem to depend on the status of the buyer (exporter and user). Wholesalers usually own their own trucks. Exporting damar from Krui for the domestic market requires a Log Transportation Pass (marked non-timber) that can be acquired from the local forestry office in Liwa at a price of Rp 30 per kilogram. A wholesaler who does not have the Log Transportation Pass can usually buy it from another wholesaler at the price of Rp 40 per kilogram. The Pass is considered to be the responsibility of the exporter and the cost is deducted from the price. From Tanjung Karang most damar is exported to Singapore. To export damar for the international market requires a Timber Transport Pass which can be acquired from the provincial forestry office at a price of Rp 40 per kilogram.

The price of damar in Krui is determined by prices on the international market as well as the domestic market. The international market, as the largest consumer of resin, has the strongest position for determining price. Competition is keen as the quality of natural resins

varies greatly and synthetic resins are produced in developed countries. In 1984 the price of damar was approximately US$ 570 per ton (Bourguiois, 1984). In 1994 the price was approximately US$ 500-700 per ton (Agustina, 1994).

Exporters in Jakarta or Singapore communicate the market price to wholesalers in Krui. This price then becomes the standard purchasing price. Farmers receive a portion of this price after the cost and profit of each agent are subtracted. The price of damar in Krui prevails for all damar producing villages. This price can fluctuate daily. Farmers report that prices change approximately every two or three days depending on the world market. Information on new prices is communicated quickly because of good communication and transportation systems. Price information is forwarded from exporters in Tanjung Karang or Jakarta to wholesalers by telephone. In two to six hours farmers will be informed. However, farmers will still not know about the quantity of damar to be purchased.

Table 1. Cost structure

Trading Agencies	1994 Selling RP	1994 Cost Rp	1994 Cost %	1994 Margin Rp	1994 Margin %	1984 Selling Rp	1984 Cost Rp	1984 Cost %	1984 Margin Rp	1984 Margin %
Farmer	550				41%	210				68 %
Intermediary Trader	600					220				
				25	2%				10	3%
Village Trader	700					230				
Total Cost		25	2%				0	0%		
				75	**6%**				**10**	**3%**
Wholesaler	1050					260				
Grading		15	1%				0	0%		
Packaging		35	3%				0	0%		
Load/unload		25	2%				0	0%		
Transportation		40	3%				25	8%		
Tax/fee		35	3%				0	0%		
Total Cost		150	11%				25	8%		
				200	15%				5	2%
Exporters	1350					310				
Tax/fee		40	3%				0	0%		
Handling		100	7%				0	0%		
Sorting		0	0%				10	3%		
Total cost		140	10%				10	3%		
				160	12%				40	13%

Sources: Agustina, 1994 and Bourguois, 1984
All % based on FOB price

Approximately 54% of the damar supply is transported by village traders to wholesalers in Krui at a cost of approximately Rp 25 per kilogram (Dupain 1994). Wholesalers purchase another 36% of the damar supply directly in the village and pay the transportation costs themselves. The remaining 10% of the damar supply goes directly to Jakarta (Dupain 1994). Agustina (1994) hypothesizes that this system has evolved because of the strong competition for acquiring damar supplies.

Farmers sell unsorted damar to village and intermediary traders at a price ranging between Rp 500-650 per kilogram (average price Rp 600) depending on quality (based on FOB price). After deducting costs, village and intermediary traders generally make a profit of approximately 6% and 4%, respectively. These profits are a reasonable return on their capital investment.

Wholesalers buy their damar supply at a cost of approximately Rp 700 per kilogram. They spend Rp 150 per kilogram for grading, packing, transporting, and taxes. They can sell high quality damar to exporters in Tanjung Karang at approximately Rp 1,050 per kilogram. Thus they earn approximately Rp 200 per kilogram for a 15% profit on their investment. They can also sell their product in Jakarta, but the profit is similar due to higher transportation costs.

Exporters in Tanjung Karang who have purchased their supply at Rp 1,050 per kilogram sell their damar to foreign markets at an average FOB (free on board) price of US$ 550-750/ton or Rp 1,350 per kilogram. Their costs include taxes and handling fees of approximately Rp 100 per kilograms. Their costs, however, are not well known because accurate data is not readily available. Based on information received from one exporter, their profits are approximately Rp 160 per kilogram for a 12% profit on their investment.

A few village traders sell their supplies directly to Tanjung Karang or Jakarta. These traders receive profits of approximately Rp 325 per kilogram, greater than that received by any other trader. These profits are due to the ability of these traders to negotiate with buyers in the larger cities and to their access to larger sources of capital (Bourgeois 1984).

Discussion

As previously mentioned, studies in 1984 and 1994 described similar trading-chain patterns. A few differences, however, can be noted. Most importantly, in 1984 farmers had a profit margin of approximately 68% over their investments (based on FOB prices). In 1994 this figure had decreased to 43%.

Village traders and intermediary collectors in 1994 received slightly higher profits (6 and 4%, respectively) than they did in 1984 (3%). This change is probably due to increases in the price of damar. But in general these traders did not invest in increasing their capacity (capital and skill). In general, village traders and intermediary collectors receive low profits because of kinship relationships with farmers, and because they do not have good bargaining position with wholesalers. Most village traders and intermediary collectors play similar roles today as before, i.e., as a gather of damar from farmers.

The position of wholesalers has changed more significantly. In 1984 they were primarily transporters of damar between village traders and exporters and they received only a 2% profit on their investment. In 1994, however, they were grading the damar and earning profits of approximately 15% on their investments. These profits are due not only to returns on their labor, but also to the capital they invest and the managerial ability they bring to their task. These abilities are further strengthened by their ability to meet government regulations for obtaining permits for transporting damar outside of the district.

