

THE SCOPE OF IMPROVING RURAL LIVELIHOODS THROUGH NON-TIMBER FOREST PRODUCTS: AN EVOLVING RESEARCH AGENDA

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ABSTRACT

The previously alleged commercialisation-conservation/development links involving non-timber forest products (NTFP) need reconsideration. NTFPs can play an important role in rural livelihood strategies and can contribute to sustained forested landscapes in various tropical areas, but there is no simple answer to how important NTFPs are in rural livelihoods. The emerging picture we describe is of a diversified research approach towards forest and NTFP use, with more attention being paid to NTFP sources other than natural forests and to the broader socio-economic and spatial context in which forest use occurs. The new 'resource-in-context' approach combines insights into community-level creativity and livelihood dynamics with those into macro-economic and spatial processes, which provides a more realistic assessment of the development and conservation potential of NTFPs.

Keywords: Forest use; poverty alleviation; forest-people relationships.

INTRODUCTION

Starting with the (in)famous article by Peters *et al.* (1989) – which has since been widely criticised (see Sheil and Wunder, 2002) – it has been assumed that the commercial extraction of non-timber forest products (NTFPs)¹ from natural forests could simultaneously serve the goals of biodiversity conservation and poverty alleviation (De Beer and McDermott 1989, Anderson 1990, Nepstad and Schwartzman 1992, Panayotou and Ashton 1992, Plotkin and Famolare 1992, Ros-Tonen *et al.* 1995, Ruíz Pérez 1996). Proponents of this 'NTFP-strategy' pointed to important benefits of NTFP exploitation for local communities, such as goods (food, fodder, fuel, medicine, construction material and smallwood for tools and handicrafts), income and employment. Compared to timber, the harvesting of NTFPs seemed to be possible without major damage to the forest, its environmental services and biological diversity. In sum, NTFP exploitation was expected to offer an economically competitive and sustainable alternative to logging.

The forestry and academic world has witnessed a wave of NTFP studies and projects based on the Peters *et al.* assumption. The picture now is one in which optimism regarding the potential of NTFP extraction as a combined strategy for forest conservation and poverty alleviation has waned. It is now acknowledged that NTFPs are very diverse and that the scope for NTFP exploitation is both product and location-specific. Various authors have suggested that the original research scope had to be extended in three directions:

- more empirically oriented product and situation-specific approaches (Arnold and Pérez 1998);
- more explicit definitions of the aim to be pursued in NTFP development – forest conservation, participatory forest management or improving livelihoods (Ros-Tonen 1999c, 2000);
- more attention to the overall livelihood strategies of people and the contextual factors affecting them (Byron and Arnold, 1999).

This has led to two other hypotheses regarding the relationship between NTFP exploitation and poverty alleviation:

- the contribution of NTFPs to improved livelihoods can best be assured through a process of their gradual domestication in human-modified (agro)forest types; and
- the way NTFPs contribute to peoples' livelihoods can best be understood by taking livelihoods rather than NTFPs as the central focus of study.

The three assumptions were reflected in the three approaches that gradually evolved:

- one focusing on NTFP extraction from natural forests;
- one focusing on NTFP exploitation in anthropogenic forest land-use systems; and
- one studying NTFP use under changing livelihood conditions.

The aim of this paper is to describe and evaluate each of these approaches and, based on empirical information, draw conclusions on the scale of the contribution of NTFPs to improved livelihoods. By combining a comparative analysis of several case studies representative of the three approaches with a review of recent literature on NTFP research, we will be able to discern some general research trends.

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DIVERSIFIED CONTEXTS OF NTFP USE

People's dependence on the forest may vary in different settings and there is no uniform category of 'forest-dependent' people (Wollenberg and Ingles 1998). Byron and Arnold (1999) proposed the following typology of people-forest relationships:

- populations living within forests for whom forests provide the main source or starting point of livelihood.
- farming communities that rely on the forest as a supplementary source of livelihood.
- people not necessarily living in or near the forest who derive their livelihoods from commercial forest activities (artisans, traders, small enterprise entrepreneurs and employees in forest industries).

This classification gives a good first approximation of forest-people relationships, but it is also important to take the dependencies on other land-use units and even non-rural environments into account. We will therefore base our review on a differentiation between three categories of forest conditions and people's dependence on forest resources:

- relatively undisturbed forest areas, where hunting, gathering and fishing are still substantial sources of livelihood for forest-dwelling people.
- areas where natural forests have been partly replaced with anthropogenic vegetation types and where people make a living from a mix of forest-based and agricultural economic activities.
- forest areas of either type where the rural-urban interface and links with outside markets predominate people's livelihood strategies.

