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**Autor:** Wetterwald, Olivier / Zingerli, Claudia / Sorg, Jean-Pierre

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# Non-timber Forest Products in Nam Dong District, Central Vietnam: Ecological and Economic Prospects

OLIVIER WETTERWALD, CLAUDIA ZINGERLI and JEAN-PIERRE SORG

**Keywords:** Non-timber forest products; natural resource management; development planning; economic development; Vietnam. FDK 892 : (596/599)

## 1. Introduction

For about twenty years now, increasing interest and high expectations in the topic of non-timber forest products (NTFPs) have been expressed by scientists, development practitioners, and conservationists. The use of NTFPs is considered as a means to preserve biodiversity-rich forest areas, because NTFP harvesting is said to be less destructive than other forest uses, particularly timber harvesting (PETERS 1996). Simultaneously, the socio-economic situation of local forest users may be improved through commercialising specific NTFPs (DE BEER & McDERMOTT 1996; WILKIE & GODOY 1996; BYRON & ARNOLD 1999; ARNOLD & RUIZ PÉREZ 2001). Some NTFPs, such as rattan, have high market value and may contribute substantially to the improvement of local rural livelihoods. NTFPs have also cultural meanings and are important for the preservation of local communities' indigenous knowledge. However, the promotion of NTFPs to improve rural livelihoods tends to be problematic. They are likely to be substituted easily and the quantities collected from wild growing NTFPs are unpredictable and mobile (cf. Panayotou 1991 in ROS-TONEN 2000; HOMMA 1996; WILKIE & GODOY 1996).

In Vietnam, new economic opportunities for the rural poor have been sought for more than a decade. Also opportunities of income-generation through the development of NTFPs for rural livelihoods have been assessed. A number of research projects all over the country are ongoing, most of them as collaborations between Vietnamese government institutions and international donors and non-governmental organisations. Also in Nam Dong district, central Vietnam, research into the NTFP topic was launched. Natural forest in Nam Dong district has a share of 65% (40 000 ha) of the total district area. It hosts a tremendous wealth in biodiversity with a number of rare endemic flora and fauna species (IUCN 1999). Moreover, the forest is an important source of sustenance for the local population. For many decades, it has provided food, medicines and construction materials for the Cotu and other ethnic groups living in the area (NGUYEN VAN DANG 1997). Many of them are still subsistent farmers. They are usually not well integrated into the market networks which deliver to the regional economic centres of Hue or Da Nang. Their income-generating opportunities are limited despite the national programmes on poverty alleviation and rural development.

This article attempts to provide insights into the ecological and economic prospects of NTFPs in Nam Dong district. We largely focus on plant NTFPs and do not include animals and environmental services in our definition of NTFPs. We concentrate our analysis on wild or primary NTFPs. Domesticated and cultivated NTFPs are referred to as secondary NTFPs. The paper draws on field research carried out between 2001 and 2003<sup>1</sup>. The research focused on the role and economic potential of NTFPs in the emerging markets in Nam Dong district. Primary data for this study was gathered in qualitative interviews and focus group meetings with Cotu and Kinh people in two communes of Nam Dong district. Participatory observation was applied when accompanying local forest dwellers into the forest.

The article begins with a short review of NTFPs studies and discusses their findings concerning ecological and economic consequences of NTFP extraction from natural forests. It then provides insights into the livelihood context of Cotu and Kinh people in Nam Dong district with special reference to the contribution of NTFPs to subsistence and income-generation. Based on the empirical findings, the paper concludes with a critical assessment of NTFPs to the economic and ecological development in remote tropical areas.

## 2. Non-timber forest products: A short review

One of the key questions concerning NTFPs, that researchers and development practitioners are currently engaged with, is how to achieve the combined goals of benefiting local low-income producers, maintaining ecosystem services and promoting participatory sustainable forest management.<sup>2</sup> There are a number of successful examples where these interlinked goals seemed to be achieved – at least in the middle term. Case studies from Amazonia, for example, show that there is great interest from global industries in NTFPs for rubber production, cosmetics or food (BROWN & ROSENDO 2000; MORSELLO 2003; VAN ANDEL 2003). Partnerships between industries and local resource users help creating new opportunities for forest dwellers to benefit from certified forest products. Both globalisation and localisation processes therefore contribute to new market opportunities for low-income producers in tropical areas. Niche product markets for NTFPs and environmental services arise as a result of globalising markets and environmental concerns (SCHERR *et al.* 2002).

In the face of continuing deforestation and dwindling forest resources in the tropics these are arguments for an enhanced focus on the market opportunities for NTFPs. Their extraction is considered by many as less ecologically destructive than timber harvesting and other forest uses (PETERS 1996). Their commercialised use may provide a sounder basis for sustainable forest management (ARNOLD & RUIZ PÉREZ 2001). It is said that NTFPs extraction is usually small scale and does not affect entire environmental services provided by the forests, such as watershed protection, protection against natural hazards or carbon sequestration (KAHN & McDONALD 1995; PETERS 1996). ROS-TONEN (2000, p. 198) points out, however, that «...it is the low extraction level rather than the ecological ability to maintain yields that makes the extraction of NTFPs sustain-

<sup>1</sup> Field research was carried out by the corresponding author for his Masters Thesis, elaborated at the Chair of Forest Policy and Forest Economics, Swiss Federal Institute of Technology, Zurich.