Exporters received similar profits in 1984 (12%) and 1994 (13%). Exporters may be satisfied with this condition as they invest less labor. This condition may open opportunities for wholesalers to make greater profits when damar price increases. Because the price is set by the international market, wholesalers may be able to take advantage of the lack of information on the part of local traders (Worrell 1959).

In the future, if village traders can obtain access to market information they may also have opportunities to play the role of wholesalers. Currently, several village traders are selling up to 4 tons per week. Because their truck loading capacity is 4.5 tons, they can only increase their volume slightly before being constrained by this capacity. Meanwhile transportation and communication infrastructure are better developed today. As demonstrated

by village traders who sell damar directly to exporters, when traders act as wholesalers they greatly increase their profits.

Farmers also have similar opportunities for direct trading. But they require greater capital, skill, organization and market information. This may require a long learning process but if they do not attempt to cross this barrier they will remain a weak player who never bargains the price. Alternative income sources such as fruits and wage labor, may provide greater returns. NGOs and governments agencies, however, can provide education and market information to strengthen the role of farmers in the trading process. Any actions, however, should be examined very carefully, with a full understanding not only of the trading chain, but of its direct and indirect implications on the agroforest ecosystem and on the related social and economic systems. The success of any proposal will mainly depend on the development of approaches that encourage community participation and on the people's willingness to move forward (Michon and de Foresta 1994).

Conclusion

Damar trading in Pesisir works as a traditional trading system. There has been little effort to develop new markets or trading links. The community considers current trading patterns to be fair. Their profits, however, would be greater if they could shorten the trading chain. Meanwhile the community needs to increase its income from damar. To meet this condition, the community needs to organize itself. The purpose of this organization should be to develop their bargaining strength in damar trading and to solve other problems they face.

References

Agustina, D. 1994. Kajian social-ekonomi dan perdagangan damar mata kucing di Wilayah Pesir. unpublished document, LATIN, Bogor.

Bourgeois, R. 1984. Production et Commercialisation de la Resine Damar a Sumatra Lampung. unpublished paper, Chaire D'Economie et Sociologie Rurales. Academie de Montpellier-Universite des Sciences et Techniques du Languedoc.

Dupain, D. 1994. Une Region Traditionnellement Agroforestiere en Mutation: Le Pesisir. unpublished paper, ORSTOM dan BIOTROP, Bogor, Indonesia.

Levang, P. and Wiyono. Enquete agro-economique dans la region de Krui (Lampung). unpublished paper, ORSTOM dan BIOTROP, Bogor, Indonesia.

Mary, F. 1987. Economic and ecological functions of farm plantations: What possible alternatives to forests? unpublished paper, Laboratorie d'Economie et Sociologie Rurale, INRA. Montpelier, France.

Michon, G. and H. de Foresta. 1994. Damar agroforests in Pesisir, Sumatra, unpublished paper, ICRAF, Bogor.

Worrell, A.C. 1959. *Economics of American Forestry*. New York: John Wiley and Sons, Inc.

CONSTRAINTS TO THE DEVELOPMENT OF NON-TIMBER FOREST PRODUCTS IN NEPAL

Rana B. Rawal[1]

Abstract

Nepal is rich in valuable non-timber forest products (NTFPs), especially medicinal and aromatic plants, yet it has not been able to adequately utilize them. This paper describes problems associated with production, processing, and marketing of these products, in particular Zanthoxylum armatum and Nardostachys jatamansi. Poor harvesting and post-harvesting practices, adulteration, historical market control by outsiders (India), and lack of international reputation and uses for Nepal's products are major obstacles. Establishing processing units at road-heads or in district centers, backed up by marketing support, can increase economic returns to rural communities and improve product quality and quantity. The government should formulate a sustainable resource management policy to facilitate judicious and efficient utilization of both cultivated and naturally occurring NTFPs.

Nepal is rich in non-timber forest products (NTFPs), many of which have significant economic value. Natural resource policy makers and program planners are increasingly becoming aware of their extensive subsistence and commercial use throughout the country, and that emerging markets worldwide hold potential for development. While promotion of Nepal's botanical resources can and should complement the objectives of rural development and sustainable forest management, several important issues must be considered (Hammett, 1993; Malla *et al*, 1993).

This paper describes the problems associated with production, processing, and marketing of Nepal's NTFPs, highlighting two products: *timur* (Zanthoxylum armatum D.C.) and *jatamanshi* (Nardostachys jatamansi D.C.). Timur is a small tree belonging to the Rutaceae family. It grows naturally throughout the Middle Hills and Mahabharat zones at altitudes ranging from 1500-2400 meters (m). The seeds are commonly traded and used in the ancient Indian healing system of *ayurveda* (*ayur* = life, *veda* = knowledge). Jatamanshi is a herbaceous plant belonging to the Valerianaceae family, growing in the sub-alpine and alpine zone. The rhizome is traded for similar purposes. In Nepal, both timur and jatamanshi are also distilled to extract a valuable essential oil. It is likely that these two species have been traded from Nepal for centuries, but documentation is scanty.

The observations made in this paper stem from the author's 14 years of first-hand experience in NTFP development as a production officer and eventually general manager of

[1]Managing Director, Herbs Production and Processing Company Ltd., Kathmandu

the Herbs Production and Processing Company Limited (HPPCL). HPPCL was the first company in the country to harness the rich treasure of medicinal and aromatic plants by producing medicinal extracts and essential oils for the drug, food, and perfumery industries in Nepal and abroad. Countless interactions with collectors, traders, and colleagues from the Department of Medicinal Plants and the Department of Forestry over the years helped to formulate the ideas presented. International buyers from India, France, Germany, the United Kingdom, and Belgium have been especially knowledgeable.

