

ASIA -PACIFIC FORESTRY SECTOR OUTLOOK STUDY II

WORKING PAPER SERIES

Working Paper No. APFSOS II/WP/2009/18

THE OUTLOOK FOR NON-WOOD FOREST PRODUCTS IN ASIA AND THE PACIFIC

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Bangkok, 2009

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INFORMATION NOTE ON THE ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY

The Asia-Pacific Forestry Sector Outlook Study (APFSOS) is a wide-ranging initiative to gather information on, and examine, the evolution of key forestry issues as well as to review important trends in forests and forestry. The main purpose of the study is to provide a better understanding of the changing relationships between society and forests and thus to facilitate timely policy reviews and reforms in national forest sectors. The specific objectives are to:

1. Identify emerging socio-economic changes impacting on forest and forestry
2. Analyze probable scenarios for forestry developments to 2020
3. Identify priorities and strategies to address emerging opportunities and challenges

The first APFSOS was completed in 1998, with an outlook horizon to 2010. During its twenty-first session, held in Dehradun, India, in April 2006, the Asia-Pacific Forestry Commission (APFC) resolved to update the outlook extending the horizon to 2020. The study commenced in October 2006 and is expected to be completed by September 2009.

The study has been coordinated by the Food and Agriculture Organization of the United Nations (FAO), through its regional office in Bangkok and its headquarters in Rome, and implemented in close partnership with APFC member countries with support from a number of international and regional agencies. The Asian Development Bank (ADB), the International Tropical Timber Organization (ITTO), and the United Kingdom's Department for International Development (DFID) provided substantial financial support to implement the study. Partnerships with the Asia-Pacific Association of Forest Research Institutes (APAFRI) and the Secretariat of the Pacific Community (SPC) supported the organizing and implementing of national focal points' workshops and other activities, which have been crucial to the success of this initiative. The contributions of many other individuals and institutions are gratefully acknowledged in the main APFSOS report.

Working papers have been contributed or commissioned on a wide range of topics. These fall under the following categories: country profiles, sub-regional studies and thematic studies. Working papers have been prepared by individual authors or groups of authors and represent their personal views and perspectives; therefore, opinions expressed do not necessarily reflect the views of their employers, the governments of the APFC member countries or of FAO. Material from these working papers has been extracted and combined with information from a wide range of additional sources to produce the main regional outlook report.

Working papers are moderately edited for style and clarity and are formatted to provide a measure of uniformity, but otherwise remain the work of the authors. Copies of these working papers, as well as more information on the Asia-Pacific Forestry Sector Study, can be obtained from:

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Acknowledgements

Many people have contributed to this report. I would like to thank C.T.S. Nair for his critical, valuable, extensive and timely inputs that facilitated the conceptualization, investigation and presentation of the outlook. My sincere thanks go to Adrian Whiteman for his important inputs in the early stages of the study. I would especially like to thank Paul Vantomme for his valuable comments and insights that helped to improve the report. Thanks are also due to Arvydas Lebedys, for helping to extract, decipher and decode the NWFP-related information from the UN Comtrade database. Mirella Salvatore also deserves a special mention for helping to collate and manoeuvre data between multiple spread-sheets for analysis.

Finally, I would like to express my gratitude to all the individuals and organizations that responded to my queries on different aspects of the outlook study.

EXECUTIVE SUMMARY

The future of forests (and by extension the role of non-wood forest products [NWFPs]) is an emerging field of global enquiry. By default or by design, the poorest populations in most countries reside in remote forested areas; most of them to some extent depend upon NWFPs for food, medicine, fibres, cultural artefacts, etc. Populations in and around forested areas are increasingly being subjected to changes brought on by globalization, economic growth, demographic shifts and the development of technology. These and other developments are presenting the forest-dependent communities with new opportunities to engage in trade as well as conservation. Granting of tenure rights to forest communities in recent years will further enhance this possibility.

The challenges of addressing global poverty in a sustainable manner are greater than ever. The establishment of the Millennium Development Goals (MDGs) reflects this desire. To what extent the targets of the MDGs have been achieved or are likely to be achieved is still in question, but the process in this regard has opened up opportunities for more systematic and sustainable use of NWFPs to contribute to the MDG goals. In addition to contributing to poverty alleviation, proper management of NWFPs can improve the natural and economic assets of a country.

Key dynamics emerging in the Asia-Pacific region

Changing concepts of what NWFPs encompass

NWFPs include items from a wide range of production systems. These vary from gathering and hunting of products in open access (forested) lands, representing the most traditional and conservative interpretation of the term NWFP, to a liberal interpretation encompassing "intensive domestication" on private/community-owned/managed farmlands. The more "liberal" the interpretation of the term NWFP, the more blurred the rational meaning becomes, as NWFPs no longer fall exclusively in the domain of forest products. An example may be walnuts, which were traditionally collected from wild trees in the Himalayan forests of Pakistan, Bhutan, and Nepal and have now been developed as orchards; similarly, the activity of harvesting wild Indian gooseberry (*Emblica officinalis*) may be compared to the cultivated sources supplying the Ayurvedic industries.

There is therefore some degree of overlap with the agriculture and horticulture sectors in data gathering, analysis and outlook.

Another point to note is that some countries in the Asia-Pacific region apply the term NWFP differently (commonly referred to as non-timber forest products, or NTFPs) and liberally, compared with regions and countries such as Europe, North America, Latin America, Australia and South Africa. For instance, in the Asia-Pacific countries of China, India, Viet Nam, Indonesia, and the Philippines, the difference in the concept is not only what constitutes a NWFP, but also its source. Each country may have its own specific reasons for various categorizations. As a consequence, some of these countries tend to be "seen" as major producers of NWFPs, but the source of production for some of these products may be farmlands, not forests.

Dynamics of collection of NWFPs from the wild

In no other region of the world are industrialization and globalization occurring so rapidly and vastly as in Asia and the Pacific. The region offers huge opportunities for employment and income generation in value-added sectors, which compete for labour

and resources with traditional farming and forest-based activities. "Gathering" NWFPs in forests is becoming increasingly "expensive", not only because of the reduction in the extent of forests but also because rural people's options for income generation are expanding. Furthermore, the increasing costs and depleting resources of some important NWFPs are creating incentives for their cultivation.

A number of countries are modernizing their farming systems with impressive productivity gains. These improvements will also percolate to some of the commercially important NWFPs, reducing the costs of cultivation and improving productivity. Developments in alternative or synthetic substitutes for products of mass consumption (like plastic replacing rattan wickerwork) are further shaping these dynamics.

Global dynamics impacting production and consumption

Globalization is increasing inter-connectedness, competition and opportunities. Many countries in the Asia-Pacific region are witnessing an increased demand for certain NWFPs. The key drivers for changing demand are economic growth, evolving socio-political situations, developments in science and technology, regional trade agreements and changing preferences of society.

There are significant efforts to conserve, cultivate and process NWFPs to ensure resource conservation while simultaneously improving the price per unit of traded products. These initiatives are visible both at the household and institutional level and are reflected in the different patterns of production, processing and trade. Several NWFPs are also moving up the value chain. Appropriate policies and institutional mechanisms (from government, private players and NGOs) in some countries provide much needed support.

The outlook identifies four broad scenarios:

1. Low-income subsistence scenario (*Subsistence societies*).
2. Resource decline and substitution scenario (*Agrarian societies*).
3. Increased commercialization scenario (*Industrial societies*).
4. Revival scenario (*Post-industrial societies*).

Each of these scenarios reflects divergent needs of society and the differing roles of various stakeholders and institutions in resource management. The drivers of such scenarios will largely be a combination of factors like economic growth, socio-political situations, innovations and development in science and technology, demographic changes, commitment towards various international agreements and conventions and changing preferences of society. Certain factors may limit the outcomes of the scenarios, including lack of infrastructure, access to technology, declines in resources due to unsustainable practices and conflicts due to increasing land-use change.

Finally, as the shift between scenarios occurs, there is bound to be some degree of adaptation difficulties and conflicting situations. Appropriate policies and institutions at this stage can play a significant role in shaping the outcomes.

1. INTRODUCTION

Background and research overview

The past decades have witnessed rapidly growing interest in NWFPs among conservation and development organizations (Arnold and Ruiz Pérez, 1998; Wollenberg and Ingles, 1998; Ruiz Pérez and Arnold, 1996; Neumann and Hirsch, 2000). This increasing attention is attributed to the potential role NWFPs can play in health care, food security and resource conservation. New markets for natural products have emerged, such as phyto-chemicals in pharmaceutical industries and additives in food industries, which have revealed the economic significance of NWFPs. Further justification for emerging interest in the sector has been more socio-political and ecological in nature. Ecological benefits are achieved from reduced forest ecosystem disturbances, *vis à vis* timber extraction practices, while socio-political interests have centred around the promotion of new development models for forest-dependent people.

This study attempts to provide future scenarios of the development of NWFPs, taking into consideration the current status, emerging trends both within and outside the sphere of NWFPs, the pitfalls and the potentials and the policy implications, indicating the options available.

Objectives of the study

The overall objective of the study is to assess the future of NWFPs in the Asia-Pacific region for the period to 2020.

The study specifically aims to:

- Analyze the existing information and knowledge on NWFPs in order to provide an overview of the broad trends in the production, processing and trade of NWFPs
- Analyze the policy, legal and institutional aspects of NWFP development, indicating the challenges and opportunities
- Assess the driving forces that impact the future development of NWFPs and identify the emerging scenarios

APFSOS II countries

This study covers 33 countries from the Asia-Pacific region. The region is classified into four sub-regions: East Asia, South East Asia, South Asia and Oceania (see Table 1).

Table 1. Countries in the Asia-Pacific region

Sub-region	Countries
East Asia	Democratic People's Republic of Korea (DPRK), Japan, Mongolia, the People's Republic of China, Hong Kong SAR, China, Taiwan Province of China, the Republic of Korea (ROK)
Southeast Asia	Brunei, Cambodia, Indonesia, Malaysia, Myanmar, Lao People's Democratic Republic, the Philippines, Singapore, Socialist Republic of Viet Nam, Thailand
South Asia	Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
Oceania	Australia, Cook Islands, Fiji, Kiribati, New Caledonia, New Zealand, Papua New Guinea, Samoa, Solomon Islands, Tonga, Vanuatu

NWFP information gaps

Wide array of products: NWFPs consist of a wide array of products which are often represented as a residual category other than timber. According to Belcher (2003), the very fact that NWFPs are defined by what they are not is indicative of the wide range of products they encompass and helps to explain the lack of consistency in addressing the various issues relating to their production and processing. Furthermore, products that are from cultivated/planted or domesticated sources are still referred to as non-wood forest products. There is no clarity as to when an NWFP becomes an agricultural commodity. The absence of data on cultivated NWFPs in annual agricultural statistics is indicative of the ambiguity on how these products are to be categorized.

Lack of comparable data: Analysis on NWFPs is marred by inadequate and unreliable information (Mittleman et al. 1998). A distortion commonly encountered in the trade statistics of most exporting countries is merged product groups (e.g. plants and plant extracts or essential oils in the UN Comtrade database and similar databases). Species level information is hard to come by; hence analysis is done for a broader category of product. Reliability of data on account of under-reporting, over-reporting or non-reporting is a major problem. Also, data are not always available for continuous years or similar products, making comparisons and analyses difficult.

Lack of appropriate documentation and dissemination: There are very few attempts to regularly document harvesting and regeneration levels of NWFPs in the wild. Information on production and consumption at the domestic level is strikingly absent in most places and for most NWFPs. Appropriate documentation at a common point source also does not exist for cultivated NWFPs (however in the case of endangered species under cultivation some amount of documentation does take place at the forest department level). Isolated attempts exist in some countries to compile market prices of NWFPs, but they are not easily accessible and are most often not amenable for systematic analysis and interpretation.

The issues above constrain a systematic assessment of the long-term outlook. Nevertheless, vast amounts of literature on various aspects of NWFPs do exist. Attempts have been made to weave such information in order to provide a larger picture of NWFPs, particularly by providing available quantitative and qualitative information and by outlining the broad patterns of long-term development.

2. NWFPs AND THEIR SIGNIFICANCE

An overview

NWFPs are a broad “group” of products that encompass all plant and animal forest resources excluding timber. According to FAO “NWFPs consist of goods of biological origin other than wood, as well as services derived from forests and allied land uses”. Invariably most of these NWFPs are gathered rather than cultivated and there is usually limited value addition at source. It is estimated that of the 6.2 billion people on the planet, 25 percent depend to varying degrees on the forest’s resources for their livelihood and 350 million people living in or near dense forest depend highly on them for their subsistence or livelihood (Killman, 2003²).

Importance of NWFPs

NWFPs have a perceived economic and social value sufficient to encourage their collection from the forest (see Table 2). A range of NWFPs are harvested for use as food and food supplements, medicines, construction materials and for socio-cultural and religious uses. They are also harvested for large-scale industrial consumption. In Lao PDR, the gathering of NWFPs is the key coping strategy for food security. Similarly in India, Sri Lanka, China, Mongolia, Bhutan and Nepal, the traditional health care systems of Ayurveda, Siddha and Unani and the Traditional Chinese Medicine/Traditional Tibetan System of Medicine (Sowa-Rigpa) are based primarily on medicinal herbs.

Table 2. Some broad estimates to indicate the importance of NWFPs

Public health contribution of NWFPs based on use in traditional medicine:	80% of the population in developing countries (WHO, 2002)
NWFPs as % of household income:	49% in India (CBD Technical series # 4 [2001]), 45% in Upland Lao PDR (Foppes and Ketphanh, 2003)
Contribution to food security and nutrition:	In Lao PDR, wild foods contribute between 61-79% of non-rice food consumption by weight, and provide an average of 4% of energy intake, 40% of calcium, 25% of iron and 40% of vitamins A and C (Clendon, 2001)

Contribution of NWFPs to local livelihoods and development outcomes

The positive contribution of NWFPs to rural livelihoods is broadly acknowledged (FAO 1995, Hegde & Enters 2000, Ros-Tonen 2000, Bennet 2002, Pfund & Robinson 2005). Collection and processing of NWFP raw materials into finished products provides employment for millions of people in the Asia-Pacific region (Mittleman et al. 1998). The majority of harvested NWFPs is used for meeting food, nutrition and healthcare requirements. Some fill a part of seasonal income gaps and others are integrated into the market economy, forming an important source of household income.

In the remote, high-altitude regions of Nepal, Bhutan, China and India, the collection of wild medicinal plants and fungi is a major income-building activity for many households in addition to contributing significantly to people’s primary health care. In China’s

² Non Wood News, 2003.

Wanglang area (Pingwu county, Sichuan), collectors can earn CNY2000 per year from the sale of Caterpillar fungus (*Cordyceps sinensis*). Often the harvesting of high value, rare species occurs illegally within protected areas and overexploitation is a key concern (WWF China, 2007).

NWFP-based small and medium forestry enterprises (SMFEs) enhance incomes and provide local employment, as in the case of tendu leaves (*D. melanoxylon*) in India and rattan and bamboo across Southeast Asia (see Box 1). In Cambodia, the collection of NWFPs like damar resin from *Dipterocarpus* spp. is a key component of people's livelihood strategies. In recognition of this, the 2002 Forestry Law of Cambodia forbade the harvest of all species which are tapped for resin.

Box 1. Rattan and Bamboo Entrepreneurs: Creating Business and Value in a Viet Nam Province

Skilled young craftsmen of rattan and bamboo products from the Phu Nghia and Phu Tuc Communes in the Ha Tay province of Viet Nam have become neo-rich, earning hundreds and thousands of US dollars. In the Phu Nghia commune, 85% of the 2,028 households are involved in producing rattan products for export. There are 25 limited companies, rattan cooperatives and enterprises in the region, out of which 17 are involved in rattan-based products for export to the Japanese, American and Australian markets.

In the Phu Tuc Commune, there are an estimated 20 young entrepreneurs who sell handicraft products in cities including Ha Noi and Hai Phong and who employ about 40-50 persons.

According to Pham Tuan Da, Chairman of the Phu Tuc Commune's People's Committee, "these enterprises have created stable jobs for thousands of local people and increased the communal revenue".

The factors that have facilitated entrepreneurship, trade and export include:

- Rich abundance of rattans (both cultivated and wild)
- Access to the capital city, Hanoi (located about 25 km away)
- Increased demand for rattan-based products from foreign tourists and niche markets
- Emerging entrepreneurship from within the province

Source: <http://vietnamnews.vnagency.com.vn/showarticle.php?num=02ECO071006>;
<http://www.asiaseed.org/apec2006sme/phuvinhinfo.pdf>

Many NWFPs fall out of subsistence use as incomes increase (this can be country-specific or area-specific, as the same NWFPs may be of relevance to other communities in a different location). For example, in China, bamboo is moving out of subsistence use and is increasingly utilized for production of high value products like flooring. However, bamboo still remains an important subsistence use product for many communities in Bhutan, Bangladesh and Myanmar.

NWFPs and Millennium Development Goals (MDGs)

Acknowledgement of the potential role of forests, and in particular NWFPs, can play in achieving the United Nations Millennium Development Goals (MDGs) (Colfer et al. 2006; FAO 2003) is growing (Table 3). Bilateral and multilateral organizations like FAO, IFAD, ADB, IUCN and the Global Environment Facility (GEF) are facilitating interventions to help achieve the MDG goals. In Lao PDR, the NAFRI-IUCN supported NWFP project has enabled communities to improve their livelihoods through strengthening market linkages (see Box 2).

Table 3. Role of NWFPs in attaining MDG targets

MDG goals		Forest/NWFP linkages for MDG outcomes
Goal 1	Eradicate extreme poverty and hunger	People residing in and near forests and leading subsistence lifestyles typically obtain a considerable, though variable, amount of nutritious foods from forests such as fruits, nuts, berries, vegetable leaves etc. In times of emergencies (droughts, famines) and seasonal shortfalls of agricultural products, these NWFPs can be a source of food security and offer an alternative means (through both cash and kind opportunities) for preventing hunger.
Goal 3	Promote gender equality and empower women	Financial empowerment of women can be achieved through the collection, processing and trade of NWFPs. NWFP activities enable women to improve their family's health and education.
Goals 4 & 5	Reduce child mortality and improve maternal health	There is much nutritional intake from edible NWFPs. Roots and tubers such as sago in Southeast Asia and PICs can be a source of starch. Many leaves, tree ants and mushrooms offer iron. Various edible oil seeds provide fats and proteins. Access to fuelwood can enable the boiling of water, which reduces many water-borne diseases.
Goal 6	Combat HIV/AIDS, malaria and other diseases	Medicinal plants (<i>Andrographis paniculata</i> , <i>Swertia chirata</i> , <i>Cinchona</i> spp, <i>Artemesia</i> spp.) have provided solutions to many diseases and illnesses (including malaria) both in traditional and modern systems of medicine. Much potential remains untapped.
Goal 7	Ensure environmental sustainability	Sustainable NWFP collection can protect the forest resource base through both community-based systems and state-controlled regimes.
Goal 8	Develop a global partnership for development	The creation of international markets for NWFPs through the rationalization of tariff and non-tariff barriers of trade encourages global partnerships, which stimulate sector and regional development.

Source: Adapted from Colfer et al. 2006; Chaudhary, 2007; Kaushal and Melkani, 2005.

Box 2. NWFP-based Interventions for Attaining MDG Targets

In the village of Nam Pheng in Oudomxay Province of Lao PDR, villagers were unable to produce enough rice to feed the community year round. Sales from bamboo shoots during the dry season did not contribute sufficiently. A NAFRI-IUCN NTFP project assisted them to analyze their predicament. The villagers realized that they could increase their income if they cooperatively sold for a fixed price measured not by bundle but by kilogram, in a fixed location. Every family agreed to join the initiative. The results exceeded expectations. In five months, the village sold over 47 tonnes of shoots and earned 50 million kip, or US\$6,670 (on average 1 million or US\$130 per family), at least four times more than the previous year. The community also gained 5 million kip in a village development fund, setting aside 100 kip for every kilogram sold.

Major impacts from the increased income include:

- From 1998 to 2002, the poverty rate in the village was halved (from 33% to 18%).
- The village achieved food security.
- Child mortality declined as medicines became affordable.
- Education improved as villagers could afford a teacher for their school.
- Villagers improved the infrastructure. New installments included a rice bank and mill, a two-room school, three water taps, an electricity generator and village electricity system and two hand tractors.
- Increased household happiness, as people could afford clothing and other basics.
- Realizing the benefits the community now enforces a set of harvesting regulations to protect their bamboo forests.

Seven surrounding villages adopted similar systems. Many other organizations have started NWFP development projects as a result of visiting the Nam Pheng site, which is now famous throughout northern Lao PDR. During a workshop in 2005, district officers of Oudomxay Province reported 112 villages where NWFP planting, harvesting and selling activities are being promoted. In a workshop in Vientiane, 2004, over 50 organizations reported NWFP selling activities throughout all provinces of Lao PDR.

Source: Morris and Ketphanh, 2003.

NWFP consumption and trade

The state of development of NWFPs depends particularly upon ecological conditions, the social and economic situation, the state of development of technologies and the larger historical context of resource use. For example China, India and Nepal are the major players in the global trade of medicinal plants (the former two countries are also the largest consumers of medicinal plants in the Asia-Pacific region). Indonesia and Malaysia dominate the production of agarwood oil (*Aquilaria* spp.). China is the largest producer of bamboo products, resin and oleoresins. The PICs produce the natural relaxant *kava kava* (*Piper methysticum*), while ROK and Japan supply mushrooms. Indonesia, Malaysia, Philippines and Viet Nam specialize in the production, consumption and trade of rattan-based products. Annual export of medicinal and aromatic plants from Nepal is estimated at 20,000 tonnes (a value of US\$18-20 million), with about 90% of that destined for Indian markets (Kanel, 2004). Over 70% of the population living in the uplands of Lao PDR is also heavily dependent on NWFPs for livelihoods. As indicated in Box 3, apart from subsistence use, a number of products are exported, mainly to Thailand and China as well as to France and the Middle-East.

Box 3. Typical NWFPs Exported from Lao PDR, with Estimated Export Volume Per Product Per Year

- Broom grass (*Thysanolaema maxima*), exported to Thailand to make brooms, 200 tonnes/year
- Sweet palm fruits (*Arenga westerhoutii*), exported to Thailand to make sweets, 600 tonnes/year
- Paper mulberry (*Broussonetia papyrifera*), exported to Thailand to make paper, 500 tonnes/year
- Benzoin (*Styrax tonkinensis*), exported to France for the perfume industry, 50 tonnes/year
- Peuak meuak (*Boehmeria malabarica*), exported to China to make glue and joss-sticks, 700 tonnes/year
- Eaglewood (*Aquilaria* spp.), exported to the Middle East as incense, 20 tonnes/year
- Bitter bamboo (*Indosasa chinensis*), exported to China as fresh edible shoots, 200 tonnes/year
- Cardamom (*Amomum* spp.) exported to China as medicine, 500 tonnes/year

Source: Foppes and Ketphanh, 2000.

Given the diversity of NWFPs and the larger state of socio-economic development, there are divergent patterns of production, processing, consumption and trade (see Table 4). Yet only a few economically dynamic NWFPs will enter regional and national markets, a situation dependent on policies, supporting institutions, market demand, and infrastructure and technology development. Entering the global value chain requires significant improvements in production, processing and trading arrangements.