<sup>2</sup> This was also one of the leading questions of Panel 2 on «Opportunities for forest markets to benefit low-income producers» at the Congress on «Globalisation, localisation and tropical forest management in the 21st century» held in Amsterdam on 22–23 October 2003, organised by AGIDS, University of Amsterdam, Tropenbos and others.

able». The recent literature makes clear, on the other hand, that many NTFPs suffer from overexploitation. Overexploited NTFPs are, for example, *Garcinia lucida* in Cameroon (VAN DIJK 1999; GUEDE *et al.* 2003), gaharu (*Aquilaria spp.*) in Indonesia (SOEHARTONO & NEWTON 2001) or most rattan species (*Calamus spp.*, *Daemonorops spp.*) in Southeast Asia (DE BEER & McDERMOTT 1996). All of them are highly valued commercial products used in globalised medicinal, perfume and furniture industries. The FAO (1997) estimates that presently at least 150 NTFPs are internationally traded. Despite some successful examples, the potential contribution of commercial NTFPs to generate cash income for local people is, however, rather limited (VAN VALKENBURG 1997; VAN DIJK & WIERSUM 1999).

When looking more at the immediate use of NTFPs as a source of subsistence in local rural development contexts, they are typically highly valued as food, medicines, handicraft and construction materials. The literature emphasises that NTFPs are indeed important products for poor forest dwelling households (DE BEER & McDERMOTT 1996; VAN DIJK 1999; BYRON & ARNOLD 1999; ARNOLD & RUIZ PÉREZ 2001). BYRON & ARNOLD (1999, p. 792) note that «forest foods are most extensively used to help meet dietary shortfalls during particular seasons in the year». Besides subsistence uses, NTFPs play also an important role for locally generated cash income for forest dwelling people. However, several factors are limiting the commercial potential of NTFPs in local development contexts. Among these are 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, which result in irregular supplies

(Panayotou 1991 in ROS-TONEN 2000). Other limiting factors are high transportation costs, poor infrastructure and logistical problems between forest dwellers and stakeholders better involved in the market chain (VAN DIJK 1999). The interactions between forest dwellers and traders are moreover likely to change the local use patterns (WILKIE & GODOY 1996). As forest dwellers are more exposed to markets their per capita income usually rises. They typically invest more in marketable high value NTFPs. A process of specialisation sets in. Simultaneously, some NTFPs are substituted by non-local industrial goods. ROS-TONEN (2000, p. 199) mentions that «it is inherent in NTFP-based livelihoods that they tend to disappear». As soon as households gain more opportunities, they invest in alternative economic activities, such as cash crops, home-gardens, husbandry or trade (e.g. DIJKMAN *et al.* 1999; DE JONG 1999).

It seems that the high expectations in NTFPs as a strategy to develop rural livelihoods are justified, particularly when plantations, agro-forestry gardens and a conversion of primary to secondary NTFPs are considered. The contribution to develop rural livelihoods from primary NTFPs alone is rather limited. Without such a distinction between different prospects of primary and secondary NTFPs, their contribution to conservation and economic development remains ambiguous. As recent studies show, the extraction of NTFPs is not as harmless to the natural forest as the expectations imply (cf. BROWDER 1992; DE BEER & McDERMOTT 1996; PETERS 1996; TRAN THIEN AN & ZIEGLER 2001). A lot of NTFPs are currently overexploited and are threatened by extinction. Moreover, NTFP production cycles are rather unpredictable and the uncertainty on NTFP markets can cause serious risks for forest dwelling households (HOMMA 1996). Some authors recently argue, therefore, for a gradual domestication of NTFP species in anthropogenic forest types as well as through the creation of NTFP-related jobs, such as, for example, in specialised manufacturing and trade (cf. VAN DIJK & WIERSUM 1999; ROS-TONEN & WIERSUM 2003).

### 3. The role of NTFPs in Nam Dong district, central Vietnam

#### Non-timber forest products in Vietnam

The expectations related to NTFPs and their potential contribution to conservation and rural development are also felt in Vietnam. A great number of government institutions and international donors engage in the topic of NTFPs. One of the most important actor is the Non-timber Forest Product Research Centre, affiliated with the Ministry of Agriculture and Rural Development.<sup>3</sup> The economic importance and value of NTFPs in Vietnam is substantial. The NTFP sector affords employment to hundreds of thousands of people, including the inhabitants of urban areas (LUONG VAN TIEN 1994). Over 4200 species from which NTFPs derive were identified (CHU HA CHU 2000). The FAO (2002) notes that rattan, bamboo, resin, essential oils, medicines, spices, mushrooms and honey are among the most important Vietnamese NTFPs. Vietnam's NTFP exports reached 40 million US\$ annually between 1986 and 1990 (DE BEER *et al.* 2000).

