



Balai Penelitian Teknologi Hasil Hutan Bukan Kayu



Dinas Kehutanan Provinsi NTB



World Agroforestry Centre

# SERTIFIKAT

*Diberikan Kepada:*

*Muktasam*

*Sebagai*

*Pemakalah*

**pada acara SEMINAR NASIONAL dalam rangka Sewindu BPTHHBK Mataram  
"Pengarusutamaan Hasil Litbang Lingkungan Hidup dan Kehutanan  
sebagai Lokomotif Pembangunan Berkelanjutan"**

**Mataram, 1 Oktober 2015**



# Value Chain Analysis of Non-Timber Forest Products and Strategic Interventions to Improve the Smallholder Livelihood: Lessons Learned from Sumbawa – West Nusa Tenggara Province, Indonesia<sup>1</sup>

Muktasam, A\*., Amiruddin\*, Efendy\*, dan Aulia Perdana\*\*

\*Lecturer at the Faculty of Agriculture – The University of Mataram

\*\*Marketing researcher at ICRAF

## Abstract

Poverty remains as an important issue of West Nusa Tenggara province. Data on poverty incidence indicate that in 2005 about 21% of the population living below the poverty line. By September 2014, the poverty incidence decreased to 17%. Various development programs have been promoted to improve the situation including community forestry program (Hutan Kemasyarakatan). Some studies have been done to understand the impacts this program, and most concluded for their limited roles in improving the smallholder livelihoods. On the basis of this argument, a study on timber and non-timber forest product production and marketing strategies has been conducted in Sumbawa since 2013. The findings of this study are presented and discussed in this paper. Using multi-stages data collection approaches (scoping studies, household survey, market survey, and focus group discussion) and value chain analysis, the results of this study indicate some constraints along the Non-Timber Forest Product value chains. Gaps in smallholders' knowledge, attitudes, skills, and practices are identified, and alternative interventions are provided to improve the value chain performance. Capacity building activities are needed to improve farmers' knowledge and skills, and to change their attitudes, aspirations and practices which in turn will improve their social, economic and environmental conditions.

**Key words:** Value, chain, livelihood, improvement, interventions

## Abstrak

Kemiskinan masih menjadi isu penting di Nusa Tenggara Barat (NTB). Data menunjukkan bahwa di tahun 2005 sekitar 21% dari penduduk NTB hidup di bawah garis kemiskinan. Data Badan Pusat Statistik (BPS) menunjukkan bahwa pada September 2014, tingkat kemiskinan turun menjadi 17%. Sejumlah program pembangunan telah dilakukan dalam rangka memperbaiki situasi, termasuk Program Hutan Kemasyarakatan (HKm). Beberapa penelitian telah dilakukan guna mengetahui dampak atau pengaruh dari program ini, namun kebanyakan menyimpulkan bahwa program-program pembangunan yang dilaksanakan memberikan pengaruh yang terbatas dalam memperbaiki kondisi penghidupan masyarakat. Atas dasar alasan ini, maka sejak tahun 2013 telah dilakukan kegiatan penelitian tentang pengembangan produksi dan pemasaran kayu dan hasil hutan bukan kayu (HHBK) bagi upaya peningkatan penghidupan masyarakat pedesaan. Hasil penelitian ini disajikan dan dibahas dalam tulisan atau paper ini. Dengan menggunakan pendekatan multi-stages data collection (scoping studies, survei rumah tangga, survei pasar, dan focus group discussion) dan analisis rantai nilai, hasil penelitian ini menunjukkan adanya sejumlah kendala atau constraints di sepanjang rantai nilai HHBK. Gaps atau distorsi teridentifikasi di sepanjang rantai nilai dalam hal pengetahuan, sikap, ketrampilan, dan praktek atau tindakan, dan alternatif intervensi diajukan dalam rangka mengurangi gaps – memperbaiki kinerja rantai nilai. Kegiatan penguatan kapasitas diperlukan untuk meningkatkan pengetahuan dan ketrampilan serta untuk merubah aspirasi, dan praktek, yang pada akhirnya akan mendukung bagi terwujudnya penghidupan yang lebih baik bagi masyarakat.

