

**A Documentation Strategy to Develop the Potential of NTFPs as a Source
of Livelihood Diversification for Local Communities in the Batang Toru
Orangutan Conservation Program**

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INTRODUCTION

A re-emerging paradigm in forestry regards forest as a multi-purpose, multi-benefit resource system serving multi-stakeholders that should be managed to enhance the welfare of local communities. This paradigm contends that non-timber forest products (NTFPs) have a high comparative advantage to address the needs of local communities, specifically products for household consumption and/or market sale to enhance family incomes. NTFPs provide a substantial proportion of income to rural households, particularly to meet seasonal regarding and other periodic needs. However, there is a shortage of information available regarding the sustainable management of these resources and the marketing their products. Look further towards the future there are few proven means of effective dissemination information regarding sustainable management and product management.

Batang Toru, located in the northern part of Sumatran island, is one of the few remaining areas to support populations of the Sumatran orangutan (*Pongo abelii*). The area is surrounded by roads, which separate it from the East Sarulla orangutan population/habitat. The Batang Toru area covers approximately 105,000 ha, with elevation of 200-1500 masl; the dominate vegetation is primary rainforest (BPKH, 2006). The Batang Toru orangutan population was documented at 400 individuals through a *Population and Habitat Viability*

Assessment (PHVA) (Singleton *et. al.*, 2004). Recent studies estimate that the population may be 380 at the current time. Although the Batang Toru orangutan population is smaller, its threat from habitat loss is relatively low (below 2% annually). This low rate of habitat loss is the result of topographic features that limit access and traditional indigenous forest management systems that are sustainable and value healthy environments.

Besides orangutans, the Batang Toru forest is also rich with other endemic plant and animal species (e.g. Dipterocarpaceae species (*Shorea* spp., *Anisoptera* spp., *Dipterocarpus* spp.) and the Sumatran tiger and tapir). To the present time the gradient of land use systems practiced by local communities in Batang Toru are compatible with conservation of the area's unique and globally important biodiversity. However, in the future, the expanding human population of Batang Toru may threaten the forest and all of its components, if suitable livelihoods options are not identified and developed. In that context, we see a number of non-timber forest products produced from Batang Toru forest systems (e.g. mixed tree gardens, agroforests, and forests) as having potential to diversify and secure viable livelihood options for the people of Batang Toru. The production of these NTFPs can be managed in a way to protect environmental resources.

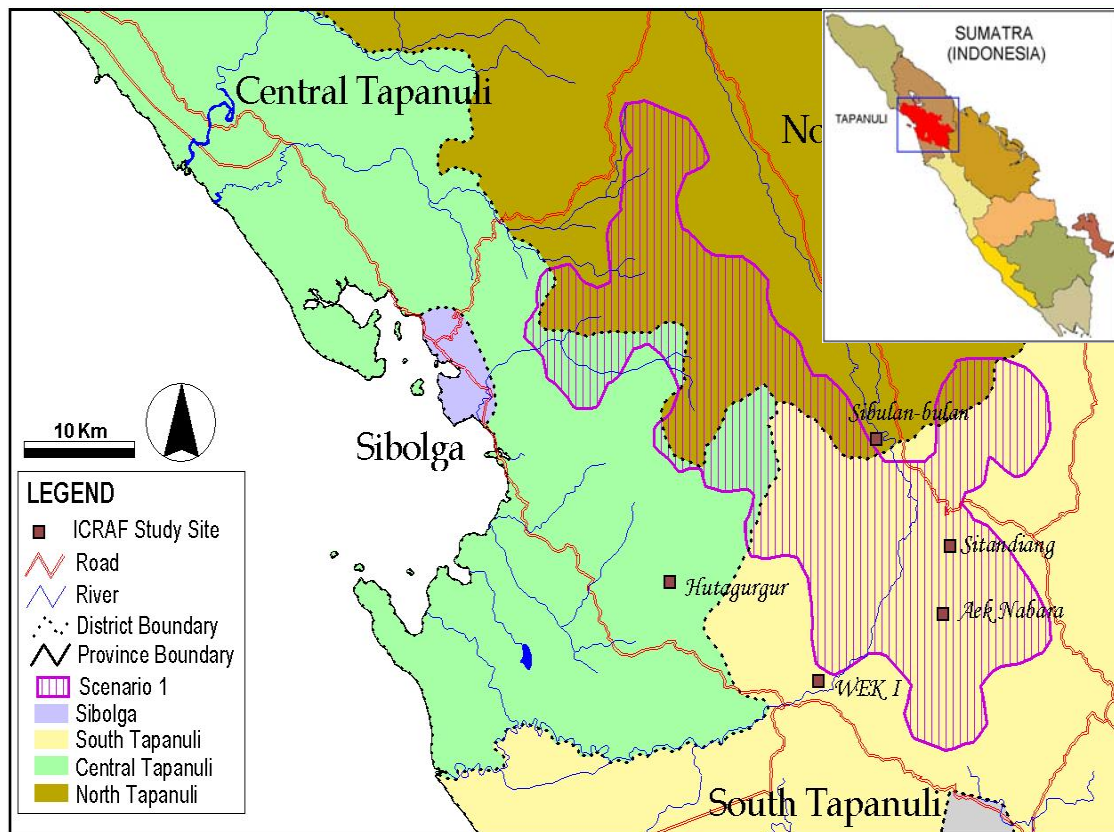
Manurung *et al* (2006) demonstrated that most smallholder tree-based farming systems are compatible with the conservation of soil, water and biodiversity. *Rubber Agroforestry Systems* (also called "Old Jungle Rubber") of Muara Bungo, Jambi contain a total of 129 woody species/hectare compared to 148 woody species/hectare identified in adjacent natural forests (Rasnovi, 2006). From a marketing aspect, many NTFP collectors/producers in the Batang Toru area have weak bargaining position with buyer; they are price takers and frequently must accept. Rapid market assessments indicate that the current NTFP market system is of limited benefit to both producers and consumers (Tukan and Kurniawan). Besides that, a lot of economic rent is invaluable in long chain of distribution. In Batang Toru area, from the sale of NTFP does not provide a large share for household total income, but it is often important in filling seasonal