#### Geographic and socio-economic overview of Nam Dong district

Nam Dong district lies in the south-west of Thua Thien Hue province in central Vietnam (figure 1). It has 11 communes and 67 villages. The 21 953 inhabitants belong to the ethnic groups

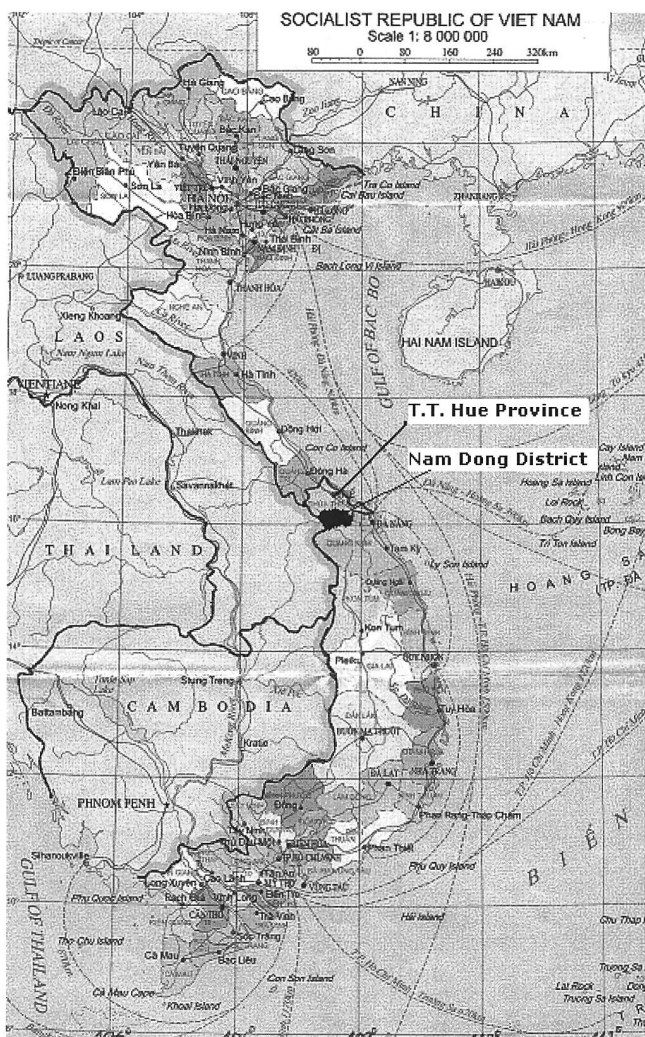


Figure 1: Political map of Vietnam (source: INTERNATIONAL TRAVEL MAP 2000, modified).

<sup>3</sup> See also [http://www.ntfp.org.vn/Network\\_En.htm](http://www.ntfp.org.vn/Network_En.htm).

of Kinh and Cotu.<sup>4</sup> Nam Dong is one of the poorest districts of the country. Based on estimations from the district office, the average income per capita in Nam Dong is about 156 US\$ per year. The main activities in the district are forestry, agriculture and trade in the two existing market places of the district (Khe Tre and Nam Dong). Industry and services (e.g. tourism) are of small importance. Nam Dong is a mountainous district, which is located in a monsoon tropical zone. This region is characterised by transitional features between the limestone mountains of the north and «earth» mountains<sup>5</sup> of the south of Vietnam (IUCN 1999). Due to the complex geological and topographic conditions, the biodiversity is unusually high including endemic species, such as the recently discovered deer-like *Truong Son muntjac*. Nam Dong district also hosts Bach Ma National Park where at least 1400 flora species were identified, which represent 12% of Vietnam's entire flora. The dominant forest types are the subtropical evergreen monsoon forest, growing above an altitude of 900 metres, and the tropical evergreen monsoon forest in the lower areas (TRAN THIEN AN & ZIEGLER 2001). Based on the official statistics published by the Forest Protection Department of Nam Dong district, no deforestation has occurred since 1999. On the contrary, the forested area has increased thanks to reforestation with indigenous tree species and *Acacia spp.*. Today, the natural forest in Nam Dong district has a share of 65% (40 000 ha) of the total district area.

Five percent of the total district area (3455 ha) are agricultural land. Due to the complex topography, rice fields are limited to 363 hectares. Swidden and cash crop fields represent 1.6% (1020 ha), perennial plants and home gardens represent 3.1% (2023 ha) of the district area. The surface for agricultural purposes has increased during the last few years at the expense of fallow land. A large area of Nam Dong district is fallow land (26%), which is extensively used by farmers as swidden agricultural land to cultivate cassava or dry rice and to collect *Thysanolaena maxima* (the broom making plant). The home gardens are very diverse and various kinds of secondary NTFPs are cultivated there. These are, for example, *Musa spp.*, *Artocarpus spp.*, *Ficus auriculifolia*, *Aquilaria crassna*, *Cinnamomum cassia*, *Baccaurea sapida* and various kinds of palm trees. Some of these secondary NTFPs have better taste and productivity than the primary NTFPs found in the area, e.g. *Artocarpus spp.* (WETTERWALD 2003). Also pepper, sugar canes, pineapples and bamboo are increasingly cultivated in home gardens.