Background

NTFPs in Nepal

Despite its small size, Nepal is well known for its diverse flora. A wide range of physiographic zones and climatic conditions support a variety of vegetation, from tropical to alpine. Approximately 5400 vascular plants have been reported in the country so far, out of which approximately 700 have medicinal properties (IUCN, 1991). Over 100 species are currently traded.

Medicinal and aromatic plant use in ancient south Asian culture is well documented in the *Rigveda*, reportedly one of the oldest repositories of human knowledge, compiled between 450-1600 BC. In addition to formalized systems such as ayurveda, a number of different ethnic groups have been using NTFPs in their own pharmacopeias for effectively curing several human diseases for centuries (Gyan *et al*, 1994).

The Middle Hills, a network of steep ridges and valleys that crosscut the country from east to west, are the source of the majority of NTFPs (Edwards, 1994). This area occupies 30 percent of the country and supports half the population with its extensive agricultural land and large forest patches. The greatest diversity of plant life also occurs in this region between 900-3660m in the sub-tropical and temperate zones. Medicinal plants are especially abundant: over 55 percent of the total number of plants with therapeutic compounds are found here (Malla *et al*, 1993).

Trade

Over the years, the trade in wild plants has grown into a vast yet secretive marketing network that continues to flourish, providing a source of income to forest-dependent farmers

throughout the Himalayan region and fueling multi-million dollar industries in India, China, and beyond (DeCoursey, 1993). In the hills of Nepal, this trade supplements meager rural incomes and subsistence agriculture. Here, few employment alternatives exist, especially for the poorer sectors of society -- those with limited access to land, labor, or credit. Even so, villagers rarely receive their due share because of manipulation and exploitation by traders and middlemen. These unscrupulous practices may also be a major factor contributing to the over-exploitation of commercial NTFPs, threatening the sustainability of the resource as well as the trade. There are few examples of adequate management of commercial NTFPs (Edwards, 1993).

The trade in Himalayan NTFPs comprises the flow of raw materials from high altitudes in the north to the Indian plains in the south. These products reach their destination through informal marketing channels often with strong historical foundations. Recent research indicates that in the rural sector alone over 10 million dollars (US) are generated annually, distributed among a large number of collectors, porters and small traders (Edwards, 1993). A small percentage is sold to local processing companies and overseas countries, but the major quantity is exported to India. Table 1 shows exports to India for 1990-91 trading season. Table 2 shows exports to countries other than India for 1989-90.

Table 1 Export of crude NTFPs from Nepal to India, 1990-91

Species	Quantity (kg)[1]	Value (NR '000)[2]
Acorus calamus (calamus)	5,777	109
Asparaus racemosus (asparagus)	78,450	909
Bergenia ligulata (rockfoil)	49,773	669
Cinnamomum tamala (cinnamon leaf)	129,371	1,132
Lycopodium clavatum (lycopodium)	17,057	149
Orchis spp. (gamdol)	921	17
Picrorhiza scrophulariaeflora (gentian)	43,050	548
Rubia cordifolia (maddar root)	22,147	225
Rheum emodi (rhubarb)	5,906	36
Swertia chirata (chiretta)	125,205	1,854
Terminalia spp. (terminalia seed)	1,150	8
Nigella sativa	33,307	165
Total:	512,114	5,821

Source: Foreign Trade Statistics, F.Y. 1990/91

[1] These figures are probably not an accurate representation of the total volume of the trade to India. One study suggests that the true quantity is around four times the official quantity (Malla *et al*, 1993)

[2] USD 1 is approximately equivalent to fifty Nepali Rupees (NR)

Table 2 Export of crude herbs from Nepal to countries other than India, 1989-90

Species	Quantity (kg)	Value* NR
Lycopodium clavatum (lycopodium)	6,960	1,046,727
Rheum emodi (rhubarb)	6,000	129,960
Nardostachys jatamansi (spikenard)	17,124	442,364
Swertia chirata (chraita)	2,000	89,176
Miscellaneous	200	3,976
Total:	32,284	1,712,203

*One US dollar equivalent to fifty Nepalese rupees (NR)
Source: Trade Promotion Center, Kathmandu

With improvements in transportation and communication, the NTFP trade has become a permanent source of income for many collectors, middlemen, and traders. Approximately 95 percent of commercial collections are done by individual collectors; communal or community-based collectors comprise the remaining 5 percent (pers. ob.). NTFPs are portered to collection points where they pass through a series of middlemen who handle progressively larger volumes of trade. Permanent collection centers are located at the road-heads, the northernmost points on the road network (Figure 1).

