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Forest Products—Non-Timber

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Abstract: *The commercial exploitation of non-timber forest products—such as fibers, nuts, spices, medicinal plants, rubber, and rattan—was proposed in the 1990s as a strategy to reconcile conservation and development in tropical forests. Its economic benefits generally have been limited, however, due to several factors—including low-production volume, irregular supplies, and poor organization—but new programs continue to address this projected goal.*

Although the exploitation of non-timber forest products is a practice that is as old as humankind itself, the terminology was only introduced in 1989 and refers to all tangible plant and animal products (other than industrial timber) that come from tropical and boreal forests and other vegetation systems, and that are used by local people for subsistence and trade. The terminology covers such diverse products as bushmeat (the meat of terrestrial wild animals), nuts, spices, medicinal plants, leaves for wrapping food, fibers, small diameter timber (denoted as ‘smallwood’) for handicrafts and tools, rattan, latex for rubber, ornamental plants, and essential oils (see Table 1). Whereas most authors tend to use the acronym NTFPs to refer to these products, the Food and Agriculture Organization of the United Nations (FAO) prefers the term *non-wood forest products*. The difference is that most authors include smallwood in the definition, and only exclude commercial timber, whereas the FAO definition excludes all products made of wood.

Table 1. Non-Timber Forest Products and Their Uses

Products category	Examples
A. Plant products	
Food	Edible plants and plant parts (seeds, roots, tubers, stems, leaves, shoots, flowers, fruits, nuts) providing vegetables, snacks, beverages, edible fats and oils, spices, flavorings, etc.
Forage	Plants used as food for livestock and wildlife
Medicinal products	Medicinal herbs, plants, and plant parts (leaves, bark, etc.)
Construction materials	Bamboo, rattan, smallwood, fibers, cork, leaves for roofing (roof thatch)
Utensils	Smallwood for handicrafts and tools, leaves for wrapping food, fibers for basketry and cloths
Biochemicals	Nonedible fats and oils, waxes, gums, latex, dyes, tannins, biochemicals for plastics and coatings, paints and varnish, toxins for hunting, hallucinogens
Aromatics	Essential oils for cosmetics, perfumes, and incense
Ornamentals	Aesthetically pleasing plants, cut and dried flowers
B. Animal products	
Food	Meat and protein from mammals, birds, fishes, reptiles and insects; eggs, edible nests, honey
Forage	Fish oil, bones
Medicinal products	Pharmaceuticals extracted from mammals, fish, and reptiles
Utensils	Horn, feathers, bones
Biochemicals	Wax, silk, propolis, guano, toxins
Ornamentals	Live animals and animal products like feathers, hides, skins, shells, and horn

Source: Adapted from FAO (1991), and hence excluding fuel wood.

Global Use and Exploitation Patterns

Statistics on NTFP use and trade are typically scarce. This has to do with the fact that most extraction is for subsistence, and the bulk of trade is unregistered on local markets. Despite this, FAO estimated in 1997 that around 150 species reach international markets, representing a value of US\$11 billion. Table 2 presents examples of the most commonly traded NTFPs on the international market and their value.

Table 2. Commonly Traded NTFPs

NTFPs	World's import (million US\$)	Notes
Natural rubber	4,221.8	Tropical moist forest regions, from intensively managed plantations, agroforestry systems and natural stands (extractive reserves) of <i>Hevea brasiliensis</i>
Ginseng roots	389.3	Tropical or subtropical, both from the wild and plantations
Essential oils	319.4	Various regions, both from wild and cultivated resources
Cork	310.7	Mediterranean regions from managed natural stands and plantations of <i>Quercus suber</i>
Honey	268.2	Worldwide product from intensively or extensively managed and wild resources
Walnut	215.9	Temperate from cultivated populations of <i>Juglans</i> spp.
Mushrooms	206.5	Temperate and subtropical both from wild and cultivated populations
Rattan	119.0	Tropical rain forests, mostly from natural stands, few plantations in Asia.
Gum arabic	141.3	Tropical arid regions, mostly from wild or extensively managed natural stands of <i>Acacia senegal</i> and <i>A. seyal</i> .
Brazil nuts	44.3	Amazonian rain forests, from wild or semi-intensively managed natural stands of <i>Bertholetia excelsa</i>
Other	9,094.1	
TOTAL OF ALL NTFPs	11,108.7	

Source: Secretariat of the CBD (2001).