**Kata Kunci:** Rantai, nilai, penghidupan, perbaikan, intervensi

---

<sup>1</sup> An article presented at "Seminar Nasional Sewindu BPTHBK", Lombok Raya – Mataram, 1st October 2015.

## **Introduction**

Poverty remains as important issues in West Nusa Tenggara. Data on poverty incidence indicate that in 2005 about 21% of the population living below the poverty line. By September 2014, the poverty incidence decreased to 17%. There have been various development programs promoted to reduce these poverty incidences for the last two decades such as IDT program, PNPM Mandiri Pedesaan, community and social forestry programs, and others, however, they are fail to reduce the poverty level substantially.

Forest degradation has been the case and issue that is associated with poverty and lack of employment at the rural areas (Muktasam, at.al., 2003). Due to the poverty, farmers and villagers were forced to do illegal logging and encroach forest land for agriculture and other activities. Data reveal that in 2007, the total size of degraded forest land in West Nusa Tenggara was about 305.732 ha and decreased to 91.859 ha in 2011 (Dinas Kehutan NTB, 2013).

Forest and land rehabilitation movement (Gerhan) as an approach to address the degradation issues has been started since 2005 in West Nusa Tenggara. Since then, a total of 56,337 ha degraded land has been tackled. About 17.898.634 trees had been planted in 2010, and 35.560.415 trees planted in 2011, covering both forest and non-forest land.

Effective management of Non-timber Forest Products (NTFP) is a potential intervention to address poverty and forest degradation issues. Various studies highlight the critical roles of NTFP for the poor (Jodha 1986; Hecht *et al.* 1988; Falconer 1992). Neumann and Hirsch (2000) concluded that the poorest segments of societies around the world are the populations principally engaged in NTFP extraction. Three reasons justify the link (1) NTFP extraction generally requires very little capital investment, (2) tropical forests tend to be occupied or surrounded by the poorest, most economically marginalised segments of society, and (3) the absence of alternative income sources. Candlenut (*Aleurites moluccana*), bamboo, honey, ratan, and gaharu have been identified as the first five important NTFP for the poor and rural communities in NTB (Dishut Provinsi NTB, 2013).

Key research questions proposed in this value chain studies are (1) how farmers or smallholders produce and market their non-timber forest products? (2) What are the constraints of the existing non-timber forest product value chains that influence NTFP roles for the poor? (3) What are the interventions that are needed to improve the value chain performance and also to improve the livelihood of the smallholders. This article discuss the

value chain of the main NTFPs such as *candlenut, honey, and medicinal plants* such as ginger and tumeric.

### **Research Methodology**

Quantitative and qualitative research methods (Creswell, 1994) were used for this *action research*. Multi-stages data collection was conducted from 2013 to 2014 that consist of *scoping studies, household survey, market survey, and participatory mapping* for the value chains. *Field observation, in-depth interviews, structure interviews, and focus group discussions* were used for data collection.

The study was conducted at Batudulang and Pelat villages – Sumbawa, and these research sites were selected purposively due to their position to the forest and the characteristics of their population. Batudulang village is located at the border of protected forest and its population tend to depend strongly on the forest while Pelat village is located at a bit far from the forest, but its population mostly growing teak in their farms.

Primary data was obtained from village households/farmers, collectors, NTFP traders, NTFP processing business, extension agents, and policy makers. Secondary data was collected from village monographs, local bureau of statistic, and related government offices such as district planning agency, forestry office, and office of trade, industry and cooperative.

Snow-ball technique was applied to investigate the key players and their activities along the NTFP value chains and to understand the flow of the products from farmers to the final customers, and the flow of information from customers to farmers.

Key variables measured for the value chain analysis are core processes, actors, activities/practices, gaps in knowledge/attitudes/skills/aspiration, cost/volume/price, and perceptions of value chain constraints and alternative interventions (M4P, 2008). Data collected were analysed using quantitative and qualitative analysis.

### **Results and Discussion**

**Selected NTFP Species for Value Chain Analysis:** The results of scoping studies, household survey, and focus group discussions provide a range of data and information on several important non timber forest product species grown, harvested, used and or sold by the smallholders at the study sites – Batudulang and Pelat villages – see Table 1.