income needs or other cash flow gaps, and helps cover particular expenses or to respond to unusual opportunities. This is why we assisted local communities to develop documentation strategies to reveal the under-appreciated benefit NTFPs provide to local incomes.

The process of assisting local communities to conceptualize conservation-livelihoods enhancement strategies for the protection of orangutan habitat in Batang Toru area has been implemented over a 1.5 year period through the USAID-funded (United States Agency for International Development) *Development of collaborative orangutan habitat protection in Batang Toru watershed, North Sumatra*. The project is implemented by Conservation International Indonesia Program, the World Agroforestry Centre (ICRAF), and Winrock International. ICRAF and Winrock have worked with local communities and local government agencies to develop local conservation-livelihood strategies that provide frameworks for: i) recognizing communities traditional role in conserving natural resources; ii) recognizing which local agricultural/forest livelihood systems are compatible with environmental conservation; and iii) strengthening communities/other stakeholders understanding/commitment to conservation as an approach to protect the environmental services (biodiversity, watersheds and carbon stocks). Strategies also identify/provide technical and marketing services/improvements to enable communities to enhance the productivity/profitability of NTFP potency in their agroforestry livelihood systems.

This paper draws primarily upon experiences in three districts related to farmer involvement in protecting and enhancing their local agroforestry livelihood systems through the development of nursery facilities and local strategies to improve the potential of NTFPs as sources of livelihood diversification for local communities.