Table 4. NWFPs at different stages of consumption and trade

Category	% share	Examples of NWFPs within the category	Characteristics
Subsistence use	70-75%	<ul style="list-style-type: none"> - Mahua flowers and fruits (<i>Madhuca latifolia</i>), sal leaves (<i>Shorea robusta</i>) (India, Bhutan, Sri Lanka, Nepal, Myanmar) - Rattan (<i>Calamus</i> spp) (Lao PDR, Myanmar, Sri Lanka) - Medicinal plants (those related with traditional health care; India, Bhutan, Sri Lanka, China and Nepal) - Lard fruit for oil-seed (<i>Hodgsonia macrocarpa</i>) (Indonesia, Thailand, Viet Nam and Lao PDR) - Jujube (<i>Zizyphus jujuba</i>) (China) - Sago (<i>Metroxylon sagu</i>) (Indonesia) - Illipe nuts, Pili nuts (<i>Canarium ovatum</i>) (Philippines) - Polynesian chestnut (<i>Inocarpus fagifer</i>), Galip nuts (<i>Canarium indicum</i>) Okari nuts (<i>Terminalia kaernbachii</i>), Pao (<i>Barringtonia procera</i>) in PICs <p>(e.g. fruits, nuts, berries, leaves, fibres)</p>	<ul style="list-style-type: none"> - Low economic importance (cater only to small markets) - Crucial for basic food, clothing, shelter and health needs and based on traditional knowledge - Bulky, hence not commercially feasible for transportation - Typically low value per unit volume
Traded for consumption at the regional and national markets	15-20%	<ul style="list-style-type: none"> - Harra (<i>Terminalia chebula</i>) - Baheda (<i>Terminalia bellerica</i>) - Aonla (<i>Emblica officinalis</i>) - Tendu leaves (<i>Diospyros melanoxylon</i>) - resins (<i>Dipterocarpus alatusis</i>, <i>Pinus</i> spp.) and gums (<i>Stercularia urens</i>) - Lac and latexes (<i>Hevea brasiliensis</i>) <p>(e.g. gums, latexes and resins, medicinal and aromatic plants)</p>	<ul style="list-style-type: none"> - Industrial applications in both food (confectionery, beverage industry) and non-food industries (paint and varnish) - Natural health care products - Synthetic substitutes either not available or use of products from natural sources preferred for cost and quality reasons
Traded at the global level	5-10%	<ul style="list-style-type: none"> - Mushrooms (Shiitake and matsutake) - Sandalwood oil (<i>Santalum</i> spp.) - Agarwood oil (<i>Aquilaria</i> spp.) - several medicinal and aromatic plants (ginseng, senna leaves) - rattan- and bamboo-based speciality products <p>(e.g. gums, latexes and resins)</p>	<ul style="list-style-type: none"> - Value per unit of volume generally high - Mostly country-specific - Rising incomes and changing societal preferences are key drivers for such products to reach the global level

3. NWFPs AND THEIR DEVELOPMENT

Non-wood forest products and changing paradigms

Notwithstanding the recognition of the potential role of NWFPs in poverty alleviation, rural development and conservation, the actual development has been relatively slow. One reason could be that NWFPs consist of a wide array of products and mean different things to different people. Management and development of the resources may become as complicated as the many domains of governance, such as Tribal/Indigenous groups or Departments of Forests and Environment/Natural Resources (and their various subsidiaries). Nevertheless, certain developments have taken place over the years and one such development of significance has been that NWFPs have ceased to be the “minor” forest products they once were.

In fact, a gamut of other developments related to NWFPs has taken place in the past years, particularly in areas of food security, livelihoods, conservation, forest rights, access and tenure issues, institutional development, trade and rural development (see Figure 1). Forest management objectives and strategies have undergone significant changes from the centralized authoritarian approach to increased involvement of local communities through stakeholder dialogue processes. The pace of development differs across countries. Subsistence use is predominant in most of the less industrialized countries, for example in the South Pacific, Lao PDR, Cambodia, Bhutan and Myanmar. In more industrialised countries, subsistence use tends to decline, while commercially important NWFPs undergo systematic domestication and cultivation. Considerable attention is given to improving tenure rights and to support SMFEs involved in production, processing and marketing.

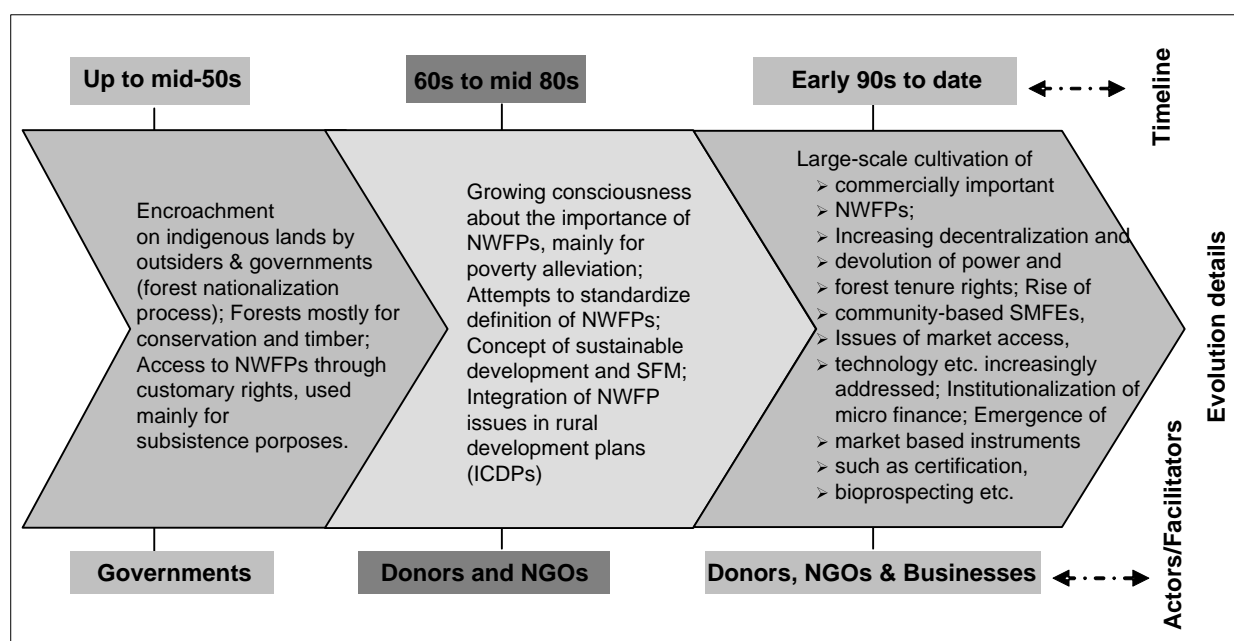


Figure 1. Trends in forest resource use impacting NWFP management

In brief, NWFPs over the years have witnessed diverse development patterns and this had an impact on the nature of research and the policy and institutional development (see Table 5).

Table 5. NWFPs and general developments

Paradigms in brief	Current status
Change in use of NWFPs	Though most of the NWFPs remain at the subsistence level, some commercially important varieties have entered the national markets and fewer still in the global markets.
Increasing importance of NWFPs as potential tools for poverty alleviation	Emphasis on value-addition and product development, capacity building, community enterprise development and market linkages for commercialization. Most of the governments/organizations/ donors that are committed to the MDGs are attempting to explore and facilitate these processes.
Changing research focus	Much of the earlier research on NWFPs focused on ecology, biology and compiling information for database creation. However, current research focuses more on the economic and policy aspects, with studies on product yield, harvesting limits, market surveys, value chain analysis, product development and silviculture, recreational use and policy implications etc. with some focus on sustainability and equity issues.
Policy and institutions	Policies are being revised to support community-based forest management. Participatory approaches, stakeholder involvement, social inclusion and collaborative management have become buzz words in the development sector. There has been a proliferation of specialized agencies.

Changing importance and shifts in use

In the last decades, some NWFPs have evolved from minor forest products to high-end “green or speciality products”. Matsutake in Japan, bush-food in Australia and wild-crafted articles in Bali are some of the important speciality items from the region. As in the case of “bush-food preparations” many of the NWFPs are being sought after for high end uses. Sago (*Metroxylon* spp.), for example went from being one of the richest starch sources for the majority of the communities in the Southeast Asian and PICs to being increasingly used in small-scale local industries. The Japan Society of Sago Palm Studies has almost standardized the procedures of using sago feedstock for ethanol production through fermentation, and in Indonesia, sago is used as an extender in the production of adhesives for the local plywood industry (Flach, 1997).

Organic food retailers and herbalist shops that supply natural products are increasing in popularity worldwide. Increased investment in R&D for new uses and processes is partially enabling these changes. For instance, a UK firm has acquired a patent on new properties of sago (see Box 4). Similarly till a decade ago in India, the Indian gooseberry, or Aonla (*Embllica officinalis*), mostly met the vitamin “C” requirement of the forest-dependent poor. The herbal resurgence overseas and within the country has made the gooseberry a base material in bulk quantity for most of the Ayurvedic, Unani and Siddha medicines as well as in the food and beauty care industries. To meet the growing demand, large-scale cultivation is being undertaken in various states in India (e.g. Pratapgarh in Uttar Pradesh supplies the best cultivated Aonla in the country), with some manufacturing units preferring cultivated versions over those that have been harvested from the wild. This is due to their uniform size and quality.

Box 4. Sago-related New Patent in the UK

In July 2007, the UK-based National Starch Chemical Holding Corporation (www.nationalstarch.com), a leading global player in the starch industry, received a patent (No. 7244312) for its invention on the fluidity properties of sago. The sago fluidity invention lays claim to sago's exceptionally fast gelling properties, high gel strengths and exceptional elasticity. This invention has significant implications for the food and chemical industries. Not surprisingly, two of the four-member invention team were from Singapore, and another was from Thailand.

Stages of development

Depending on the level of growth of an economy, NWFPs undergo different stages of development. For instance, in many of the PICs such as Papua New Guinea, Vanuatu, Samoa and even Cambodia and Lao PDR in Southeast Asia, NWFPs play a subsistence role or act as "safety nets" to tide over periods when crop production is unsatisfactory. These economies are in the early stages of growth; hence NWFPs play a dominant role and may contribute over 50% of people's total income. In countries such as Nepal, India, Viet Nam, Indonesia and Malaysia, NWFPs are being increasingly integrated in the agriculture-based economy. In these countries, development has concentrated more on issues of market access, better infrastructure and financing facilities. Yet the 'safety net' function of NWFPs is also found in these integrated economies and many communities continue to derive NWFP subsistence use benefits. In contrast, in the East Asian region, including China and Japan, significant investments have been made in research and technology development. Markets in this region are more developed and tend to be more dynamic.

Out of hundreds of NWFPs produced in a country, very few NWFPs reach the national/global markets as compared to the quantity that is available locally. This could be because of market access issues and lack of demand.

In brief, NWFP development has differed between remote areas with forest-dependent livelihoods, mixed rural areas with multi-enterprise livelihoods, and urban-linked areas with specialized forest-related livelihoods.

Policies and their impact on NWFP use and management

In many regions of Asia, most of the forests are owned by the State. However, in PICs such as PNG, Fiji, Vanuatu and Samoa, forests are primarily under customary community ownership. As far as subsistence use from forests is concerned, it is permitted in most of the Asia-Pacific countries, though not without some degree of conflict as to how much can be extracted and who should be the beneficiaries.

Table 6 summarises the policies that impact NWFP use, management and development in some of the countries in the Asia-Pacific region (for more details see Annex 5). Only a handful of countries like Viet Nam, India and Nepal have formulated dedicated policies towards NWFP development and in most countries the National Forest Policy (or equivalents) govern the use and management of NWFPs. Certain countries like Australia and China have given recognition to sectoral development of NWFPs, like the bush-food industry and Traditional Chinese Medicine (TCM) respectively.

Table 6. Overview of policies in the Asia-Pacific region that impact NWFPs

Countries	Policy/ policy brief	NWFP use, management and development
Australia	National Indigenous Forestry Strategy (2005)	This policy attempts to integrate the indigenous aborigines into commercial forestry sector enterprises by focusing on the emerging bush-food industry.
China	Devolution of state and collectively-owned forests to individual households under the Rural Land Contract Law (2003) The Industrial Policy (1991-2000)	Under the collective forest management practices, management is well-defined and shares from NWFP permits, taxes, fees and sale are distributed to village members according to family size. The Industrial Policy gave impetus to large-scale cultivation of medicinal plants for the production of Traditional Chinese Medicine and supports conservation of wild resources.
India	Joint Forest Management, 1990 The Panchayat (Extension to the Scheduled Areas) Act, 1996 Under the new Foreign Trade Policy, 2004 expansion of the "Vishesh Krishi Upaj Yojana to include SMFEs and their products. Scheduled Tribes and other Forest Dwellers (Recognition of Forest Rights) Act, 2006	Aspects include: <ul style="list-style-type: none"> - Usufructs sharing rights of communities in the JFM area range between 25%-50%. - Ownership rights of NWFPs with <i>Panchayats</i> and <i>Gram Sabhas</i> - Increasing the share of NWFP exports both as raw and as value-added products - Granting of forest tenure rights, with scope for better NWFP use and management - Institutionalization attempts by forming the National Medicinal Plants Board (2000), Department of AYUSH etc.
Nepal	CFM, Inclusion of NWFPs in the National Forestry Programmes, Formulation of new "Herbs and NTFP Development Policy 2004"	Usufructs sharing rights of communities at 100% (in the case of NWFPs) are included. The new NWFP policy provides a guideline for NWFP management, value addition and marketing.
Viet Nam	National strategy on Non-timber Forest Product Development and Conservation 2006-2020	The new strategy has acknowledged the role NWFPs play in the regional and national economy. It attempts to closely link research, training and extension of NWFP conservation and development. According to the Five Million Hectare Reforestation Program (5MHRP), by 2010 Viet Nam could have more than one million hectares of NWFP plantations and other types of NWFP forests.

Source(s): Various, but mainly Brown and Durst, 2003, Nurse and Mala, 2005.

The development of NWFPs is determined by the policies of a country, which may hinder or support their production, consumption and trade. Policies of importing countries can also impact development of the sector, as in the case of kava kava (*Piper methysticum*) from the PICs (see Box 12).

4. NWFPs: STATUS, PATTERNS AND TRENDS

In the past decade, a range of patterns has emerged related to NWFP production, consumption, marketing and trade in the Asia-Pacific region, with important implications on policies, institutions and capacity building in many countries. These developments have also had a significant bearing on economic development and resource conservation.

Increasing demand for NWFPs: During the last decade the general trend has been an increase in the demand for NWFPs. However, most of the increase in demand is for NWFPs linked to industrial application, especially in the food, pharmaceutical and cosmetic industries. The global trade value of NWFPs has increased. For example, the value of NWFP imports rose from US\$9 billion in 1996 to US\$14 billion in 2005. Many new countries have entered the global market since 2000, including Maldives, PNG, Fiji, New Caledonia, Bangladesh, Sri Lanka, Cambodia, Bhutan and Nepal (see Annex 1). In many cases, entry has been based entirely on new products. For example, Kiribati's entry into the global market in 2005 was based upon the production of mushrooms and truffles.

The contribution of Asia and the Pacific (in terms of export) to global trade has been significant, accounting for about 40% of the traded NWFP value. Although a couple of countries account for the majority of this, most of the Asia-Pacific countries are involved.

Entry, exit and re-invention of some products: As with other commodities, the overall trade pattern and the key players involved undergo considerable changes as the nature of demand and producer competitiveness changes. Participation in the global value chain has its ups and downs. Entry for some countries (as in the case of mushroom and truffles trade by Kiribati in 2005) has been primarily based on the potential to meet the growing demand for a product. Subsequently, for those NWFPs that are experiencing decline in demand, it has been either because of the collapse of the end use industry (as in the case of lac, with the decline of the gramophone industry) or cheaper alternative source for the product itself (synthetic substitutes, as in the case of *Terminalia chebula*) or increased supply from cheaper sources (Lao PDR and Cambodia for bamboo and rattan supply in Southeast Asia and East Asia).

In the case of lac, India continues to supply and meet the global demand, but other important suppliers like Thailand and China have reduced their lac production and export by 26% and 78% respectively, probably due to changes in the cost of production, especially in the context of more remunerative employment (see Table 7). India's increase by 26% in lac exports between 2000 and 2005 is largely to meet the supply gap on account of reduction of exports from these countries.

Table 7. Change in patterns of lac trade

Countries	Year 2000		Year 2005		% change
	Total quantity traded (in tonnes)	Trade value (in '000 US\$)	Total quantity traded (in tonnes)	Trade value (in '000 US\$)	
India	9069	26,729	9180	33,633	+26
Thailand	5891	11,055	2175	8,186	-26
China	474	2,839	116	621	-78

Source: Based on UN Comtrade data as on 31 August 2007.

Changes are taking place in terms of the commodities traded. Increasingly, products like bamboo and rattan are being traded as value-added products, where re-invention in terms of use or applications has increased the demand for the product. Till the late 1990s, China, Philippines and Indonesia exported mostly raw bamboo. These countries are now producing a range of diversified, value-added bamboo products from high quality fabrics, construction materials like bamboo flooring and ceilings to food supplements such as bamboo vinegar. The existing skill-sets of the people in handling bamboo-related products for subsistence use are being overhauled through training and capacity building initiatives to deal with the technology for producing such high-value products.

Factors governing the trends: The NWFPs for which demand has increased are characterized by (a) possible use at a commercial scale in some industrial applications; (b) lack of substitutes, or, if available, not preferred by the consumer either for quality or cost reasons; and (c) ease of procurement from wild or domesticated/ cultivated sources.

Concurrently, subsistence use value, the predominant feature of NWFPs, is also declining in many rural communities. This can be attributed to rising incomes, depletion of resources and the perceived notion of 'backwardness' involved in using subsistence NWFPs.

Production patterns of NWFPs

A wide range of production patterns exist. CIFOR's analysis of 61 case studies (Ruiz-Perez et al. 2004), suggests that NWFP production and use falls into one of three strategies: (a) subsistence collection and use, (b) integrated with agriculture and (c) specialized production. In the case of *subsistence collection*, NWFPs have known to contribute up to 50% or more of the household cash income. Harvesting is done using traditional technologies and is spread over large areas, reflecting low productivity per hectare.

In the case of *integrated agriculture*, NWFPs are one of many commodities cultivated along with other crops and management is focused on production. Items are then sold in the local and intermediary markets. Since enhancing income is the primary objective of cultivation, many producers also undertake some primary processing.

In the case of *specialized production*, substantial resources are invested and cultivation is more systematic. Most cultivators are economically better off and are able to take risks. The means of production in this case are generally through high technology and produce generally reaches the national and international markets.

Two broad patterns of change can be observed in the case of NWFPs in the Asia-Pacific region:

- a) From subsistence use to commercialization
- b) From collection from the wild to domestication and cultivation

From subsistence use to commercialization

Subsistence use is the predominant mode of NWFP production in forested rural areas, where more than half of the population of most countries in the Asia-Pacific region resides. Many of the local communities are dependent to some degree on NWFPs either as food, medicines or for production of artefacts and implements for household use.

Reasons for subsistence use: The reason why NWFPs continue to attract resource-poor forest-dependent people, despite the fact that these activities are characteristically labour

intensive, is because they (a) generally have low technical entry requirements; (b) can provide immediate cash; and (c) the resource is freely accessible in most cases (Neumann and Hirsch, 2000), though sometimes the same characteristics make NWFP collection and consumption an inferior activity (Angelsen and Wunder, 2003; Shreckenberg et al., 2006). More importantly, many forest-dependent people have no affordable or attainable alternative resources, while forests products are readily available.

Factors promoting commercialization of NWFPs: Though many NWFPs are likely to remain subsistence products, there are some shifts towards commercialization. Largely this is related to changes in the economic situation of a country, affecting both the demand and supply. As incomes rise, demand for goods perceived as inferior is replaced by those perceived to be superior. As income goes up, supply also declines as collection of low-value NWFPs become less remunerative.

A shift from subsistence use is more likely when the driving forces for commercialization exist, namely better income opportunities. For instance, wattle seed (*Acacia* spp.) commercialization is the result of a chance discovery of a new use based on the coffee-like properties of a product that was traditionally eaten fresh. Production of flour from dried beans has led to the creation of a new bush-food industry in Australia. The growth of the bush-food industry indicates the change in society's preferences and the willingness to pay for products considered "inferior" a generation ago. In New Zealand, the similar NWFP resource-base is also in the early stages of promoting a bush-food industry.

Examples of subsistence use products that are now shifting to commercialization include sago in Southeast Asia (Indonesia, Philippines, Malaysia and Thailand), wattle seed and quandong fruit in Australia, mushrooms and truffles in Kiribati and Bhutan and bamboo in China. The reasons for the shift in production and use have been different for different NWFPs. The shifts in use and consumption are not uniform among countries. For instance, large chunks of the population in China may enter into bamboo commercialization and trade, but that is not to say that subsistence use has altogether ceased in China. Bamboo in poorer communities in western regions such as Yunnan and Guiyang still serves as construction materials, agricultural tools, utensils, musical instruments, etc. Similar is the case with sago, wattle seed and mushrooms in their respective countries. Access to markets is a key factor in realizing better economic values (Neumann and Hirsch, 2000) and this seems to be the most dominant factor in all the cases noted earlier.

Challenges of NWFP commercialization: During the last two decades, growing evidence indicates that approaches to NWFP commercialization have not been universally successful in the Asia-Pacific region. They have neither fulfilled expectations of local income generation nor led to improved conservation of resources (Godoy and Bawa, 1993; Sheil and Wunder, 2002). Success stories are few when compared to the number of attempts. For instance, New Zealand's Kiwi fruit (*Actinidia deliciosa*) took almost 60 years to shift from a subsistence fruit to a commercialized product, and then to enter the global value chain as a major export. Similar is the case with macadamia fruit (*Macadamia integrifolia*) from Australia. In the information and technology age, the time-frame for the development of any NWFPs may be shorter, but will be definitely longer than any standard product life-cycle.

For NWFPs that have a strong demand and potential as well as institutional support, the difficulties of achieving a mass market and scale despite innovations must be overcome (see Box 5). The lack of examples of initiatives that have endured suggests the difficulties and complexities involved in the commercialization of NWFPs.

Box 5. Commercialization Difficulties for a Product with Strong Institutional Support

Bamboo is a classic example of a product that is re-defining and re-positioning itself as a “new-age product”. Much research and development and promotion is ongoing for bamboo at various country levels, and there is hardly any comparable product with such versatility in use and applications. However, production and sales on a commercial scale are still low. Part of the reason could be the average time any new product takes to arrive at one’s home, which is 20 years or more.

According to Profound 2006, the primary weakness in the commercialization of industrial bamboo products is the lack of knowledge and familiarity of EU and US consumers as well as the unfamiliarity of sub-contractors with bamboo flooring, resulting in installation problems. Still young and underdeveloped, it will be some time before the bamboo industry matures (Garzon and Held, 2003; Held, 2002; Larasati, 1999; von Reitzenstein, 2004).

There are many challenges to initial commercialization (see Box 6). Contexts, communities, institutional mechanisms, ownership of the idea and market access determine product uptake and approaches. Conditions that have led to this shift in most of the cases are: (a) popular perception that hunting and gathering practices for livelihoods are attributes of poorly developed societies; (b) increasing demand for the products; and (c) appropriate responses to that demand through institutional and other arrangements.

Box 6. Challenges of NWFP Commercialization

- Identifying which products have commercial potential
- Production is often dispersed and markets poorly developed
- Markets are diverse and faddish, but product development is long
- Volumes are typically small
- Identifying appropriate technology
- Barriers to entry may be high

Source: Belcher and Shreckenberg, 2007.

Shifts in use and likely impacts on resource management: The potential of NWFP commercialization as a tool for poverty alleviation is well recognized. As the shift in pattern from subsistence use to commercial production becomes standard, the main issue would not remain restricted to the magnitude of subsistence but rather how to support this shift. When a subsistence product becomes commercially important there are changes in actors and stakeholders. For example, when there is a potential for revenue generation, restrictions are imposed on subsistence collection, undermining the livelihood of traditional collectors. The nationalization and de-nationalization of certain NWFPs of economic significance is a case in point in certain states of India.

A shift from subsistence use to commercial sale also has important implications for resource management, as larger volumes are harvested. Hence there is an increasing trend towards conferring forest tenure and access rights to forest-dependent communities (White and Martin, 2002). Secure tenure is a necessary but not a sufficient condition to encourage sustainable resource management. Increased commercialization presents significant challenges pertaining mostly to resource use conflicts, meeting the quality and quantity demands of the market, ensuring local capacity to enforce tenure rights, etc. Moreover, as this transition takes place, it is likely that young people will not be attracted to subsistence living; this would eventually lead to an increase in the average age of people who collect NWFPs for subsistence use (Kostov and Lingard, 2004).