## Methodology and results

Thanks to the high forest cover and high biodiversity the potential of NTFPs to develop rural livelihoods seems to be favourable in the Nam Dong district. In order to investigate the importance of NTFPs for local livelihoods and the ecological and economical impact of NTFP extraction a case study was conducted in Thuong Long commune. Semi-structured interviews, card sorting, pair wise ranking and forest walks were the most frequently used methods. *Table 1* shows the names

<sup>4</sup> There are 54 ethnic groups in Vietnam from five different ethnolinguistic families. The Kinh are the majority group with 83% of the total population. Historically, they primarily inhabited the lowlands and delta areas. In the process of Vietnamisation, people resettled and moved to resource-abundant areas in the uplands (MCLEOD 1999). The uplands are traditionally home of the 53 other ethnic groups. The Cotu people belong to the Mon-Khmer ethno-linguistic family group. There are about 37 000 Cotu people living in the uplands of central Vietnam (DANG NGHIEM VAN *et al.* 2000).

<sup>5</sup> Alluvial soil, old and stream/river alluvium, yellow-red soil in magma stone, yellow-red soil in clay stone (source: forest enterprise Khe Tre).

and uses of local NTFPs. It results from eight focus group discussions.<sup>6</sup> The forest dwellers were asked to classify primary NTFPs according to their importance for subsistence and marketing.<sup>7</sup> To obtain the scientific name of the plant species the Cotu names were translated during a work shop (mainly Kinh traders, commune authorities and Cotu forest dwellers) into Vietnamese. Once the Vietnamese name was known, professors of the forest faculty in Hue and various books were consulted. In addition, a botanist was consulted for those species with no record. Four categories were created in order to achieve an overview of the approximate total importance of the products across Thuong Long commune. In reality, the limits between the categories of importance are blurred and for the category «not important NTFPs» a few examples are given in contrast to the other three categories with full record.

In Nam Dong, 83 species were identified from which primary NTFPs are collected.<sup>8</sup> Primary NTFPs are collected from 29 tree species, 18 species belonging to the «remaining group»<sup>9</sup>, 11 other climbing plants besides rattan, 10 rattan species, 6 mushroom species, 5 bamboo species and 4 bee species. The following NTFPs were identified: honey, bee nest, rattan cane, stem water, bamboo stem, bamboo shoot, mushroom, leave, fruit, bulb, root, bark, resin, oil, entire plant, flower and palm heart.

Most primary NTFPs are collected for food (31%), for sale (27.7%) and for construction and handicraft (18.1%). NTFPs collected to produce medicine have a share of 9.7%.<sup>10</sup> NTFPs used for beverage, food for animals and for other purposes such as products used for hunting and catching animals have a smaller share than the other main purposes. Primary NTFPs, which are primarily sold, are rattan canes, leaves of *Rhapis laosensis* (hat making plant), flower of *Thysanolaena maxima* (the broom making plant), honey, bamboo stems, bamboo shoots, fruits, and mushrooms.

The results shown in *table 2* are based on a card sorting exercise. It illustrates the importance of NTFPs for households by involvement in NTFP collection from the natural forest. The criteria to measure the intensity of collecting and selling NTFPs, were discussed together with the village chiefs and commune authorities. The intensity of collecting primary NTFPs was defined by «days per month spent in the forest» and the involvement of households selling primary NTFPs was defined by «the frequency of selling NTFPs (x times/month)».

Out of 377 households living in Thuong Long, 55 households or 14.5% of all households collect NTFPs in very high quantities. They were described by the commune officials as professional NTFP collectors and spend an average of 18 to 21

<sup>6</sup> The focus group discussions were conducted with five male participants each. The results are therefore gendered. It is likely that female participants would have provided different information about NTFPs because they use the forest differently than men.

<sup>7</sup> Importance was defined, together with the forest dwellers as follows: «Important products for livelihood are products which farmers need to survive (e.g. food, building materials) and to earn money so that they can buy clothes and pay school fees.»

<sup>8</sup> CHU HA CHU (2000) has identified in Vietnam 4269 species from which NTFPs (wild and cultivated) derive of which 1863 are used as medicine. TRAN THIEN AN & ZIEGLER (2001) have identified 432 species which are potentially used by the local population around Bach Ma National Park for a variety of medicinal purposes.

<sup>9</sup> Tree species are defined as trees which produce wood, are straight growing and belong to the dicotyledons. The remaining group includes monocotyledons (e.g. palm trees, banana tree, orchids), herbs and bushes.

<sup>10</sup> NTFPs used for medicinal purposes are probably underrepresented. Nowadays, traditional Cotu medicine are increasingly being substituted by synthetic remedies. This is coupled with a loss of indigenous knowledge.