CHARACTERISTICS OF STUDY AREA



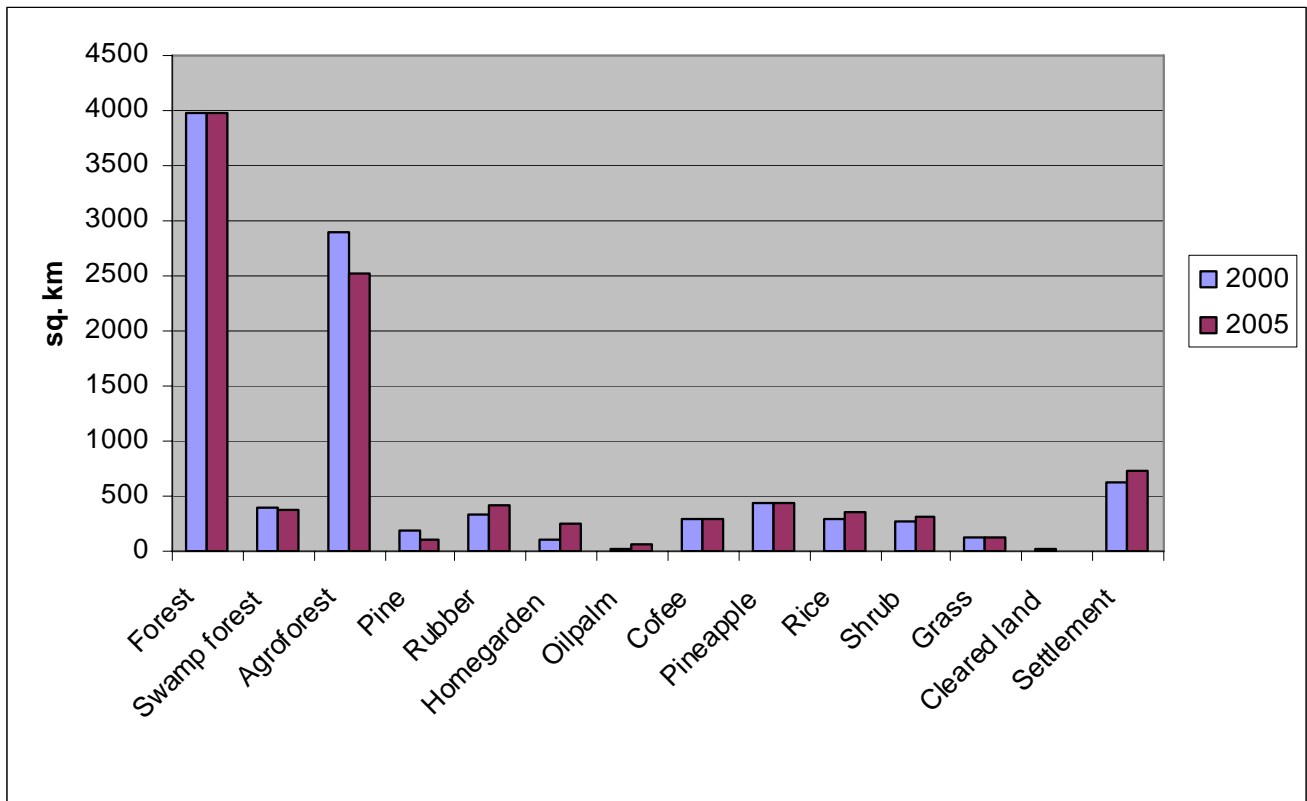
Picture1. Map of Study Area

The study area covers an area of 91,400 ha in the province of North Sumatra, Indonesia. Within the area there are a total of 251 villages located in parts of 3 different districts (Kabupaten). The human population of the study area is 133,971 in 27,906 households. The three districts have similar histories and demography. All three have large rural-based populations with population densities varying from 126/km² in Central Tapanuli, to 69/km² in North Tapanuli, to 54/km² in South Tapanuli. The population is dominated by the indigenous Batak Toba, Batak Pesisir, Batak Angkola-Mandailang ethnic group with some transmigrant communities primarily of Javanese. Natural forest and agroforests are the primary land cover.

The local communities in all 3 districts, and specifically the study area, have a long history of sustainable forest resource management through a gradient of land use intensities ranging from mixed tree gardens (*kebun campur*) where species composition is largely controlled by farmers and management is intermediate, to natural forests where impact from human intervention is light with small quantities of products harvested. In between are various types of agroforests (forest farming systems) where human management favors plant species that provide useful/valuable products but management remains extensive rather than intensive. The primary products from the mixed tree gardens of Batang Toru are rubber (*Hevea brasiliensis*), cacao and, in some villages, sugar palm (*Arenga pinnata*). These crops are the main source of on-farm family subsistence/income. In the natural forests and agroforests, plant species (forest species that have been domesticated or semi-domesticated) that are important or hold potential include: gaharu (incense from *Aquillaria sp.* tree), benzoin (*Styrax benzoin*), durian (*Durio zibethinus*) and petai (*Parkia speciosa*), nilam (patchouli oil), flowers (orchids and *Nepenthes*). The products from these species are used for home consumption and sold in local/provincial markets. In all three land use systems (mixed tree gardens, agroforests, and natural forests) planning and management is limited. Improvements in managing the species/crops and developing market linkages could benefit the productivity, profitability and sustainability of these systems.

The predominant agricultural practice among districts is wetland rice production, followed by upland agroforestry systems. In this agroforestry system, an area is planted with a mix of rubber, cacao, durian, salak and other valuable crops. However these systems are minimally managed.