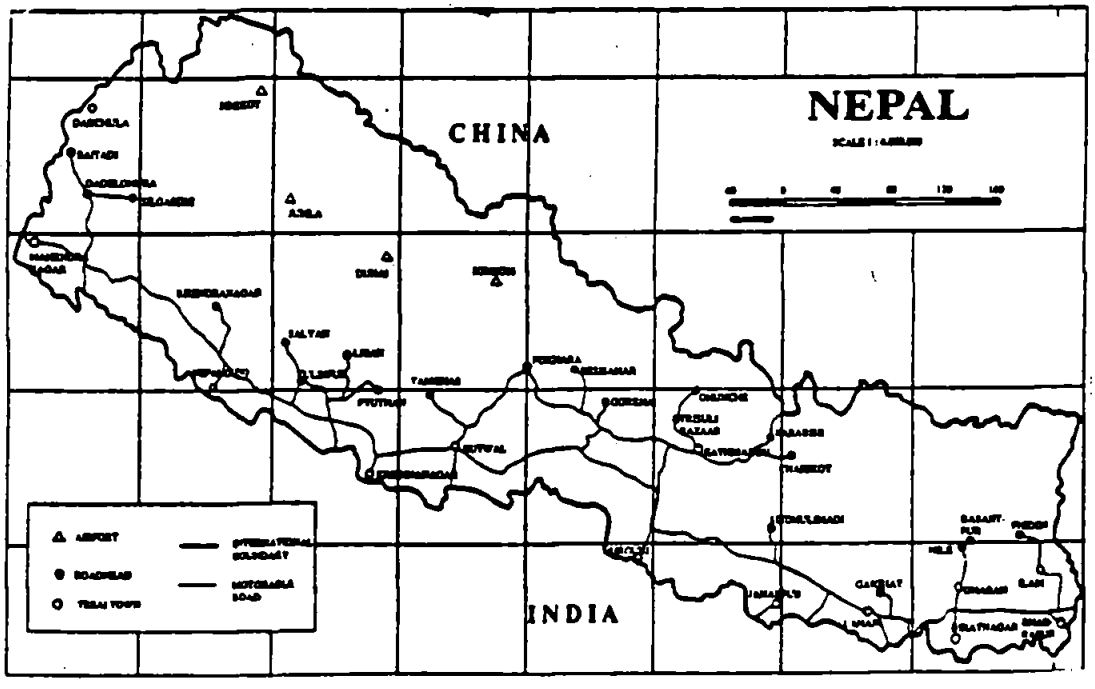


Figure 1 Major trading centers for NTFPs in Nepal
Source: Edwards *et al*, 1993

NTFPs are transported to India via a series of trading towns near the East-West Highway in the southern lowlands, or *terai*. These towns are where the large wholesalers, typically of Indian descent (*Marwadi*), reside. From here they manage their collection operations over large areas that funnel northwards from road-heads. Terai wholesalers are powerful figures in the NTFP trade because of their good access to Indian markets and control of the border trade. Figure 2 shows a typical market chain for Nepal's NTFPs.

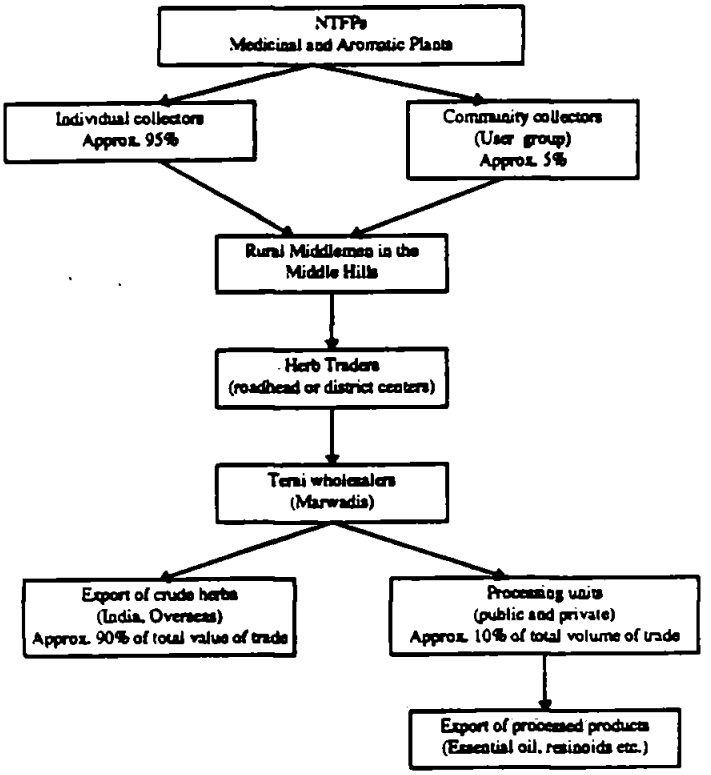


Figure 2 NTFP marketing chain in Nepal
Source: author

Cultivation

Numerous farmers in the Middle Hills are independently cultivating native NTFPs with varying degrees of success. These include wild marigold (Tagetes glandulifera), *indrayani* (Tricosanthes palmata), *chiraita* (Swertia chirata), timur (Zanthoxylum armatum), and *sugandhakokila* (Cinnamomum glaucascens). Due to the extension efforts of HPPCL, more than 1500 additional acres are devoted to cultivating exotic sub-tropical species with well-developed international markets such as lemongrass (Cymbopogon flexuosus), palmarosa

(Cymbopogon martinii), cintronella (Cymbopogon winterianus), mint (Mentha arvensis), chamomile (Matricaria chamomila), and basil (Ocimum basilicum). HPPCL is training local people in both mono-cropping and agroforestry techniques and provides a stable, long-term market to farmers who participate in their program (HPPCL, 1994).

Processing and Trade

In order to develop the NTFP sector, the government of Nepal formed the Department of Medicinal Plants to conduct research on NTFP ecology, production, and processing. Later, in 1981, HPPCL was established as a parastatal industry to commercialize this resource and promote business at the national and international level. HPPCL was also intended to bring economic benefits to rural communities by offering a better price for raw materials. A small number of private firms followed. Commercial enterprises, however, continue to be constrained by monopsonistic practices among the large wholesalers. These firms do not look favorably on value-addition in Nepal; they want to continue their age-old practice of selling cheap raw materials to India.

With the assistance of HPPCL, a number of communities have set up their own small-scale distillation industries. Farmers living near Kathmandu in Chapagaun Village (Lalitpur District) and Thoshe Village (Dolakha District) process wintergreen oil from Gaultheria fragrantessima; Thoshe villagers also distill rhododendron oil from Rhododendron anthropogon. Jatamanshi oil is distilled in mid-west Nepal in the village of Rangagaun (Dolpa District). In the far west (Humla and Jumla Districts), two units were recently established to distill jatamanshi, rhododendron, and juniper (Juniperus communis).