Although figures on international trade are hard to obtain, a large number of studies and reviews carried out during the past two decades provide insight into how NTFPs are used worldwide. The use patterns show a remarkable resemblance globally. On all continents, people in remote areas use a considerable number of plant species for subsistence, with over five hundred different species being no exception. More than 50 percent of these are used for medicinal purposes, whereas animal species—fish and game—are important sources of protein. Hunting for and eating bushmeat are also culturally important activities. Even when people migrate to cities, bushmeat continues to be a favorite food item, particularly in Africa. In the case of all other products, the general tendency is that the poorest consume relatively more forest products than others. These products can be considered “gap fillers” that complement farm produce both qualitatively (complementary items) and quantitatively (a fallback during the slack season).

Gathering NTFPs tends to be replaced with other activities once alternative options become available. Exceptions to this are some specialized and culturally important activities such as hunting, handicraft making, and the extraction of products for stable external markets such as those for specialty food like edible birds’ nests, certain ginseng roots, and exclusive mushrooms. This results in a diversified picture of the importance in NTFPs for people’s livelihoods, with access to markets being the main determining factor. Belcher and co-authors (2005) grouped them as follows:

1. *Subsistence*. Households extract low-value products like palm fibers, low-value wood carvings, fuel wood, and medicinal plants from forests and fallows, and process and use these mainly within the household for their own use. Income from NTFPs in this group is less than 50 per cent of the household’s total income (cash and subsistence), but it is their main or only source of cash income.
2. *Supplementary*. Households extract fruits and medicinal plants from the wild for local processing, consumption, or the regional market. Households in this group receive more than half of their income in cash, but less than 50 percent of that from NTFPs.
3. *Integrated*. Households cultivate NTFPs or manage them intensively in a limited area and process them locally to sell on local and domestic markets. Examples of products in this group are bamboo, high-value wood carvings, fruits, and resin. As is the case in the supplementary group, these households earn a large proportion of their income in cash, from a combination of farming, off-farm activities, and NTFPs, with the latter providing less than 50 percent of their household income.
4. *Specialized-natural*. Households exploit high-value food items and medicinal plants from the wild for national and international markets that generates more than 50 percent of their income, which is at an intermediate level.
5. *Specialized-cultivated*. Households cultivate and intensively manage specialty food products and resin or dyes for international markets, which provides them with an income that is higher than the local average, with more than 50 percent being derived from NTFPs.

As regards the processing technologies employed in NTFP production, the general perception is that these are simple. This is true for such products as Brazil nuts, basketry, and rattan furniture, but Belcher and Schreckenber (2007) note that some NTFPs used in drugs or vegetable oil require processing in very sophisticated laboratories.

Sociopolitics of NTFP Use

The term *non-timber forest product* was first used by authors like Charles Peters, Jenne de Beer, and Melanie MacDermott to make clear that what foresters tended to label “minor forest products,” because of their insignificant value compared to timber, were of tremendous value for people living in tropical rain-forest areas, as a source of food, fodder, medicines, construction materials, and tools. In addition to these subsistence uses, NTFPs also provided a source of cash income in remote areas where other employment opportunities were scarce. Based on an inventory of NTFPs in a Peruvian rain forest, Charles Peters and co-authors (1989) illustrated that the net commercial value of NTFPs was higher than timber, considering the fact that NTFPs, unlike timber, can be harvested annually.

A lively debate evolved around these products and their potential to contribute to conservation and development aims. The underlying reasoning of such a strategy is that local authorities and forest resource managers will have an interest in preventing indiscriminate forest use or the conversion of forest to other land uses when NTFP extraction contributes to the gross national product (GNP) and export earnings. As far as local communities are concerned, increased income from the trade in NTFPs was thought to provide a stimulus for protecting their forests and managing them sustainably. Since it was assumed that many NTFPs can be harvested without significantly altering the forest structure, they would maintain the forests’ environmental services and biological diversity. All these factors have led to the notion that the commercial extraction of NTFPs would be a potentially sound conservation strategy, while also contributing to local development. In Brazil, in particular, NTFPs like rubber and Brazil nuts also became a symbol of the struggle of rubber tappers to ensure the protection of extractive reserves, where they could continue their sustainable forest-based way of life, protected from threats from cattle ranchers and other actors making a claim to forest land.