Table 1. Six Important NTFPs Identified for Batudulang and Pelat Villages (FGD Results)

Batudulang		Pelat	
NTFP Species	Value (Score x Weigh)	NTFP Species	Value (Score x Weigh)
(1) Honey	1449	(1) Asam	477
(2) Coffee	1337	(2) Kunyit	420
(3) Candlenut	1253	(3) Temulawak	298
(4) Ginger	1196	(4) Bambu	175
(5) Tumeric	967		
(6) Tai angin (local name)	694		

These FGD results are consistent with the results of in-depth interview and observation in which the same NTFPs were highlighted such as *honey, candlenut, coffee*<sup>2</sup>; *ginger, and tumeric. Ketak and tai Angin*\*\* (Usnea, extracted non-timber forest product used for drugs or medicine) are the other NTFP species harvested and extracted from the forest, however according to the local villagers, selling others is better of then selling a bunch of ketak (100 units) where it is sold only IDR.5000, while harvesting tai angin may lead to forest degradation as farmers cut the trees to get the product. The discussion in this paper focus on these 3 NTFP species, namely candlenut, honey, and medicinal plants (ginger and tumeric)..

### The Existing Value Chains of the Selected NTFPs

***Candlenut (production and marketing practices)***: Participatory mapping of candlenut marketing reveals that the actors of candlenut producing and marketing are *farmers, village collectors, Sumbawa traders, Lombok processors, and Lombok retailers* –Figure 1. There are three chains of candlenut marketing found in this study, namely (1) *farmers →Sumbawa retailers →customers*, (2) *farmers →customers*, and (3) *farmers →village collectors →inter-island traders →Lombok traders →retailers →customers*. However, the third is the main chain for the candlenut marketing where about 90% of the total production go through this chain.

<sup>2</sup> Excluded from the analysis as it is not belong to the NTFPs – according to the P35