Local-level processing is promising, but problems still exist. For example, a wintergreen distillation unit established near Kathmandu (Nagarkot Village, Kavre District) by a Forest User Group chairman and HPPCL has ceased to function due to a conflict between local raw material suppliers and the processor, even though the market was guaranteed by HPPCL. As the NTFP sector increases, problems such as these should be expected and must be addressed on a case-by-case basis.

At present, prospects for exporting Nepal's NTFPs directly to countries other than India do not appear to be substantial. More than 90 percent of the total amount of NTFPs collected in Nepal are exported as raw materials to India (Edwards, 1993). In addition to a

huge domestic market, India has advanced processing technology which is compatible with international demands and standards.

Timur (Zanthoxylum armatum DC.)

General Description

Timur is a small, thorny, dioecious tree with dense foliage (Figure 3). It is found throughout the Himalaya in hot, sub-tropical valleys from Kumaun to Sikkim, at altitudes ranging from 1500 to 2400m. In Nepal, it is known as *baletimur*. It is commonly found on degraded slopes and shrublands associated with Pinus roxburghii and Quercus incarnata. It grows naturally in well-drained soils with low fertility and moderate to strong acidity.

Various parts of the plant, including the wood, have a pungent taste and odor. The fruits have long been used as a local spice and in traditional medicine: the bitter taste and spicy aroma reduces fevers and increases sweating (Achrya *et al*, 1979). The seeds are also used extensively in ayurvedic preparations for stomach problems, toothaches, and as a repellent against leeches because of their deodorant, disinfectant, and antiseptic properties (CSIR, 1985). The tree itself has been used for centuries as live fencing to safeguard crops from animals.

Figure 3 Timur (Zanthoxylum armatum DC.)

Up until the early 1960s, the majority of hill farmers participated in small-scale trade of timur seeds. At local trading centers near the Indian border (*hat bazaar*), they exchanged timur for salt and other supplies. Over time this practice diminished due to the development of new income alternatives, but still occurs in scattered pockets across the country. The elder generation recall that large-scale trading of timur seed started a short time later when the Terai forests were opened for settlement and the transportation infrastructure was improved. This prompted more trading activity between upland and lowland communities. Virtually all seeds collected today are traded; subsistence use is relatively low (Achet *et al*, 1993). Table 3 shows current export figures for timur.

Table 3 Export figures for timur

Year	Quantity (ton)	Revenue* (NR '000)
1988/89	183	640
1989/90	320	1121
1990/91	372	1301
1991/92	305	1069
1992/93	297	1039

* One US dollar equivalent to fifty Nepalese rupees (NR)
Source: Department of Forestry and Soil Conservation

In the mid-western regions, timur is found in abundance on private land because propagation is considered a worthwhile activity. In Salyan and Pyuthan Districts, farmers commonly plant timur along farm borders and on unproductive wasteland. One farmer from Salyan planted timur on three *ropani* (1 ropani = 1/20 of a hectare) of private forest land. This occurred only after he was able to obtain a loan from the Agriculture Development Bank, demonstrating that credit is often an important factor in NTFP cultivation. Farmers in this area also reported that the normal management cycle of timur is 20 years, with highest seed yields occurring after 10 years (Achet *et al*, 1993).

Production Problems

Production is defined here as the acquisition of quality raw material for processing. There are a number of problems associated with timur production including adulteration, immature harvesting, and improper drying.

Even though people are well aware of proper harvesting practices, adulteration remains a constant problem. Collectors mix timur seeds with those from an unidentified plant (*tigedi*)

to increase the weight and fetch a better return. Tigedi seeds strongly resemble timur and are found throughout the hill region. Collectors also mix dried or powdered leaves of timur and other plants with timur seeds for the same purpose.

In government forests where access is difficult to control, timur is commonly harvested at an immature stage. Collection takes place on a 'first-come, first-serve' basis; there is no incentive to wait until the seeds ripen for fear of others taking the stock. Collectors also commonly keep the timur stored in cloth sacks until they are full enough to warrant a trip to the market. This deteriorates the quality because the seeds cannot dry evenly and may get moldy. Poor quality seeds are sold to traders who often mix them with seeds of higher quality, thus reducing the overall quality of the bulk raw material. Timur originating on private and community managed land, however, has much better quality controls. Unfortunately, the majority of timur continues to come from unmanaged government forests.

The best timur in Nepal comes from Pyuthan District, in the Mid-Western Development Region. Here the seeds are harvested when mature, typically between August and September, because they come from private and customary forests (even though the latter are technically owned by the government). People know that there is no hurry to collect seeds because they are certain of their harvest. As a result, farmers make more money due to the higher and more predictable quality. In contrast, timur from the neighboring district, Dang, is the worst quality because most seeds are harvested prematurely from open-access government land and are mixed with tigedi.

Processing Problems

Processing refers to all the steps involved in the production of essential oils, extracts, and resinoids from plant materials. Good raw material enhances both yield and quality of the finished product.

If timur seeds are harvested in the correct season and dried properly, they are adequate for processing into oil. The oil is extracted using steam distillation, the most common processing system in Nepal. For the best quality oil, distillation should be done within six months of harvest. It is difficult, however, to determine seed age when examining them in the market because traders mix different ages together. Quality timur oil is light yellow in color and has a refreshing, spicy aroma. If the raw material is inferior, the color is different

(usually darker) and it smells less pleasant. Even if the raw material is good, the quality of the oil or extract may suffer from inferior processing technology.