Whereas the discussion initially focused on NTFPs from natural tropical rain forests, it later focused on products from other forest types as well, including those from semi-arid areas and human-modified vegetation types like forest gardens and agroforestry systems. One of the reasons is that NTFP exploitation is economically more feasible in anthropogenic (human-made) forests where product density is higher.

A few decades of research have made it clear that NTFPs are indeed an important safety net for poor forest-dwelling people, but have little potential to lift people out of poverty. There are several problems that hinder the trading of NTFPs, especially in isolated areas. These include a lack of storage and processing facilities, bad roads, and high transportation costs. As a consequence perishable products, in particular, have to be consumed locally. Due to the seasonality and unpredictability of production cycles, the low densities of products in the wild and their wide distribution mean volumes are low and supplies irregular. Markets are also fragmented because NTFPs provide input to a wide range of industries including food and beverages, pharmaceuticals, cosmetics, and botanical medicines. Producers often face the difficulty of meeting international quality standards prevalent on these markets, and these are also subject to trends and are therefore changeable. All this, combined with a lack of organization among harvesters, often makes NTFP producers dependent on intermediaries and subject to exploitative production and trading relations. As a result, the contribution of commercial NTFPs to poverty alleviation is generally limited.

The potential of NTFP trade as a strategy to save natural forests has also been disappointing. Initially the idea was that, due to their low densities, NTFPs could be harvested without much harm to the forest, whereas adding value to the forest would be beneficial to

their conservation. In practice, however, successful marketing engenders increased production, and therefore overexploitation, as has been observed in the case of rosewood (used for essential oil), rattan, edible birds' nests, palm heart, and other species. Alternatively, successfully traded NTFPs are substituted with cultivated species or synthetics, as was the case with rubber. In such instances the forest conservation stimulus is lost, or forests are replaced with plantations, which results in loss of biodiversity.

Finally, NTFP exploitation alone is rarely sufficient to survive, as a result of which it is combined with activities such as farming or gold panning, which have more detrimental effects on the forest.

Trends for the Future

Among the wide variety of factors that determine the success of NTFP marketing and its contribution to poverty alleviation and forest conservation, tenure security and multi-actor partnerships generally stand out. Tenure security, that is local ownership or long-term access and control rights to forest assets, may effectively contribute to poverty reduction because it enables local people to capitalize on forest resources through company–community deals or participation in certification, payments for environmental services (PES), and reducing emissions from deforestation and degradation (REDD) plans. These schemes in particular (which, in the case of certification, are associated with niche markets for fair trade, biotrade, and organic trade) are expected to offer the greatest potential as regards forest-based income in the near future. In addition, well-defined and secure property rights are a key condition for achieving sustainable management of natural resources because they ensure that managers can reap the benefits of their management efforts, which in turn stimulates them to protect the resources from overexploitation and make long-term investments.

It should be noted, however, that the relationship between tenure and sustainable forest use is ambiguous. First, having secure property rights to a forest area does not mean that the holder of the property rights will leave the area forested. Second, deforestation can also be a way to claim land and secure tenure. Third, rather than the formal legal tenure status, it is the *perceived* tenure security that is most important in shaping land-use decisions as research by Koen Kusters on dammar resin agroforests in Sumatra, Indonesia, has made clear.

The second important factor for a successful NTFP strategy is community organization and multi-sector partnerships. Both of these are needed to tackle many of the challenges associated with NTFP production. Forest people generally lack political power, and that puts them in a weak negotiating position. Self-organization and linking up with actors in the public and private sector (companies and nongovernmental organizations) can help improve tenure security, the equitable rule of law, political empowerment of forest fringe communities, and access to markets. Such partnerships have also become necessary because shifts in governance have increased the array of actors in the forest arena and the need to deal with competing interests and claims. Finally, the new potentials in the field of forest-based income, such as certification, PES, and REDD, require access to information, a proper approach to dealing with complicated procedures, and links with actors at global levels that are hard to oversee for actors in faraway forest areas. In order to reap the benefits of these new schemes, the forest-dwelling poor need brokers and watchdogs to increase their political and economic leverage.