The three selected case studies in the first category were carried out in Guyana by Van Andel (2000), in Honduras by Demmer and Overman (2001) and in NW Amazonia by Duivenvoorden *et al.* (2001). The selected case studies in the second category were carried out in Cameroon by Van Dijk (1999a), in West Kalimantan, Indonesia, by De Jong (2002) and in the Philippines by Kusters (1999). The third category is represented by a study carried out in Bolivia (Henkemans 2001, see also Assies 1997 and Bojanic Helbingen 2001) in a relatively isolated region that thrives on a forest-based economy founded on the exploitation of Brazil nuts and other forest products.

These varying contexts set the stage for three different, though partly overlapping, approaches to study the options for NTFP development.

THREE APPROACHES TO NTFP DEVELOPMENT

NTFP extraction from natural forests in remote areas²

Use of NTFPs

In settings where natural forests predominate, the predominantly indigenous populations live by practising slash-and-burn subsistence agriculture, extracting forest products, hunting and fishing. In these settings, the forest offers a wide range of goods contributing to people's basic needs for food, shelter and medicines, and the inhabitants have an extensive knowledge of both the forest and the potential uses of forest species. They are characterised by:

- The high number of plant species used or potentially used as NTFP (575 in Indonesia, over 500 in South Cameroon, 357 in Guyana, around 1,000 in NW Amazonia).
- The large proportion of those used for medicinal purposes (around 300 species in both Guyana and Cameroon; 50% of the 160 NTFPs used for subsistence in Bolivia).
- The importance of animal species – fish and game – as a source of protein, especially among the poorest segments of the population, and the cultural importance attached to hunting.³
- A general tendency, even in situations where most people should be classified as 'poor', for the poorest among them to be the ones who consume relatively more forest products than others.
- Even in conditions where hunting/gathering from natural forests form an integral part of people's livelihoods, in most cases they depend on slash-and-burn agriculture for the provision of their staple food (bananas in the case of the Tawahka Indians, rice and cassava in the case of Amerindians in Guyana and yucca and bananas in the case of the Indians in NW Amazonia).

Forest products, including timber products and earnings from forest-based services like guide work, contribute to people's cash income, especially where other forest-generating opportunities are absent. For example:

- In Honduras the most important forest-based sources of income for Tawahka men include the sale of canoes and wood boards and guide work. Women may earn a modest amount of money from the sale of handicrafts (clothes, hammocks and baskets made from bark) and forest medicines. On average, 23% of the Tawahka people's cash income is forest-based.
- In Guyana the options for commercialisation seem to be more diverse, including palm heart, live animals, the aerial roots of several hemi-epiphytes that provide

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raw materials for the furniture industry, fibres for hammocks, baskets and tourist souvenirs, medicinal plants, palm leaves for roof thatching, and mangrove bark commonly used for tanning leather. Palm heart and furniture fibres form the major source of income for forest-dwelling people.

- In NW Amazonia the main commercial forest products are fish (large catfish and, to a lesser extent, ornamental fish) in Colombia, wood and animal products such as bush meat and skins in Ecuador, and construction timber and (on a small scale) some handicrafts in Peru. The scope for trading plant forest products is limited mainly to some forest fruits (*Mauritia flexuosa*, *Euterpe precatoria*, *Theobroma grandiflorum*), medicinal plants, fuelwood and forest product-based handicrafts. Only 0.6% of the total primary production and 0.3% of all income generated by trade.
- In South Cameroon, hunting provides 90% of the average cash income for the Bagyeli people, who still depend to a large extent on hunting and gathering. The sedentary Bantu farmers living in the same area sell both game and vegetal NTFPs, which on average generates around 20% of their cash income.

Except for bush meat (Cameroon), live animals (Guyana), fish and, to some extent, wood, the trade is primarily oriented towards local markets and the traded quantities are often nihil. Due to limited demand and poor infrastructure, NTFP trade offers little scope for boosting people's incomes, unless there is an established (export) market, as in the case of Brazil nuts in Bolivia (Henkemans 2001). Even so, forest-based income is often an essential ingredient for sustaining present livelihoods and forest products are in many cases the major source of income for forest-dwelling people where other economic options are absent.