Timur distillation entails a by-product known as *marc*, the leftover timur seeds after extraction of oil. The marc is not wasted, but used to make tooth powder and incense sticks. Proper drying of marc is essential, otherwise molds will destroy the smell and quality.

Marketing Problems

Marketing here refers to the sale and distribution of value-added products such as essential oils and extracts. Even though timur oil is a major source of linalool, it is not known in international markets. HPPCL is the only organization in the world that produces and markets this oil internationally, but currently there are only three buyers, each with a small demand. According to Durbeck and Wilder (1993), however, the oil has good marketing potential in Europe.

Three main factors limit the marketability of timur. First, there is a lack of knowledge among buyers. Linalool, the main constituent (55-65 percent), has already been synthesized, so the market for natural oil is limited to specialty markets such as aromatherapists. These markets, unfortunately, utilize very small quantities. The flavoring and perfume industries may be potential buyers, but they have not developed any use for this product as yet.

Second, there is a lack of consumer trust in oils produced in Nepal. Buyers are not confident that both supply and quality will be consistent. Because there are many different sources of raw materials, the quality is not always uniform. Yearly production of oils based on wild harvests also tends to fluctuate. Additionally, different batches may have different smells, even though the chemical constituents are the same. Buyers from the West are wary due to bad experiences with Nepalese and other South Asian suppliers in the past.

Third, historical low value uses in India perpetuate a low quality market in Nepal. Traditional links exist between collectors and traders in Nepal and buyers in Indian who use timur for cheap products such as tooth powder. Traders are satisfied with lower quality raw material because it is easy and cheap to acquire and the market is reliable. Tooth powder contains both leaves and seeds, and has a small percentage of oil. Other adulterants can be mixed in as well. For these reasons, it is difficult to encourage collectors to produce better quality seeds.

Jatamanshi (Nardostachys jatamansi)

General Description

Jatamanshi is a sturdy perennial herb occurring at altitudes ranging from 3000 to 5000m in the sub-alpine and alpine regions of Nepal (Figure 4). The rhizome, which is thickly covered with brown hair, is the main part used commercially. In English it is called spikenard; it is locally known as *bhutle*. It is aromatic and bitter, and after distillation it yields an essential oil. In India it is largely used as an aromatic adjunct in the preparation of medicinal oils and is popularly believed to increase the growth and blackness of hair (Watt, 1908). With the recent increase in roadhead price to a stable NRs 60/kg (USD 1.20), a few farmers, especially in far-west Nepal, are beginning to cultivate jatamanshi on an experimental basis. Tested cultivation methods exist but have not been widely adopted so far; the vast proportion of jatamanshi is collected from natural sources on government land.

Figure 4 Jatamanshi (Nardostachys jatamansi)
Source: M. DeCoursey

Traditionally the jatamanshi rhizome was used as incense in Buddhist temples, mixed together with juniper and rhododendron leaves. This is still practiced today. Jatamanshi is also used in ayurvedic preparations because of its antiseptic, antispasmodic, sedative, and carminative properties. It is also good for indigestion, leprosy, hysteria, and palpitations of the heart. The oil is used in fragrances and aromatherapy (Coppen, 1994).

Jatamanshi has been traded for centuries. Even though it is currently banned for export in its crude form, a thriving black market trade exists. Only the export of oil is legally allowed, but volumes are low because there are few processors. Table 4 shows current export figures for jatamanshi.

Table 4 Export figures for jatamanshi

Year	Quantity (ton)	Revenue* (NR '000)
1988/89	111	777
1989/90	118	827
1990/91	70	493
1991/92	203	1423
1992/93	113	793

* One US dollar equivalent to fifty Nepalese rupees (NR)
Source: Department of Forestry and Soil Conservation

Production Problems

Like timur, adulteration is also a problem with jatamanshi. Stems are added to the rhizomes in order to increase the volume. And because the majority is harvested from government land, immature harvests and collector competition is common. Under these circumstances, the oil produced is of inferior quality.

Proper drying of the raw material is necessary for good quality oil. If the raw material is dried too much, the oil is lost. If it is dried too little, excess moisture causes fungus and fermentation to occur which changes the chemical constituents of the oil. Because jatamanshi grows in remote, rugged mountain areas the harvests need to be shipped quickly as delays diminish the potency of the rhizome. The moisture content is very high just after the harvesting (more than 85 percent), and if the rhizomes are not dried properly they start to decay right away. This results in a low oil yields and inferior quality.

Processing Problems

The best quality jatamanshi for processing uses mature rhizomes which are air-dried, graded, and cleaned (separated from soil and other foreign particles). The essential oil is obtained through steam distillation. The rhizomes must be distilled within one year from the date of collection provided there are good storage facilities. The oil yield varies from 0.8-2 percent by weight. Good quality jatamanshi oil is a lightly viscous liquid with a heavy,

musk-like odor. The color varies from amber to deep blue or greenish blue. The quality of the oil depends on the quality of the raw material: because there are many different raw material sources, the oil is not always uniform.

The marc (distilled jatamanshi rhizomes) is also used to make incense sticks. Proper drying after distillation is essential because molds can destroy the smell.

Marketing Problems

Jatamanshi oil is also not a common product in the international market and only a few processors are distilling it at present. It is, however, a versatile substance that can be used for a number of purposes. In the perfume industry, it can be incorporated into scents with oriental or woody bases, heavy florals, and animal/amber essences. It can also be used as a flavoring agent.

Currently there are several small-volume buyers, but the main market continues to be India -- for raw material only. Indian processors mix jatamanshi rhizomes with other essential oil-bearing roots, leaves, bark, and seeds to produce *Ittar*. Ittar is a special traditional perfume blend used in India and the Middle-East. Like timur, substantial effort is required to introduce jatamanshi oil to the world market.