From collection in the wild to domestication and cultivation

Since this shift from subsistence to commercialization, various innovations in NWFP resource management have taken place, both self-initiated and externally driven. These have either been in the form of community-based natural resource management, domestication or cultivation or marketing and enterprise development.

To a certain level, NWFP removal from forests has minimal impact. However, continued and unsustainable harvesting of NWFPs without attempts towards regeneration of stocks can have a major influence on the species concerned and on the forest ecosystem. The increasing concern over large-scale harvesting of NWFPs because of increasing market demand has necessitated domestication and cultivation of commercially important NWFPs (Wilkie, 1999; Cunningham, 1999). Domestication of NWFPs has a long history, starting when societies moved from hunting and gathering to agrarian societies (cardamom, mango and cocoa were once NWFPs). However, domestication of species in earlier times was driven more for socio-cultural than commercial reasons as is the situation now. An interesting case of domestication has been in the high altitude Indian Himalayas, where indiscriminate harvesting pushed an important medicinal and aromatic plant (*Saussurea costus*) to a highly endangered status. Domestication initiatives have achieved some degree of conservation (see Box 7).

Box 7. Domestication, Cultivation and Trade of *Kuth*, a High Value Endangered Species

In India, *Saussurea costus* (*kuth*), (A CITES listed, Appendix I species) and now a high-value medicinal plant, was found in the wild till the early 20th century, predominantly in the high altitude Himalayan regions of Ladakh in Jammu and Kashmir and also parts of Himachal Pradesh. Because of rampant and indiscriminate harvesting and trade with China, Pakistan and Afghanistan in the early 20th century, the species almost became extinct in the wild. For the last 30-40 years there has been no report of existence of this species in the wild. Yet in the Lahaul and Spiti regions of Himachal Pradesh, this species was domesticated by the local people; formal cultivation and trade of *Saussurea costus* has been taking place for the last 50 years. Since the initial days of cultivation, the local people even formed a cooperative society based in Manali called the *Lahaul Potato and Kuth Growers Society*.

Appendix I species normally require a CITES clearance for any kind of domestic or international trade, given primarily by the CITES office in New Delhi. Trade without a proper cultivation certification can have serious implications on the engaged parties. The local DFO of Lahaul for *kuth* has issued a cultivation certificate with a stamp of authority of the CITES country office, New Delhi. This is a classic case of domestication of a high value species, which is almost close to extinction in the wild.

Note: CITES Appendix I species are only permitted for non-commercial trade purposes, with permission from an appropriate authority.

Wild harvesting of NWFPs and its issues: NWFP harvesting when viewed from an ecological perspective reveals impacts on (a) biodiversity (as those with market demand are heavily harvested, affecting the wild population dynamics) and (b) the maintenance of the productivity of the resource (mostly in the case of unsustainable harvesting). Cases of chopping off of branches for Aonla (*Embllica officinalis*) (Prasad et al. 2002) and premature cutting of sandalwood trees are well known in India. In the case of sandalwood, despite substantial investments in their protection, the high value of products continues to encourage illegal removal.

Cultivation of NWFPs and its main drivers: Economic feasibility is the main rationale behind bringing any species into cultivation. However, as long as sufficient volumes of material can be obtained at a lower price from the wild, domestication will not be a priority (Schippmann et al. 2002).

There are no reliable country statistics on the extent of NWFP cultivation. China is reported to have the largest area under medicinal plant cultivation and Indonesia has the largest area under rattan cultivation. Meeting the demands of the markets has not been the only purpose of domestication; in many instances cultivation has been undertaken to meet subsistence needs or for cultural and aesthetic values.

Some of the forces driving increased cultivation of medicinal and aromatic plants include addressing (i) the quality issues of raw herbs, (ii) certainty of supplies, (iii) concerns about resource depletion in the wild, and (iv) growing costs of collection (with increases in wage rates in some countries). In PICs, the restrictive governmental policy related to high value sandalwood trees has led farmers to grow them on the fields despite their long gestation period (see Box 8).

Box 8. Experiences with Sandalwood Plantations in Vanuatu

The sandalwood industry has been and still is an important commercial industry in the southwestern Pacific. A number of sandalwood species occur across the area including *Santalum austrocaledonicum* in New Caledonia and Vanuatu and *Santalum yasi* in the Fiji Islands and Tonga. Sandalwood was heavily exploited in the middle of the last century and has been utilized periodically since. Carvings, incense production and sandalwood oil are the three major uses.

In Vanuatu, there was a change in government policy in 1977 which recognized the importance of management for sandalwood. The policy restricted the export of sandalwood logs and called for efforts to encourage replanting and local sandalwood processing.

Since this change in policy, certain developments have taken place in the region:

- Two sandalwood oil distilleries have been established in Port Vila
- There is increasing interest from local communities in replanting sandalwood, with a number of smallholders planting blocks of sandalwood on the islands of Santo, Erromango, Tanna and Efate, in association with *Casuarina* sp., and crops such as papaya, citrus and kava
- Through “trial and error”, farmers are exploring various ecological conditions, planting methods and effective hosts for sandalwood trees. Some are growing in the natural forest areas and some in backyard gardens.
- Despite the long gestation period, the future potential gain is attracting farmers on the islands.

Source: Robson, 2004.

In the case of liquorice in the Inner Mongolia region of China, a reason for cultivation (apart from the demand factor) was to retain the soil stability (see Box 9), as the deserts of Mongolia are prone to rapid wind erosion.

Box 9. Inner Mongolia: Transition to Cultivated Liquorice

Inner Mongolia is an autonomous region between China and Mongolia. Almost 50% of the region consists of degraded pastures. This area is rich in the liquorice plant (*Glycyrrhiza uralensis*); the extracts from the roots have a great demand in the flavouring and medicine industry. In order to protect the ecological conditions of the northwestern arid areas and to meet the ever increasing demand for liquorice, the Chinese government has halted the collection of wild liquorice in those regions. These plants help stabilize the sand and retain moisture in the soil, making further collection of the plants a potential hazard to the ecological integrity of this broad locale. The wild liquorice supply is now being replaced by cultivated liquorice. The Anmin Licorice Production Base (ALPB) has been established in Heilongjiang Province, 100 km (60 miles) from the capital city of Harbin near the border with Jilin. The field-clearing and nursery work for this project were started in the autumn of 1999. In order to meet the potential market for liquorice roots, about 600 households have set aside a portion of their land for liquorice cultivation. In 2002, about a 1000 tonnes of liquorice roots were obtained from that cultivation, also giving the farmers a good return compared to that of the traditional agricultural crops such as millet, sorghum and maize.

What is evident from these examples is that significant research, development and standardization of agricultural techniques and extension initiatives have propelled the cultivation of medicinal plants.

Characteristics of NWFPs under cultivation and cultivation patterns: There is no clear definition as to what constitutes large-scale or small-scale cultivation in the case of NWFPs. The extent of cultivation is related to the size of the market and product characteristics. In general, low value bulky products like bamboo and rattan are cultivated in extensive areas to satisfy the large-scale demand. On the other hand high value products, especially those that are used as raw materials in pharmaceutical industries, are grown in small areas and managed intensively. Depending upon the species, ecological requirements and product value determine small-, medium- or large-scale cultivation. For instance, large areas (roughly ≤ 25 hectares or more) of bamboo or rattan plantation may qualify as large-scale cultivation. However, for high-value, low-volume NWFPs like some medicinal plants (*Nardostachys jatamansi* in Nepal, *Saussurea costus* and *safed musli* in India, *Panax ginseng* in China) and mushrooms like Shiitake in the DPRK a few hectares of cultivation (≤ 5 hectares) may qualify as large-scale cultivation.

Cultivation patterns in the Asia-Pacific region have largely been of two kinds depending upon (i) the scale of cultivation and (ii) the technology used (see Table 8).

Table 8. Cultivation types and their characteristics

Cultivation type	Cultivation characteristics	Main NWFPs under cultivation	Technology used and markets catered to
Small-scale	<ul style="list-style-type: none"> - normally cultivated in backyard/kitchen gardens - some use agro-forestry models - subsistence cropping practice mainly for domestic use or for sale in local markets 	Fruits, nuts, fibre, medicinal, aromatic and dye plants	Technology is simple and locally developed; products cater to local markets and are also used for household consumption.
Medium scale	<ul style="list-style-type: none"> - cultivated on a larger scale (a couple of hectares) - many farmers in a region engage in cultivation of a few common species 	Medicinal and aromatic plants (<i>Embllica officinalis</i> , <i>Glycyrrhiza uralensis</i> , <i>Mentha arvensis</i> , <i>Chlorophytum borivillianum</i>)	Cultivation is based on standardized agro-technology. Planting material in some cases is produced through tissue culture techniques. Post harvest technology is available. Products cater to domestic and international markets.
Large-scale	<ul style="list-style-type: none"> - mostly organized to meet industrial demand - individuals are either linked up through an outgrowers scheme or buy-back arrangements - large areas in a district/province may fall under a few species 	Bamboo and rattan, a few medicinal and aromatic plants used in bulk in some industries	Cultivation is based on standardized agro-technology. Planting material in some cases is produced through tissue culture techniques. Post harvest technology is available, and products undergo multi-level processing and value-addition. Products cater to domestic and international markets.

The latter two patterns are being adopted mostly by the relatively well-off and sometimes even by wealthy farmers and absentee landlords. The landless poor and farmers with marginal land holdings mostly depend on products collected from the wild. Domestication fails to succeed in the case of such NWFPs.

Can cultivation become the sole solution to meet the demand? Even though there has been an enormous increase in cultivation in recent years for some NWFPs, wild harvesting still continues to meet the bulk of the demand.³ Lack of baseline information and regular documentation for most of countries has resulted in lack of knowledge as to how much wild extraction of NWFPs is taking place and what the future supply looks like. Many medicinal and aromatic plants are unsuited to high volume monoculture or the market is too small to make commercial plantation financially viable. For others, no standardized cultivation protocols exist, as is the case with many of the rare and endangered medicinal plants of the Himalayas. In the case of some tree-based products

³ About (80-90%) of the consumed and traded NWFPs are still harvested from the wild (WWF, FRLHT 2006).

like gums, resins, seeds etc., the gestation period is very long and hence they are seldom cultivated on private lands. There are some efforts to grow and domesticate these plants, yet they still account for less than 10% of the total requirements (Prasad, 2009).

The problem of over-exploitation of wild plants cannot be solved by domestication alone. Most experts believe that there is not enough cultivatable land available to meet the increasing demand, unless more forest areas are converted. Since such conversion of common property resource/public property in response to surges in demand for an individual or a group of products is never a pragmatic option, (see Box 10), the solution is to support existing sustainable practices of wild harvesting alongside promotion of the cultivation of economically valuable species in a scientific and ecological manner.

Box 10. Cultivation of NWFPs in China

To counter the threat of overexploitation, many traditionally used wild herbs are now being cultivated in China. Of the 1,000 registered varieties of NWFPs in Traditional Chinese Medicine (TCM), 150 are grown, changing the landscape as well as the ways the plants are handled. Sichuan, for example, has long been acclaimed for its high-quality wild herbs, but recent TCM pressures have encouraged the creation of plantation-style medicine farms. In 2005 there were over 30 large-scale farms covering some 40,000 hectares in this province alone. While cultivated herbs take the pressure off natural ecosystems, they do strain already limited cropland. Since 2000, the amount of land under TCM cultivation in China has nearly doubled, to 1 million hectares nationwide.

Source: The Worldwatch Institute, 2005.

Cultivation and some of its issues

Monocultures: Monoculture plantations, driven by attempts to maximise outputs, are becoming a trend in high-input based NWFPs like some of the medicinal plants. Apart from negatively impacting biodiversity, monoculture plantations also affect the resilience of crops against pests, disease or changes in climate. Monoculture practices for high-value medicinal plants may make economic sense, yet most NWFP markets are quite volatile. NWFPs like bamboo and rattan however are also subject to agro-forestry models of cultivation, which can somewhat reduce the unwarranted ecological and economic impacts.

Vulnerability to booms and busts: Booms and busts, the over-production of one or two currently popular commodities and the subsequent market crash, are a common phenomenon. High prices result in indiscriminate expansion of cultivation, overproduction and subsequent price drops (see Box 11). This is of particular concern for NWFPs considering their unstable market.

Box 11. The Not-So-Pleasant Story of *Safed Musli*

Chlorophytum borivillianum (*safed musli*) also known as Indian ginseng is a crop that has impacted many farmers in different ways in India, making some rich in a short period of time and frustrating others with frequent price fluctuations.

Markets for *safed musli* typically have been very volatile. Madhya Pradesh, one of the leading states in *safed musli* cultivation, saw prices crash from US\$ 40-US\$50 per kg in 2001-2002 to US\$15-US\$20 per kg in 2003. Reports of many farmers suffering losses on the pretext of buy-back arrangements for *safed musli* by individuals/organized institutions are unsurprising, yet people continue to cultivate this “wonder crop”. The several *musli*-based products in the market do not match the extent of production. There are no official estimates to indicate its demand. A high-input crop, the large-scale plantation of *safed musli* occurring after 2000 has been more subsidy-driven than based on the actual demands of the market.

Vulnerability is mostly related to specific external markets and development of synthetic substitutes (e.g. lac in India), though sometimes bust-phases for certain commodities occur as part of reforms and amendments in policies (as in the case of kava in the Pacific Island Countries (see Box 12) or of rattan in Indonesia in the early 1990s). In the context of the latter, impetus is given to conservation through cultivation. Yet the lack of timely and reliable information on NWFPs coupled with secretiveness and unaccountability can accentuate the impacts. The old adage “not to put all eggs in one basket” is relevant here.

Box 12. The Crippling of the Lucrative Kava Export Industry of PICs

History: *Kava kava* (*Piper methysticum*) is a member of the pepper family. The roots of kava have been used for centuries in PICs viz. Vanuatu, Fiji, Samoa, and PNG as a ceremonial and social drink. In western countries kava has been mostly sold as a dietary supplement and in pharmaceutical preparations for patients suffering from anxiety, stress, nervousness and insomnia.

Kava production: Kava is an NWFP that is cultivated on a large scale, but wild sources continue to meet the market demand. Most of the PICs grow kava, however the archipelago of Vanuatu, the islands of Pentecost, Santo, Tanna, Epi, Ambae, Tongoa and Maewo are the primary kava growing areas. In Vanuatu, kava production is less than that of copra (coconut) and cocoa, but the cash value to small subsistence Vanuatu kava farmers is significant.

Trade and export: During the late 1990s, kava was one of the top 10 best selling herbs globally. A boom in 1998 witnessed a surge in sales to an estimated US\$50 million. Only some 100,000 kg were shipped to Europe during the whole of 1996, compared with 50,000 kg of dried roots shipped *every week* from Fiji alone in 1998 (Laird, 1999). In 1997, kava extract was sold for US\$100/kg by processing companies to manufacturers, compared with US\$250-300/kg in 1998, a 300% rise in price (Laird, 1999).

Trade ban in the western countries: The growing kava export industry in PICs received a devastating setback in 2002 when countries in the European Union, led by Germany, imposed bans on kava products and withdrew licenses for all products containing kava or kava's active ingredient (kavalactone). This was because of the alleged links between kava extract and liver damage. Other countries like the UK, US, Canada, Australia, New Zealand and Singapore also imposed a ban on the import and use of kava extract.

Post ban impacts and initiatives: As a result of the ban, the livelihoods of thousands of households across PICs suffered. Phytopharm, the Germany-based consulting firm on botanical research, decided to carry out an in-depth investigation into EU Member States' market restrictions on kava products at the behest of the Centre for Development Enterprises (CDE) and PROENVEST. The International Kava Executive Council (IKEC), consisting of members from both PICs and EU, was constituted in November 2003 in response to this trade disaster. The findings of the report were deliberated in the International Kava Conference 2004 organized by IKEC in Fiji in 2004; stakeholder representatives, scientists, health authorities and academics from 16 countries including the Pacific African Caribbean Pacific (ACP) and European Union (EU) States participated.

The outcomes of the conference, which led to the drafting and adoption of a resolution in 2004, included: (1) The efficacy and safety of kava in the treatment of conditions of nervous anxiety, stress, and restlessness, were proven through more than 20 clinical trials involving over 10,000 patients. Out of 82 reported cases of liver toxicity attributed to kava, about four only could be substantiated, highlighting that the incidence rate is one case in 50 million kava extract users; (2) Toxicity studies on kava suggest a hypothesis that the causal factors to the reported cases may be related to the variety of kava* utilized, and possibly the extraction method used; (3) The World Health Organization (WHO) was requested to work on kava safety evaluations

Current status: WHO in association with the Natural Standard Research Collaboration (NSRC) an international, multidisciplinary research group and leading innovator in the medical publishing field carried out the "Assessment of the Risk of Hepatotoxicity with Kava Products". It contains a description of kava, its historical use and safety information, regulatory information, analytical results and clinical recommendations as well as conclusions and recommendations by the Committee appointed to handle this enquiry. Recent developments suggest a possible review of the kava import ban by the concerned countries as a result of the outcomes of the WHO report.

Lessons learned: The story of *kava kava* illustrates the value of understanding traditional uses of NWFPs, the significance of considering safety issues in herbal preparations, the need for introducing and enforcing quality standards and regulations to ensure that quality of raw materials are used in pharmaceutical, food and the cosmetic industry and the role of third party mediation.

*Many indiscriminate kava varieties were exported and used in the tablet industry including even wild or false kavas. This is because people were quick to exploit the high prices in the absence of any kind of quality control both between PICs and export to Europe and the US.

Processing and value-addition

General overview: In an increasingly competitive marketplace, highest returns are not for raw materials but for processed products. The potential of enhanced income for people downstream in the value chain have been aptly articulated (FAO 1995 and 1999; Shiva and Mathur 1996; Belcher, 1998).

Markets change constantly. Knowing what to produce, when to produce it, how much to produce, and how to process it for the highest prices are important issues for any producer. Producers need to go beyond what they want to produce and sell and begin to think more about what the market wants to buy. Jason Clay, (2004)

A value chain is a set of value-adding activities through which a product passes from the initial production or design stage to final delivery to the consumer and can be local, national, regional or international in scope. The worth of the commodity increases at each stage of processing, packaging and transport (Kaplinsky, 2000). An NWFP value chain can be broken down into several sub-sets of activities: production, collection, processing, storage, transport, marketing and sale. The relative importance of each of these differs from product to product; they may not occur sequentially and some may even be repeated or omitted for particular products (Marshall et al., 2003). Some chains, particularly for locally traded products, are very short and simple with harvesters selling products directly to consumers. Value chains that extend beyond the local level tend to be more complex but more rewarding (Belcher and Schreckenberg, 2007) (see Table 9).

Table 9. Price variations at different levels of the value-chain in Oddar Meanchey Province, Cambodia

NWFPs	Village price (in riel)	District price (in riel)
Wood mushrooms	500-1,000/kg	1,500-2,000/kg
Liquid resins	17,000-20,000/30 litres	21,000-25,000/30 litres
Honey	8,000-10,000/litres	11,000-12,000/litres
Solid resins	700-100/kg	1,500/kg
Rattan mats	35,000-45,000	50,000-61,000
Bamboo shoots	500-700/kg	600-1,000/kg

Source: Community Forestry International (CFI), (2006).

Scope and opportunities for value-addition: Most communities that are dependent on NWFPs often harvest more than the household needs and then sell the surplus in the local market. Traditionally, most forest producers sold/bartered fresh or dried NWFPs. However, there has been a growing realization that simple processing and value addition like cleaning and drying can enhance returns. The expansion of processing activities either as individuals/collectives or through enterprises largely concentrates on a limited number of products in most countries, indicating that markets do not exist for all NWFPs. Sometimes markets are almost entirely for value-added products rather than raw materials (e.g. “bidi” in the case of tendu leaves in India and Bangladesh).

Processing and value-addition largely depend on markets for such value-added products, and more importantly investments in skills and technology. There are marked differences between countries and within countries, in terms of capacity to add value. So far, only some countries (China, India) have made concerted efforts towards bridging the gap between technological development and implementation in the field. Again, this is limited to just a few products, for example bamboo and sandalwood. There are also cases

where restrictive policies in the importing countries prevent the opportunity of marketing value-added products (between Lao PDR and Thailand, NAFRI et al., 2007).

However, key competencies are emerging in most of the countries to deal with changing demand, as in the case of household construction materials in China, Indonesia and Philippines, essential oils and medicinal plant processing in India and Nepal and food and food supplement processing of mushrooms and truffles in China and DPRK. Hong Kong and Singapore are examples of countries that earn increasingly higher revenue from their value-added exports of NWFPs. The reason for the development of such competencies in these countries can be attributed to a shift to other lucrative activities by the importing countries, which generally did most of the high-end processing at their end. For example, till the mid-80s most of the solvent extraction for essential oils took place at plants in the UK, Germany and France. Yet rising input costs have undermined such processing; this has encouraged domestic processing by the raw material producing countries.

From low-level or no processing to improved semi-processing (small scale)

Markets are penetrating into formerly rural, subsistence-based economies. With the monetization of societies and this market penetration, NWFPs are being extracted in large quantity and variety to meet the growing demands, and producers are increasingly realizing that local agents and traders are willing to pay more if NWFPs undergo local processing (see Box 13).

Box 13. Processing Experience in Lao PDR

Economic reforms in the early 1990s provided new livelihood opportunities to the communities living in the remote and landlocked area of Lao PDR. Tourism is now one of the fastest growing industries. Since 1998, a variety of private enterprises have started to produce *po sa* (*Morus papyrifera*), a kind of mulberry bush that caters to the expanding tourist market. In 2000, production of 100 kg of bark brought US\$35 to a household. Production of paper earns US\$0.93 person-day from 2 kg of bark, as opposed to US\$0.46 for direct sale of the bark.

Source: Extracted from NAFRI, NUoL, SNV, 2007.

Local processing or primary processing is mostly limited to cleaning, drying and sometimes grading. The scale of operation is generally small and undertaken at the household level. The technology used is simple, locally developed and so are the returns from the trade, which are low for most countries. Of the NWFP-categories listed earlier, “food and food supplements” and “household construction materials, wares and artefacts” are the ones that undergo such primary processing.

Processing is mostly driven by the need (a) for a simple transformation in the quality of the product to receive better margins, (b) to satisfy demand which is only for the value-added products, and (c) to improve storage and transport enabling consumption at a later date.

Examples of NWFPs that undergo primary level processing include *Mahua* flowers (*Madhuca latifolia*) in India and Bangladesh, wild Palawan honey in Philippines, fruits of *Zizyphus jujube* in Myanmar as well as bamboo and other fibre materials used to make baskets and other household items in Cambodia and Bhutan.

From low-level processing to improved semi-processing (large scale)

In many countries and regions, a select number of products have graduated from low-level and small-scale processing to improved processing techniques. Communities

working voluntarily in collectives (like self-help groups [SHGs] in South Asia or community organizations in Southeast Asia) are providing opportunities to work on NWFP-based community enterprises. This helps groups to scale up operations and enhances their negotiation power with buyers.

Earlier these kinds of processing activities were non-continuous and seasonal, feeding into the household income only during lean agricultural seasons. But there is growing evidence of year-round involvement by communities attempting to specialize in any one or two product/product types rather than dealing with a range of NWFP products required in different markets. Communities are becoming more organized and capable in managing production and trade more systematically (see Box 14).

Box 14. GMCL: Attempting to Achieve Scale through Collective Action

Established in 2000, the Grama Mooligai Company Limited (GMCL) successfully created the structure to bring together collectors and cultivators of medicinal plants in the Amul – a cooperative movement in India. The pioneering concept of the GMCL has been promoted by the Foundation for Revitalization of Local Health Traditions (FRLHT) (<http://www.frlht.org.in/>), an NGO based in Southern India.