Contribution to sustainable forest use and poverty alleviation

Various studies highlighted the often important role of NTFPs for local communities, but they have also led to doubts about the potential of NTFP extraction from natural forests to contribute simultaneously to forest conservation and poverty alleviation (Arnold and Ruiz Pérez 1998, Ros-Tonen 1999a, 2000). The commercial harvesting of NTFPs does have a number of negative ecological impacts, including a gradual reduction in the vigour of harvested plants, decreasing rates of seedling establishment of harvested species, potential disruption of local animal populations and nutrient loss from harvested material (Peters 1996). For instance, Demmer and Overman (2001) observed a complete cessation of flowering and fruiting in *Asterogyne martiana*, from which leaves were harvested for roof construction, while Guedje (2002) observed that a decrease in vitality of *Gnetum africanum* often occurred as a result of stripping the bark for use in palm wine. Such impacts can sometimes be remedied by careful extraction and plant management. In practice, however, the time-consuming nature of such measures in combination with low returns often discourages extractors to follow such a procedure (H. de Foresta, pers. comment). As a result, over-exploitation frequently

occurs when NTFPs are harvested on a commercial scale. Thus, the assumption of ecologically sustainable commercial NTFP extraction was found to be doubtful or in several cases even untrue.

The potential of NTFP extraction to alleviate poverty proved to be limited. The main actors in NTFP extraction are usually the socially most marginalised people. They generally live in poor conditions where even the most basic health care and educational services are lacking. Only in a few situations is extraction capable of providing a significant contribution to rural livelihoods, notably where the extraction of different commercial NTFPs can supplement each other and can be combined with farming. In the Amazon region such agro-extractive cycles include a rotational collection of wild rubber, Brazil nuts and, more recently, palm heart (Assies 1997). In general, however, the income-generating capacity of NTFP extraction in natural forests is restricted due to the often low densities at which the NTFP-producing species occur and their irregular distribution (Boot 1997, Van Valkenburg 1997, Van Dijk 1999b). Only in some oligarchic forests may high densities of specific NTFP species occur (Peters 1992). Extraction is mostly a part-time, seasonal and subsistence-oriented activity, complementary to farming, mining or logging. The trade in NTFPs is often hindered by marketing problems, such as:

- a lack of information on potential markets and marketing channels;
- the fragmented nature of NTFP markets;
- the lack of sufficient volume and the unpredictability of the production cycles, resulting in irregular supplies (Panayotou and Ashton, 1992);
- the perishable nature of many products;
- poor infrastructure and high transport costs;
- the lack of organisation among harvesters and lack of access to credit and storage facilities (Panayotou and Ashton, 1992, Van Dijk 1999a);
- the volatility of many NTFP markets, where prices fluctuate (Arnold and Ruíz Pérez, 1998) and many NTFPs follow a boom-and-burst cycle which ends up in their substitution by domesticated species or synthetic alternatives (Homma, 1992).

The points limit extractors' access to markets which results in exploitative production and trading relations, under which many of them are being caught up in a debt-peonage system.⁴

These limitations suggest that NTFP-extraction based livelihoods tend to be ephemeral (*e.g.* Ros-Tonen 2000). Extractors of NTFPs prefer other jobs when alternative employment opportunities become available (*e.g.* Bowder 1992, Godoy and Bawa 1993, Dove 1993), unless they are able to specialise on some relatively profitable products such as Brazil nuts or rattan. Demmer and Overman (2001) found that the more wealthy Tawahka Indians in their study area

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concentrated on the extraction of woody species used for canoes at the expense of fishing, hunting and other forest activities. Similarly the consumption of NTFPs, tends to dwindle as other food sources become available through improved supplies from agricultural and industrial sources or (in Africa) more efficient food relief programmes (Godoy *et al.* 1995, Arnold and Ruiz Pérez 1998, Byron and Arnold 1999). Other reasons for a decreasing importance of NTFPs in local consumption include:

- the penetration of new products in rural markets;
- change of taste preferences;
- decreased availability of NTFP resources; and
- reduced NTFP knowledge as a result of a change to sedentary crop production and exposure to modern information through communication and schooling (Arnold and Ruiz Pérez 1998).

Even though the scope for boosting incomes through commercial extraction of NTFP from natural forests is relatively low, NTFPs have a role to play in poverty alleviation. Millions of forest-dwelling people still depend substantially on NTFPs for subsistence, while the sale of forest products may be one of the few opportunities they have of earning an income. Moreover, the option of selling forest products may serve as a means of obtaining money in times of necessity. Thus, the scope for poverty alleviation of NTFP extraction from natural forests does not relate to *boosting* incomes, but rather to its role *as a safety net for the poor* (Wunder 2001, Arnold 2002).