Based on data land cover data in 2000 and 2005, forest land use/cover has not changed much between the two periods. The area remains dominated by forest (4000 sq.km) and agroforest (2500 sq.km) (see Figure 1). Local communities make extensive use of both of these land use systems.



Figures1 Batang Toru Land use/cover change 2000 - 2005

MATERIALS AND METHODS

The first field survey under the project was conducted in October 2005, in the three districts Batang Toru area. The survey was designed to obtain detailed information about agroforest system, socio-economic condition, livelihoods activities, market information, and orangutan habitat information. The NTFPs data collected from key information from each village was calculated in terms of rupiah per month. Additional economic data was obtained from the districts government.

RESULTS AND DISCUSSIONS

Documentation Strategies

The development process of local documentation strategy for key villages in Batang Toru area was guided by ICRAF/Winrock staff stationed at the site augmented by other specialists visiting periodically from Bogor. Local documentation strategies integrated four key scientific and conservation concepts:

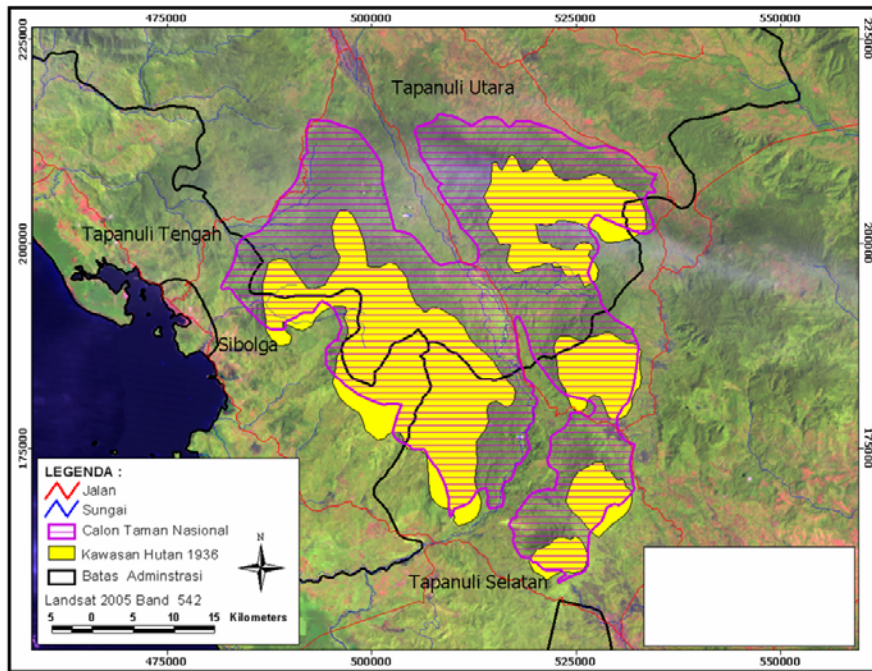
- Recognition of communities traditional role in conserving natural resources;
- Recognition that local agricultural/forest livelihood systems are compatible with environmental conservation;
- Strengthening communities and stakeholders understanding/commitment to conservation as an approach to protect the environmental services (biodiversity, watersheds and carbon stocks); and
- Identify/provide technical assistance on management and marketing to enable communities to enhance the productivity/profitability of NTFPs in their agroforestry livelihood systems.

To be successful, local documentation strategies need to be socialization to all stakeholders, especially those in local communities. Hence, local communities were the number one key audience for the strategy. To do this effectively, an integrated training was developed and implemented that matched the conservation and livelihood focus for the strategies.