The GMCL is a member-owned enterprise with shareholding restricted to medicinal and aromatic plant (MAP) gatherers and cultivators. At present, its shares are held by 30 groups representing 1200 members. The GMCL has collaborated with 13 NGOs in 7 states whereby the local community-based organizations are involved for up-scaling the operations. It has linked with some 1200 retail outlets and several large pharmaceutical companies to market its processed raw herbs and finished products, mainly honey. The company's turnover rose from a modest Rs2.5 million (US\$0.06 million) in 2001-2002 to Rs5.2 million (US\$0.13 million) in 2002-2003 and the turnover had reached Rs6.7 million (US\$0.17 million) in 2003-2004, growth close to at an average rate of 30% annually. This is a very high performance compared to the general forest-based industry. The GMCL has been attempting to link up producer groups in the national and global value chains, thereby ensuring fair prices. The members, mostly women, have been trained on simple value addition techniques like sorting, grading, packing and sustainable harvesting techniques along with handling most aspects of trade. The GMCL has also launched a set of herbal remedies for primary healthcare under the brand name "village herbs."

There have been similar initiatives elsewhere, where communities are collectively working to improve sales of NWFPs (for example, processing *lokta* handmade paper and Jatamansi oil in Nepal, bitter bamboo in Lao PDR and medicinal plants in India). In all these cases there has been external institutional intervention from ANSAB, IUCN and FRLHT respectively, providing the necessary support and guidance required during the transition from a seasonal to a continuous activity. In the case of *lokta* handmade paper (see Box 15), support from UNICEF in the form of a small but steady market has been instrumental for its revival. It enabled the industry to tap niche markets outside Nepal and to enter a global value chain.

Box 15. Development of New Value Chains: Hand-made Paper Production in Nepal

Hand-made paper production in Nepal based on *lokta* is a typical example of the changing fortunes of small-scale forestry enterprises. Production of *lokta* paper has a long history dating to at least the 12th century. Hand-made paper was being produced in several locations, catering to the demand for government records and religious texts. Decline of the industry started in the 1930s due to imports of hand-made paper products from Tibet. This was accentuated by imports of machine-made paper from India and by the 1960s the hand-made paper industry in Nepal had almost collapsed. Traditional knowledge of *lokta* paper production was limited to only a few families in Baglung and Parbat districts. Growth of tourism in the 1970s led to a revival and this introduced the opportunity for tapping international markets. Favourable market opportunities were taken advantage of by the UNICEF/ADBN project “Community Development through the Production of Handmade Paper” launched in 1980. The project facilitated the creation of a global value chain including the creation of a craft products factory with the final products ending as UNICEF greeting cards and other artefacts. Currently there are about 600 hand-made paper units including 377 registered units. Of these, 175 produce about 30,000 tonnes of paper products. The industry is currently growing at an annual rate of 16 percent and paper making is now done in 16 hill districts. Community involvement in the management of forests through Forest User Groups (FUGs) has strengthened the resource base and a number of FUGs have taken up hand-made paper production. Presently the industry is reported to employ about 28,000 persons of which over 70% are women.

Source: Biggs and Messerschmidt, 2005; Subedi et al., 2006.

In processing NWFPs on a bulk scale, there is an interesting case in India, where one of the oldest and largest manufacturers of Ayurvedic medicines linked up at the resource production level to supply a semi-processed NWFP (pulp of Indian gooseberry) under the conditions of maintaining high standards while processing, storage and supply (see Box 16).

Box 16. Contracting Out Semi-processing of NWFPs

Dabur, one of the top herbal manufacturers in India, has outsourced partial processing of its brand “Chawanprash” (an ancient Ayurvedic health tonic, widely used as a rejuvenative, energizer and immunity booster) to a local processing unit in Madhya Pradesh, a leading producers of Aonla. The bulk processing of the pulp, involving thousands of tonnes of Aonla, forms the base of Chawanprash.

Individuals/communities involved in the bulk trade of high-volume NWFPs that add value to products realize better margins in the value chain. This move has ensured a ready market for the producers and enhanced their bargaining power. The forest department of Madhya Pradesh plays a pivotal role in ensuring fair terms of trade for all parties concerned.

General characteristics of semi-processing on a large scale: Large-scale activities are more intensive and specialized, with a range of technology options from cost-effective low to medium-range technologies. Micro-finance and short-term bank loans have begun to provide the much needed capital to facilitate processing activities, which involve cleaning, sorting, grading, packaging, oil extraction, pulping etc.

Commodities such as tendu leaves and Aonla in India, mushrooms in China and rattan in Indonesia and Viet Nam qualify for products undergoing processing on a large scale.

From improved semi-processing to development of an end use product (small scale)

SMFEs involved in value addition of NWFPs are continuously striving to upgrade product quality. Processing at this level involves a certain degree of technological inputs and a minimum scale of production to remain commercially viable.

The minimal processing done at the community/self-help group levels usually involves small quantities. In most of the cases the lack of improved technology, capital and access to markets are limiting factors. Yet the opportunity to enhance income, improve entrepreneurial abilities and develop negotiation skills are reasons for community members to engage in such activities.

Barring a few countries like Japan, DPRK and ROK, the collecting, consuming and selling of mushrooms were part of the subsistence economy until the late 1990s. Today a wide variety of mushrooms are sold in the region's supermarkets. From 2002 to 2005 the mushroom market grew by 3-4 times (see Figure 2). This has been possible because of changing consumer preferences and appropriate investment in technology and supply-chain management.

Also, there is an emerging trend of "herbal fairs", "forest fairs" or "handicraft fairs" being organized to provide a ready market for such processed products.

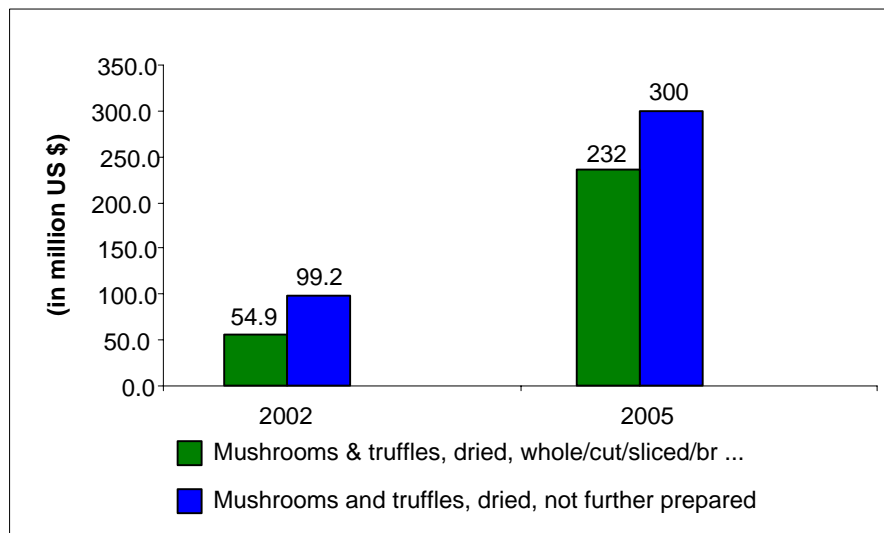


Figure 2. Export of mushrooms (both semi and fully processed), 2002/2005

Product development and branding. A strong brand identity is increasingly critical to obtaining a fair price for products produced by local communities. Branding is currently promoted as a means to ensure that NWFP commercialization makes a positive contribution to rural livelihoods (Schmitt and Hoffman, 2006). However, producer groups need assistance from people who are skilled in marketing (Marshall et al., 2006). For some products, producer groups in Southeast Asia and South Asia are turning to branding to have an edge over large-scale mass-produced, sometimes inorganic products.

Developing a brand identity for community-made products is like telling a story about the people who actually harvest or create those products. There is a likelihood of creating a connection with the customer. Increasingly, this strategy is being adopted by the producer groups. Brand names like "Vindhya Herbals" and "Villageherbs" for medicinal herbs, "Leh Berry" for high-grade beverage made from Seabuckthorn in Ladakh in India and

“Craftimex” for bamboo and rattan handcrafted items made in Viet Nam are becoming common.

Apart from creating a sense of confidence amongst the processors, all of these initiatives help to enhance income through “socially responsible” market niches.

However, to aid branding and to avoid possible conflict and confusion between the cultivated and wild harvested products, it is imperative that some agreed definition on the harvesting and processing be created to ensure quality and maintain acceptable standards.

From improved semi-processing to development of an end use product (large scale)

Catering to mass markets necessitates a scaling-up of operations at some stage in the value chain. Large-scale processing leading to the development of an end product is marked by mechanized processing, improved transportation facilities and innovation (Nair, 2007). Scaling-up of production generally takes place for a product in a country which produces in large quantity or if it is a niche product in an area.

In the Asia-Pacific region, large-scale processing with the result of an end product has taken place only for a few NWFPs in some countries. Also, not all enterprises involved in the processing of those NWFPs operate on a large scale. For example, some of the bamboo and rattan products from China, Indonesia and India and phyto-medicines from China, India, Singapore and Hong Kong are operating on a large-scale. In the case of bamboo, innovation and research in China is leading the development of modern uses with large potential markets, such as corrugated bamboo roofing sheets, re-constituted wood from bamboo, and a wide range of bamboo mat boards. The bamboo shoots industry (both growing and processing) for food is developing at a phenomenal rate in some parts of the world fuelled by ever-increasing demand.

Figure 3 highlights how the international trade of bamboo, rattan and other fibrous NWFPs used for weaving and making handicraft items, is changing. Those items that are underlined indicate the ones for which value addition has taken place (likes mats and screens, walking sticks, other non-mats and screens but value-added bamboo and rattan products). Furniture items made from these two NWFPs are not discussed due to the absence of data. Nevertheless, there is an indication of strong demand for rattan-based furniture; Swedish furniture leader IKEA’s move in this direction is evidence of this demand.

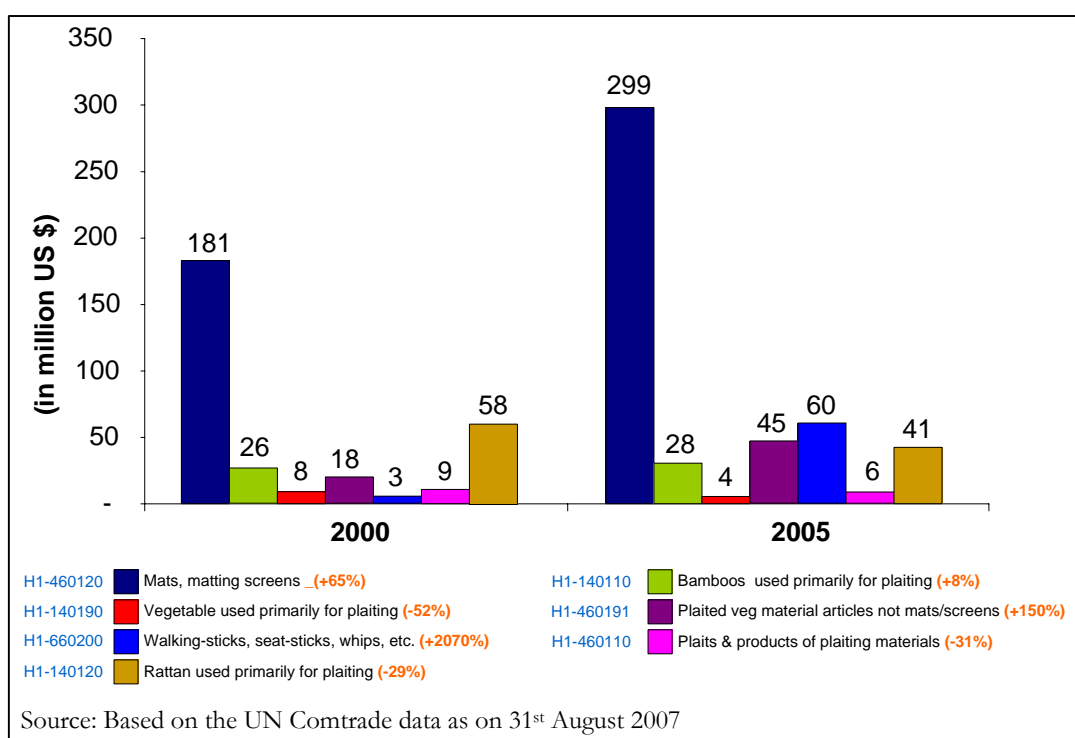


Figure 3. Bamboo and rattan products (both processed and unprocessed), 2000/2005

New technologies and markets are enabling the emergence of new enterprises, processing and sale of value-added products. Box 17 highlights the innovations that are taking place in bamboo and integration strategies for mainstreaming the new products.

Box 17. Bamboo, Innovations and Growth Prospects

Bamboo, supposedly considered as the poor man's timber of Asia, has in the last couple of years witnessed immense growth in product development. Those countries with a natural abundance of the material have invested in research, institutional development, capacity building and promotion of large-scale cultivation. Though China, India and Indonesia are progressing at a faster pace, others like Nepal, Bhutan and Fiji are not lagging far behind. Bamboo cultivation and bamboo-based products are increasingly encouraged as a route for rural development.

Some innovations

Indonesia and India: Successful testing of low cost, earthquake proof housing by the Indonesia-Aids-Organization team at Colorado State University (2007) and by the Center for Bamboo Initiatives at the National Institute of Design (NID) and UK-based Timber Research and Development Association (TRADA) under a joint collaboration at the Earthquake Engineering and Vibration Research Centre, Bangalore. The Indian Government, in an attempt to boost bamboo harvesting and trade before flowering begins, has eliminated all export duties until 2007.

China: Bamboo fibre clothes, bamboo beer and vinegar, bamboo-based panels and flooring materials, bamboo charcoal (INBAR, 2003).

The characteristics of NWFPs that are taken up for large-scale processing are: a) the existence or potential of bulk demand, (b) the potential to supply the raw materials increasingly from cultivated sources, if not from a range of diversified wild sources and

(c) an enabling policy and institutional environment that stimulates the development of the industry.

Challenges involved in processing and value-addition: Like all primary agricultural products, NWFPs face their share of challenges for improved semi-processing and end product development at all levels of operation. The challenges are from within the sector as well as external. For instance, improved processing within the “health and beauty products” and “food and food supplements” categories requires individuals or communities to obtain licenses and permits from authorities involved in management and quality control issues of food and drug items. Hence protracted bureaucratic procedures may be a deterrent, despite the importance of stringent standards (see Box 18). Similarly, in the case of bamboo and rattan fine finishing, appropriate chemical treatment for an increased shelf-life and uniformity in quality of raw materials used would need to be considered by those involved in value-addition.

Box 18. Traditional Chinese Medicine (TCM) and Quality Assurance Measures

Growing international demand for Traditional Chinese Medicine (TCM) has created a boom in the trade of medicinal plants species from China, putting increasing pressure on wild populations. The State Administration of Traditional Chinese Medicine (SATCM) estimates that US\$600 million worth of Chinese herbs and medicines are exported to more than 130 countries every year with approximately 50% of species in the trade still originating from the wild. In the United Kingdom, which accounts for the largest share of the TCM market in Europe, there are more than 2,000 clinics and 20 importing companies involved in TCM dispensation. British universities are also starting part-time degree courses in different aspects of TCM.

One result of this rise in TCM popularity worldwide has been the growing realization of the importance of rigorous authentication and quality control systems. This is vital to protect patients from inferior quality, incorrect or even fake herbs (partly the result of over-collecting from the wild). A spate of adverse health reactions, some serious, has highlighted the need for authentication/quality control centres. It was for these reasons that, in 1998, the Chinese Medicinal Plants Authentication Centre (CMPAC) at the Royal Botanic Gardens (RBG), Kew, UK was established in collaboration with the Institute of Medicinal Plant Development (IMPLAD) in Beijing. CMPAC's primary aim is to provide an independent centre of scientific expertise for the authentication and, where possible, quality assessment of Chinese medicinal plants in the UK and wider markets.

Source: Christiru et al., 2006.

The internal challenges pertain to group dynamics, resource pooling and sharing responsibilities.

In brief, for processing and value-addition to be sustainable activities, adherence to quality standards (prescribed or self-initiated) is paramount along with the ability to make timely delivery of the quantity demanded in markets.

Commercialization and trade patterns

General overview of markets and trade of NWFPs. Commercial opportunities for NWFPs are emerging throughout the world as economic liberalization opens new markets and governmental decentralization and democratization are enabling communities to have a greater role in the management of forest resources (Newmann and Hirsch, 2000). Countries are increasingly attempting to increase their revenue from the trade of NWFPs in both raw and processed forms.

Yet this opportunity of increased trade has not been a reality for many remote small-holder farmers. The farmers in the Himalayan region of India, Nepal, and Bhutan lack transportation facilities and market expertise. The perishability of many products exacerbates this problem. In some countries like Indonesia, a declining abundance of NWFPs due to logging, fire and establishment of mono-crop oil plantations affects the subsistence use of NWFPs by the indigenous communities, leading to food insecurity and health problems (Corpuz and Tamang, 2007). In areas close to towns and cities or those with better infrastructure, farmers are more involved in the cultivation of NWFPs and are able to take advantage of the market opportunities. Table 10 provides an indication of commercialization and trade of some NWFPs and the factors that enable the process.

Table 10. Countries, their main NWFPs under trade and enabling factors

Countries	Main products under trade	Factors helping the development of the NWFP sector
Nepal	Medicinal and aromatic plants such as <i>Nardostachys jatamansi</i> (jatamansi), <i>Swertia chirata</i> (chirayta), <i>Asparagus racemosus</i> (shatawari) and hand-made lokta paper from <i>Daphne</i> spp.	<ul style="list-style-type: none"> - Presence of an organized body such as FECOFUN (Federation of Community Forest Users) - Appreciation and support from government and NGOs to promote NWFP-based enterprises - Development of Market Information System facilities
Viet Nam	<i>Calamus</i> spp. (rattan), honey, <i>Piper nigrum</i> (black-pepper)	<ul style="list-style-type: none"> - Support from government and NGOs to promote NWFP-based enterprises - Shared border with China, increased access to its markets - Inherent skill-sets on basic processing techniques of rattan
India	Medicinal and aromatic plants such as <i>Cassia angustifolia</i> (Senna leaves), <i>Lantago ovato</i> , <i>Withania somnifera</i> , <i>Emblica officinalis</i> honey, <i>Diospyros melanoxylon</i> (tendu, "bidi" leaves), sal seeds, lac and <i>Acacia</i> spp. (gum arabic), essential oils such as <i>Cymbopogon</i> spp. (citronella), <i>Mentha arvensis</i> (mentha), <i>Santalum album</i> (sandalwood oil/sandalwood artefacts)	<ul style="list-style-type: none"> - Presence of many community-based institutions such as SHGs; many are into NWFP value addition as an alternative source of household income - Appreciation and support from the government, donors and NGOs to promote NWFP-based enterprises - Emergence of support institutions and expertise in extending training related to cultivation, processing and value addition, market information and marketing platforms for trade and network development through organization of "herbal fairs" etc. - The health heritage of the country (such as traditional systems of healing – Ayurveda, Siddha and Unani) and rising incomes are providing a domestic market for NWFP products
Indonesia	Rattan and agarwood	<ul style="list-style-type: none"> - Government support for large-scale cultivation to meet the increasing demands of the markets - Experience of being market leaders in these two niche products - Ready markets available in China and Japan
China	Medicinal and aromatic plants, bamboo shoots, mushrooms, bamboo furniture and other speciality products	<ul style="list-style-type: none"> - The health heritage of the country such as TCM provides a large market for NWFP products - Significant investment in R&D, technology development for large-scale production and a skilled workforce

		- The well-developed market systems and networks for domestic trade and export
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Global trade of NWFPs

Open access to NWFP products and the occasionally (and correspondingly) high demand in the global markets have in several cases led to opaque market chains and unclear international trade (Pfund and Robinson, 2005). In this report, attempt has been made to analyse global trade of NWFPs under two broad categories: a) those whose Harmonized System (HS) code refers to single NWFPs; and b) the HS code that refers to NWFPs that are included with other commodities. Concerning production sources and processing level, not all products are sourced from the wild or are at the same level of processing. However, as far as the trade value is concerned, it is exclusively for NWFPs, even if it is included under other HS codes with other commodities.

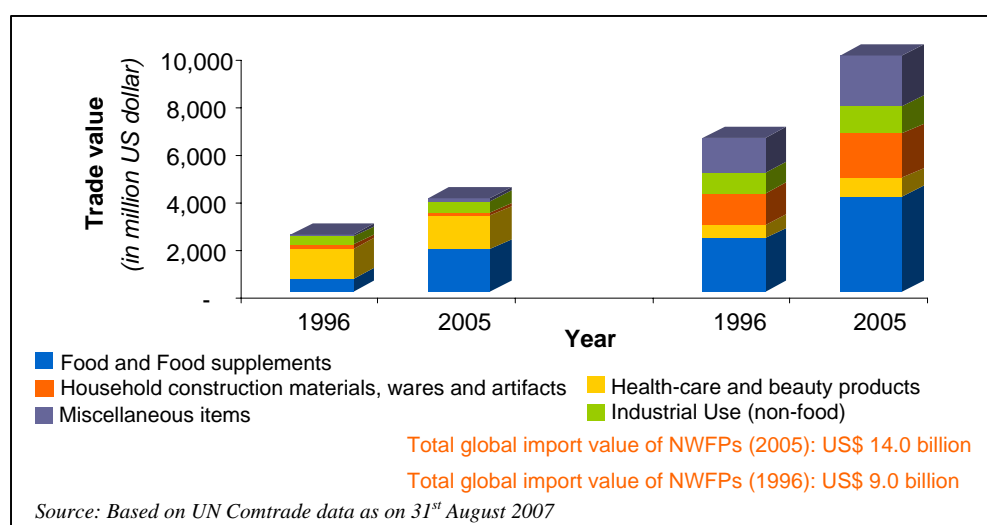


Figure 4. Total import value of NWFPs, 1996 and 2005

Figure 4 shows there has been an increase of about 55% in the global trade value in the last decade between (1996 and 2005), from US\$9 billion to US\$14 billion.

Data for several PICs such as PNG, Fiji, Kiribati, and the Cook Islands, are not available before the year 2002. Bangladesh, Bhutan, Cambodia, the Cook Islands, Nepal and PNG have not reported data for the year 2005. Similarly, data for Lao PDR, Myanmar and Brunei are not available for any years. One possible reason for the lack of data is that some of these countries have not been able to harmonize their trade data between HS 1996 and HS 2002.

What is also noteworthy is that the decline is sharp for China and India, two of the emerging economies of the world. The decline in contribution of NWFPs to total exports is little more than one-third in China and little less than one-half in India. Also, for the major global exporters like Hong Kong, Thailand and Singapore, the contribution is less than 0.2%.

This is a reflection of increasing tendencies of societies to give up use of products whose value decreases over a period of time. The increased revenue from decreased contribution owes largely to the increasing trend of selling value-added products as long as there are other products that are more worth trading.

NWFP export of the total export of any country is very small (see Table 11), accounting for less than 1%, barring Kiribati and Sri Lanka where it is 1.35% and 1.27% respectively (see Annex 2). However, exports from most countries grew by about 1.5 to 2 times between 2000 and 2005.

Table 11. Share of NWFP export *vis-à-vis* total exports of select countries

Countries	2000		2005	
	Export of NWFPs (in '000 US\$)	Total export value (in '000 US\$)	Export of NWFPs (in '000 US\$)	Total export value (in '000 US\$)
China	3,477,054	249,202,551	2,894,004	761,953,410
India	386,296	45,249,594	561,569	103,404,167
Indonesia	303,798	62,123,973	360,072	85,659,948
Australia	125,284	63,766,224	186,810	105,751,493

Source: Based on UN Comtrade data as on 31 August 2007.

Table 12. Global NWFP trade and contribution of the Asia Pacific

Export-Import	1996 (million US\$)	2000 (million US\$)	2005 (million US\$)	% change (1996 & 2000)	% change (2000 & 2005)
(a) Global import value	8930.9	9319.9	13971.5	4	50
(b) Total global export	7082.2	8001.6	12873.8	13	61
(c) Export (Asia-Pacific)	3466.6	3487.9	5186.5	1	49
(d) Export (rest of the world)	3615.6	4513.6	7687.4	25	70

Source: Based on the UN Comtrade data as on 31 August 2007.