The scope for NTFP exploitation in anthropogenic forest land-use systems

Recognising that the extraction of NTFPs from natural forests has limited potential for improving household economies several scholars suggested that the objective of enhancing forest-based livelihoods be better fulfilled by optimising NTFP production in anthropogenic vegetation types (Wiersum 1997a, Van Dijk and Wiersum 1999, Kusters *et al.* 2001, De Jong 2002). Van Dijk and Wiersum (1999) found that the most limiting factor to the further development of NTFP extraction from natural forests in South Cameroon was the relatively low density of NTFP species in natural stands and they suggest that management intensification and semi-domestication (*e.g.* through mixed cacao and NTFP plantations) would be a feasible option to increase the development potential of NTFPs. This suggestion was based on the observation that forest products are not exclusively collected from wilderness areas, but from forested landscapes in which a mosaic of more or less natural and anthropogenically developed land uses and vegetation types (including secondary forests, mixed cocoa plantations and agricultural fields with scattered trees) coexist. Such landscapes are the result of an evolutionary

continuum in interactions between people and forests from nature to culture (Wiersum 1997b) (Table 1). This process of co-domestication of forests and tree species is closely linked to a gradual change in exploitation rights from open access to communal and finally to private land and/or tree tenure rights (Den Hertog and Wiersum 2000, Paudel and Wiersum 2002). Often, several NTFP production systems characterised by a specific set of exploitation rights coexist in one area (Van den Berg *et al.*, 2000).

The study of forest products and local forest management in three Bidayuh villages in West Kalimantan (De Jong 2002) confirms the co-existence of several NTFP exploitation systems involving various types of managed natural forests and anthropogenic vegetation types. Table 2 is presented here as an example. Van Valkenburg (1997) also noted such coexistence of NTFP exploitation systems in East Kalimantan.

The *tembawang*, is a good example of how local communities have developed NTFP exploitation systems which are intermediate between natural forests and monocultural plantation systems. These forest gardens consist of a mixture of

TABLE 1

Different NTFP production systems (Wiersum, 1999)

A. (Modified) forests with prevalently tolerant forest management practices
<p>1. <i>Gathering of non-timber products in natural forests in which NTFPs are protected</i>: specific areas or specific tree species in natural forests that are favoured and protected because of their value for providing useful materials. Example: individually claimed trees</p> <p>2. <i>Resource-enriched natural forests</i>: natural forests, either old-growth or fallow vegetation, whose composition has been altered by selective protection and incidental or purposeful propagule dispersion of food and/or commercial species. Examples: enriched natural forests; enriched fallows</p>
B. Transformed forests with prevalently intrusive forest management practices
<p>1. <i>Reconstructed natural forests</i>: (semi-)cultivated forest stands with several planted useful species, tolerated or encouraged wild species of lesser value and non-tree plants (herbs, lianas) composed of mainly wild species. Example: forest gardens</p> <p>2. <i>Mixed arboriculture</i>: cultivated mixed stands, almost exclusively of planted, and often domesticated, tree species. Examples: home gardens; smallholder plantations</p> <p>3. <i>Interstitial trees on croplands</i>: either naturally regenerated or protected trees, or planted and sometimes domesticated trees scattered over agricultural fields. Example: scattered fruit trees cultivation on/along crop fields</p> <p>4. <i>Commercial plantations with associated agroforestry practices</i>: plantations of domesticated tree crops which are (temporarily) inter-cropped with food plants or grazed by livestock. Example: (mixed) tree-crop plantations</p>

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TABLE 2

Managed forests in Dayak villages in West Kalimantan (adapted from De Jong, 2002).

Forest type	Description	Main uses	Corresponding category in Table
<i>Pulau rimba</i>	Privately owned mature natural forest islands surrounded by agricultural fields	Rattan, poles, wild fruits, palm heart	A1-2
<i>Sompuat</i>	Honey tree forest islands	Apiculture	A.1
<i>Hutan tutupan</i>	Communally protected natural forest	Ironwood, rattans, edible leaves, medicinal plants, fruits	A.1-2
<i>Bawas</i>	Swidden fallow secondary forests	Various forest products	A.2
<i>Tembawang</i>	Mixed-fruit forest gardens	Fruits, rubber, bamboo shoots, rattan, leaves (various species), ironwood, firewood	B.1-2
<i>Kebun karet</i>	Rubber gardens	Rubber	B.2-4