Discussion: Problems and Prospects in NTFP Development

> *It is a simple warning: if controlled, Himalayan herbs are like a 'treasure' of Nepal, but without good management this valuable resource can quickly be extinguished.*
>
> (Lecop and Lecop, 1984)

This section examines the development of Nepal's NTFPs from a larger perspective, pointing out necessary action to overcome the constraints described above. Five issues are highlighted: inconsistent supply, harvesting and post-harvesting practices, adulteration, processing technology, and marketing.

Inconsistent Supply

In Nepal, many of the raw materials that come from natural sources have a problem with sustainability of supply. These problems are well-illustrated by the wild yam, Dioscorea deltoides (*bhyakkur*). Bhyakkur is one of the main sources of natural diosgenin, an effective

birth control drug. HPPCL once had a diosgenin extraction plant in Kathmandu but closed it soon after opening because of the lack of raw material. Because bhyakkur was so common in Nepal's forests, nobody expected that there would ever be a shortage. Problems occurred because Indian demand for the raw material also increased at the same time HPPCL was establishing its own factory. This caused a rush to collect, and little was done to ensure regeneration. The industry in Nepal collapsed to the detriment of everyone concerned. This situation is not unique: several valuable plant resources from Asia have come under threat of extinction through market booms combined with uncontrolled harvesting including Rauvolfia serpentina, and Dioscorea deltoides in India, Ephedra sinecia in China, and Artemisia maritima in Pakistan (Wijesekera, 1993).

The survival of natural plant species can only be ensured if industrial needs are met through other means of production besides wild harvests. Cultivation of commercial NTFPs, supported by competitive pricing and stable markets, is the only way to ensure a consistent supply. A wealth of agrotechnology literature on medicinal and aromatic plants indicates that plant material with an abundance of desired constituents can be reproduced and improved upon under cultivation, even in an alien habitat (Franz, 1993).

Harvesting and Post-Harvesting Practices

Harvesting is often carried out by herders who take animals to high altitude pastures during the summer rainy season. While they have good understanding of location and habitat, they tend to harvest everything they see with no regard for regeneration. They also may harvest plants while immature because of insecure tenure rights and competition, especially on land belonging to the government. These problems can only be solved by handing over government land to local committees for management.

If collection occurs at the proper time, raw materials should be sorted and cleaned before drying to ensure uniform high quality. Many collectors do not bother to do this. Drying comes next, and is one of the most vital steps in post-harvest processing. Drying directly in the sun or over an open fire are not good methods because much of the desired ingredient is lost. Slow controlled drying stops both respiration and microbiological action.

Prolonged storage in damp conditions followed by time-consuming transportation to the final destination also results in raw materials of poor quality and irregular quantity. The

best way to store dried plants before transporting them is to put them in bamboo baskets or in jute sacks and hang them in a ventilated place. This will decrease temperature in the center of the bulk and prevent insect infestation and molds (Lecop and Lecop, 1984).

Adulteration

Adulteration is a common occurrence with commercial NTFPs in Nepal because of the minimum value-addition work done in the country. If jatamanshi, timur, and other well-known NTFPs such as the bark of Cinnamomum tamala (*dalchini*) were processed only in Nepal, adulteration would be checked: processors would refuse to buy questionable raw materials and offer a better price for genuine quality. NTFP exports are commonly adulterated because prices are so cheap that Indian merchants buy virtually everything Nepal has to offer, regardless of quality. Thus, there is no incentive to have better quality controls or standards. Cheap prices encourage collectors and traders to increase their stock with counterfeit substances.

HPPCL prefers to buy timur from Pyuthan District rather than Dang District and offers a better price because the quality is reliable. Processors always prefer good quality stock even though they have to pay more -- adulterated timur seeds are only good for cheap products such as toothpowder, not for extraction of timur oil.

Developing a decentralized network of distillation units would help to improve oil quality by increasing contact between collectors and processors. There would also be reduction in the number of middlemen. More processing units with marketing support near the road-head will certainly discourage adulteration of commercial NTFPs.

Processing Technology

Direct fire distillation units are not good for extracting oil because there is no regulation of heat inputs. If constant care is not taken when heating, the oil may have a burnt smell which will destroy the quality. Processing units should therefore be based on steam distillation and purchased from professional manufacturers. Well-made units stop the formation of steam channels during distillation which, if allowed to occur, would reduce the quality of the oil. Other factors to consider in designing a proper distillation unit are:

(1) the size of still relative to local supply;
(2) steam pressure sufficiently high;

(3) density of the raw material when packed into still;
(4) distillation time (varies with different plants), and
(5) rate of steam injection.

For some medicinal plants, a different extraction method is required involving pulverization, percolation with solvent, concentration, and drying. This is a complicated process and not appropriate for remote regions. It works only in urban areas where there is advanced technical knowledge to meet the standards specified by pharmaceutical industries. In contrast, the market requirements for essential oils from distillation are often less specific, and can be met easily by ordinary people with a small amount of training.

Marketing

Marketing is the biggest challenge facing NTFP processors in developing countries, especially in land-locked Nepal. As stated earlier, most of the aromatic NTFPs (including jatamanshi and timur) are not known to the international market and fall under the 'non-conventional' category of botanical products. As such, vigorous marketing is needed to promote Nepal's NTFP industries. Oils may have to be marketed through dealers or export agencies because it is often not be feasible for processors to deal directly with end-users. At present all oils are exported, but in the future the market may include domestic buyers as well: foreign firms have recently begun to enter Nepal for the manufacture of soaps and detergents, and domestic industry continues to expand.