# CANDLENUT VALUE CHAIN

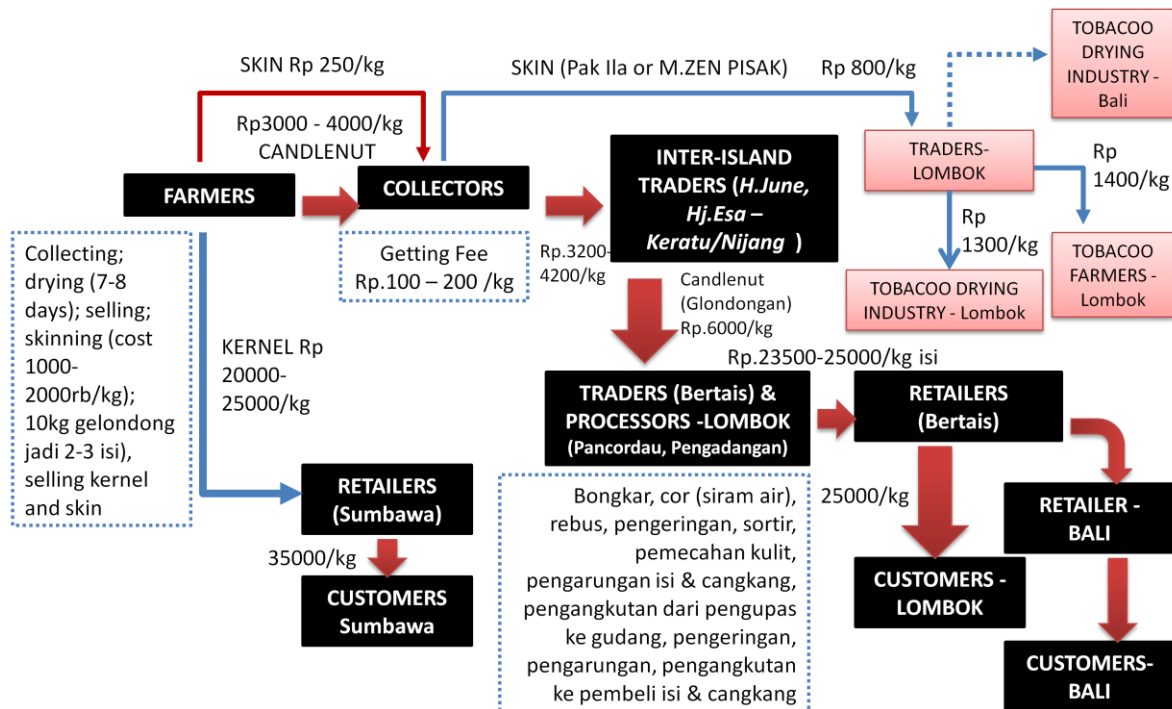


Figure 1. Marketing Chain of Candlenut

The results of the the study highlight that candlenut contributes significantly to the local economy through income generation and job creation. Every household at Batudulang has its own farm and get income from it, while candlenut business (production, processing and marketing) absorb a significant numbers of workers. During the harvesting season (lasted from August to December) every farm employ 3 to 4 collectors to collect the nuts from the ground that paid between IRD. 1000 to IDR. 1,500 per kg.

Farmers mostly sell their candlenut to the village collectors at the price Rp.3000,-to Rp. 4000,-per kg in March to May as the peak season of harvesting (the price could be Rp.6000,- per kg during Agust - October where the supply is limited). The collectors then sell it to Sumbawa traders at Rp. 3200,- to Rp.4200,- per kg with a profit range between Rp.100,- to Rp.200,- per kg. This study confirmed for limited numbers of traders (oligopsony) whom then sell the products to Lombok taders at East Lombok (Apitaik), Central Lombok (Desa Pancordau), and Mataram (at Bertais Market) at Rp. 6000,- per kg. The candlenut then is processed at Pengadangan (Masbagik subdistrict - East Lombok) and Pancordau village (Batukliang subdistrict - Central Lombok) with a processing cost Rp. 50.000,- per 100 kg or Rp.500.000 per ton candlenut. The Lombok candlenut traders get about 260 kg to 320 kg per

ton of raw candlenut. According to the processors, the candlenut from Donggo – Bima district and Narmada – West Lombok district is relatively bigger than Sumbawa candlenut.

The processed candlenut (kernel) at East Lombok is sold in some wet market at Masbagik, Selong, and others, while the processed candlenut from Central Lombok is mostly sold at wet market at Bertais, Central Lombok, West Lombok and Mataram City. Few traders also sell the kernel to Bali. The price of kernel at Bertais range between Rp.23.500,- to Rp.25.000,- per kg (the price could be cheaper when customers buying a sack - 50 kg per sack), then sell to the ordinary customers at a price of Rp. 25.000 – Rp.26.000,- per kg.

Candlenut skin produced by the village households sold at the village level to the collectors at Rp.250,- per kg, and then sell to Lombok traders at about Rp. 800,- per kg. The candlenut skin then sell by the traders to tobacco farmers in Lombok at Rp.1300,- per kg or sell it to Bali customer for tobacco drying industri at a more expensive prices.

**Honey:** Honey is another strategic NTFP for Sumbawa, and especially for Batudulang communities. It is extracted from the surrounding protected forest and from the communities' private land. The honey producers working together in groups to collect honey and they apply local norms such as “those who know first the honey bee nest, then they are the owner and have the right to harvest it<sup>3</sup>”.

The production and the marketing of honey at Batudulang and in Sumbawa in general has been managed well through community groups, farmer cooperative and the Sumbawa forest honey network (Jaringan Madu Hutan Sumbawa or JMHS). Through groups, farmer cooperative and the network, honey is collected, processed, packaged and sold to the final customers and retailer industries and companies.

The success story of honey management and marketing has had critical impacts to the local community, local government, and even at the national and international levels. The head of farmer cooperative who has involved in honey production and marketing even was invited by the national level organisation (Indonesian Forest Honey Network or Jaringan Madu Hutan Indonesia) to share his experience in various honey training events such as in Kalimantan and in Philippine (supported by Swiss Contact), and Kamboja – in the last five years.

---

<sup>3</sup> The harvesting frequency of honey at Pelat range between 1 to 5 times a year while for honey at Batudulang the harvesting frequency range between 2 to 11 times a year.