planted, tended and spontaneously regenerating trees and have a structure and species composition that compare favourably with those of mature natural forest. The five *tembawang* inventoried by De Jong (2002) had an average number of 426 trees/ha (dbh \geq 10 cm), with a range of 281-569 trees/ha and a total number of 191 tree species for 4.48 ha. Two neighbouring forest plots had 562 and 569 trees/ha and a total number of 224 tree species for 2 ha. Of a total of 581 recorded plant species (trees, shrubs, vines, herbs), 174 occurred in both the *tembawang* and natural forest plots, while 202 occurred only in *tembawang*. The total number of species with a reported use in both *tembawang* and neighbouring private and village forest plots was 575, with 160 species on average in the *tembawang* plots, and 218 on average in the natural forests plots.⁵ These figures suggest that the forest gardens not only hold an enormous potential for NTFP use, but that they also play a role in maintaining a high biodiversity even where the natural forest has disappeared.

There is no unidirectional trend from forest towards more specialised NTFP exploitation systems (such as enriched swiddens and rubber gardens), but a complex pattern in which land-use intensification may occur in some areas, while others may experience de-intensification (Wiersum 1997b). For instance, de-intensification might take place in swidden fallows which run the risk of becoming permanently invaded by *Imperata cylindrica* (*alang-alang*). Under these circumstances, farmers may opt not to reserve such fields any longer for future rice production, but to plant them with rubber and fruit trees (De Jong 2002).

In Cameroon, similar trends in NTFP exploitation systems as in Kalimantan were noted (see Table 3). Species richness and the number of NTFP specimens per ha were highest in the least disturbed forest and swamps, but only 50% of the 28 NTFP species with a known market value were collected from these habitats, with the other half coming from anthropogenic habitats such as fallow lands, secondary forests and, in particular, cocoa plantations. Some commercial NTFPs, such as some fruit species and *Strophantus gratus* (the seeds of which are traded at international markets as an input for the pharmaceutical industry), had their highest abundance in cacao plantations. The different forests and forest-derived habitats not only differed with respect to the type and intensity of cultivation and harvesting techniques, but also with respect to the rights of access and ownership of different NTFP resources. As a result, the exploitation and management of different NTFP resources were shaped by a complex system of customary and official legal rules and regulations (Van den Berg *et al.* 2000).

The studies in Kalimantan and Cameroon made it clear that NTFPs from outside natural forest areas in anthropogenic and man-made vegetation types can contribute to people's livelihoods, and some of these types have been purposively manipulated to this end. Such (semi-) domestication of NTFPs in a complex of anthropogenic land-use types not only involves a gradual selection of species and modification of the natural forest habitat but also a gradual strengthening of social institutions regarding the production of NTFPs (Wiersum 1997a). The presence of biodiverse NTFP production systems such as the *tembawang*, which are intermediate between natural forests and mono-cultural plantations, indicates the creativity of local communities in enhancing their environment with species valued by them. From an NTFP resource point of view, these anthropogenic forest types are enriched rather than degraded. Michon and De Foresta (1997) argue that such agroforests should be considered as truly domesticated forest ecosystems.

TABLE 3

Species diversity and richness in different habitats in South Cameroon (Van Dijk, 1999a)

Habitat type	# ha	Number species/ha	Number NTFP specimens/ ha	Total number of different NTFP species ^a
Forest > 540 m	7	103	637	166
Forest 350-540 m	3	101	551	153
Forest < 350 m	2	112	570	158
Swamp forest	1	109	734	125
Secondary forest (logged)	3	100	543	157
Secondary forest (agriculture)	4	82	470	139
Cocoa plantations (abandoned)	1	85	371	105
Cocoa plantations	1	81	271	96
Young fallow lands	2	51	151	87

^a Numbers for the total area inventoried of each habitat type.

NTFP use from a livelihood perspective

The importance of the various socio-economic conditions that affect the role NTFPs play in people's livelihoods indicates that attention needs to be given to the fact that previously remote forest areas are increasingly becoming incorporated into external social, economic and policy networks (Wiersum 2000). Under the impact of such external conditions the livelihoods of forest dwellers are subject to change and no longer restricted to a single activity, crop or even space. An example is the situation of bamboo cutters in the Sierra Madre, the Philippines, whose sources of livelihood changed dramatically during the last decades. Improved accessibility of the region and more widespread possession of draught animals made farmers move from subsistence-oriented shifting cultivation to more sedentary and cash-oriented corn farming based on the use of ploughs, fertilisers and agrochemicals. The economic importance of small-scale logging – the most important off-farm source of income for forest migrants during the 1990s – diminished as a result of the depletion of the most accessible timbers. Now only 4% of the study village's income comes from logging, as compared to 58% from the sale of corn and 13% from cutting bamboo for construction and for tobacco drying (Kusters *et al.* 2001). Examples such as this one illustrate that the scope for NTFPs to contribute to rural livelihoods can best be understood by focusing on the characteristics and dynamics of rural livelihoods rather than on the characteristics of NTFP resources.