**Table 1: Name and use of NTFPs (source: WETTERWALD *et al.* 2001; WETTERWALD 2003).**

Species	Purpose				
	Construction and handicraft materials	Food and beverage	Sale	Medicine	Other purposes
<b>Most important NTFPs</b>	<b>9 products</b>	<b>3 products</b>	<b>9 products</b>	<b>1 product</b>	<b>1 product</b>
<i>Mel aphidis</i>		honey	honey		
Mật ong ruồi <sup>12</sup>		honey	honey		
<i>Calamus platyacanthus</i> (K) <sup>11</sup>	cane		cane, basket		
<i>Calamus scipionum</i>	cane, leaves		cane, basket		
<i>Calamus rudentum</i> (R)	cane		cane, basket		
<i>Calamus tetradactylus</i> (K)	cane		cane, basket		
<i>Calamus tonkinensis</i> (R)	cane		cane, basket		
<i>Rhapis laosensis</i>	leaves		cane, basket		
<i>Shizotachium zollineri</i>	stem	shoots	stem		
<i>Eupatorium odoratum</i>				plant	plant
<i>Imperata cilindryca</i> (nt)	plant				
<b>Important NTFPs</b>	<b>4 products</b>	<b>11 products</b>	<b>6 products</b>	<b>3 products</b>	<b>3 products</b>
<i>Thysanolaena maxima</i>			flower		
<i>Menlocalamus</i> spp.	stem	shoots	stem		
<i>Mussaenda frondosa</i>		leaves, stem, root		root	
Cây chuồn <sup>12</sup>		bark		bark	fruit
<i>Scaphium lychnophorum</i>	bark		fruit		
<i>Pandanus tectorius</i>	leaves		mat & pillow		
<i>Musa coccinea</i>	leaves	flower, fruit			leaves, stem
Parts of the bee nest			wax		
<i>Termitomyces albuminosa</i>		fungi	fungi		
<i>Auricularia auricula</i>		fungi	fungi		
<i>Schismatoglottis calyprate</i>		Leaves, stem		root	
<b>Less important NTFPs</b>	<b>6 products</b>	<b>4 products</b>	<b>5 products</b>	<b>0 products</b>	<b>1 product</b>
<i>Calamus poilanei</i> (V)	cane		cane		
<i>Daemonorops longispathus</i> (R)	cane		cane		
<i>Bambusa schizostachyooides</i>	stem	shoots			
ran <sup>12</sup> bamboo	stem	shoots	shoots		
<i>Phrynium placentarium</i>			leaves		leaves
<i>Licuala bracteata</i>	leaves				
Tritèng <sup>13</sup> mushroom		fungi			
<i>Litsea</i> spp.			bark		
Mật ong ao <sup>12</sup>		honey			
Dây a ngồn <sup>13</sup>	stem		fishing net		
<b>Some examples of not important NTFPs</b>	<b>9 products</b>	<b>38 products</b>	<b>23 products</b>	<b>11 products</b>	<b>9 products</b>

*Livistona speciosa* (DD)<sup>14</sup>, *Homalonema occulta* (nt), *Arenga* spp., *Ficus auriculifolia*, *Hopea pierrei* (EN), *Aquilaria crassna* (CR), *Dipterocarpus alatus* (EN), *Spondias pinnata* (nt), *Alangium* spp., *Baccaurea sapida*, *Artocarpus* spp., *Pterocarya tonkinensis*, *Canarium* spp., *Nephelium lappaceum*, *Shorea guiso* (CR), *Zanthoxylum nitidum* (nt), *Schefflera octophylla* (nt), *Pueraria thomsonii*.

days per month in the forest during summer time (April-September). Most of these households (45 households) collect specific NTFPs (e.g. *Calamus* spp.) for trade. Besides the professional collectors, there are 94 households (25%) which spend 12 to 15 days per month in the forest to collect NTFPs. 85 households (22.5%) spend a period of 6 to 8 days per month during the good weather season in the forest. Interesting is the high number of households that collect NTFPs in very small quantities or none at all. These 143 households or

42% of all households spend an average of only two days per month in the forest. The table shows that the dependency of

<sup>11</sup> IUCN red list threat categories 1994: (K): insufficiently known; (nt): near threatened; (R): rare; (V): vulnerable.

<sup>12</sup> Vietnamese name.

<sup>13</sup> Cotu name.

<sup>14</sup> IUCN red list threat categories (2002): (CR) critically endangered; (EN): endangered; (DD) data deficient.

**Table 2:** Cross table showing the involvement of households in the collection and sale of NTFPs in Thuong Long commune (source: WETTERWALD 2003).

		Involvement of households in selling NTFPs			Total
		sell most NTFPs (3 times/month)	sell an average quantity of NTFPs (1–2 times/month)	sell least NTFPs (Hardly or never sell)	Total
Involvement of households in collecting NTFPs	collect most NTFPs 18–21 days/month	45	4	6	55
	collect a lot of NTFPs 12–15 days/month	10	65	19	94
	collect an average quantity of NTFPs 6–8 days/month	3	49	33	85
	collect least NTFPs 0–2 days/month	1	10	132	143
<b>Total</b>		<b>59</b>	<b>128</b>	<b>190</b>	<b>377</b>

rural households on NTFPs is very heterogeneous. It indicates that over 50% of all households hardly sell NTFPs. This is because 42% of all households hardly collect NTFPs or use them for subsistence only. A relatively small group of 59 households sell NTFPs three times a month. These households concentrate their searching activities on marketable NTFPs (e.g. rattan canes, honey, leaves of *Rhapis laosensis*). In sum, there is a strong direct correlation between the involvement of households collecting NTFPs and selling NTFPs.