Geographically, two main areas of honey marketing are identified. First, honey is sold to the nearest market destinations such as Sumbawa, Lombok and Bali which absorb about 30% of Sumbawa honey production. Second, honey is sold to Jakarta and it absorbs about 70% of the production. The value chain analysis reveals the following chains of honey production and marketing:

- (1) Farmers → Collectors → Traders → Retailers → Customers
- (2) Farmers → Collectors → Retailers → Customers
- (3) Farmers → Collectors → Customers
- (4) Farmers → Customers

At it can be seen in Figure 2, honey from Batudulang is sold in different kinds of packages with various volumes. At the village level the honey is sold between Rp.55,000 to Rp.85,000 per bottle while at the customer level the price of the same volume could be Rp.100,000 per bottle.

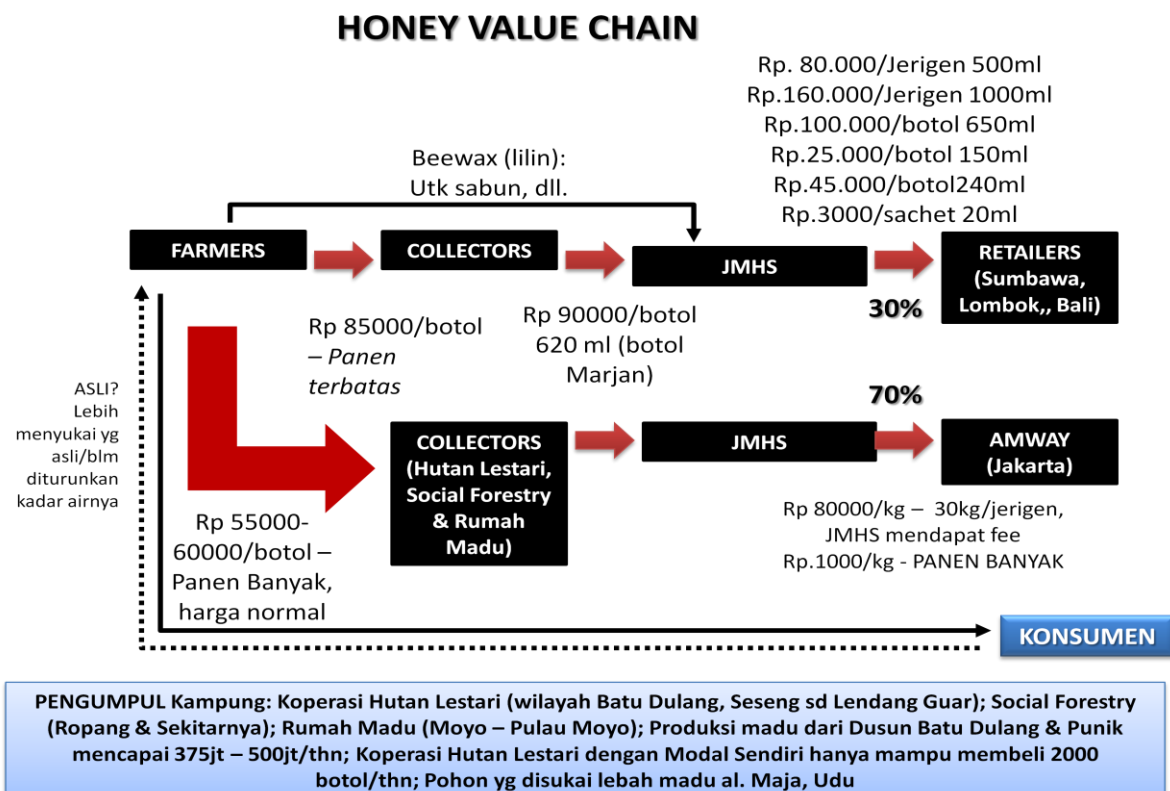


Figure 2. The Marketing Chain of Honey at Batudulang - Sumbawa

**Ginger and Tumeric:** Ginger and tumeric are the other NTFPs that perceived the most importance source of income for the local households. These two medicinal plants are growing



well at the forest and private land, even at the moment are still cultivated in a limited amount. According to the scoping studies and FGD results, one farmer could produce about 12,000 kg tumeric from 2.0 ha of land in 2013 (the case of Pak Junaidi). From this production, about 5 – 6 ton were sold to the collectors with the price of Rp.1600,- per kg while the rest was processed into an instant drink - “Kunyit – Mangkudu”. This farmer also processing his ginger product into instant drink - “Jahe instant”. All these NTFP processing products are sold at the village level as well as at the district level through Galeri UMKM or at “Rumah Madu” outlet belong to the Sumbawa Forest Honey Network. The study confirmed only one household do processing ginger and tumeric and employing 4 – 6 households. The following quotations give further details of the business activities of ginger and tumeric.