Several recent studies on the livelihood strategies of rural people in developing countries have highlighted the significance of livelihood diversification (*e.g.* Ellis 1998, Zoomers 2001). Most forest people are no longer merely hunters and gatherers and many farmers are no longer exclusively farmers. People at the forest fringe live from a combination of natural resource exploitation and farming, off-farm employment and labour migration to cities or even abroad. Within such economically and spatially diversified livelihoods, natural resource exploitation such as the collection of NTFPs still plays an important role. Rural communities, even if they are incorporated in external networks, still partly rely on NTFPs for their own consumption. Henkemans, for instance, found in a Bolivian area subject to seasonal migration that the local communities still used 160 forest species. Urban-based people also still use selected forest products. Recently it has become increasingly evident that urban-focused commercialisation of NTFPs not only involves the sale of 'wild' products that are cheaper than their industrially produced substitutes, but also those that are held in high cultural esteem (Cocks and Wiersum 2003).

Henkemans (2001) explicitly used a livelihood approach (Carney 1998) for the analysis of the importance and prospects for sustainable NTFP use and distinguishes between five forms of capital, *i.e.* natural, physical or produced, human, financial, and social capital. The degree to which people have access to these and succeed in effectively combining them to realise their self-defined development objectives determines to a large extent whether they are capable of maintaining and improving their standard of living and reducing their vulnerability. Both economic

rationality and socio-cultural norms and values – such as peoples’ identification with a forest-based livelihood – determine people’s livelihood choices. In forest-fringe communities, people combine the extraction of timber and non-timber forest products with agriculture and wage labour in a year-round agro-extractive cycle which provides them with food, fuel, shelter and other necessities. In the more accessible areas, the rural-urban interface plays an important role in this ‘multi-tasking strategy’.

The availability of the five capital forms determines the future prospects for sustainable forest-based livelihoods. According to Henkemans (2001), these prospects are poor under the isolated conditions of a *barraca* system – Brazil nut collection camps where the exploitation of forest resources is controlled by a single patron – as:

- access to natural capital (in terms of right to control) is restricted, hence can hardly be used to improve people’s livelihoods;
- physical capital (especially publicly-owned economic and social infrastructure) is poorly developed;
- human capital imposes constraints due to poor diet and health conditions and lack of self-confidence and inventiveness;
- financial capital is virtually non-existent; and
- the mobilisation of social capital is hindered by a lack of social cohesion and social organisation.

The author is more positive about the prospects for communities of former rubber tappers that have become independent, in particular those that have a well-developed infrastructure, good social organisation and can benefit from a strong urban-rural link. People in these communities seem to be able to combine the positive elements of two worlds. A relatively secure food supply from forest and farming land and a social network which they can fall back on in times of economic hardships provides them with *tranquilidad* (tranquillity, peace of mind), while the markets, income-generating opportunities, educational and health facilities and development agencies in nearby regional towns compensate for the constraints on development and economic suffering (*sufrimiento*) associated with forest life in more isolated areas.

In contrast with this optimism, Bojanic Helbingen (2001) considers the long-term options for alleviating poverty on the basis of a forest-based economy in the same region as limited, because the natural potential for either NTFP exploitation, sustainable timber extraction or agroforestry development is too restricted. He argues that in addition to sustainable forest-based production systems, non-forest economic activities need also to be developed to enhance the development of the region and combat the widespread poverty among its inhabitants.