### Economic and ecological effects of NTFP use

A number of NTFPs extracted in Thuong Long are important to generate cash income in the local development context. Fresh mushrooms of the species *Auricularia auricula* and *Termitomyces albuminosa* usually achieve high market prices (1.3–2 US\$ per kg). Honey is also valued highly because it achieves good prices. However, it underlies high price fluctuations depending on its supply in the forest. During field research in 2000, honey supply was low and the price for a bottle (65 cl) of honey was exceptionally high at 8 US\$. In 2002, on the other hand, supply in the forest was high and the price was as low as 2 US\$ per bottle. These high price fluctuations cause uncertainties for cash income generation from NTFPs. Also fruits and mushrooms have unpredictable supply volumes and are difficult to be traded, even though a local market would exist. The quantities collected are usually too small for that it would be worthwhile to transport the products to the local market. These examples show clearly the problem of supply fluctuation of primary NTFPs (cf. Panayotou 1991 in ROS-TONEN 2000). Uncertainties in generating cash income from NTFPs emerge also because forest dwellers have no means to control prices. If they need cash immediately they will sell all NTFPs at very low prices. These uncertainties demonstrate the statements of FEARNside (1989) and BROWDER (1992) who claim that it is doubtful whether households within extractive economies are ever likely to be wealthy.

Another highly valued NTFP, not only globally but also in Thuong Long, is rattan (*Calamus spp.*, *Daemonorops spp.*). There are a number of rattan species that are of interest for both local and non-local users. Small diameter rattan species are more important for forest dwellers than the large diameter rattan species. Their abundance is higher, they are easier to collect and they offer a wider range in subsistence use. However, they achieve lower prices (6 cents per cane of 5.2 m length) than large diameter rattan species (0.2–0.3 US\$ per cane of 2.5 m length). All rattan species are collected in large quantities even though some of them are threatened (e.g. *Calamus rudentum*, *Calamus tonkinensis*). For *Calamus scipo-*

*num*, which is the most frequent and most traded NTFP in the area, the collected quantities are declining tremendously due to overexploitation. Forest dwellers currently need more than one day to extract seven out of ten rattan species. The ecological consequence is also demonstrated in the reduction from formerly 20 rattan factories located in Hue to only three today. The decline of rattan is also due to an open access regime. Agents from rattan furniture factories visit the district and clear the stand of *Calamus poilanei* and *Daemonorops longispatus* during three to four years. Their recovery takes a minimum of 15 years before they can be collected again. Even though the land allocation process for forest land started in the 1990s, land and property rights are not well developed and controlled. An open-access regime prevails. The forests in Thuong Long are usually accessed by both local and non-local actors. Non-local actors usually follow more market-driven interests than local subsistent farmers. A situation of competition between local and non-local resource users occurs that is likely to result in an overexploitation of traded NTFPs and to unsustainable income generation for local people (cf. ADAMS *et al.* 2002).

Bamboo species are other important NTFPs for food, construction material and sale. Today, most of the bamboo species (e.g. *Shizotachium zollinzeri*, *Menlocalamus spp.*) are planted in home gardens or bamboo forests. *Menlocalamus spp.* seem to have disappeared from the natural forest. The previously mentioned conversion from primary to secondary or cultivated NTFPs has clearly taken place in the case of bamboo.

Most Cotu forest dwellers do usually not process raw NTFPs but only collect and sell them. This is so for the leaves of *Rhapis laosensis* used to produce the Vietnamese cone hat and the flower of *Thysanolaena maxima* to produce brooms. These are products traded in very large quantities. Cotu people report that they lack of knowledge and processing techniques. Therefore, the Cotu normally do not benefit from added value of the NTFPs they collect. Those NTFPs that are processed by Cotu are usually only traded among Cotu people. Such products are, for example, bamboo and rattan basketry, mats and pillows produced from leaves of *Pandanus tectorius*. Cotu informants moreover report that *Mussaenda frondosa*, *Musa coccinea* (banana tree) and *Schismatoglottis calyprata* (herbaceous monocot stem) are still important when they suffer from food shortage. These products are easy to collect and have a high supply in the forest.

Based on the IUCN threat categories presented in table 1 and a qualitative inventory carried out in the commune Thuong Long (WETTERWALD 2003), the extraction of NTFPs from the natural forest is not that harmless as believed. On the one hand, NTFPs with large markets (e.g. *Calamus spp.*, *Dae-*

*monorops spp.*) are collected in an unsustainable manner. On the other hand, some NTFPs occur naturally in low abundance, which increases the risk of overexploitation. The supply of NTFPs (abundance and spatial distribution) in the natural forest may also affect the use of the products regarding economic decisions. Local forest dwellers consider several marketable NTFPs as not important for them, because they require high searching time and are therefore not lucrative. Moreover, the above given examples show also price fluctuations (e.g. honey), market information (e.g. medicinal herbs, essential oils), and cultural differences (e.g. processed NTFPs) affect the marketing potential of NTFPs in the area.