**“How many people involved in ginger and tumeric processing? Where do you sell the processing products?”**

*“Only me, but involving 4 – 6 households. We processed the products and then deliver to those households (together with the package and label) to be packaged. Once they finished, then they bring back the final packaged products to me for selling; We sell the products at the village kiosk and to Sumbawa. Sometimes the products are sent to Mataram but not routine – we send it once in 2 to 3 months; We could produce these kinds of product from 200 kg ginger per month while tumeric about 300 kg per month” (an interview with a farmer who is also the head of farmer cooperative)”*

Three value chains were identified in the study, namely: (1) Farmers → Village Collectors → Retailers → Customers; (2) Farmers → Retailers → Customers; and (3) Farmers → Customers, however, the first chain is the most common market chain for this NTFP species – Figure 3.

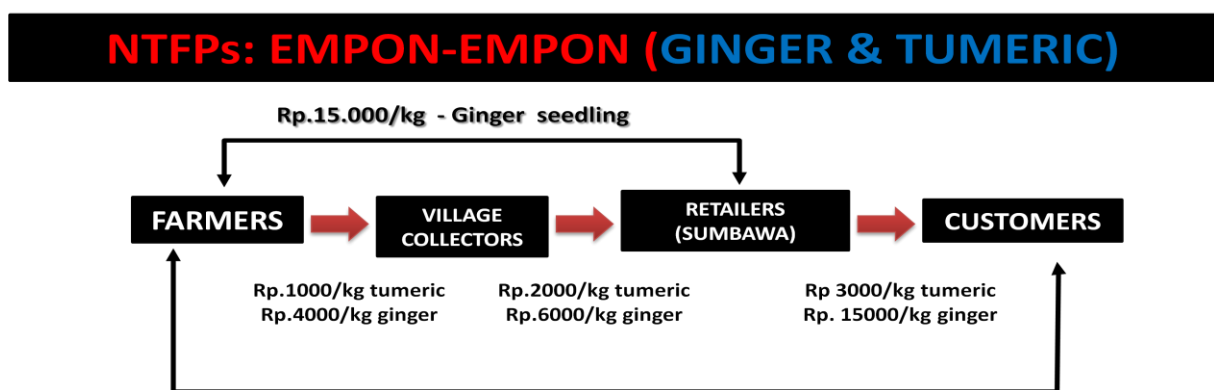


Figure 3. Marketing Chain of Ginger and Tumeric at Batudulang and Pelat

## Identified Constraints and Alternative Interventions

**Identified Constraints:** Identified constraints of NTFP management at *Batudulang* are: (1) *Low and fluctuative price of NTFP*. Farmer cooperative failed to address this issue and therefore farmers are the price takers of their products such as candlenut, coffee, and medicinal plants. The price of liana and usnea is also low where farmers just get Rp.5000,- per bunch (100 units) that make the trading is not interesting<sup>4</sup>. (2) *Farmers were not able to work in partnership with NTFP processed industries* such as PT. Jamu Sidomuncul due their limitation in production. (3) *Farmers' lack of market information on the NTFP price, species, quantity, quality, and the final customers* – including for liana and usnea. (4) *Limited access of local farmers to nursery industries* for fruit trees such as durian, manggis, kelengkeng, rambutan and red ginger. (5) *Limited numbers of local farm households who are processing the NTFPs* where for example only 20% of the village households involved in candlenut processing, and only few households involved in ginger and tumeric processing, and none of the village household processing liana. (6) *Limited use of farm land for intensive cultivation of NTFP* – farmers practicing traditional formof agroforestry. (7) *Lack of extension services and supporting policies* for NTFP production, processing and marketing.