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TRENDS IN THE ROLE OF NTFPS IN PEOPLE’S LIVELIHOODS: THE FOREST AS A SAFETY NET AND SOURCE OF MARKET-ORIENTED PRODUCTION

What are the implications of diversification strategies for the importance of NTFP harvesting and exploitation in peoples’ livelihoods? In this respect, several authors (Wunder 2001, Arnold 2002) point at two, partly opposing, trends:

- One of NTFP extraction becoming a function of increasing poverty and forests forming a safety net for the poor. As such, forests provide a cheap alternative for food, medicines and building materials in times of economic hardship. This hypothesis of the forest as a safety cushion was specifically addressed by Demmer and Overman (2001). They present some evidence to suggest that the poorest people rely on the forest for edible products during the months in which agricultural products become scarce and less diverse (at the end of the dry season and the first months of the rainy season). In these months, poor Tawahka households increase their use of game to a peak that could not be observed among the more wealthy households. The strongest indication that the forest functions as a safety net for Tawahka Indians can be seen in the seasonal consumption of wild banana; a forest product considered inferior compared by the domesticated species and which is hardly consumed by the wealthier households.⁶ Among the local Camba people in Bolivia fishing and the sale of bush meat (in addition to wage labour and the sale of fruits, manioc and plantains, if available) are options to bridge a slack period between the sale of the agricultural harvest and the start of the Brazil nut harvesting season. It seems that the role of the forest as a safety cushion is important particularly in the more remote areas where few other options exist to compensate for scarce food resources.
- One of newly emerging income-generating opportunities as a result of increasing exposure to markets. This occurs locally where improved infrastructure gives more people access to urban markets, but also at globally when new markets are opened as a result of economic globalisation and liberalisation. Notably the areas closer to roads and markets benefit from these new opportunities, which implies that location matters when it comes to the role that NTFPs can play in people’s livelihoods (*cf.* McDowell and De Haan, 1997, Wiggins and Proctor, 2001).

Demmer and Overman (2001) specifically address the consequences of increased integration into markets on forest resource use and investigated how the behaviour of Tawahka Indians in Honduras changed with increased market integration and wealth levels. They found no statistically significant relationship between integration (estimated from the amount of household cash earnings and labour transactions with outsiders) and the time spent on forest-related activities and agriculture. With increased market integration the relative share of forest products in people’s total cash income decreased, indicating a growing importance of non-

forest based income. Generally speaking, more integration into the market leads people to earn more money from the sale of fewer products. When people become wealthier, the time spent on forest-based activities diminishes, while the reverse is true for the time spent on agricultural and other economic activities (*e.g.* tending a shop, wage labour or gold panning). The decrease in time spent on forest-related activities is not associated with a decrease in the consumption of forest products. With increasing wealth, the consumption of wood, game, fish and medicines initially increases and only after a twenty-fold increase in wealth do forest product consumption levels tend to fall below those of poorer households. The same trend was observed in Cameroon and Guyana. In the latter case, better-off people continued using traditional NTFPs such as basketry, fish and game. However, instead of gathering, hunting and fishing themselves, they buy these products from their poorer neighbours (T. Van Andel, pers. comment). To sum up, increased integration into markets creates new economic opportunities and this changes the importance of forest products for people's livelihoods. The main tendency is towards specialisation and increased importance of non-forest based occupations, but this does not necessarily imply that the consumption of NTFPs decreases.

DISCUSSION: OPTIONS AND CONDITIONS FOR IMPROVED FOREST-BASED LIVELIHOODS

NTFPs play an important role in meeting subsistence needs, especially in remote areas where they represent one of the scarce sources of cash income and form a safety net in periods during which food becomes scarce. The scope for *improving* people's livelihoods on the basis of NTFPs is likely to be limited to areas closer to urban markets and to be feasible only if the following conditions are fulfilled:

- producers have secure tenure rights (*e.g.* extractivist reserves in Brazil);
- producers can combine NTFP production with other rewarding economic activities (farming, logging and/or off-farm employment) to overcome seasonality and price fluctuations;
- products can be harvested efficiently from areas where the abundance of NTFP-producing species has increased as a result of tending, enrichment planting and domestication;
- infrastructure is available to ensure that the products reach the markets;
- products have established markets (*e.g.* Brazil nuts, palm heart and bamboo) or the potential to reach promising niche markets (*e.g.* carbon crediting, eco-tourism, fair trade markets, 'eco-friendly' and certified products);
- producers have the capacity to add value to the product (*e.g.* handicrafts, furniture making, or processing of food products);

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- producers are organised and maintain effective alliances with outsiders (development agencies, environmental organisations and research organisations), who may help identify new markets and potential donors.

Research has a role to play in the following aspects (*c.f.* Ros-Tonen, 1999c):

- identifying areas where people depend to a large extent on forest resources, so that access to these areas can be secured in land-use planning;
- clarifying forest laws and regulations that hinder or facilitate the commercialisation of NTFPs;
- designing participatory forest management plans for the exploitation of forest products (including small-scale timber products) from natural forests that are preserved for biodiversity and/or watershed protection;
- developing production systems in human-modified and man-made vegetation types;
- developing processing techniques which add value to NTFPs;
- searching for optimal marketing channels and opportunities;
- investigating options for more equitable commercialisation patterns.