### Contributions of NTFPs to rural livelihoods

The case study shows that 58<sup>15</sup> households (15%) depend highly on primary NTFPs for subsistence use; and for about 50 households (13%) primary NTFP collection is an attractive alternative to generate additional income besides agricultural activities. On the other hand, for 132 households (35%) living in Thuong Long commune, primary NTFPs are not important neither for subsistence nor for cash income. This heterogeneous pattern of NTFP dependency in a forest dwelling community has also been described by BYRON & ARNOLD (1999). There is a strong correlation between the involvement of households collecting NTFPs and selling NTFPs. Households which depend on NTFPs for their subsistence usually collect a wider range of different NTFPs than the professional NTFP collectors. These 58 households mainly build their houses with NTFPs and several NTFPs are collected to improve the quality of meals. Additionally, they also collect NTFPs for trade to generate small cash income. In contrast, professional NTFP collectors primarily focus on marketable, high value NTFPs with low searching and collecting costs. They mostly seek rattan, honey, and leaves to produce the Vietnamese cone hat (WETTERWALD *et al.* 2001; WETTERWALD 2003). This shows a specialisation process also mentioned by WILKIE & GODOY (1996). Professional NTFP collectors usually substitute those NTFPs requiring high collection costs by agricultural produce and products bought in the market. There are a number of reasons why 143 households of Thuong Long commune hardly collect any primary NTFPs anymore. Their abstinence from NTFP extraction are identified as labour force constraints (families with young children, old age, bad health), cash income by other opportunities, agricultural intensification or decline of NTFP resources. All of them lead to a substitution of primary NTFPs.

The importance of NTFPs for households in Thuong Long commune also shows a pattern of social differentiation between Cotu and Kinh people. The Cotu people are involved both in agriculture and NTFP extraction. The Kinh people, on the other hand, are more involved in agriculture and hardly collect NTFPs. They rather process and trade them. Generally, Kinh are more wealthy and more involved in the market network than the Cotu. They are less dependent on NTFPs for subsistence and additional cash income. The social differentiation is also manifested in the market chain. The Cotu are the collectors with less market power than the Kinh traders, who usually set the prices.

When comparing the importance of primary NTFPs ranked by forest dwellers in our research and the FAO (2002) we find both correspondences and differences. Rattan, bamboo, honey and mushrooms are considered by both the FAO and the local forest dwellers as important NTFPs for local liveli-

hoods and cash income generation. In contrast, differences occur with regard to the importance of medicinal plants, resin, essential oils and spices. Their importance is rated unevenly among households, depending on their knowledge and specialisation. In summary, the empirical findings in Thuong Long commune emphasise the following aspects that influence NTFP collection in Nam Dong:

- Availability of the products in the forest
  - NTFP occurs naturally in low abundance or has an unsuitable spatial distribution pattern for economically viable use. Its quantities are too small and searching costs are too high.
  - Decline of NTFP due to overexploitation.
- Market constraints
  - Substitution of NTFPs by agricultural and industrial products
  - Lack of market information
  - Price fluctuations
  - Logistical problems (especially transport)
- Collecting and processing techniques
  - Lack of rational collecting and processing technologies
- Cultural differences
  - NTFPs processed by Cotu people are not marketed by Kinh; loss of additional income.

## 4. Conclusions

The promotion of NTFP extraction for the development of rural livelihoods touches on complex issues regarding local economic development and ecological sustainability in a globalised economy. This article has argued that promoting the development of NTFPs tends to be problematic if not considered carefully. It drew on a case study of Nam Dong district, central Vietnam, to discuss the prospect of NTFP extraction as environmentally friendly and locally anchored development strategy. The focus on NTFPs implies that a more sustainable forest management is linked with an improvement of local people's well-being situations. The article reveals that this assumption has shortcomings. The impact of NTFP harvesting depends highly on its intensity (e.g. rattan) and which parts of the NTFPs are being used (e.g. bark). Several species still used as NTFPs in Nam Dong appear on the IUCN red list of threatened species (see *table 1*). Given the high use pressure on certain NTFPs and their relatively low abundance, the ecological impact of NTFP extraction from the natural forest is considered high in Nam Dong district. The improvement of economic situations of local people is also not guaranteed because NTFPs are highly unpredictable due to resource characteristics and their history of exploitation. Their seasonal occurrences impede a continuous contribution to local people's well-being. The use of NTFPs moreover shows a picture of social differentiation. Some households still depend highly on NTFPs as food supply. Others have achieved a level of well-being where they can select specific NTFPs for marketing or substitute them completely. Although it is claimed that NTFP extraction benefit poor forest dwellers, it does not necessarily help the poorest. They are often confronted with labour force restrictions that do not allow them to allocate a lot of time for NTFP collection and marketing. Another reason why local producers benefit relatively little from commercialised NTFPs, such as rattan, is that the products are locally sold for very low prices. In the international market they are highly valued NTFPs, however. As small scale producers, local people have no stake in price negotiations and are little integrated in marketing logistics. They generally lack of sufficient market information and are unlikely to meet the requirements set by the international traders and trade agreements. NTFP users therefore

<sup>15</sup> Is based on adding households that collect most, a lot and a medium quantity of NTFPs in the column «sell least NTFPs»: 58 = 6 + 19 + 33.

often depend fully on the interventions outlined by non-local users, development agencies and national governments. We find that NTFPs as a strategy to develop rural livelihoods is unlikely to create viable economic opportunities for low-income forest users. As shown, NTFPs are likely to be substituted in the process of agricultural intensification and industrial development. In Nam Dong district we observe a substitution effect as primary NTFPs are increasingly being modified and cultivated in man-made production systems in the agricultural and settlement areas. Therefore, NTFPs tend to be useful for short or middle-term economic boosts. A number of them, such as bamboo and mushrooms, may successfully be converted from wild to secondary NTFPs and used commercially over a long period of time. It will be necessary to rank the locally identified NTFPs according to their present and future economic potential. By doing so, NTFPs can then either be enriched in the natural forest or cultivated in agroforestry systems. Moreover, it will be necessary to change institutional frameworks and property rights in order to benefit and protect local NTFP extractors. If NTFPs are extracted by non-local users, for example, the local people need to get contracts to participate in the NTFP market or to receive compensation payments. The links between global industrial interests and local produce need to be thoroughly assessed in order not to reproduce negative capitalisation flows from the local to the global level, disadvantaging and marginalising local forest dwellers. The existing open access regimes need to be closed down and replaced by property rights regimes entitling local people to maintain access to their resources and to exclude others.