Similar constraints of NTFP management were also found at *Pelat village*: (1) *NTFP development is not the main priority* for the local communiti as they are mostly dependent on food crops such as peanut, casava, and maize. (2) *As results, less intensive use of farm land for NTFP production was found*. Farmers do not apply best managemen practices of their teak plantation, they do not do pruning, thinning and other recommended practices. (3) *Lack of market information* on NTFP price, species, quantity and quality. (4) *Subsistent form of NTFP production*. (5) *Limited and even the absence of extension services and specific policies* to support NTFP development. (6) *None of the local households involved in processing NTFP* into more profitable products such as ginger and tumeric instant drinks.

The same challenges on NTFP management were also identified by Uprety, Y. At.al. (2010) in their research on NTFP at Bardiya District of Nepal. The following six main challenges were discussed: (1) Lack of market information: information on price, quality and quantity demanded, market to sell the product, and the market chain. (2) Limited species-specific information such as availability, distribution, productivity, and regeneration potentials. (3) Lack of infrastructure for storage, value addition and grading of products. (4) Threats to

---

<sup>4</sup> *Dibanding dengan pekerjaan lain, misalnya menjadi buruh tanam dengan upah Rp.60.000,- sehari atau pekerjaan mengupas kemiri dan lainnya.*

NTFPs from over-grazing, deforestation and unsustainable harvesting. (5) Lack of clear policy on collection, trade permits and taxation. (6) Lack of capacity with the communities for the better management of NTFPs.

**Alternative Interventions:** In-line with the identified constraints, Table 2 summarised the intervention options to improve the existing management of NTFPs in Sumbawa, especially at Batudulang and Pelat villages.

Table 2. Constraints and Alternative Interventions to Improve NTFP Management at Batudulang dan Pelat Villages - Sumbawa

<b>Constraints</b>	<b>Alternative Interventions</b>
(1) Low and fluctuative price of NTFP	<ul style="list-style-type: none"> <li>• Improving farmers' capacity in NTFP marketing through human capital development, collective action and marketing, and paradigm shift (market oriented decision making)</li> <li>• Strengthening farmers' financial capital through effective farmer cooperative and lending-saving activities</li> <li>• Promote effective partnership with NTFP processing industries</li> </ul>
(2) Farmers were not able to work in partnership with NTFP processed industries	<ul style="list-style-type: none"> <li>• Improving production system</li> <li>• Establishing NTFP farmer network and or association</li> <li>• Establishing and strengthening farmers' social capital (NTFP groups and network) – following Sumbawa Forest Honey Network or Jaringan Madu Hutan Sumbawa (JMHS)</li> </ul>
(3) Farmers' lack of market information on the NTFP price, species, quantity, quality, and the final customers	<ul style="list-style-type: none"> <li>• Facilitating effective distribution and sharing of market information through effective coordination of value chain actors</li> <li>• Improving the roles of government (the local office of trade and industry) in disseminating market information</li> </ul>
(4) Limited access of local farmers to nursery industries	<ul style="list-style-type: none"> <li>• Improving farmers' capacity in nursery industry – training and study visit</li> <li>• Facilitating network with nursery industry</li> </ul>
(5) Limited numbers of local farm households who are processing the NTFPs	<ul style="list-style-type: none"> <li>• Introducing NTFP processing technologies</li> <li>• Capacity building activities through training, extension, and study visit</li> </ul>
(6) Limited use of farm land for intensive cultivation of NTFP	<ul style="list-style-type: none"> <li>• Developing and introducing best agroforestry practices</li> <li>• Research and development on the local specific agroforestry system</li> </ul>
(7) Lack of extension services	<ul style="list-style-type: none"> <li>• Improving the capacity of extension organisations and their field extension agents</li> <li>• Develop a share vision among NTFP stakeholders about the importance of NTFP for local household economy</li> </ul>

The success story of NTFP management through agroforestry development in Thailand (Muktasam, A. 2004) highlight the critical roles of rural communities through their critical awareness of the local situation, the external challenges, and the importance of collective actions through groups and network.

## **Conclusions and Recommendation**

**Conclusions:** More variative NTFP were found in Batudulang compared to the limited species of NTFP as Pelat village. Some important NTFP found at Batudulang are *kemiri, kopi, dan empon-empon seperti jahe dan kunyit, madu, ketak, rotan dan bambu* that are harvested and or extracted from their garden and the surrounding protected forest. The study found that Batudulang population has been strongly dependent on the NTFP compared to the Pelat population, especially candlenut, coffee, and medicinal plants such as ginger and tumeric.