CONCLUSIONS

This paper has shown that the original conservation/development proposition launched in the NTFP debate by the end of the 1980s has been subject to revision. The NTFP studies reviewed in this paper demonstrate how attention has evolved gradually from a resource focus to a landscape and livelihood (or ‘resource-in-context’) focus. The first studies focused mainly on the potential of natural forests for NTFP extraction. In later studies the focus extended to include the total landscape used by local communities to maintain their livelihoods as well as the socio-economic and spatial contexts in which these are embedded. In doing so, it became clear that local communities have often been very creative in devising forest-derived vegetation systems in which the production of essential NTFPs is actively stimulated. Such domestication of NTFPs not only involves a gradual intensification in human energy in creating and maintaining NTFP resources, but also the gradual incorporation of NTFP production systems in social networks that regulate access and ownership. As a result of this understanding of community-level creativity and the dynamics in maintaining NTFP resources, it is now clear that there are many more sources of NTFPs than natural forests alone and that each vegetation type has its own potential for contributing to sustainable rural livelihoods.

The second major shift in the focus of NTFP studies concerns an increased livelihood-oriented approach to forest use and NTFP production. This shift led to

the recognition that the notion of ‘forest-dependent’ people needs further refinement. Various categories of forest users exist which differ in their relation to, and interference in, the forest. Forest resources play different roles in the livelihood strategies of each type of user, ranging from being a substantial source of food, materials, medicines and equipment in relatively undisturbed forest conditions, to sources of supplementary products in mixed landscapes or situations where alternative livelihood options are available.

Forest-based as well as other rural livelihoods are undergoing rapid changes. Except for populations in remote areas, who have few alternative options available, there is a growing tendency among forest-adjacent communities to seek a livelihood strategy which combines forest-based production with farming and off-farm activities. The opportunities available seem to be directly related to the access to urban markets and available infrastructure and these locational factors should be taken into account when assessing the scope for improved forest-based livelihoods. Moreover, attention should be given to the gradual domestication of NTFP species in anthropogenic forest types and people’s farming systems. In the zone near urban centres, where little or no NTFP exploitation occurs, NTFP-related jobs (*e.g.* specialised manufacturing and trade) could be created. The prospects of improving livelihoods on the basis of NTFP production are promising in particular in areas where forests perform important environmental functions such as slope stabilisation, watershed protection or the provision of recreational facilities for urban people and where NTFP production for established markets and urban demand can be part of a participatory, multifunctional forest management strategy. Research could shed a light on the conditions under which this potential can be realised.

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NOTES

- ¹ Non-timber forest products are defined in this paper as all plant and animal products other than commercial timber, that come from forested landscapes including human-modified ones. Although it would be more accurate to distinguish between wild non-timber forest products (NTFPs) for products harvested in natural forests and domesticated forest products (DFPs) for those growing in forest gardens, agroforestry systems and other anthropogenic vegetation types, we do not make this distinction in this paper. The main reason is that the change from natural to anthropogenic vegetation and the concomitant change from wild plants to domesticated ones is a gradual rather than an abrupt process.
- ² Unless otherwise specified, data in this section are taken from the above cited case studies.
- ³ Van Dijk (1999a and b) mentions no less than 280 animal species that are used as a source of protein, including bush meat, fish, crustaceans, insects and molluscs. Demmer and Overman (2001) indicate the importance of animal species in the Latin-American context.

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- ⁴ Such debt-peonage systems occur mainly in Latin America. Under such systems, the extractors are seldom or never paid in cash for their work. Instead, the buyer advances merchandise, which can be paid off with the harvested products. Because the costs of the advanced merchandise are usually higher than the price paid for the NTFPs, the extractors are kept in a situation of permanent indebtedness from which it is almost impossible to escape. This system is known as *endeude* in Colombia, *habilito* in Bolivia, *aviamento* in Brazil and ‘bonded labour’ in Guyana.
- ⁵ Yet, only 11-18 species (7-12%) of these were actually harvested in 1993, while these numbers were even slightly lower for the managed natural forests (2-11%).
- ⁶ The authors warn, however, against jumping to conclusions that the cushion function of the forest applies only to the poor, pointing to extreme events like Hurrican Mitch when *every* Tawahka was dependent on forest food in the weeks preceding the arrival of outside food aid.