Contribution of the Asia-Pacific region to global trade

The global trade of NWFPs has increased over the years from almost US\$9 billion in 1996 to almost US\$14 billion in 2005 (Table 12). Though the increase in global trade from 1996 to 2000 was marginal (4%), from 2000 to 2005 the increase rose by 50%. In the overall export (b), the percent contribution from the Asia-Pacific region (c) has consistently been around two-fifths of the global export. Also, the change in growth both for the rest of the world and the Asia-Pacific region is more after 2000, indicating the recent surge in demand. Even within the Asia-Pacific region, about two-thirds of the export is accounted for by East Asia (see Figure 5).

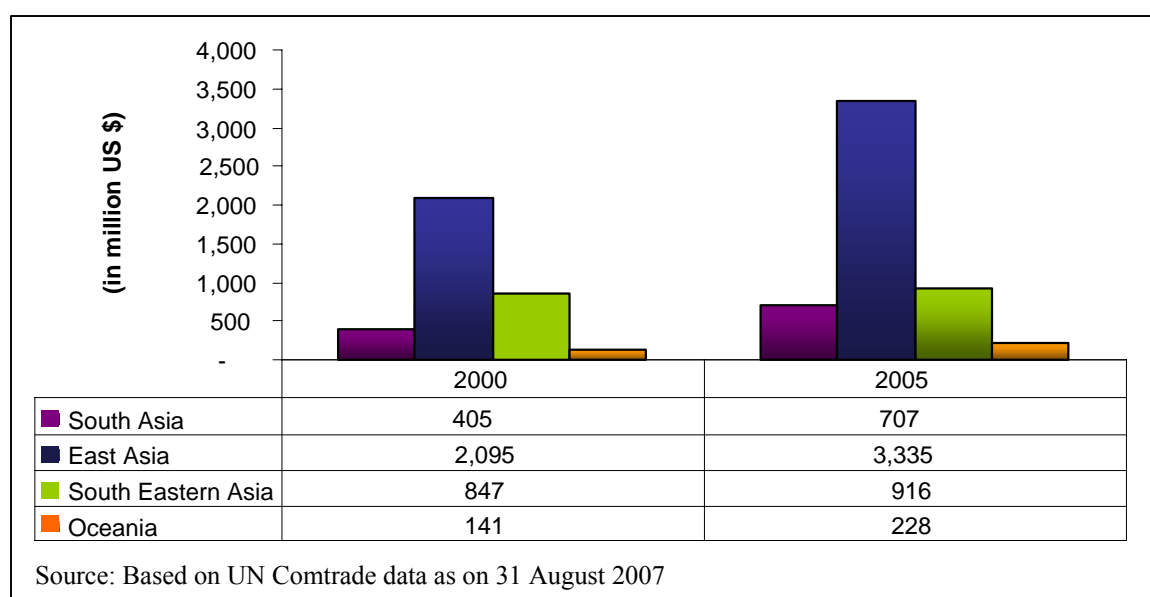


Figure 5. Global export value for the Asia-Pacific region, 2000 and 2005

Though there is a marginal decline in overall exports (in terms of percentage) of almost all the countries (see Figure 6) between the period 2000 and 2005, it is however interesting to note that in absolute value, revenue from NWFP exports has doubled for most of the countries (see Table 13).

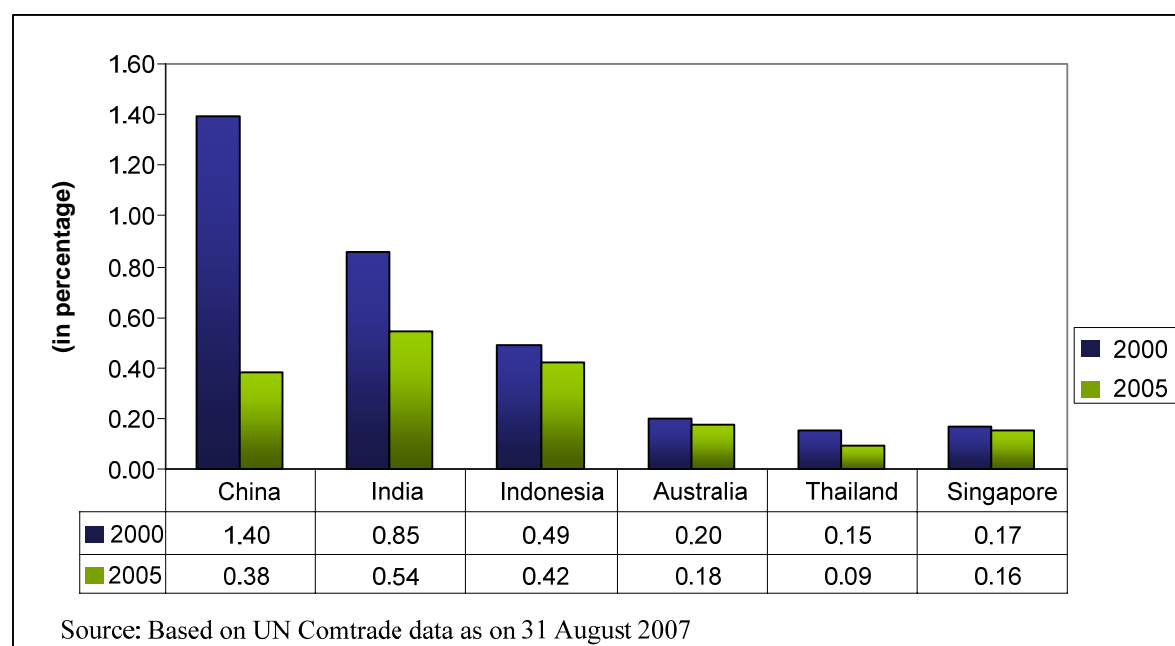


Figure 6. Percent contribution of NWFPs to total export value, 2000 and 2005

The main reason for this decline in export percentage is because of the rapid growth of exports of other commodities. Moreover, in rapidly growing economies, rising labour costs limit the availability of labour for production and processing of NWFPs. A case in point is Malaysia, where it is increasingly difficult for rubber plantation owners to hire labour for tapping of latex. Collection of a number of other NWFPs (for example rattan) has faded out in view of non-availability of labour.

Global trade patterns of NWFPs

Examining the NWFPs that led to the value of US\$ 14 billion in 2005 highlights that trade was dominated by those NWFPs that fed the food industry (46%), followed by health and beauty markets (34%) and then those NWFPs that were required for construction and household artefacts (14%) (see Figure 7). Within the food industry the main drivers were speciality food items such as mushrooms and truffles. Similarly, the health and beauty market segment is primarily dominated by the essential oils used in the growing flavours and fragrance industry. The remaining one-third of the trade consists of NWFPs used in industrial applications such as lac, oleoresins, rosins and turpentine and products for household construction and handicrafts (bamboo and rattan-based products), followed by other NWFPs such as tendu leaves, dried flowers for decoration, ornamental fish etc. (see Annex 4).

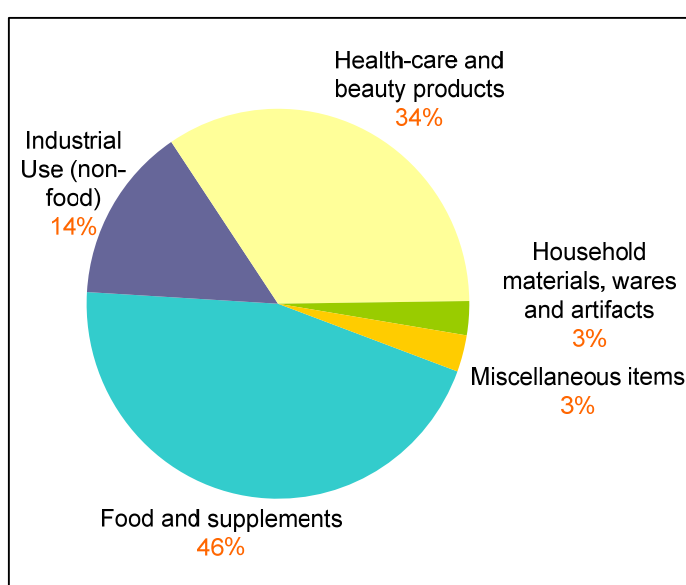


Figure 7. Global trade patterns of NWFPs, by category 2005

Source: Based on UN Comtrade data as on 31 August 2007.

NWFPs export vis-à-vis the natural forest cover

The dominance of some of the countries in the export market in terms of the value of trade is largely due to their large geographical area and consequent diversity of products and the large quantity they could collect. However, the value of trade on a per hectare basis of natural forest area is greater for some of the smaller countries like Sri Lanka, Kiribati and the Cook Islands as compared to some of the dominant (in terms of absolute quantity) NWFP-exporting countries like China, India, Indonesia and Australia (see Table 13 and Annex 3 for more details).

Table 13. Value of NWFP exports per unit of natural forest area, 2005*

A-P countries	Total natural forest area (in '000 ha)	NWFP exports (in '000 US\$)	Value of NWFP export per unit of forest area (in US\$)
Australia	163678	186810	1.14
China	197290	2894004	14.67
Cook Islands	16	114	7.13
India	67701	561569	8.29

Indonesia	88495	360072	4.07
Japan	24868	67757	2.72
Kiribati	2	48	24.00
Nepal	3636	7707	2.12
Pakistan	1902	45353	23.84
Sri Lanka	1933	77928	40.31

*Exporting year for the Cook Islands is 2004.

Countries, their main exports and their percentage contribution

Every country has its own set of NWFPs that are traded in the international markets. On average, countries from the Asia-Pacific region export about 25-30 NWFPs with China, India, Indonesia and Thailand exporting about 50 commodities (see Annex 4). Out of these, only a small number of products generate a major share of the income (see Table 14). It is interesting to note that for most of the Asia-Pacific countries, the top five NWFP-exported items generate on average almost 75% of the income. Furthermore, two or more of their commodities enter into global trade after undergoing some amount of value addition (see Annex 4).

Table 14. % contribution by top 5 NWFPs in overall NWFP exports, 2005

Countries	% share of the top 5 NWFPs to the total NWFP trade	Countries	% share of the top 5 NWFPs to the total NWFP trade
Australia	83.9	Mongolia	97.5
China	62.9	New Caledonia	99.9
Fiji	98.5	New Zealand	87.6
Hong Kong SAR	65.2	Pakistan	88.6
India	79.0	Philippines	94.7
Japan	68.2	ROK	83.7
Kiribati	100.0	Singapore	73.7
Malaysia	74.9	Sri Lanka	95.3
Maldives	98.9	Thailand	54.1

Key factors leading to increased demand

The main product categories and the trends in demand are summarized hereunder.

(i) Essential oils and botanical extracts

According to the World Flavors & Fragrances report 2005, global demand of essential oils in the last few years has grown. The industry was estimated to be worth US\$19 billion in 2008 at an average growth rate of 4.7 percent per year. Demand for essential oils and plant extracts is largely driven by the food flavouring industry, cosmetic and fragrance industries and industrial solvents. Pharmaceutical and medicinal uses drive the demand for botanical extracts, while plant-derived chemicals, gums and polymers have industrial markets.

Historically, flavour and fragrance supply and demand have been dominated by Western Europe, the US and Japan, and these regions continued to lead in 2003 with 65 percent of demand and over three-quarters of worldwide production. However, maturity in these large markets is compelling industries to explore new markets and to re-invent their operations to remain competitive. In the Asia-Pacific region (China and India), this is a key area of interest for countries due to their low per capita consumption of fragrances,

cosmetics and processed foods. Technology development for this sector is increasing and raw materials are available at a relatively low cost.

(ii) Exudates (gums, latexes and resins)

The continued demand for exudates (gums, resins and latexes) is driven by their industrial applications. Some of the industries in which these NWFPs find application include:

- Adhesive industry, *gums*
- Food processing and beverages, *gums and resins (shellac)*
- Varnishes and printing inks, *benzoin, resin (rosin and turpentine)*
- Pharmaceuticals and cosmetics, *gums, resins and latex*
- Textiles, *gums and resins*
- Leather, electrical, computer hardware and polishes, *resins (primarily shellac)*
- Tyre industry, *latex*

In the case of resin (shellac), apart from having international demand it also has large-scale domestic demand. For instance, in 2006 the shellac demand in China stood at about 1,000 to 2,000 tonnes/year in the chemical industry, 1,000 tonnes/year in the military industry and 1,000 tonnes/year in pharmaceutical and food industries. Latex products are also being used extensively as alternatives to solvent-based systems such as adhesives, sealants and coatings because of global legislation concerning the use of volatile and flammable solvents. Natural rubber latex is particularly used in medical gloves, threads and condoms. Gloves are by far the largest market sector, consuming around 60% by weight out of the three main non-tyre-related products. The market is being driven by the spread of HIV/AIDS and other pandemic diseases which require protective measures to prevent infection.

The reason why natural latex from rubber plants is superior to synthetically produced vinyl films and to most other competitive materials is due to the excellent film-forming nature of natural rubber latex, which acts as a barrier to pathogens including viruses. The nature of end-uses has led to the development and introduction of new standards such as the Standard Malaysian Glove (SMG) programme (a joint effort by the Rubber Research Institute of Malaysia [RRIM] of the Malaysian Rubber Board [MRB] and Malaysian Glove Manufacturers) to supply gloves of internationally high standard for safety and reliability.

(iii) Food and food supplements

Much of the demand in this sector has been driven by the resurgence in global and domestic preference for healthy, organically grown natural products. These “speciality food items” are often the re-discovery of traditional food items such as mushrooms and truffles in Japan and Korea, chestnuts in China and wattle seed in Australia (see Box 19).

Box 19. The Changing Scenario of Wattle Seed

In recent years, there has been an upsurge of interest in novel food products and in particular those products branded as "bush-foods." Bush-foods are defined as native plant or animal products used by indigenous Australians as either a traditional or contemporary foodstuff. Wattle seed, the seed from the plant *Acacia victoriae* is one such bush-food that has been traditionally collected and used to meet the dietary requirement of Australian aborigines (some of whom still practice hunting and gathering) along with seeds of other *Acacia* species in as much as 70% of their total diet (Hiatt, 1978, Lister et al., 1996).

Discovery leading to formation of a new industry: In 1984, there was an accidental discovery by Vic Cherikoff, the pioneer of the Australian native food industry (<http://www.cherikoff.net>). These days, Cherikoff Wattleseed is used extensively around the world from the famous Australian chef, Benjamin Christie to mainstream bakers in Europe and specialty chocolatiers and ice cream manufacturers in New York. American celebrity chef Emeril Lagasse made Cherikoff Wattleseed ice cream on his TV show. Popular singer Peter Gordon (of New Zealand and UK fame) uses it in his signature dish. An interesting development for wattle seed products has been the inclusion of "Wattle seed Anzacs biscuits" on QANTAS flights beginning in February 2005. Moreover, Queen Elizabeth II on her visit to Australia in March 2006 to inaugurate the Commonwealth Games was offered a dessert flavoured with wattle seed. To add to that list "Wattlecino" is the new form of *wattle-flavoured cappuccino* sold in Australian coffee bars these days.

Reasons for the wattle seed fad: The reason why wattle seed has become such an exciting commodity in the specialty food segment is because it has an excellent coffee and roasted hazelnut flavour with a hint of chocolate. This makes wattle seed a splendid caffeine-free coffee substitute that can be used for adding flavour to ice cream, cookies, biscuits, sauces and breads. This interest has led to the widespread use of bush-foods in the restaurant industry both in Australia and overseas. In some instances, these products have become souvenir items, marketed as "uniquely Australian cuisine" or as having been "wild collected by Aboriginal people on their traditional homelands, just as they have done so for thousands of years". The bush-food industry, characterized by a few large companies and a very large number of micro-businesses, is believed to be worth around US\$15 million in retail value in Australia, and is growing steadily (Morse, 2005).

For the best and first harvest of the season's matsutake mushrooms in Japan, buyers are willing to pay almost any amount of money. Yet with the Japanese crop shrinking (probably due to extraction exceeding regeneration, increases in summer temperatures in the last couple of years, the inability to develop cultivation protocols and disease infestation (pine wilt) in the pine forests of Japan), 90 percent of the matsutake sold in Japan is imported. The principal sources are China, DPRK, ROK, Western Canada, the Northwestern United States (Oregon) and Morocco. Rising incomes complement this growth in demand.

While communities that are involved in the production of these NWFPs are poised to benefit from such trade, this requires formulation of appropriate development plans. For the speciality food industry/bushfood industry to grow, at least three critical issues must be addressed and incorporated into management and marketing strategies. These include (a) sustainable management and regulation of the resource, (b) understanding the characteristics, preferences and intentions of the consumers and (c) the environmental and social impacts of increased pressures on the forest resources.

(iv) Household construction and handicraft materials

There is a growing demand for novel products with mass production possibilities from NWFPs, especially bamboo and rattan. Although there are hundreds of species of

bamboos, only a few are used for commercial-scale production especially in modern uses like corrugated bamboo roofing sheets, bamboo mat boards, etc.

Rattan is receiving attention from large furniture retailers like IKEA to market products to high income consumers in Europe and the US. Improved design has contributed to its popularity. Designer sofas, beds, tables, cupboards, baskets and walking sticks are some of the products that have entered the high income markets.

Emerging trends in NWFP marketing and trade

The Asia-Pacific region as a major NWFP market

Increasing affluence and greater awareness about the long-term benefits of nature-based medicines and foods that have medicinal properties (nutraceuticals) have led to an increased use of NWFPs in the Asia-Pacific region. Growing demand for botanical medicines in China and India (in 2000, India had some 7800 small, medium and large herbal enterprises (Singh, 2001) and China has about 3000 TCM manufacturing units), is providing opportunities for neighbouring countries to find a ready market. Markets in India, China and Australia grew almost 4-5 times from 2000 to 2005 compared to the period 1996-2000 (see Figure 8 and Table 15).

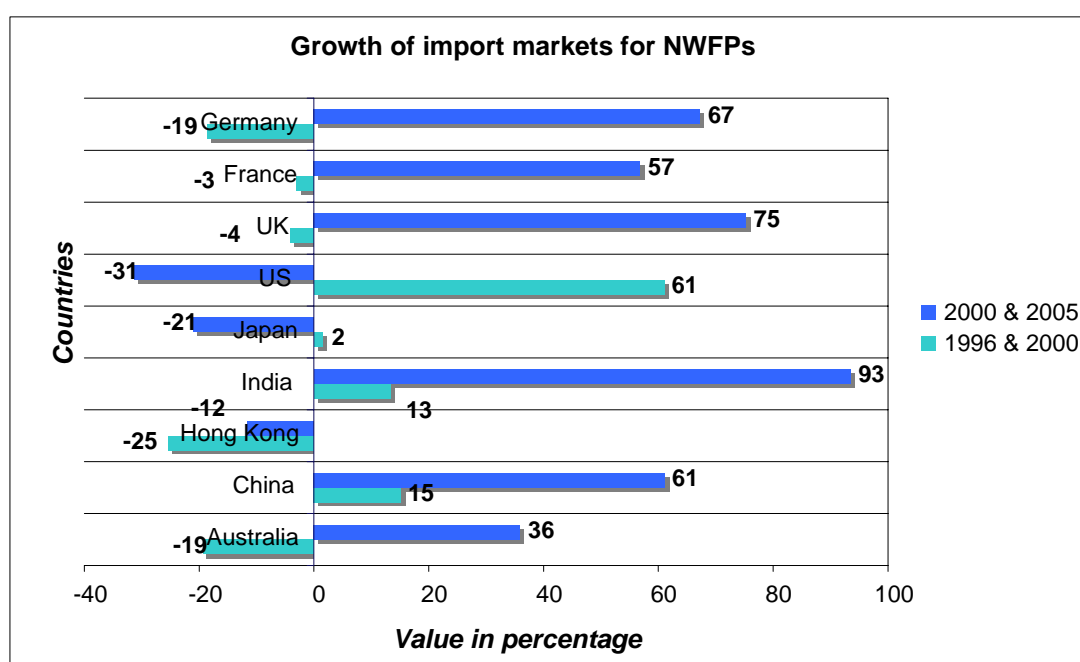


Figure 8. Growth of import markets for NWFPs in the Asia-Pacific region

Table 15. Import value of NWFPs of selected countries

Countries	1996	2000	2005
	(in '000 US\$)		
Australia	107,466	86,691	117,819
China	148,868	171,444	276,365
Hong Kong	881,517	657,995	581,931
India	85,093	96,492	186,686
Japan	1,345,391	1,366,054	1,078,981
US	1,496,359	2,410,403	1,655,543
UK	421,179	403,854	707,778
France	607,017	588,909	923,742
Germany	939,224	765,455	1,280,212

Source: Based on UN Comtrade data as on 31 August 2007.

Trade dominated by a few countries in the Asia-Pacific region

The bulk of the NWFP exports comes from the East Asian region with China dominating the trade, followed by Southeast Asia where Indonesia, Singapore and Thailand contribute significantly together (Figure 9). South Asia is dominated by the trade of India and similarly Australia and New Zealand lead the Oceania region. Apart from these players, other countries which account for a significant amount of global trade are Japan, Philippines, DPRK and Malaysia.

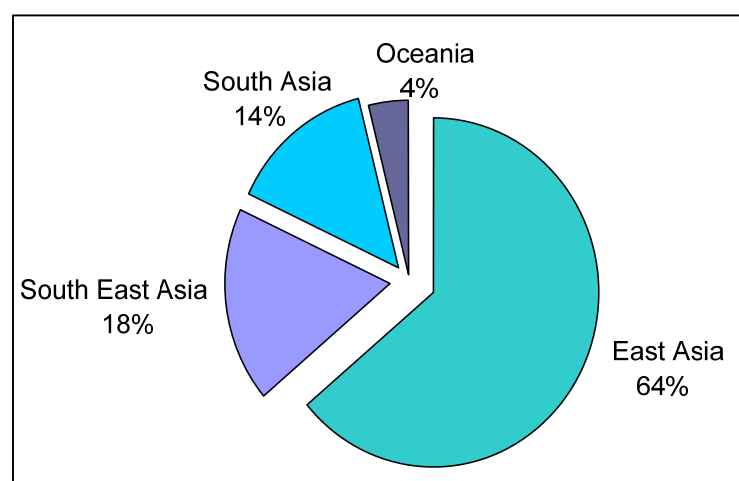


Figure 9. Total export of NWFPs from the Asia-Pacific region, 2005

Movement of NWFPs from local value chains to global value chains

Most NWFPs are locally or nationally traded. The few that have reached wider markets did so because of: (a) increased market demand; (b) a niche in product availability or skill-sets resulting in a natural market edge; (c) favourable policies of trade and development and (d) well-developed marketing networks. Moreover, when NWFPs move from the local value chain to the global value chain, there is a growing trend towards waste reduction and making secondary products out of waste (Marsh and Smith 2007) resulting in efficiency in production.

Bamboo: Bamboo is a classic example of a product that is increasingly moving from the local to the global value chain, with a diversified range of products such as flooring, laminated furniture, building panels (similar to timber-based plywood, chipboard), high quality yarn and fabrics, activated carbon and bamboo extracts for use in the food

industry. The emergence of bamboo as a timber substitute has coincided with a growing demand for timber. Bamboo's appearance, strength and durability combined with its rapid growth and capacity for sustainable harvesting make it an increasingly attractive wood substitute.

The potential of bamboo can only be realized when the skill-sets of the people dependent on this resource are enhanced for integration at various levels of processing, along with the development of infrastructure for storage, processing, transportation etc. Bamboo has the potential to provide opportunities for individuals/communities to move up the value-chain from raw material suppliers to supplying semi-processed products (see Table 16).

Table 16. Overview of the emerging bamboo processing industry and its characteristics

Processing/ industry category	Type of products	Characteristics of this category	Likely impact
<i>Low-value and bulk processing industries</i>	Charcoal	The industry achieves only marginally higher levels of income as compared to those selling unprocessed raw bamboo culms. The industry can utilize low quality bamboo and leftovers and processing waste from other industries and various species.	Large-scale livelihood opportunities for the poor; impact marginal per capita basis as rates of are employment generally low
<i>Medium-value processing industries</i>	Chopsticks, bamboo vinegar, juice, and mat boards, handicrafts	Industries are able to use lower grades of bamboo than in the premium processing industry.	Employment opportunities for relatively higher skilled people, rates of employment moderate
<i>Premium processing industries</i>	Bamboo flooring and ceiling, high quality yarns and fabric	Premium quality bamboo is required. The industry's rate of economic impact is twice the level of the medium-value processors and five times the level of the low-value and bulk processors.	Livelihood opportunities for relatively fewer people; rates of employment high

Rattan is experiencing a similar story. IKEA, which sourced bulk of the rattan from Viet Nam till 2005, is now exploring Cambodia and Lao PDR for economic and ecological reasons. This is an example of a local valuechain expanding and integrating with a global value chain.