Value chain analysis also highlight the more advance chains of NTFP found at Batudulang. NTFPs from this village have been sold and transported not only to the local markets in Sumbawa, but also to Lombok, Bali, and Java/Jakarta, especialy for honey. Business organisations such as community groups, farmer cooperative, and honey network are exist and play their roles.

Several constraints found to restrict the roles of NTFPs for local community livelihood improvement such as low and fluctuated NTFP price, lack of market information, limited roles of extension, less optimum use of space and land, and the lack of capacity of local community and their cooperative to meet industrial demand.

**Recommendations:** The following suggestion are proposed to improve the existing NTFP value chain performance:

- (1) District level workshop is needed to share the findings with all key NTFP stakeholders. It is expected that by improving their awareness and knowledge on the critical roles of NTFP they could take action to improve the situation.
- (2) Capacity building activities are needed to address all identified constraints, both ath agency level as well as at the community level.
- (3) Effective extension should be promoted to help NTFP producers and or extractors improve their knowledge, attitudes, skills and practices which in turn lead to the adoption of best management practices of NTFP in Sumbawa.

## **Acknowledgements**

We are grateful to the local communities of Batudulang and Pelat villages, and the local government for providing valuable supports, data and indormation during the studies. We also thanks to the support given by the ACIAR forestry programs, ICRAF, CIFOR, FORDA, and WWF. We are also thankful to the anonymous reviewers for their helpful comments on earlier versions of the paper.

## References

- Creswell. J. W. 1994. *Research Design Qualitative and Quantitative Approaches*. London: SAGE Publications.
- Falconer, J. 1992 A study of the non-timber forest products of Ghana's forest zone. *In: Cousell, S. and Rice, T. (eds.) The rainforest harvest: Sustainable strategies for saving the tropical forests?*, 135-41. Friends of the Earth, London.
- Hecht, S.B., Anderson, A.B. and May, P. 1988 The subsidy from nature: shifting cultivation, successional palm forests, and rural development. *Human Organization* 47: 25-35.
- Jodha, N.S. 1986 Common property resources and rural poor in dry regions of India. *Economic and Political Weekly* 21(27): 1169-81.
- M4P (2008). *Making Value Chain Working Better for the Poor: A Tool Book for Practitioners of Value Chain Analysis, Version 3. Making Market Work Better for the Poor (M4P) Project*, UK Department for International Development (DFID). Agricultural Development International: Phnom Penh, Cambodia.
- Muktasam, A. (2004). "A Study of Rural Development in Two Asian Countries: A Benchmarking Process for Best Practices", a paper presented at Fukuoka Japan for the Third Asian Public Intellectual (API) Fellowship Workshop, 30<sup>th</sup> November – 4<sup>th</sup> December 2004).
- Muktasam, A. (2015). *Value Chain Analysis and the Strategic Roles of Extension in Up-Grading the Chain: Lessons Learned from Maize Value Chain Studies In Nusa Tenggara*. A paper (draft) produced for ACIAR publication (in progress for on-line publication).
- Muktasam, A., Amiruddin, Efendy, and Perdana, A. (2015). *Analisis Rantai Nilai dan Model Bisnis Hasil Hutan Kayu dan Hasil Hutan Bukan Kayu di Sumbawa (Objective 2 Report as Part of an ACIAR Project entitled "Development of Timber and Non-timber Forest Products' Production and Market Strategies for Improvement of Smallholders' Livelihoods in Indonesia" – ACIAR Project Number FST/2012/039*.
- Neumann, RP., and Hirsch, E. (2000). *Commercialisation of Non-Timber Forest Products: Review and Analysis of Research*. Center for International Forestry Research: Bogor, Indonesia.
- Oakley, P. (1994). Bottom-up Versus Top-Down: Extension at The Crossroads. *Ceres*, 145(January-February), 16-20.
- Upriyati Y, Boon EK, Poudel RC, Shrestha KK, Rajbhandary S, Ahenkan A, and Tiwari NN 2010. Non-timber Forest Products in Bardiya District of Nepal: Indigenous Use, Trade and Conservation. *Journal of Human Ecology*, 30(3): 143-158 (2010)

\*\*\*