Rapid Land Tenure Assessment

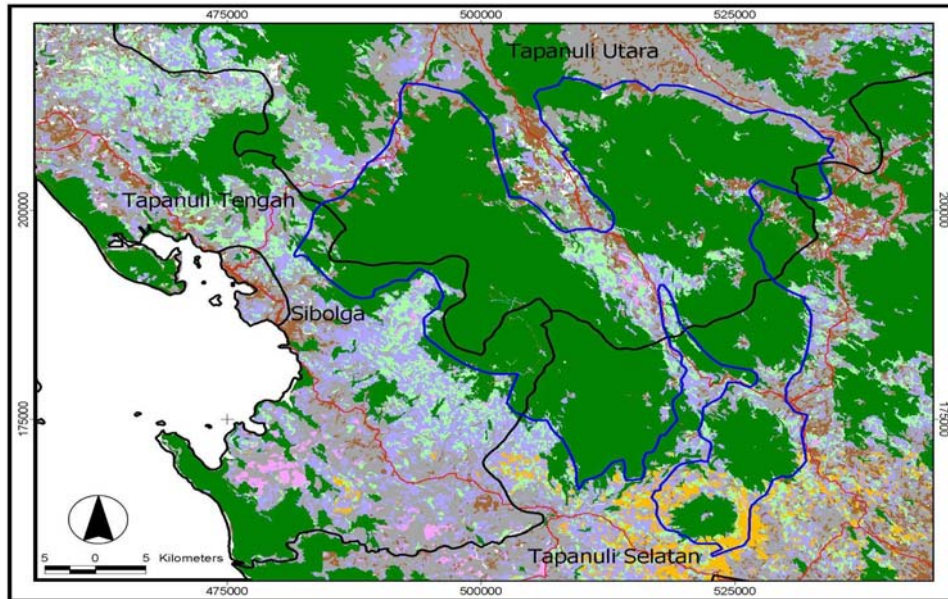
To recognize the local community's traditional role in conserving natural resources the Rapid Land Tenure Assessment (RATA) method was used to document historic land tenure, land use, related issues and policy options to resolve conflicts (Galudra et al, 2006).

Recently, some government agencies with international and local NGO's proposed a national park in Batang Toru Watershed to conserve and protect the habitat of orangutan (Perbatakusuma, 2006). This proposal reflects the assumption that the main threat to the habitat is deforestation. Each year, the North Sumatra Province lost about about 71,000 ha of forest. It is assumed that the Batang Toru Watershed area has experienced or is threatened by a similar loss of forest/habitat that would threaten local orangutan population (Wich and Geurts, 2002). However, site specific research in and surrounding Batang Toru shows that local communities help protect the forest and conservation areas, if their traditional land tenure is recognized. These results support a dynamic policy option regarding the best way to conserve and protect the orangutan habitat; reward those stakeholders who demonstrate a tradition and ability to practice effective conservation. Recognition of traditional tenure claims is seen as more effective than the proposing a national park, which is threatening to local communities as they have been left out of discussions and their priorities/needs not considered. In additional, legally status of Batang Toru state forestland is uncertain as not all of the area has been delineated and gazette according to forest laws/regulations (include the specific law). Since 1936, only half of the Batang Toru Watershed has been gazetted as state forest land (Picture 2).



Picture2. Map of Forest status in 1936 (overlapping with landsat image 2005)

Although the government claims the area as state forestland through Minister Decree No. 44/2006, local communities also have valid tenure claims under adat law. Batang Toru community's also known as traditional communities which still adopted and practiced the adat role for cultures and land use claims (ICRAF observed, 2006). Picture 3 shows that 32,573 ha of the state forestland have been used by the local communities since 1930's and should be classified as agroforestry. Over half of this area (17,392 ha) *customary land use rights* have already been legally recognized by the National Land Agency. However forest authorities refuse to recognize these customary rights and the Land Agency's jurisdiction. Current efforts to enhance orangutan conservation in the area need to consider the views of the local stakeholders who are the *de facto* managers and protectors of the Batang Toru forest. By ignoring valid local claims, particularly from conservation minded communities, forest authorities risk an escalation of tension and possible conflict that may make non-participatory, non-transparent conservation efforts counter-productive (van Noordwijk, 2006).



Picture 3. Tenurial map of Batang Toru

Smallholder Tree Based Farming Systems

In Batang Toru area, NTFP products are correlated with the smallholder tree-based farming system and the forest itself. The tree-based farming systems were characterized by limited proactive management and planning. Tree-based farming systems are managed on a traditionally extractive basis; few inputs (quality germplasm, fertilizers, labor, etc) are allocated to these systems. Spacing is irregular and species components often primarily the result of chance. Harvesting products is often the most common management activity, with minimal weeding to control herbaceous and woody competition (Manurung *et al.*, 2006). As a result, the quality and quantity of products may be far below the systems' potential. Farmers often occupy weak positions and are ill prepared to assume an active marketing role. Farmers generally: i) lack access to market information (product demand, specifications and prices); ii) lack understanding of market channels; iii) produce products of unreliable quality and quantity; and iv) rarely engage in grading or processing to improve product quality (and their profit-margin) (Roshetko *et al.*, 2007).