Technology development supporting trade of NWFPs

Technology development has ensured that more fully or semi-processed NWFPs enter the market arena.

Processed and value-added products: NWFPs of late are being packaged and sold in bulk either in powder, pastes, concentrates (e.g. sea-buckthorn juice), extracts, oils etc. Other ready-to-consume NWFPs are available dried, canned and frozen (e.g. mushrooms, bamboo shoots) that have a relatively longer shelf-life. All these developments are opening up opportunities for both high-end and low-end processors. For such processing, most equipment used is locally fabricated and low-cost. Grinders, driers, distillation units and decorticators are readily available. Some of the industries producing essential oil are

able to produce flakes, crystals, etc. but the industry is dominated by small-scale distillers who still rely on less sophisticated traditional methods of distillation.

Connected communities: For trade and marketing, the ‘virtualization’ of organizations and market processes provides an increasing opportunity to network and reach potential customers directly through cost-effective approaches. For instance, platforms like E-bay, Alibaba and similar other online portals provide opportunities for online trading both through bidding and direct purchase agreements.

Developing technology to enhance production from cultivated sources: To address the increasing demand for NWFPs, research institutions and other NGOs over the last couple of years have begun to dedicate a part of their resources towards development and standardization of NWFP cultivation and processing techniques. Cultivation/propagation techniques for species like *Aquillaria* in Indonesia, sandalwood in Australia, *mentha*, lemon grass and *Chlorophytum* species in India are generally standardized in an attempt to enhance supplies. Otherwise, cultivation protocols for a whole range of other NWFPs have been developed and are easily accessible.

Supply chain development in East and Southeast Asia

Every product requires various stages or levels of processing. The crux is to understand the processing requirements of buyers and, based on the available resources, attempt to meet the demands of the customers. If resources are limited, it is worthwhile to collaborate with similar interested partners to capture and maintain market leads. This trend, prevalent in the agricultural sector, is taking hold in NWFP markets along with increasing efforts to streamline the value chain based on the collective strengths of different players.

There are indications of change in the processing and trade of several NWFPs, notably bamboo and rattan. The trade pattern is characterized by managed, coordinated supply chains that are dominated by a few large players along with some medium-level players that are bulk suppliers. In Southeast Asia there are many countries such as Philippines, Indonesia, Malaysia, Viet Nam, Cambodia and Lao PDR that have natural abundance as well as significant areas under plantation of these two NWFPs. Given the geographical proximity of these countries, coupled with the favourable trade policies in the regions, there have been recent efforts to integrate the supply. Even within China, various counties and provinces with abundant bamboo resources are supplying each other as when demand rises in the bamboo-based industries. Though India has the largest bamboo resources in the world, with almost 11.4 million hectares (Lobovikov et al., 2007), supply chain management remains inadequately developed, especially in comparison with China’s over 5.4 million hectares of bamboo plantations. With increasing internal pressure to halt environmental degradation and forest loss, China has embarked on increased imports from the adjoining countries.

Moreover, the gradual shift to high-end processing and product diversification gives scope for neighbouring countries to supply bamboo and rattan products to China. A report assessing the supply and demand status of rattan during the period 1995-2001 (Vantomme, 2003) concludes that there is very little imbalance between supply and demand of rattan; however there has been a change in the direction of trade: Indonesia is now the main exporter of cane and China the world's largest importer (see Figure 10).

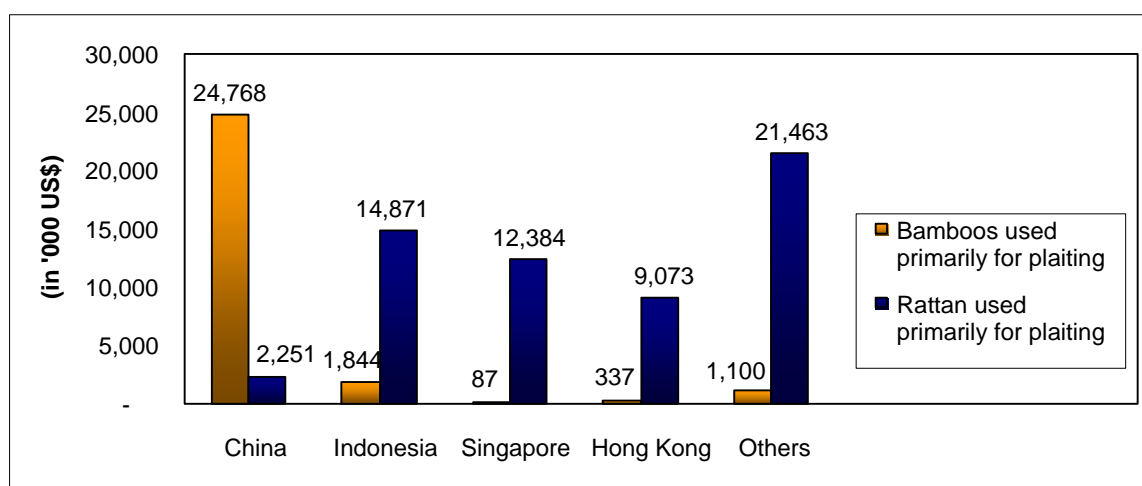


Figure 10. Bamboo and rattan exports (unprocessed), 2005

Table 17 substantiates the increasing consumption of bamboo and rattan products by China, most of which are being used for value-added products.

Table 17. Export value of processed bamboo and rattan products, 2005

Countries	Basketwork, wickerwork vegetable material products (in million US\$)	Plaited vegetable material articles (not mats or screens) (in million US\$)	Walking-sticks, seat-sticks, whips, etc. (in million US\$)
Indonesia	45.3	0.2	0.2
Philippines	88.1	0.6	0.0
Hong Kong	33.4	0.2	6.3
Others (India, Japan, Malaysia, Singapore, Thailand)	7.4	1.0	0.3
China	776.9	42.6	52.1
Total	951.2	44.6	58.9

Source: Based on UN Comtrade data as on 31 August 2007.

The better market access and well-developed marketing networks in China are lacking in most other countries, although they do have cost advantages compared to China. These countries therefore feed into the less-technology intensive mass-processing and production of individual items required by the ever-increasing Chinese market. Partial processing of items such as bamboo blinds, chopsticks, charcoal, wood panels etc. are such examples of supply chain integration within a commodity by a few players (or countries in this case).

It is a good sign that some of the NWFP products like bamboo and rattan are witnessing high-end supply-chain development and management. Similar developments are also taking place for the “speciality food items” segment like mushrooms and truffles in Japan, DPRK, ROK, Hong Kong and Singapore.

Certification of NWFPs as a market-based instrument for conservation and trade

There is a potential for organic, ecological and fair-trade certification for NWFPs (Viana et al., 1996; Krudener, 2000; Shanley et al., 2002; Walter, 2002), which in the long run can ensure ecological integrity, social equity and economic viability of NWFP-based

operations. These market-based instruments can to some extent respond to the needs of the poor by ensuring comparatively better returns.

Though the concept of certification is picking up, its application to NWFPs is still in the early stages. Some organizations like the International Federation of Organic Agriculture Movements (IFOAM), Fair-trade Labelling Organization (FLO) and Forest Stewardship Council (FSC) are increasingly promoting NWFP certification. However, certification is plagued with challenges including high costs, unclear market benefits, dispersed beneficiaries, lack of effective monitoring and control mechanisms and undefined sustainable harvesting limits for NWFPs. Whatever certification exists is concentrated in the Latin American region. Viet Nam and Philippines are attempting to certify rattan-based products and wicker furniture (still in the early phase of implementation). This is also the case with the FSC-certified *jatamansi* and wintergreen oil and *lokta* handmade paper finding its way into the UK and US markets (see Box 20). Another such attempt has been made in Bhutan, which has only been moderately successful so far (see Box 21). The future of NWFP certification in Asia and the Pacific remains uncertain.

Box 20. FSC Certification of NWFPs in Nepal

Every year in Nepal's Himalaya highlands, the collection and sale of NWFPs represents a potential long-term source of income for local villagers. However, villagers typically sell their goods to exploitative medicinal herb traders, who encourage them to harvest as much as they can while paying them poorly. Once a plant supply runs out, the traders move on, leaving the villagers with a depleted source of livelihood.

In January 2005, the Rainforest Alliance awarded FSC certification to FECOFUN, whose members harvest their forest botanicals responsibly to ensure long-term availability of their natural resources and maintain forest health. They then sell their wild-crafted ingredients to the international natural products industry, which so far has been quite responsive. The villagers' certified essential oils and hand-made paper are now available in the United States and the United Kingdom.

Source: Rainforest-Alliance Newsletter, March 2007.

Box 21. Bio Bhutan: Linking Communities to Markets through Certified Products

Bio Bhutan is a pioneer enterprise that produces and markets natural and organic certified products from Bhutan for Bhutanese and international markets. Organic production is a new venture in Bhutan and efforts to establish policies for organic agriculture were recently initiated (2005) by the Royal Government of Bhutan. Certification of three products was initiated the same year by Bio Bhutan, and organic certificates have been obtained for two of them in January 2006 (both NWFPs): lemon grass oil (*Cymbopogon flexuosus*) and pipla (*Piper pedicellatum*). The Kerala-based INDOCERT was the agency that carried out the certification process (which follows EU Standards and Regulations for organic products). Farmers from the Dozam village (also the oldest community forestry group in Bhutan) supply lemon grass oil from their 5 distillation units, and they are being trained on an annual basis by Bio Bhutan on the standards and requirements of organic certification.

According to Vantomme and Walter (2003), forest-based certification of NWFPs, despite having merit as a concept, may not become a universal phenomenon to promote the sustainable use of NWFPs. However, under certain conditions such as improved awareness, enabling policies (for example, reduced cost of certification through public-private partnerships, for consumers to ultimately pay a reasonable amount for the product) and effective monitoring on the ground, forest-based certification might prove to

be an appropriate tool for sustainable forest management (SFM), in combination with other certification schemes like those based on organic or fair trade systems.

5. OTHER ISSUES OF SIGNIFICANCE

Countries, porous borders, ports and global trade

Global trade figures may not reflect the country of production and even the country of value-addition. In the different regions of Asia and the Pacific, there are certain countries which by virtue of their location stand to benefit from this increasing global demand and trade of NWFPs. Table 18 attempts to identify the products which move through neighbouring porous borders. There are however no authoritative estimates on how much revenue is lost due to unaccounted trade. For example, pepper (*Piper* spp.) had an estimated global annual production of around 325,000 tonnes in 2003. Though India (averaging 34%) has been the largest producer, in the last five years Viet Nam (27%) has become the world's largest exporter, partly drawing upon supplies from adjoining countries, especially Cambodia, whose annual production is estimated to range between 2,500 to 11,000 tonnes (Winrock International, 2005). Another interesting example is that of Hong Kong and Singapore, which account for a significant share of the global trade despite not being countries of origin. This is possible because of their well-developed ports, infrastructural facilities such as storage and enabling policy environments.

Table 18. Global trade players, regional countries and indication of some NWFPs that cross borders

Countries	Sharing borders with	Main NWFPs likely to cross borders
China (East Asia)	Viet Nam, Myanmar, Mongolia, Lao PDR	Rattan, bamboo, medicinal plants (including those grown in Cambodia)
India (South Asia)	Nepal, Pakistan, Bangladesh, Bhutan	Medicinal plants from Nepal and Bhutan (<i>Nardostachys jatamansi</i>) Bamboo products from Bangladesh and Bhutan Fruits and nuts (<i>Chilgoza</i>) from Pakistan
Thailand (Southeast Asia)	Cambodia, Lao PDR, Myanmar	Bamboo
Indonesia (Southeast Asia)	Papua New Guinea	Agarwood

Factors influencing trade

Global and regional trade flows are shaped mostly by geographic proximity, trading arrangements (often related to proximity), historical and political elements, the kind and level of technology used and an appropriate climate for NWFP production. Other important determinants of trade are volume of production, price, product quality and reliability of delivery. Changes in policies could have significant impacts on the trade dynamics as witnessed in the case of *Kava kava* and “biscuit” in PICs (see Box 22).

Box 22. Vulnerable Trade Dynamics in the Small Island Developing States (SIDS)

Export diversity in the Pacific Islands is less than in any other region. Fiji and Vanuatu are relatively large Pacific developing states, the former having a population of about 800,000 and the latter 220,000. Fiji is one of the more developed Pacific Island economies.

The conflict between Fiji and Vanuatu (2004-2005) is popularly known as the “Kava-Biscuit War”. The issue was that of exports-imports of these two commodities between the two countries.

Kava kava (*Piper methysticum*) is an NWFP used in the preparation of a ceremonial and social drink. Vanuatu is the main kava exporter while being the main importer of biscuits from Fiji. In 2004, Vanuatu decided to not import biscuits from Fiji, for the simple reason it considered that biscuits were priced higher that year and that it could import them for a lower price from other adjoining countries. Given the ban on biscuit importation from Fiji by Vanuatu, Fiji imposed a ban on kava import (it was the main importer of kava from Vanuatu) the same year.

After a series of banning and lifting of bans between the two countries, the conflict has come to rest with some trade negotiations agreeable to both parties. This highlights that in regions where production and trade options are limited, there can be unfair trade practices and trade is simply not a function of good product and good price. Tariff and non-tariff barriers can significantly impact trade dynamics.

There are no recognized standards for engaging in NWFP trade. There are many factors that determine a successful and well-developed market and trade for any given product. This is more so for NWFPs as there is variability of products in terms of quality even within a small region, not to mention those produced and obtained from various sources.

NWFPs and global trade of endangered species

Commercialization of NWFPs has achieved modest successes for local livelihoods but has not always created incentives for conservation. According to the Species Survival Commission (the Medicinal Plant Specialist Group of the IUCN) about 15,000 species, or 21 percent of all medicinal and aromatic plant species are at risk, more than half of them due to trade, which is mostly illegal.

The increasing rarity and continued high demand (and hence value) of some of the important plant species under global trade such as agarwood, *Saussurea costus* (kuth) and sandalwood from the Asia-Pacific region have led to a marked increase in plantation establishment. Indonesia and Malaysia, leaders in the trade of agarwood (from which the most expensive oil is made), have established large areas of plantations, and so have other countries like PNG, Lao PDR and Bhutan. Adjoining areas like Viet Nam have refined the inoculation techniques for the agarwood host trees. For the *Saussurea costus* market in India and abroad, natural forests have ceased to be a source; all products that enter the market chain are from cultivated sources in Himachal Pradesh in India. The shrinking natural resources of sandalwood in India are being supplemented by large-scale plantations in Australia (see Box 23).

Box 23. Sandalwood Industry at the Cross-roads

Sandalwood oil is one of the world's most widely used essential oils, prized for its scent and for its therapeutic effects in Ayurveda, Chinese and Tibetan medicinal systems. India has been the traditional leader of the sandalwood oil industry for more than 5,000 years. Natural forests of Karnataka, Kerala and Tamil Nadu produced the bulk of the supply. Sandalwood production fell from 4,000 tonnes/year in the 1960s to 1,000 tonnes/year (the total world trade being 6,000 tonnes) in the 2000s, largely due to unsustainable management, including illicit removal and the outbreak of the "spike disease". Australia has seized this opportunity, given its vast tracts of uncultivated lands. In the last decade and a half, Australia has seen a significant amount of investment in research and development and establishment of large-scale sandal plantations. Further, scientists in Australia successfully developed a method whereby the extraction cycle for oil has been reduced from the current 50 years (as in India) to 15 years.

Australia is now the leader in the sandalwood oil market thanks to its large tracts of well managed plantations. Currently, sandalwood resources in Australia are available for harvest in excess of 200,000 tonnes. Many Indian companies of late have begun investing in Australian sandalwood plantations and setting up extraction units in the country.

However, at this stage the sandalwood industry is in a transition phase and there is uncertainty as to who will be the leader a decade from now. The issues of quantity versus quality and the willingness of the consumers to pay for what the product is worth are unclear. Australia, through its well-managed large-scale plantations, is able to meet the increasing demand, but as far as receiving higher trade value is concerned, it is the Indian sandalwood that fetches the premium price for its unique aroma. According to Quandong 2006 (the news magazine of the Western Australian Nuts and Tree Crop Growers Association (WANATCA), Australian sandalwood fetches about A\$10,000 a tonne, very low compared with A\$40,000/tonne for the Asia-Pacific variety (Indonesia and Papua New Guinea are other countries where sandalwood trees are found naturally) and A\$73,000/tonne for premium Indian sandalwood.

Source: FAO NWFP-Digest-L (2007).

These examples go on to elaborate the fact that the dwindling resources and increasing trade demand have led governments and private entities to promote and develop plantations of these valuable species. This is however not the case of many of the other species that are endangered either due to absence of cultivation protocols or in cases where wild resources receive a preferential market treatment in terms of better price and access.

NWFPs, trade and ecological sustainability

This increase in demand for NWFPs has raised concerns about the ecological impact and eventually the sustainability of the dependent enterprise/industry/livelihood activities. Table 19 attempts to highlight the various NWFPs that are under trade both in the domestic and international markets and the sustainability issues in the country from where the NWFPs are most harvested. It is imperative that the concerned countries take appropriate conservation and development measures to ensure sustainability of the livelihood opportunities that NWFPs provide to millions of households.

Table 19. Ecological sustainability of various NWFPs in the trade and global value chain

Criteria	Typical products	Level of sustainability	Country of concern
Destructive harvesting, very slow re-growth and limited distribution	(a) sandalwood (b) agarwood	High level of threat	(a) India and Nepal (b) Indonesia, Malaysia PNG, Vanuatu and Lao PDR
Destructive harvesting, fast re-growth but requiring special surroundings	(a) <i>Hak tin hung</i> fern roots and <i>kheua</i> hem vines (b) matsutake mushrooms	Under moderate threat	(a) Lao PDR (b) Japan and DPRK
Destructive harvesting, fast re-growth, grows anywhere with the same agro-eco climate	(a) bamboo, (b) rattan (c) lac	Sustainable if large-scale plantation occurs and timely pruning	(a) China (b) Indonesia & Viet Nam (c) India and Thailand
Mostly under cultivation, no impact in the wild	(a) <i>Saussurea costus</i> (b) <i>Hevea brasiliensis</i>	Sustainable, if maintained with the demand	(a) India (b) Malaysia, Thailand, India
Slow depletion of natural stock	(a) dammar resin, (b) gum karaya (c) tendu leaves	Not sustainable in the long run; dependent on forest protection and plantation measures to ensure future supply when the current stock gets exhausted	(a) Indonesia, Cambodia and Lao PDR (b) India (c) India
Increasingly under cultivation, moderate impact in the wild	(a) indian gooseberry (Aonla) (b) <i>Kava kava</i> (c) sandalwood	Excessive demand outstrips supplying potential; products from cultivated sources meet part of the demand; pressure from the wild partially removed	(a) India (b) Vanuatu, Solomon Islands, Fiji, Tonga (c) Australia

Source: Adapted from Foppes and Ketphanh, 1997.

Changing needs and preferences of society

In recent years there has been a major shift in the needs, preferences and aspirations of society. This is by virtue of the rapidly increasing population, economic prosperity, mobility and technology development. Lately there has been an increasing emphasis on products that come from natural sources or are organic for food, beauty and health care needs. There is a broad range of consumers. On one end of the spectrum are those looking for cheap and better alternatives, as driven by economic concerns over environmental or social issues. Yet others are willing to pay premium prices for products that are of good quality and that are organically grown.

It is believed that this change in preference of societies is likely to impact one of the most important NWFPs of India, the tendu leaf (*Diospyros melanoxylon*), which is used in the bidi industry (a major source of livelihood and employment in the rural areas). Yet growing health consciousness amongst rural people and strict measures by the government to curb tobacco consumption raise questions on the future of tendu leaf in industry. An attempt has been made to do a SWOT analysis of the bidi industry so that those involved in its trade can leverage on its strengths, innovate and initiate measures to

minimize its weaknesses (see Box 24).

Box 24. Current Developments and Future of the Bidi (*Diospyros melanoxylon*) Industry in India

Bidi and its importance in the rural economy of India: Bidi, deemed the “poor man's cigarette” in India, is made by rolling a few grams of tobacco flakes in tendu (bidi) leaves, which is an NWFP, growing mostly on degraded forest lands. It is mainly grown in the States of Madhya Pradesh (MP), Chattisgarh, Orissa, Maharashtra, Andhra Pradesh and Bihar. According to one of the reports commissioned by WHO (Aghi, 2000), the bidi industry is one of the largest employers in the informal sector.

Production management, trade and development: State institutions like the MPMFP Federation, Chattisgarh MFP Federation and Orissa Forest Development Corporation manage the collection and trade of the tendu leaves in Madhya Pradesh (MP), Chattisgarh (CG) and Orissa respectively. It is major revenue earner for the State exchequer. For most of these States, more than 70% of the 50% contribution from the forestry sector comes from NWFPs; a significant share comes from the tendu leaves trade (Prasad, 1999, Hegde et al. 2000). The collection is managed with the help of a 3-tier cooperative system in the case of MP and CG in an attempt to prevent exploitation of the poor at the hands of traders, and it has been successful to some extent.

Bidi rolling, which is the next stage in the production process, is mainly a household-based cottage industry and is labour intensive. Raw material (leaves) production centres are mostly located in the central (MP, CG) and eastern part of India (Orissa); raw materials (tobacco) in the western part (Maharashtra and Gujarat) and the final processing industry in the southern belt of India (Andhra Pradesh, Karnataka, Kerala and Tamil Nadu) from where the bidis are marketed and distributed.

SWOT Analysis of the bidi industry

Strengths

- One of the largest employers after agriculture and the construction sector, and occasionally the only employer in certain areas. Provides stable livelihood opportunities at the doorstep of about 40 million people during the tendu leaf collection stage and to another 60 million people, mostly women for rolling out of bidis
- Organized and institutionalized collection and trading of tendu leaves
- Attempts to safeguard against accidental injury or death of the collectors by means of insurance policies, not a common practice in the informal sector
- Despite being in the unorganized sector, the manufacture of bidis is done in a systematic manner right from the production to the marketing stage
- Enjoys a very low level of taxation compared to cigarettes (Duty per kilogram for cigarettes can be as high as Rs722/kg, while combined duty per kilogram for other tobacco products like bidis and chewing tobacco is only Rs21/kg)

Weaknesses

- The tendu leaf policy does not have any scope for involvement of cooperative members at any level for price fixation
- The workers in the bidi industry, most of whom are women and children work in inhospitable conditions and ingest a large amount of tobacco dust while rolling
- By not having any specific policy against employability of children at the household level, human and labour rights are violated
- The manufacture of bidi is labour-intensive, but workers are paid much below the daily average wage rate in most cases

- Since the bidi industry employs large numbers of women workers, exploitative practices, which affect workers in general, tend to affect the lives of more numbers of women than men

Opportunities

- The opportunities for the industry are to improve working conditions of the people, restrict child labour and improve trade practices
- Selling of nicotine-free and flavoured bidis
- The opportunity for the government is to create avenues for alternative sources of employment for these bidi workers who are on the verge of losing their livelihood options
- Possible short-term markets in the adjoining neighbouring South Asian countries
- Such opportunities should not just create short-term employment opportunities. The attractiveness of the bidi industry is the stability of income and flexibility in working hours it provides year after year
- Promote NGOs/voluntary organizations for rehabilitation programmes in areas where the bidi industry contributes significantly to the rural household income

Threats

- Increasing commitment of the national government to various international agreements on reduction of tobacco consumption resulting in enactment of legislations for the same (India is signatory to the WHO Framework Convention on Tobacco Control [WHO FCTC] and has enacted the tobacco control legislation called “Cigarette and other Tobacco Products Act 2003”)
- The bans imposed by certain importing countries like the US in 1999 can impact trade
- Anti-tobacco campaigns and awareness programmes, specially targeting the consumers of bidi by obliging the manufacturers to put pictorial representation of skull and bone (apparently the sign of danger in India) on every bidi packet – *the bulk consumers of tobacco in the country*
- Competition amongst bidi brands and gutka and mini-cigarettes and possible loss of bidi market share
- Increasing shift in societal preferences for health conscious products due to rising incomes may reduce bidi consumption to a certain extent even in the rural areas
- The industry is critically dependent on the availability of low cost labour; the increasing economic growth of India may create alternative income sources in some parts of the country, undermining the availability of low cost labour

NWFPs, markets and role of institutions

In a subject matter as diverse and complex as NWFPs, institutions and policies have a significant role to play. Associated challenges pertain to issues and aspects as diverse and far-ranging as forest rights and tenurial issues, access and vulnerability of the markets, inappropriate level of skills and human capital for leveraging benefits from the growing natural products sector along with access issues to technology and finance. As far as NWFP-based SMFEs are concerned, in most cases after reaching a certain level of scale and expertise comes a stagnation phase either for want of better access to markets, finance, technology, and logistics support etc. These factors have necessitated greater roles for policies and institutions.