The increased focus on NTFPs, particularly in remote areas of the tropics, implies three-fold objectives: low-income forest dwellers are better off; natural forests are protected; and forest land is better managed by participatory sustainable forest management schemes. To achieve this we find it necessary to cultivate NTFPs, to implement proper land and use rights, to improve the marketing of NTFPs, and to establish a well functioning monitoring systems in the natural forests. In order to give NTFPs a effective role in economic and ecological development, it is vital that the challenges mentioned above are being thoroughly assessed and worked upon by the agencies and institutions promoting NTFPs as pro-poor development strategy.

## Summary

This article analyses the ecological and economic prospects of non-timber forest products (NTFPs) and examines the importance of NTFPs for the livelihoods of local forest dwellers. It gives a brief review of NTFPs and the expectations and limitations associated with their use and extraction from natural forests. It argues that when looking at wild NTFPs only, they offer only limited opportunities for the development of local rural livelihoods. The empirical part of the article draws on a case study of NTFP extraction in Nam Dong district, central Vietnam. It provides insights into local NTFP use patterns and the importance of NTFPs for local households. Finally, it assesses the ecological and economic prospects of NTFPs in Nam Dong district. The article concludes that the supply of primary NTFPs in the natural forest is usually insufficient to meet market demands and ecological and economic requirements. If the primary aim is to develop rural households, it is necessary to enrich NTFPs in the natural forest or to cultivate them in man-made systems.

## Résumé

### Produits forestiers non ligneux dans le district de Nam Dong, centre du Vietnam: perspectives écologiques et économiques

Cet article traite de la place qu'occupent les produits forestiers non ligneux (PFNL) dans les moyens d'existence des habitants locaux. Il fournit une brève vue d'ensemble des PFNL ainsi que des potentialités et des contraintes liées à leur récolte dans les forêts naturelles et à leur usage. Il apparaît que le recours aux seuls PFNL sauvages n'offre que des possibilités limitées d'amélioration des conditions de vie dans le milieu rural. La partie empirique de l'article repose sur une étude de cas menée dans le district de Nam Dong, mettant en évidence les pratiques locales liées aux PFNL, l'importance de ces derniers dans l'économie des ménages et leurs perspectives écologiques et économiques. Les possibilités d'extraction de PFNL primaires dans les forêts naturelles ne suffisent pas, en général, à couvrir les besoins du marché et à répondre aux impératifs écologiques et économiques. Dans un but d'amélioration des conditions d'existence des ménages ruraux, il est nécessaire d'enrichir les forêts naturelles en plantes fournissant des PFNL ou de les cultiver dans l'espace rural.

## Zusammenfassung

### Nichtholzprodukte im Bezirk Nam Dong in Zentralvietnam: Ökologische und ökonomische Perspektiven

Im Aufsatz wird ein kurzer Überblick über die Nichtholzprodukte (NTFPs) und deren Stellenwert für den Unterhalt der lokalen Bevölkerung im Bezirk Nam Dong gegeben. Im Rahmen einer Fallstudie wurden die lokalen Waldnutzungsgewohnheiten sowie der Stellenwert der NTFPs für die einzelnen Haushalte untersucht. Es zeigte sich, dass das natürliche Angebot an NTFPs in den Naturwäldern meist nicht genügt, um die Nachfrage auf dem Markt zu befriedigen und die ökologischen und ökonomischen Anforderungen zu erfüllen. Sollen ländlich-bäuerliche Haushalte als wichtigstes Ziel entwickelt werden, so ist es nötig, die NTFPs in den Naturwäldern zu fördern oder im landwirtschaftlich genutzten Gebiet anzubauen.

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#### Authors

- OLIVIER WETTERWALD, Dipl. Forst-Ing. ETH, Friesenbergstrasse 13, CH-8055 Zürich. Email: [wetterwald@gmx.ch](mailto:wetterwald@gmx.ch).
- DR. CLAUDIA ZINGERLI, Chair of Forest Policy and Forest Economics, Swiss Federal Institute of Technology, Rämistrasse 101, CH-8092 Zürich. Email: [claudia.zingerli@env.ethz.ch](mailto:claudia.zingerli@env.ethz.ch).
- DR. JEAN-PIERRE SORG, Chair of Silviculture, Swiss Federal Institute of Technology, Rämistrasse 101, CH-8092 Zürich. Email: [jean-pierre.sorg@env.ethz.ch](mailto:jean-pierre.sorg@env.ethz.ch).