At this time, oil production in Nepal is based solely on size of the external market; the internal demand for these items is met through imports from India, France, Germany, the Netherlands, and Switzerland. These imports are chiefly synthetic or blends. Domestic processors should therefore develop blending techniques to cater to Nepal's growing industries, including food, beverage, confectionery, soap, and pharmaceutical. There is scope for import substitution, but the small size of the internal market at present precludes sole dependence on it.

Reaching the customer is not an easy task. Consumers in developed countries usually have their own reliable suppliers and are hesitant to switch to a new source for fear of poor quality products, faulty delivery schedules, and lack of guaranteed supply. Because of this, the essential oil producer has to approach the fragrance/flavor compounding firms (the real

large-scale consumers of aromatic products) through trading houses and importers. Developing a trustworthy relationship over a long period is absolutely essential, and will sometimes enable the producer to sell directly to the consumer. Entrepreneurs in this field must have a long-term commitment.

Acceptance of new or unique essential oils by the world market involves a longer time frame than conventional items. This is partially due to the numerous tests carried out by the consumer on the usefulness of the particular oil, its safety (freedom from toxicity), its stability, and its competitiveness over similar products already on the market. HPPCL is currently facing this situation with jatamanshi and timur oil.

Conclusion

The NTFP sector in Nepal should be given greater attention to ensure better benefits for the people and the country, and to protect the sustainability of the resource. After first securing tenure rights for producers and collectors, long-term resource management policies should be formulated which are based on local management. Cultivation of valuable wild species and those with stable markets should be encouraged, and value-added processing should be decentralized, moving away from the cities to the road-heads and district centers. In addition, substantial effort is required to develop markets for Nepal's NTFPs, especially non-conventional products.

Taken together, these activities will help to improve quality control, reduce transportation costs, and limit the chances of adulteration by fostering close contact between producer/collector and processor. Trade and marketing practices may also be improved. If harnessed effectively, the NTFP sector can make a significant contribution to the GDP and the welfare of rural communities throughout Nepal.

Acknowledgements

The author wishes particularly to thank the organizers of this workshop, Dr. Deanna Donovan and Dr. Jefferson Fox, for their generosity in selecting me as a participant. Special thanks to Ms. Maureen DeCoursey and Mr. David M. Edwards for their valuable suggestions on how to improve this paper.

References

Acharya, B. P. *et al.* 1979. Aromatic plants of Nepal, part II: Chemical investigation on the fruits of Zanthoxylum armatum Roxb. *Journal of Nepal Pharmaceutical Association.*

Achet, S. K. *et al.* 1993. Non-timber forest products in Nepal: The scope for sustainable commercialization. Report submitted to Appropriate Technology International, Washington DC, USA, by New Era Consultants. Kathmandu, Nepal. Unpublished.

Coppen, J. J. 1994. A study of the potential for added-value processing of selected non-timber forest products in Nepal. Source unknown.

Council of Scientific and Industrial Research (CSIR). 1985. *The wealth of India.* Volume number unknown. CSIR Publication and Information Directorate. New Delhi.

DeCoursey, M. A. 1994. Healing forests and ailing economics: Non-timber forest products in Nepal. *TRI News/Journal of the Tropical Resources Institute* 13(2):46-49.

Durbeck, K and A. Wildner. 1993. Trade promotion of essential oils from developing countries to the Federal Republic of Germany. In *Business symposium on herb extracts/essential oils briefing report.* Nepal-German Chamber of Commerce and Industry. Kathmandu, Nepal. Unpublished.

Edwards, D. 1993. The marketing of non-timber forest products from the Himalayas: The trade between East Nepal and India. *Rural Development Forestry Network Paper 15b.* Overseas Development Institute. London.

Edwards, D., DeCoursey, M. and R. Bowen. 1993. National framework for research into jaributi. In *Focus on jaributi: Proceedings of the non-timber forest products seminar held in Kathmandu on 12 May 1993.* Forest and Research Survey Center Occasional Paper 2/93. Forest Research and Survey Center, Ministry of Forests and Soil Conservation. Kathmandu.

Franz, C. M. 1993. Personal communication. Address: Institute for Botany and Food Sciences, University of Veterinary Sciences, Links Bahngasse 11, A103, Wien, Austria.

Gyan, L. S. *et al.* 1994. Domestication and commercial cultivation of medicinal and aromatic plants (MAPs) in Nepal. In *Proceedings of National Seminar on NTFPs.* Ministry of Forests and Soil Conservation. Kathmandu, Nepal.

Hammett, A. L. 1993. Non-timber forest products: Profits and panacea? In *Focus on Jaributi: Proceedings of the non-timber forest products seminar.* Forest Research and Survey Center Occasional Paper 2/93. Ministry of Forests and Soil Conservation. Kathmandu, Nepal.

Herbs Production and Processing Company Ltd (HPPCL). 1994. Annual Report. Kathmandu, Nepal.

International Union for the Conservation of Nature (IUCN). 1991. *Background papers to the national conservation strategy for Nepal: Volume II - medicinal plants.* IUCN. Kathmandu, Nepal.

Lecop, J. and I. Lecop. 1984. *Medicinal plants: a handbook.* Sahayogi Press for UNICEF-Nepal. Kathmandu, Nepal.

Malla, S. B. *et al.* 1993. Minor forest products of Nepal: General status and trade. Report submitted to Forestry Sector Institutional Strengthening Program Component No.2. Kathmandu, Nepal. Unpublished.

Watt, G. 1908 (reprint edition unknown). *The commercial products of India.* EP Dutton and Company. New York.

Wijesekera, R. O. 1993. Production and processing of medicinal plants in Asia. In *Proceedings of the regional expert consultation on breeding and improvement of medicinal and aromatic plants in Asia.* Bangkok, Thailand.