Farmers are interested in intensifying the management of their tree-based farming systems, but hesitate because they do not know where and how to focus their efforts (Roshetko et al, 2007). Resource scarcity, absence of knowledge regarding propagation and management, and limited access of market and governments' policy disincentives/ambiguities are the limited factors for farmers to intensify the management of their tree farming systems (Tolentino *et al.*, 2002; LSU, 2002; and Potter and Lee, 1998). Under conditions of insecure land tenure and market access, smallholder farmers can not and will not cultivate a wide range of tree species as a component of their efficient, integrated and risk-averse livelihood and land-use systems and will not effectively respond to the increased demand for wood products (van Noordwijk *et al.*, 2003).

Mobilizing the self-strengthen of community-based forest management can be initiated through developing a replicable and efficient extension approach designed to reach motivated and innovative farmers who are committed to improve their incomes and environmental services by increasing the production and market access for their agroforestry products (Roshetko et al, 2007). The extension approach is based on providing a series of workshop trainings to farmer leaders and more intensive follow up assistances to farmer groups that these leaders have helped to organize agroforest productivity enhancement and marketing. Below is NTFPs products in Batang Toru that harvest their agroforest.

Table1. Types of NTFPs products in the Batang Toru area

No	Plant species	Utilization		Comment
		Products selling	Subsistence	
1	<i>Arenga pinnata (aren)</i>	Brown sugar	Thatch	Farmer produces brown sugar and directly sells it in local markets
2	<i>Hevea brasiliensis (rubber)</i>	Latex	Fuel wood	Farmer produce rubber and sell it weekly in local markets
3	<i>Coffea Robusta (coffee)</i>	Fruit	Fuel wood	Farmer produce coffee and directly sells it in local markets
4	<i>Durio zibethinus (durian)</i>	Fruit	Wood	Farmer produce durian in mixed gardens, agroforests, and forests, for sale in local markets
5	<i>Parkia speciosa (petai)</i>	Fruit	Fruit	Farmer produce petai in mixed forests, agroforests and forest's for sale in local markets
6	<i>Styrax benzoin (benzoin)</i>	Resin	Fuel wood	Current production is low due to low market demand and price
7	<i>Cinnamomum burmanii (Cinnamon)</i>	Bark	Fuel wood	Farmer produce cinnamon and sell it in local markets
8	<i>Lansium domesticum (duku)</i>	Fruit	Fruit	Farmer produce duku and sell it in local markets

Source: Interview with farmers

Improvement of Local Marketing Systems

Cash income from NTFP can represent a substantial part of farmers' income. Effective and suitable marketing options can help farmers maximize their income from these products and keep income predictably stable. Sound marketing can also reduce the risk of market over-supply, which drive downs the product price. Batang Toru watershed provides a lot of valuable NTFPs. Some of the NTFP products have economic value but are traded in small irregular quantities with low prices received by the farmer producer/collector. In Indonesia, most

smallholder farmers have poor market knowledge and linkages (Roshetko and Yulianti 2002). This is true NTFPs, in Batang Toru as illustrated by the case of sugar palm. Project surveys and interview with farmers demonstrate a higher demand than supply for sugar palm, indicating sugar palm holds great potential for communities with established palm gardens. The market prefers small-sized units (500 -1000 grams) of sugar palm, however process sugar palm in larger-sized units (>10 kg). Color and packaging also influenced trader preference and price for sugar palm, but most farmers do not consider these factors either when processing their sugar palm. Farmers prefer to stay with their standard practices due to their uncertain market intelligence. Key NTFP products from the Batang Toru area are shown in Figure 2. Rubber makes the biggest contribution for the household income (40%) followed by durian (18%) and coffee (17%). Cacao (9%) and beetle nut (7%) are the next biggest contributors to household income. All five products are produced in both mixed gardens and agroforests.