The growth and development of NWFPs over the last decade and a half have resulted in the proliferation of specialized agencies to cater to the emerging needs. These agencies are either private entities (consultancy firms, trading houses [export and import, fabrication units etc.] or government/donor-supported [NGOs, quality testing laboratories, educational and research institutions etc.]) rendering services such as

education, awareness generation, training, project formulation, enterprise development, machinery, marketing facilities, storage and logistics support (see Box 25).

Box 25. Proliferation of Specialized Agencies Catering to the Emerging Needs of NWFPs

Of late somewhat more specialized agencies such as research and development (R&D) institutes, microfinance institutions (MFIs) and certification agencies have emerged to address the research, capital and certification needs of stakeholders associated with NWFPs. There are also institutions specifically dedicated to oversee the interests of any individual product or product types, although most of these have a generalized approach ensuring the overall development of NWFPs.

Some of the specialized agencies catering to the needs of the Asia-Pacific region are:

Associations: Gingko Technical Association (GTA)-China; Artisan's Association of Cambodia; Ayurvedic Drug Manufacturers Association of India (ADMA) and Essential Oil Associations of India).

Consortia (Global NTFP Partnership to which many National and International level NGOs, corporate entities, governments and donors are members, MAPSCON-India).

Networks (IDRC and IFAD-supported International Network for Bamboo and Rattan [INBAR]; Viet Nam NTFP Network; IUCN-supported NTFP Network in South and Southeast Asia, WWF-supported Global Forest & Trade Network, ANSAB-Nepal, Honeybee Network-India).

Others: IFOAM, FSC (Forestry Stewardship Council), service providers for the commercial enterprises etc.

These agencies allow individual stakeholders and organizations dealing with NWFPs to come together, to dedicate resources, and to collectively lobby for a cause. Such proliferation of institutions and organizations is occurring across the globe and invariably all of them are attempting to address the same issues.

6. SCENARIOS

The study on NWFPs by Mittleman et al. (1998) undertaken in the context of the first Asia-Pacific Forestry Sector Outlook Study identified the following scenarios for NWFPs. Attempts have been made to assess their status and examine their relevance for the next decade.

Status of the scenarios identified in APFSOS I

Scenario 1: demise of NWFP supplies

The study noted that the resurgence of interests in herbal and natural products is taking a toll on wild resources and that there was a trend toward depletion of NWFP resources. The scenario persists even today owing largely to the fact that wild sources continue to meet more than 80-85% of demand. In response to depletion, the source of supplies is changing with consequences on production and employment. For instance, in Cambodia, reduced availability of resin in some areas has resulted in a loss of local markets and caused the poorest fishermen to resort to coating their boats with cement or plastic sheeting (World Rainforest Movement, 2005). Similarly, China is increasingly streamlining the supply of bamboo from the adjoining bamboo-producing countries of Viet Nam and Lao PDR, partly to conserve its resources but primarily for reasons of cost-effectiveness.

Apart from indiscriminate harvesting, another factor leading to the depletion of some NWFPs is the lack of feasible options such as cultivation, substitutions by other plants or development of synthetic substitutes. In the case of consumptive items, the natural flavours and aromas are preferred; hence extracts from wild/cultivated products will continue to be in demand.

Scenario 2: domestication and cultivation of NWFPs

This scenario has emerged in the case of some of the valuable species that are in demand, but whose supply from the wild has declined significantly. In order to meet the increasing domestic and global demand, different countries have resorted to domestication and cultivation of NWFPs (see Box 26).

Box 26. Emerging NWFP Cultivation Trends

<i>Countries</i>	<i>NWFPs under domestication and cultivation</i>
China	Bamboo and mushrooms
Indonesia & Malaysia	Rattans and agarwood
Korea	Shiitake mushrooms
India	Aonla (<i>Emblica officinalis</i>), Aloe vera, Isabgol (<i>Plantago ovato</i>), safed musli aromatic plants (<i>Mentha</i> , <i>Palmarosa</i>)
Australia	Sandalwood
Bhutan & Lao PDR	Agarwood (initial stages)

There are no studies to indicate whether large-scale cultivation has reduced pressures on wild supplies or if it just meets the ever-increasing demand. Also, there are increasing debates about the poor and landless becoming further marginalized as they will not be able to participate in the cultivation process and thus benefit from the growth in demand. In addition, some of their harvested products may have to face competition from NWFPs

from cultivated sources, which may be preferred for their uniformity and regularity of supply.

Scenario 3: promoting fair trade in NWFPs

The previous outlook indicated the scope of promoting fair trade practices in NWFPs on similar lines as agricultural commodities. This was largely with the focus of increasing the income for the producer groups. Moreover the growing concern for resources to be harvested from sustainable sources has to an extent influenced institutions to promote market-based instruments such as certification, branding and labeling apart from fair trade. Neither fair trade nor certification for the majority of the NWFPs have taken place, despite the optimism they have generated. With the exception of a few (for example bamboo and rattan) NWFPs are mostly non-mass market commodities, making it difficult to implement certification. Costs of certification will therefore remain substantial. Branding and labeling to some extent have enabled some communities to realize better margins (Tribes and Vindhya Herbals, in India and Craftimex in Viet Nam) but such achievements are few.

Scenario 4: enabling policy environment

Increasingly governments are realizing the need to integrate NWFP concerns in their development plans. Forest management strategies in general are changing in many Asia-Pacific countries and initiatives in local forest and bio-diversity management are evolving towards involving local communities and making forest governance more responsive. Governments are attempting to adapt their existing policies to the changing realities of economic, environmental and social development rapidly taking place in the Asia-Pacific region. These policy changes in general pertain to recognizing forest ownership and access rights of the forest-dependent communities, participatory or collaborative approaches to forest management and streamlining resources to promote the development of NWFPs. Some examples to indicate the changing scenario include drafting of the policy in Viet Nam (2006) that exclusively focuses on the development of NWFPs, drafting of the “Community Forest Bill” 2005 in Thailand with the intention of recognizing the lands of the indigenous communities and the enactment of the Scheduled Tribes and other Forest Dwellers (Recognition of Forest Rights) Bill, 2006 and the development of the new foreign trade policy (2004) in India to include NWFPs for export under special agricultural commodities.

NWFP scenarios for 2020

The diverse nature of NWFPs makes scenario analysis complex for the simple reason that every country and every region within the country has its own set of NWFPs with their specific production cycles, consumption patterns, processing requirements and trade characteristics. Regardless of these issues, attempts have been made to visualize possible futures for NWFPs based on how economies perform, how societies evolve, how private companies do business and what possible changes in the policy and institutional environment may take or are taking place. As Peterson et al. (2003) puts it, scenario planning despite its limitations can help to clarify the key uncertainties and incorporate alternative perspectives into decision-making.

This scenario setting exercise has largely drawn upon the current production, processing and marketing trends, with the assumption that some of these trends may continue but may be at a different scale and nature for different regions. In an attempt to capture the various facets of NWFPs, this scenario analysis has looked into:

- The types of societies a country has and the types of NWFPs that would hold relevance for these societies at their different stages of development
- Other developments in societies, as driven by a combination of factors that has a significant bearing on the future of NWFPs as a resource and on millions of the NWFP-dependent people
- Roles of institutions and enabling policies on the overall outcomes of the scenarios

It is important to note that each scenario will have its own characteristics, reflecting the interests and values of society in general and the role various stakeholders and institutions play. The determinants of such scenarios will largely be a combination of factors like economic growth, socio-political situations, innovations and development in science and technology, demographic changes, commitment towards various international agreements and conventions and changing preferences of the society.

Based on the societies and their development characteristics, four broad scenarios can be envisaged of relevance to NWFPs (see Figure 11).

- a) Scenario 1: low-income subsistence scenario (purely subsistence societies)
- b) Scenario 2: resource decline and substitution scenario (integrated agrarian societies)
- c) Scenario 3: increased commercialization scenario (industrial societies)
- d) Scenario 4: revival scenario (postindustrial societies)

All scenarios may find relevance in certain countries and similarly some countries may completely bypass some scenarios due to their development status. For example, based on the current status and trends on NWFP production, consumption and trade, scenarios 1 and 2 may hold true for countries like Lao PDR, Cambodia, Mongolia, PNG, Fiji, Myanmar, Bhutan and Maldives; scenarios 2 and 3 for countries like Viet Nam and Nepal. All four scenarios may be relevant for countries like Indonesia, Philippines, Malaysia, India and China, whereas for Japan, ROK, New Zealand, Australia, Singapore and Hong Kong scenarios 3 and 4 may be applicable.

<i>Main stakeholders and the scenarios level where they may have influence</i>					
<i>Societies & Scenarios</i>	Local communities	Traders	Governments	Small scale cultivators/ SMFEs	Large industries
<i>Subsistence societies</i> Low-income subsistence scenario	<ul style="list-style-type: none"> - Collection from the wild - Minimal processing 				
<i>Agrarian societies</i> Resource decline and substitution scenario	<ul style="list-style-type: none"> - Increasing domestic markets - Value-addition low 				
<i>Industrial societies</i> Increased commercialization scenario					
<i>Post-industrial societies</i> Revival Scenario					

Figure 11. Scenario setting for various types of NWFPs

Scenario 1: low-income subsistence scenario (subsistence societies)

General characteristics

These are principally traditional societies with a great degree of reliance on natural resources for their basic survival needs.

a) NWFPs and their status at this stage

Almost 80-85% of NWFPs are used for nutrition, health-care and other basic needs, and may continue to remain at the subsistence use level. This would largely be the case because not all NWFPs have commercial importance, hence remain freely available for local level consumption purposes. NWFPs at this stage may undergo very little processing and value addition, and if so it would mainly be for enhancing storage possibilities.

b) Subsistence societies, forests and development issues

It is likely that with such use patterns, the impact on forests would remain minimal. Subsistence societies would continue to (i) reside around the forest fringes, (ii) lack private property or have unclear land use and access rights and (c) be vulnerable to development pressures and increased marginalization.

This scenario in general would reflect the overall poverty and development status of a country. If poverty persists, subsistence use may increase.

Most of the wild fruits, nuts, berries, flowers, fibre plants and edible leaves constitute a part of this scenario.

Scenario 2: resource decline and substitution scenario (agrarian societies)

General characteristics

These societies (agrarian) may largely derive their income from agriculture and farming practices, but wild harvest of commercially important species may continue to supplement household income in many of the cases. Those NWFPs that were used by these societies earlier for subsistence needs may face a decline in use. This may be possible because of access to improved market goods and agricultural commodities. Some NWFPs, especially those having commercial importance, may still be collected from the wild largely as a strategy to enhance income. Individuals with land may attempt to grow such commercially important NWFPs and diversify their income sources. Understanding about markets and market dynamics for such societies would remain limited. Some of the NWFPs may undergo value addition to enhance handling during storage and transportation, which eventually may accrue better profit margins. It is possible that individuals/producer groups may increasingly get linked up to various value chains and may find a way out of their low-income status. Value addition however, would be limited to use of simple and low-cost processing techniques.

a) Commercialization leading to overharvesting and resource decline

The resurgence of interest in herbal products may tend to negatively impact resources in the wild. In response to such market demand and prospects of short-term gain, harvesters may resort to overexploitation of a particular species or a group of species. Most NWFPs fall in the domain of common property resources (CPR) and the lack of secure and enforceable property rights on forests may accentuate this overexploitation, as communities may have little incentive to adopt sustainable harvesting practices.

b) Absence of knowledge on sustainable harvesting limits and its implementation leading to depletion

Although sustainability is a major issue, the diversity of products with divergent production sources and cycles make setting up harvesting limits difficult. This problem is accentuated with some NWFPs whose production tends to be cyclical and spread over a number of years, as influenced by species characteristics and changes in climatic factors. Low investment also discourages research. Though CITES attempts to facilitate regulation of endangered species, many species may shift between various levels of vulnerability. Also, in the absence of standard acceptable inventorization methods and baseline information about NWFPs, proper monitoring becomes difficult.

c) Loss of traditional knowledge and decline in NWFP use

Traditional knowledge about NWFPs as food, handicraft items of daily use or medicinal value is based on use and transfer and is mostly confined to the older generations. Localized knowledge is at risk of being diluted or lost due to out-migration and the changing lifestyles of people from the rural communities. When there is every likelihood of reduced use and application, either because of enhancement in the socio-economic conditions of communities or the perception of NWFP-related use and applications as being inferior, knowledge may eventually be lost.

Examples of such NWFPs could be various types of medicinal plants used for their leaves, roots, stems, flowers and seeds and bamboo and rattan-based handcrafted products.

Scenario 3: Increased commercialization scenario (industrial societies)

General characteristics

In industrialized societies only those NWFPs that are of commercial importance will receive increased investment in cultivation and processing. Such NWFPs would continue to reach the national or international markets catering to bulk consumption needs. The increased commercialization scenario would be aided with high levels of investment in technology, supply-chain management and distribution of end-products through supermarkets and other retail outlets. The demand for these NWFPs is likely to remain steady but with fluctuations, because of occasional shifts in sources of production in order to check global prices.

a) Supply from forests and possible regulation by governments

Forests may continue to be the main source as it may continue to be the cheaper option for industries. The long-term sustainability of some NWFPs may however become a problem, particularly if no investments are made towards enhancing the production capacity of those concerned areas or species that produce them. Considering the potential of certain NWFPs for revenue generation, governments may try to control, restrict or regulate trade of such NWFPs with some investment in forest protection and measures to regenerate the growing stock.

b) Meeting demand through organized cultivation

Certain industries are poised to grow because of many favourable factors and this would create a demand for NWFPs in both raw and processed forms. These include essential oils and botanical extracts for the flavouring, fragrance and pharmaceutical industries; exudates such as gums, latexes and resins for various industrial applications; food and food supplements in the specialty food industry and bamboo-based new-age construction materials in the event of shrinking timber supplies.

There are already visible signs of overharvesting and resource depletion. Conservation officials and environmental groups in most countries are increasingly becoming concerned and may push for a ban or extraction restriction for some species that are indiscriminately harvested. Even in the absence of such an outcome, the safety and efficacy issues of herbal formulations will necessitate that manufacturers streamline their raw material sourcing practices. Apart from quality issues, manufacturers/bulk consumers are attempting to mitigate their risks from unstable and fluctuating prices of NWFPs through promotion of large-scale cultivation (see Box 27).

Box 27. Organized Cultivation by Dabur in Nepal

Realizing the challenge of a long-term supply of medicinal plants, particularly those whose harvesting in the wild is now banned or is likely to be banned and whose price and availability are unstable, Dabur Nepal Limited (DNL) (the sister-concern of the multinational Indian Ayurvedic manufacturer) entered cultivation of medicinal plants in Nepal back in 1995. It has since established one of the biggest medicinal plants greenhouses in the South Asia region at Banepa, Kavre District in Nepal. In 2001, Dabur was cultivating some 20 species on 50 hectares of land; 8 of them are endangered medicinal plants used in Ayurvedic and Tibetan medicine such as padamchal/medicinal rhubarb (*Rheum Emodi*), kutki (*Picrorhiza kurrooa*), jatamansi (*Nardostachys jatamansi*), kuth (*Saussurea Lappa*) and lauth salla/Himalayan Yew (*Taxus baccata*) intercropped with apple and peach trees. Through IFAD assistance under a leasehold forestry project in 2002, cultivation has spread in some 16 districts in Nepal including Marpha, Manang, Jumla, Nagarkot and Birgunj.

The company sells seedlings at cost price to encourage farmers to cultivate the plants, which the company buys back. The Rs.100 million nursery, where moisture, temperature and humidity are regulated by computers, produces three-and-a-half million seedlings every year. The endless rows of pampered plants are shifted to a shade house, where they are “hardened” before being transported to Dabur’s satellite nurseries in 11 districts in Nepal, and from there they are distributed to the farmers.

Source: Limbu, 2001. Rana, 2001.

As a response to this, many species have already been brought under cultivation in various countries and the trend is likely to continue as long as costs of production can be kept low. If the demand cannot be met from cultivated sources, as is going to be the case for some NWFPs, forests in countries with weak institutional capacity will continue to meet that demand. If the demand increases further, there is every likelihood that synthetic substitutes would be developed. In essence, increased commercialization opportunities may enable some of the NWFPs to have expanded market opportunities.

Examples of such NWFPs include medicinal and aromatic plants, gums, latex, shellac, resins, oleoresins, bamboo-based new products etc.

Scenario 4: revival scenario (postindustrial societies)

General characteristics

Economies that have undergone the transition to a postindustrial society may attempt to focus on organically grown products. Most of the NWFPs fit that profile well. End-products made out of such NWFPs are highly researched, technology-based and many times customized to suit the customer’s needs. As a result consumers are not reluctant to pay the premium prices for such products. Though the market for such value-added NWFPs may remain limited, the trade in absolute value can be significant. The growth of such NWFPs as in the current scenario would largely be driven by the private sector.

Most of the entrepreneurs I've met have had an innate desire for social change. They understand that business isn't just financial science, where profit is the sole arbitrator; it is just as much about taking part in political and social activism, using products as conduits for social change. Anita Roddick, founder of The Bodyshop, New Academic Review, 2002

a) Down-to-earth and back-to-nature trends

The increasing inclination of developed societies to go back to nature for safer remedies for health and beauty care in the past decade has led to rapid growth in the natural products industry. This momentum is likely to gain pace as more people search for alternative and preventive approaches to health care. NWFPs are part of the larger "natural products" industry (in the US alone, which is one of the main NWFP markets, the natural and organic products industry – according to the Natural Foods Merchandiser's 2007 Market Overview – is said to be growing at 9.7 percent annually, with more than US\$56 billion in consumer sales). Though the bulk of the products still falls under the agricultural commodities category, this societal trend also opens up opportunities for NWFP-based botanical medicines, dietary supplements, nutraceuticals etc.

b) Some corporate entities aligning their interests with those of the markets and society

More corporations are going "green" and discovering that being sensitive to environmental issues also equates to better business. Eco-friendly policies can help companies to attract young talent, increase productivity and reduce costs (Mattioli, 2007). Moreover, the issue of fair trade practices promoted by organizations like Oxfam, Amnesty International and Caritas International as a level-playing field for the producer groups is gaining ground, and may encompass NWFP products/producer groups sooner or later.

Box 28. Nepal and “The Body Shop” Connection

Plants are the flavour of the month,” says Carroll Dunham, who carries out research and development in herbal products for Wild Earth in Nepal, a small private company she runs with partner, Laiku Lama. The company, which started in a single room in the mid 1990s, these days supplies products to The Body Shop and retails its own range of herbal products. Dunham learned the business the hard way, struggling with unreliable transport, lack of technical know-how and processing problems.

Wild Earth also established linkages with organizations like Women's Craft, WEFD, ICIMOD, the Mountain Institute and WWF Nepal, who have long been active in income-generation opportunities for women. In order to enhance the skill-sets of the women working with them, they also conduct regular training on proper harvesting practices and prepare various herbal products. The company now runs relatively smoothly, and targets upper middle-class female customers, selling scented pillows, amulets, herbal soap, and elixirs – all well-packaged and complete with a story.

The company's products for The Body Shop include amulets called Love, Dream, Tranquillity and Energy, and necklaces named after the Ayurvedic grouping (*Vata*, *pitta* and *kapha*). All their products, explains Wild Earth's promotional material, are made with “Himalayan herbs,” and inspired by “ancient healing recipes of the Orient.” Dunham also runs an experimental farm in Nagarkot (some 30 km from the capital city Kathmandu), growing herbs and some high altitude mountain plants.

Source: Limbu, 2001.

Not many but a few of the beauty and health care products entities (e.g. Rainforest Mist by Vic Cherikoff in Australia) dedicate a portion of profits from their sales to communities which supply the raw materials. Certification, labelling and branding have enhanced the acceptability of such products (see Box 28). Though there are very few “The Body Shop”-like businesses, the growth potential is substantial.

c) Scope for the revival scenario in Asia-Pacific countries

The Asia-Pacific region, most of which is situated in the tropical belt, is endowed with rich biodiversity and has the potential to meet the growing demand for natural products. Already in terms of absolute value the region contributes two-fifths of the global export in NWFPs and it is likely that its market share will continue to remain as much, although markets may witness more value-added products. Some countries like China, India, Japan, and Australia may facilitate this revival scenario through the use of modern tools in genetics and plant breeding, plant biotechnology and natural products chemistry. Also, there is every possibility that some of the Asia-Pacific countries apart from the ones mentioned above may witness the revival scenario, and this may create opportunities for certain NWFPs and some countries within the Asia-Pacific region for meeting the demand.

Examples of such NWFPs would include essential oils of premium quality used in the cosmetic and flavouring industry, specialty food items and wild-crafted artefacts etc.

Some issues that facilitate or limit scenario outcomes

Possible conflicts on sustainability issues due to increased commercialization

Triple bottom line outcomes for industries are still a distant reality. The concept of corporate social responsibility remains largely a voluntary measure. This scenario may not continue for long. Those companies which have historically depended on NWFPs will be required to become accountable and pay attention to social and ecological considerations. In the future, environment issues will become people's issues and companies that are seen as acting illegitimately or resorting to unfair trade practices may face difficulties with their stakeholders such as employees, governments, consumers and communities, eventually compelling ethical business practices.

Lack of markets, technology and infrastructure development likely to impact cultivation

Cultivation is seen as a way of reducing the pressure on NWFPs occurring in the wild and at the same time for meeting the increasing demands of the market. Increasingly firms are getting into cultivation to ensure a steady supply of raw materials or the quality of the produce. There are various schemes in many countries that promote on-farm cultivation of NWFPs through subsidies and short-term loans. Most of these NWFPs cultivated are short-duration crops with higher income generation possibilities compared to traditional agricultural crops; and invariably many of them fall under medicinal and aromatic plants. There is a need for a certain degree of caution because in the event of agricultural crops not being sold, they can be consumed at the household level or even be exchanged for similar commodities at the local level, which is not the case with most NWFPs that are under cultivation.

The bulk of traded NWFPs still undergo very limited value addition. This could be due to lack of access to appropriate and cost-effective technologies or the absence of transportation, communication and storage facilities.

Scenarios and the role of enabling policies and institutions

Within the timeline of this outlook study, different countries may witness different scenarios. Figure 12 attempts to summarize the various possible scenarios for NWFPs based on choices societies make and the inclinations they exhibit.