Further Reading

Allegretti, Mary Helena. (1990). Extractive reserves: An alternative for reconciling development and environmental conservation in Amazonia. In Anthony B. Anderson (Ed.), *Alternatives to*

- deforestation. Steps toward sustainable use of the Amazon rain forest* (pp. 252–264). New York: Columbia University Press.
- Angelsen, Arild, & Wunder, Sven. (2003). *Exploring the forest–poverty link: Key concepts, issues and research implications* (Center for International Forestry Research Occasional Paper 40). Retrieved July 23, 2010, from http://www.cifor.cgiar.org/publications/pdf_files/OccPapers/OP-40.pdf
- Arnold, J. E. Michael, & Ruiz Pérez, Manuel. (2001). Can non-timber forest products match tropical forest conservation and development objectives? *Ecological Economics*, 39, 437–447.
- de Beer, Jenne, & McDermott, Melanie. (1989). *The economic value of non-timber forest products in Southeast Asia*. Amsterdam: Netherlands Committee for International Union for Conservation of Nature.
- Belcher, Brian; Ruiz Pérez, Manuel; & Achdiawan, Ramadhani. (2005). Global patterns and trends in the use and management of commercial NTFPs: Implications. *World Development*, 33(9), 1435–1452.
- Belcher, Brian, & Schreckenberg, Kathrin. (2007). Commercialisation of non-timber forest products: A reality check. *Development Policy Review*, 25(3), 355–377.
- Food and Agriculture Organization of the United Nations (FAO). (1991). *Non-wood forest products: The way ahead* (FAO Forestry Paper 48). Rome: FAO.
- Food and Agriculture Organization of the United Nations (FAO). (1995). *Report of the International expert consultation on non-wood forest products: Yogyakarta, Indonesia, 17–27 January 1995*. Rome: FAO.
- Kusters, Koen; Achdiawan, Ramadhani; Belcher, Brian; & Ruiz Pérez, Manuel. (2006). Balancing development and conservation? An assessment of livelihood and environmental outcomes of nontimber forest product trade in Asia, Africa, and Latin America. Retrieved July 23, 2010, from <http://www.ecologyandsociety.org/vol11/iss2/art20/>
- Kusters, Koen; de Foresta, Hubert; Ekadinata, Andree; & Van Noordwijk, Meine. (2007). Towards solutions for state vs. local community conflicts over forestland: the impact of formal recognition of user rights in Krui, Sumatra, Indonesia. *Human Ecology*, 35(4), 427–438.
- Mayers, James, & Vermeulen, Sonja. (2002). *Company-community forestry partnerships: From raw deals to mutual gains?* London: International Institute for Environment and Development.
- Peters, Charles; Gentry, Alwyn; & Mendelsohn, Robert. (1989). Valuation of an Amazonian rainforest. *Nature*, 339, 655–656.
- Ros-Tonen, Mirjam, & Wiersum, Freerk. (2005). The scope for improving rural livelihoods through non-timber forest products: An evolving research agenda. *Forests, Trees and Livelihoods*, 15, 129–148.
- Ros-Tonen, Mirjam. (2000). The role of non-timber forest products in sustainable forest management. *Holz als Roh- und Werkstoff*, 58, 196–201.
- Secretariat of the Convention on Biological Diversity (CBD). (2001). *Sustainable management of non-timber forest resources* (CBD Technical Series 6). Retrieved July 23, 2010, from <http://www.cbd.int/doc/publications/cbd-ts-06.pdf>
- Springate-Baginski, Oliver, & Wollenberg, Eva. (Eds.) (2010). *REDD, forest governance and rural livelihoods: The emerging agenda*. Bogor, Indonesia: Center for International Forestry Research.
- Sunderlin, William; Angelsen Arild; Belcher, Brian; Burgers Paul; Nasi Rober; Santoso, Levanía; & Wunder, Sven. (2005). Livelihoods, forests, and conservation in developing countries: An overview. *World Development*, 33(9), 1383–1402.