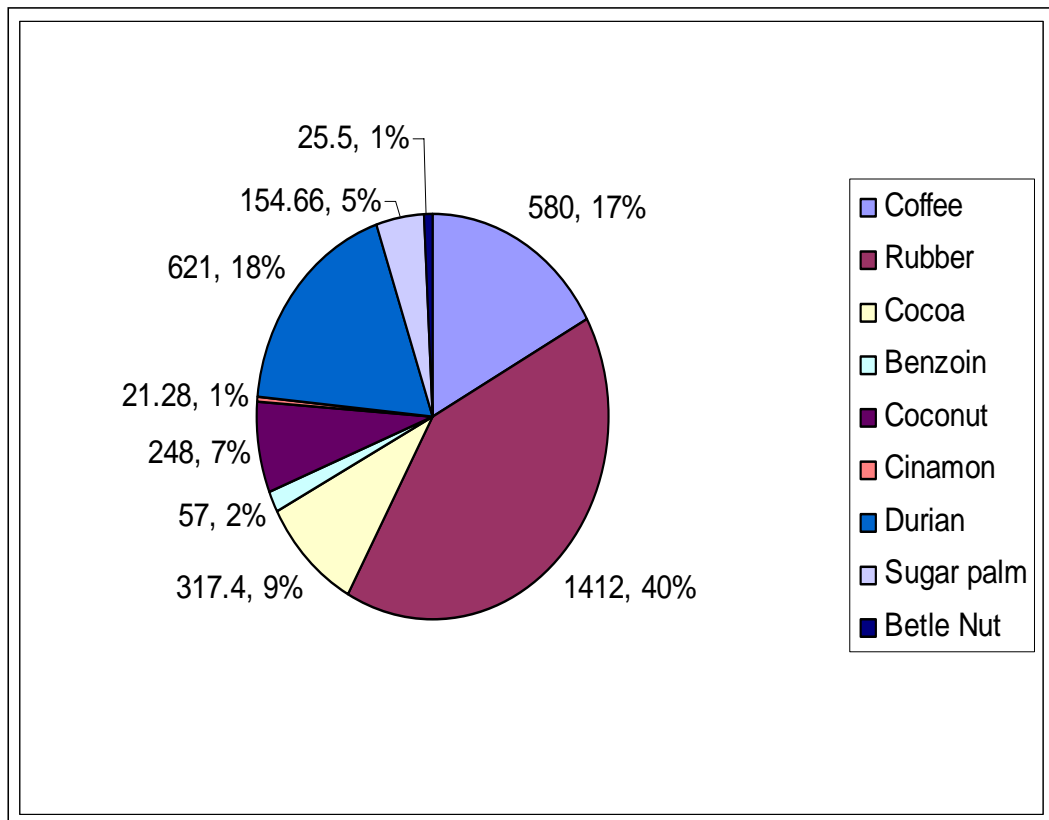


Figure 2. Income percentage from NTFPs within three districts

As is true across Indonesia (Roshetko and Yulianti 2002) the primary marketing problems faced by local farmers is a lack of market information regarding market demand and specification, price changing, quantity and quality required and market channel. These constraints can be drastically reduced if farmers develop/maintain accurate market information and use that information to create marketing strategies to enhance their market access and role. A good market information systems identifies opportunities for farmer producers and how to make the products and services available to the consumer in the most desirable and efficient way. By linking NFTP production with market information, farmers can learn what adjustments they must make in the production system to better meet market demand. Through marketing, farmers can increase their options and make better use of their limited resources to earn greater incomes.

CONCLUSION

As a process, the development of NFTP strategy activities is dynamic and is developed based on community needs and environmental conditions. Based on our observations and experiences, the successful development NTFPs strategies requires within the community and with relevant local governments, as well as the application of the following four strategies:

- Recognition of communities traditional role in conserving natural resources;
- Recognition that local agricultural/forest livelihood systems are compatible with environmental conservation;
- Strengthening communities and stakeholders understanding/commitment to conservation as an approach to protect the environmental services (biodiversity, watersheds and carbon stocks); and

- Identify/provide technical assistance on management and marketing to enable communities to enhance the productivity/profitability of NTFPs in their agroforestry livelihood systems.

The NTFPs strategies recently developed by ICRAF in collaboration with Winrock International have placed major attention on local capacity building as an approach to improve technical/marketing skills and more closely link, and even merge, livelihoods and conservation activities/attitudes at the village level. Through this approach we hope to: i) improve productivity/profitability of smallholder agroforestry systems, and ii) draw attention to Batang Toru farmers' long successful history of forest conservation making possible recognition and rewards for the valuable environmental services communities provide. Although still new, these efforts show positive impact and further promise. Improved awareness of local people to use better rubber seeds, giving more attention to better manage their agroforests and the value of farmer groups are an example of the impact of our strategies. These strategies also gives further promises related to the impact, especially impacts on marketing and knowledge regarding to how farmers merged conservation and livelihoods issues together.

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