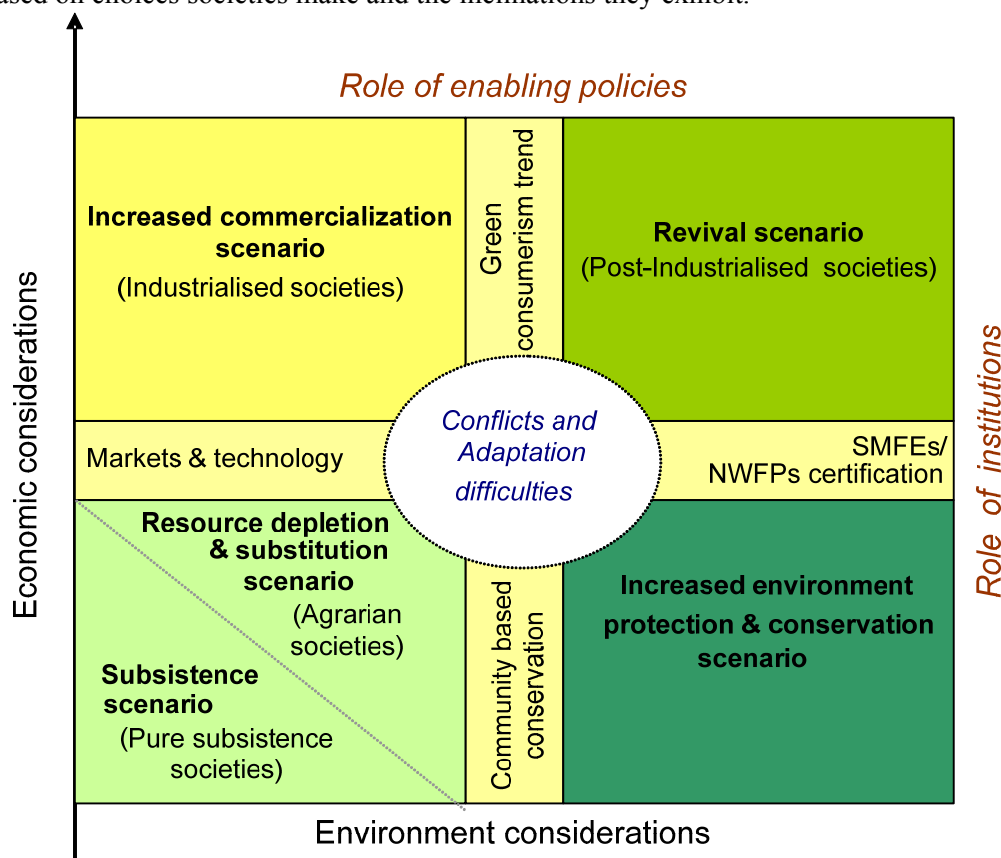


Figure 12. Scenarios and the role of institutions and policies

A shift from one scenario to another is likely to be aided or restricted depending on a number of factors. For example, the shift from an agrarian society to an industrial society would only occur in the event of access to markets and technology. Similarly, in order to limit the resource depletion scenario, increased attempts for resource conservation would need to be made at the country level, with or without community involvement. Going by the trends of increasing tenurial rights granted to communities (White and Martin, 2002), it is likely that communities are going to be involved through various community-based natural resource management approaches.

Those NWFPs under increased commercialization pressure may witness conservation planning both through *in situ* and *ex situ* measures. The revival scenario on the other hand would attempt to strike a balance between both the environmental and economic considerations. Green consumerism trends would largely drive this scenario wherein sustainability issues hold significant importance. Development of cost-effective and innovative certification mechanisms may ensure sustainable utilization of resources, and may increasingly facilitate the linking of local value chains to global ones. Also, the revival scenario would only occur under the conditions of improved investment in research and development, science and technology, capacities and dynamism of SMFES, rising incomes and willingness to pay.

It is imperative to note that as the shift between one scenario to the other takes place, adaptation difficulties and conflicting situations are likely to arise. Therein lies the role of

enabling policies and institutions to facilitate various processes as these developments take place.

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8. ANNEXES

Annex 1. Asia-Pacific countries with the total number of commodities traded that are NWFPs and their total value (2000 & 2005)

S. No	Countries	2000		2005	
		Total no. of commodities traded	Value of trade (in '000 US\$)	Total no. of commodities traded	Value traded (in '000 US\$)
1	Australia	45	125,284	46	186,810
2	China	51	1,444,079	52	2,894,004
3	Fiji	20	817	22	658
4	Hong Kong SAR	50	429,455	51	237,465
5	India	48	386,296	52	561,569
6	Indonesia	52	303,798	52	360,072
8	Japan	47	48,421	46	67,757
9	Kiribati	0	-	2	97
10	Malaysia	40	38,529	47	46,693
11	Maldives	2	415	10	637
12	Mongolia	7	4,042	9	2,812
13	New Caledonia	0	-	10	644
14	New Zealand	33	14,199	42	38,729
15	Pakistan	0	-	27	45,353
16	Philippines	26	169,249	31	164,885
17	Republic of Korea	40	168,502	39	133,130
18	Singapore	53	229,756	51	244,429
19	Sri Lanka	0	-	38	77,928
20	Thailand	50	102,844	52	100,117

Annex 2. Share of NWFP exports in the total value of exports in 2005

Countries	NWFP exports (in '000 US\$)	Total exports (in '000 US\$)	% share of NWFP in the total export
China	2,894,004.1	761,953,409.5	0.38
Sri Lanka	77,928.1	6,159,855.3	1.27
Japan	67,756.9	594,940,865.8	0.01
New Caledonia	636.9	701,701.3	0.09
Thailand	100,116.9	110,110,034.2	0.09
Malaysia	46,692.7	140,962,926.5	0.03
Pakistan	45,353.2	16,050,200.7	0.28
New Zealand	38,728.6	21,730,098.3	0.18
India	561,568.6	103,404,167.1	0.54
Mongolia	2,812.0	1,064,384.7	0.26
Fiji	657.9	701,701.3	0.09
Singapore	360,072.3	229,652,339.1	0.16
Maldives	643.9	154,174.7	0.42
Australia	186,809.7	105,751,493.0	0.18
Kiribati	48.3	3,573.3	1.35
Philippines	164,885.2	41,254,683.5	0.40
ROK	133,129.7	284,418,167.2	0.05
French Polynesia	1,443.5	210,286.6	0.69
Iran	21,221.5	60,012,000.0	0.11
Hong Kong	237,465.3	292,118,674.2	0.02

Annex 3. Value of NWFP exports per unit of forest area

AP countries	Total natural forest area (in '000 ha)	NWFP exports (in '000 US \$)	Value of NWFP export per unit of forest area (in US\$)	Exporting year
Australia	163,678	186,810	1.14	2005
Bangladesh	871	7,462	8.57	2004
Bhutan	3,195	441	0.14	1999
Cambodia	10,447	623	0.06	2004
China	197,290	2,894,004	14.67	2005
Cook Islands	16	114	7.13	2004
Fiji Islands	1,000	658	0.66	2005
India	67,701	561,569	8.29	2005
Indonesia	88,495	360,072	4.07	2005
Japan	24,868	67,757	2.72	2005
Kiribati	2	48	24.00	2005
Korea, Republic of	6187	133130	21.52	2005
Malaysia	20890	46693	2.24	2005
Maldives	1	644	644.00	2005
Mongolia	10252	2812	0.27	2005
Nepal	3636	7707	2.12	2003
New Caledonia	717	637	0.89	2005
New Zealand	8309	38729	4.66	2005
Pakistan	1902	45353	23.84	2005
Papua New Guinea	29437	678	0.02	2003
Philippines	7162	164885	23.02	2005
Samoa	171	82	0.48	2004
Singapore	2	360072	180036.00	2005
Sri Lanka	1933	77928	40.31	2005
Thailand	14520	100117	6.90	2005

Annex 4. Countries, their main exports and % share of the top 5 NWFPs in the total trade (2005)

Countries	Top 5 NWFPs under export	Total value of the top 5 items (in '000 US\$)	% share of the top 5 NWFPs to the total NWFP trade
Australia	Nuts edible, fresh or dried, <i>nes</i> ; honey, natural; essential oils, <i>nes</i> ; animals, live, except farm animals; plants & parts, pharmacy, perfume, insecticide use, <i>nes</i>	156711	83.9
China	Basketwork, wickerwork products of vegetable material; mats, matting and screens, vegetable plaiting material; mushrooms and truffles, dried, not further prepared; rosin and resin acids; plants & parts, pharmacy, perfume, insecticide use, <i>nes</i>	1821582	62.9
Fiji	Ornamental fish, live; chestnuts, fresh or dried; oil seeds and oleaginous fruits, <i>nes</i> ; raw vegetable materials for dyeing or tanning; liquorice roots	648	98.5
Hong Kong	Plants & parts, pharmacy, perfume, insecticide use, <i>nes</i> ; basketwork, wickerwork products of vegetable material; ginseng roots; ambergris, civet musk, etc for pharmaceutical use; raw fur skins of other animals, whole	154882	65.2
India	Mucilages & thickeners from locust bean, guar seeds; plants & parts, pharmacy, perfume, insecticide use; natural gum, resin, gum-resin, balsam; lac; foliage, branches for bouquets, etc – except fresh	443915	79.0
Indonesia	Essential oils, <i>nes</i> ; nuts edible, fresh or dried, <i>nes</i> ; basketwork, wickerwork products of vegetable material; edible products of animal origin, <i>nes</i> ; cinnamon and cinnamon-tree flowers whole	210825	58.6
Japan	Colouring matter of vegetable or animal origin; ornamental fish, live; animals, live, except farm animals; rosin and resin acids; mushrooms and truffles, dried, not further prepared	46197	68.2
Kiribati	Mushrooms and truffles, dried, not further prepared; mushrooms & truffles, dried, whole/cut/sliced/br	97	100.0
Malaysia	Ornamental fish, live; edible products of animal origin <i>nes</i> ; foliage, branches for bouquets, etc. – fresh; reptile skins, raw; nuts edible, fresh or dried, <i>nes</i>	34986	74.9
Maldives	Ornamental fish, live; chestnuts, fresh or dried; oil seeds and oleaginous fruits, <i>nes</i> ; raw vegetable materials for dyeing or tanning; liquorice roots	637	98.9
Mongolia	Animals, live, except farm animals; raw fur skins of other animals, whole; nuts edible, fresh or dried, <i>nes</i> ; Mushrooms and truffles, dried, not further prepared; plants & parts, pharmacy, perfume, insecticide use, <i>nes</i>	2741	97.5
New Caledonia	Essential oils, <i>nes</i> ; ornamental fish, live; mats, matting and screens, vegetable plaiting material; plants & parts, pharmacy, perfume, insecticide use, <i>nes</i> ; colouring matter of vegetable or animal origin	643	99.9
New Zealand	Honey, natural; ambergris, civet musk, etc for pharmaceutical use; animals, live, except farm animals; plants & parts, pharmacy, perfume,	33935	87.6

	insecticide use, <i>nes</i> ; vegetable products, <i>nes</i>		
Pakistan	Natural gum, resin, gum-resin, balsam, not gum arabic; nuts edible, fresh or dried, <i>nes</i> ; honey, natural; plants & parts, pharmacy, perfume, insecticide use, <i>nes</i> ; mushrooms and truffles, dried, not further prepared	40172	88.6
Philippines	Basketwork, wickerwork products of vegetable material; mucilages and thickeners, <i>nes</i> ; abaca fibre, raw; ornamental fish, live; plaits and products of plaiting materials	156093	94.7
Republic of Korea	Ginseng roots; chestnuts, fresh or dried; mushrooms other than the genus <i>Agaricus</i> , fresh/chilled; mucilages and thickeners, <i>nes</i> ; mushrooms and truffles, dried, not further prepared	111415	83.7
Singapore	Ornamental fish, live; reptile skins, raw; plants & parts, pharmacy, perfume, insecticide use, <i>nes</i> ; essential oils, <i>nes</i> ; edible products of animal origin, <i>nes</i>	180097	73.7
Sri Lanka	Cinnamon and cinnamon-tree flowers whole; ornamental fish, live; vegetable products, <i>nes</i> ; foliage, branches, for bouquets, etc. – fresh; natural gum, resin, gum-resin, balsam, not gum arabic	74281	95.3
Thailand	Nuts edible, fresh or dried, <i>nes</i> ; flour or meal of sago, starchy roots or tubers; ornamental fish, live; lac; animals, live, except farm animals	54208	54.1

nes: not elsewhere specified

Annex 5. Overview of the policies in the Asia-Pacific region with a bearing on NWFPs

Countries	Policy/ Policy brief	NWFP use, management and development
Australia	National Indigenous Forestry Strategy (2005)	This policy attempts to integrate the indigenous aborigines into commercial forestry sector enterprises with a focus on the emerging bush-food industry by building partnerships, capacity building initiatives and institution development.
Bangladesh	National Forest Policy (1994)	No specific NWFP policy. The National Forest Policy is the overarching policy for NWFP use and management which attempts to optimize the contribution of forest resources for environmental stability and economic and social development and increase forest cover.
Bhutan	National Forest Policy of Bhutan 1974. The revised Forest and Nature Conservation Rules 2003 has some reference on NWFPs mainly from the conservation point of view. Development of a national NWFP management strategy (under preparation in 2007)	The National Forest Policy is the overarching policy for NWFPs. Management is on ad-hoc basis, rules applicable to timber are applied for NWFP management. For subsistence use, NWFPs can be collected and consumed, but for commercial harvesting, permits need to be obtained.
Cambodia	Statement of the Royal Government on National Forest Policy (2002)	The policy emphasizes conservation and sustainable management as twin pillars supporting sustainable socio-economic development. Community participation in forest management is seen as necessary to ensure food security, poverty reduction and socio-economic development. The new law establishes export quota arrangements for timber products and NWFPs.
China	Devolution of state and collectively-owned forests to individual households under the Rural Land Contract Law (2003) The Industrial Policy (1991-2000)	Under the collective forest management practices, management is on a well-defined area, shares from NWFP permits, taxes, fees and sale are distributed to village members according to family size. The Industrial Policy, gave impetus to large-scale cultivation of medicinal plants for production of Traditional Chinese Medicine, attempts for conservation of wild resources.
India	Joint Forest Management, 1990 The Panchayat (Extension to the Scheduled Areas) Act, 1996 Under the new Foreign Trade Policy, 2004 expansion of the "Vishesh	Usufructs sharing rights of communities in the JFM area in the ratio between 25%-50%; Ownership rights of NWFPs with <i>Panchayats</i> and <i>Gram Sabhas</i> ; Scope of increasing the share of NWFP export both raw as well as value-added products. Granting of forest tenure rights, scope for better NWFP use and management. Has a limitation on marketing of NWFPs, to be

	Krishi Upaj Yojana to include SMFEs and their products. Enactment of the Scheduled Tribes and other Forest Dwellers (Recognition of Forest Rights) Bill, 2006	done in nearby local villages and markets. Institutionalization attempts by forming the National Medicinal Plants Board (2000), Department of AYUSH etc.
Indonesia	Community Forestry Law (1991-2007)	Indigenous communities in Indonesia have “adat” rights, that are traditional use rights over forests and the government gives recognition to this right. Communities have access to NWFPs within the provisions of community forestry programmes, which have seen many changes over the years. 1995: MoF Decree No. 622/Kpts-II/1995 – through this decree the local people are given access to use NWFPs 2004: Government Regulation No. 34/2002 -- Mentions about empowering local people for NWFP use and management under three schemes: (1) Hutan Kemasyarakatan (HKm) or Community Forest, (2) Hutan Desa or Village Forest and (3) Kemitraan or Partnership (Article 84).
Lao PDR	The Forest Law (1996) Forest Strategy (2020)	The 1996 Forest Law provides a legal framework for NWFPs for rural families to be able to satisfy their ‘family economic necessity’, including collection of NWFPs for sale. Under the Forest Strategy 2020, utilization and management of forest resources with the involvement of local communities are considered important in fulfilling the government's forest policy targets.
Mongolia	National Forestry Statement (1998)	No specific NWFP policy. The National Forest Policy is the overarching policy for NWFP use and management which attempts to protect and develop the existing forests to ensure their maximum contribution to soil and watershed protection, conservation of existing ecosystems, while also meeting the needs of Mongolian people. The Mongolian Law on Forests divides forests into three categories: <i>strict, protected, and utilization zones</i> . From the utilization zone, NWFPs may be harvested for household purposes within this zone, pursuant to the appropriate permit obtained from local governors.
Myanmar	Myanmar Forest Policy (1995)	No specific NWFP policy. The National Forest Policy is the overarching policy for NWFP use and management which attempts to focus on enhancing national socio-economic development and ensuring ecological balance and environmental stability.
Nepal	CFM, Inclusion of NWFPs in the National Forestry	Usufructs sharing rights of communities, 100% in the case of NWFPs.

	Programmes, Formulation of the new "Herbs and NTFP Development Policy 2004"	The new NWFP policy provides a guideline for NWFP management, value addition and marketing.
New Zealand	National Forest Policy Statement (1992/1995)	No specific NWFP policy. The National Forest Statement (which has been jointly made with the Australian government) is the overarching policy for NWFP use and management. The thrust is on sustainable management of the nation's forests.
Pakistan	National Forest Policy (2002)	Has recognized the sustainable utilization of NWFPs through community involvement for poverty alleviation. A special conservation plan for Chilghoza (<i>Pinus Gerardiana</i>), one of the main NWFPs from Pakistan is being made.
Papua New Guinea	National Forest Policy (1990)	No specific NWFP policy. The National Forest Policy is the overarching policy for NWFP use and management which attempts to govern utilization of forest resources to generate economic growth, employment, and greater participation in industry; and to manage and protect forest resources as a renewable asset
Philippines	Some ethnic minority control over forests through peace negotiations, titling of indigenous territories	Management of forests under CBFM, and Peoples Organizations manage forests. Policies, rules and regulations to support CBFM are in place. Titling of indigenous territories
Samoa	National Forest Policy (1995)	No specific NWFP policy. The National Forest Policy is the overarching policy for NWFP use and management which attempts to promote sustainable forest management emphasizing meeting basic human needs, forest protection, individual and collective responsibility, and economic development.
Solomon Islands	National Forest Policy (1994)	No specific NWFP policy. The National Forest Policy is the overarching policy for NWFP use and management which attempts to promote SFM involving communities
Sri Lanka	The National Forestry Policy (1995)	The National Forest Policy (1995) is the overarching policy for NWFP use and management. Under the multi-use production forestry, NWFPs can be harvested for local use and development of local economy
Thailand	The "Community Forest Bill" 2005 (under draft stage, passed by Lower House of Parliament, stalled in the Upper House) The coup d'etat of 19 September 2006 further delayed the process of Community Forest bill formulation and promulgation and a solution for the	The Bill can have implications in either legalizing the rights of indigenous communities over forests or pose a threat for relocation and resettlement of these indigenous communities who depend on NWFPs as their sole livelihood options.

	indigenous issues over forest rights.	
Viet Nam	National strategy on Non-timber Forest Product Development and Conservation 2006-2020	The new strategy has acknowledged the role NWFPs play in the regional and national economy. It attempts to create close links among research, training and extension of NWFP conservation and development. Also, improve community capacity in NWFP conservation and development contributing to livelihood improvement. Prioritize species, conduct market forecast, information dissemination for facilitating harvesting and trade decisions. According to the Five Million Hectare Reforestation Program (5MHRP), in 2010 Viet Nam could have more than one million hectares of NWFP plantations and other types of NWFP forests.

Annex 6. UN Comtrade data whose HS code refers to single NWFPs (HS 2002)

Commodity Code	Commodity description	Category
H1-070952	Truffles, fresh or chilled	Food and Food supplements
H1-200320	Truffles, prepared or preserved, not in vinegar	Food and Food supplements
H1-080240	Chestnuts, fresh or dried	Food and Food supplements
H1-170220	Maple sugar and maple syrup	Food and Food supplements
H1-130120	Gum arabic	Food and Food supplements
H1-080122	Brazil nuts, shelled dri	Food and Food supplements
H1-080121	Brazil nuts, in shell fr	Food and Food supplements
H1-230810	Acorns and horse-chestnuts for animal feed	Food and Food supplements
H1-121210	Locust beans, locust seeds	Food and Food supplements
H1-130110	Lac	Industrial Use (non-food)
H1-130190	Natural gum, resin, gum-resin, balsam, not gum arabic	Industrial Use (non-food)
H1-400130	Balata, gutta-percha, guayule, chicle and similar gums	Industrial Use (non-food)
H1-320110	Quebracho tanning extract	Industrial Use (non-food)
H1-320120	Wattle tanning extract	Industrial Use (non-food)
H1-450110	Natural cork, raw or simply prepared	Industrial Use (non-food)
H1-121110	Liquorice roots	Health-care and beauty products
H1-121120	Ginseng roots	Health-care and beauty products
H1-121190	Plants & parts, pharmacy, perfume, insecticide use nes	Health-care and beauty products
H1-130214	Pyrethrum, roots containing rotenone, extracts	Health-care and beauty products
H1-120792	Shea nuts (karite nuts)	Health-care and beauty products
H1-140110	Bamboos used primarily for plaiting	Household construction materials, wares and artifacts
H1-140120	Rattan used primarily for plaiting	Household construction materials, wares and artifacts
H1-530521	Abaca fibre, raw	Household construction materials, wares and artifacts

H1-140210	Kapok	Household construction materials, wares and artifacts
H1-200891	Palm hearts, otherwise prepared or preserved	Miscellaneous items
H1-060410	Mosses and lichens for bouquets, ornamental purposes	Miscellaneous items

Annex 7. UN Comtrade data whose HS code refers to NWFPs that are included with other commodities (HS 2002)

Commodity Code	Commodity description	Category
H1-040900	Honey, natural	Food and Food supplements
H1-041000	Edible products of animal origin nes	Food and Food supplements
H1-071230	Mushrooms and truffles, dried, not further prepared	Food and Food supplements
H1-200390	Mushrooms n.e.s. preserved, not pickled	Food and Food supplements
H1-080290	Nuts edible, fresh or dried, nes	Food and Food supplements
H1-090610	Cinnamon and cinnamon-tree flowers whole	Food and Food supplements
H1-090620	Cinnamon and cinnamon-tree flowers crushed or ground	Food and Food supplements
H1-110620	Flour or meal of sago, starchy roots or tubers	Food and Food supplements
H1-120799	Oil seeds and oleaginous fruits, nes	Food and Food supplements
H1-130232	Mucilages & thickeners, from locust bean, guar seeds	Food and Food supplements
H1-130239	Mucilages and thickeners nes	Food and Food supplements
H1-140490	Vegetable products nes	Food and Food supplements
H1-320190	Vegetable tanning extracts nes, tannins, salts, derivs	Industrial application (non-food)
H1-320300	Colouring matter of vegetable or animal origin	Industrial application (non-food)
H1-330130	Resinoids	Industrial application (non-food)
H1-380510	Gum, wood or sulphate turpentine oils	Industrial application (non-food)
H1-380610	Rosin and resin acids	Industrial application (non-food)
H1-140410	Raw vegetable materials for dyeing or tanning	Industrial application (non-food)
H1-051000	Ambergris, civet, musk, etc for pharmaceutical use	Health-care and beauty products
H1-330129	Essential oils, nes	Health-care and beauty products
H1-140190	Vegetable materials nes, used primarily for plaiting	Household construction materials, wares and artifacts
H1-140290	Vegetable material nes used as stuffing	Household construction materials, wares and artifacts
H1-1403	Vegetable material for brooms and brushes	Household construction materials, wares and artifacts
H1-460110	Plaits and products of plaiting materials	Household construction materials, wares and artifacts

H1-460120	Mats, matting and screens, vegetable plaiting material	Household construction materials, wares and artifacts
H1-460191	Plaited vegetable material articles not mats or screen	Household construction materials, wares and artifacts
H1-460210	Basketwork, wickerwork products of vegetable material	Household construction materials, wares and artifacts
H1-660200	Walking-sticks, seat-sticks, whips, etc.	Household construction materials, wares and artifacts
H1-940380	Furniture of cane, materials nes	Household construction materials, wares and artifacts
H1-010600	Animals, live, except farm animals	Miscellaneous items
H1-030110	Ornamental fish, live	Miscellaneous items
H1-060491	Foliage,branches, for bouquets, etc. - fresh	Miscellaneous items
H1-060499	Foliage,branches, for bouquets, etc. - except fresh	Miscellaneous items
H1-410320	Reptile skins, raw	Miscellaneous items
H1-430180	Raw furskins of other animals, whole	Miscellaneous items