

**ANALYSIS OF WILD HONEY DEVELOPMENT POLICY FOR LOCAL PEOPLE
LIVELIHOODS IMPROVEMENT IN THE SUMBAWA DISTRICT**

**(Analisis Kebijakan Pengembangan Madu Hutan bagi Peningkatan Penghidupan
Masyarakat Lokal di Kabupaten Sumbawa)**

Marcellinus M.B. Utomo,* dan Levina A.G.P

Balai Penelitian dan Pengembangan Teknologi Agroforestry
Jl. Raya Ciamis-Banjar km. 4, Po. BOX. 5, Pamalayan, Kode Pos 46201, Ciamis, Jawa Barat, Indonesia
Telp. +62 265771352; Faks. +62 265775866

Article Info

Article History:

Received 05 May 2017;
received in revised form
12 November 2017;
accepted 05 January
2018.

Available online since
27 March 2018

Keywords:

Development
Honey
Sumbawa
Improvement
Livelihood

ABSTRACT

It has been more than five years Sumbawa becomes the center of wild honey development by Ministry of Environment and Forestry. However, scientific information of its condition is still lacking. This article aims to fill that gap and to discuss the efforts needed in order to make Sumbawan honey more contributes for local people in Sumbawa District. This paper assesses the effectiveness of the Ministry of Environment and Forestry's supporting programs for wild honey development in The Sumbawa District using two indicators: livelihood capital development and problems on the ground accomplished. The results indicate the programs have not yet optimally developed local peoples' livelihood capitals and many problems remain occurred on Sumbawan honey business development. This study suggests that works in these areas should be undertaken simultaneously, and encompasses strengthening contract agreement, both horizontally and vertically, and modifying the direction of current programs.

Kata Kunci:

Pengembangan
Madu
Sumbawa
Peningkatan
Penghidupan

ABSTRAK

Telah lebih dari lima tahun Kabupaten Sumbawa dijadikan sentra pengembangan madu hutan oleh Kementerian Lingkungan Hidup dan Kehutanan. Namun demikian, informasi ilmiah tentang kondisi perlebahan di Kabupaten Sumbawa masih terbatas. Artikel ini bertujuan untuk mengisi kekosongan tersebut dan secara lebih detail membahas tentang upaya-upaya yang diperlukan agar madu hutan Sumbawa mampu lebih berkontribusi bagi masyarakat lokal. Dengan menggunakan dua indikator, yaitu pengembangan aset/modal penghidupan dan permasalahan yang telah berhasil terselesaikan, artikel ini menilai efektifitas program-program pendukung bagi pengembangan madu hutan di Kabupaten Sumbawa oleh Kementerian Lingkungan Hidup dan Kehutanan. Hasil studi ini mengindikasikan bahwa program-program selama ini masih belum secara optimal mengembangkan aset-aset penghidupan masyarakat lokal dan masih banyak masalah dalam pengembangan bisnis madu Sumbawa. Studi ini menyarankan bahwa pekerjaan di area ini harus dikerjakan secara simultan, dan meliputi penguatan kontraktualisasi baik secara horizontal maupun vertikal, dan memodifikasi arah atau pendekatan program yang ada saat ini.

* Corresponding author. Tel.: +62 87826266500
E-mail address: marcell.utomo@gmail.com (M.M.B. Utomo)

I. INTRODUCTION

Around 1.6 million people in the world rely on forest resources for their livelihoods, with 75% of them living in extreme poverty (World Bank, 2001 in FAO, 2006). Poor households often utilize non-timber forest products (hereinafter NTFPs) as resources for subsistence (FAO, 2006). Non-timber forest products are defined as those that “consist of goods of biological origin other than wood that are derived from forests, other wooded land and trees outside forests – edible nuts, mushrooms, fruits, herbs, spices and condiments, aromatic plants, game, fibers, resins, gums, and other plant and animal products” (FAO, 1999: pp. 63).

In Indonesia, the central Government has stipulated six superior NTFPs. These are honey, agar wood, beauty leaf, silk, bamboo, and rattan. The purpose of the stipulation is to focus the Government’s support on the business development of these products. To do this, the central Government chooses a certain geographical area in which it will support the development of each product. These areas are called “clusters” and are chosen on the basis of economic criteria, social, biophysical and environmental values, institutional situation, and the advance of technology (Directorate Forestry Utilization Development, 2012). The Ministry of Environment and Forestry (hereinafter MoEF) is the agency within the Government responsible for giving effect to this policy. The cluster for honey production is Sumbawa District, West Nusa Tenggara Province, where honey is collected from the wild.

The wild honey mostly comes from *Apis dorsata*, a giant Asian honeybee species, which remains undomesticated because of its ferocious characteristic. This honeybee species lives in a colony, which a big colony builds a large beehive (more than 70 cm in length). The practice of honey hunting has been running for a long time ago. The reaping process of honey mostly requires an experienced climber and usually needs customary ritual before reaping started. In 2010 and 2011 alone, at least 10 tons of honey produced and marketed in Sumbawa annually. This indicates that honey must have a role in driving local economy in Sumbawa, especially for those who dwell inside and/or adjacent to forests.

The designation of this cluster means that from 2010, MoEF will implement supporting programs focused on the development of the wild honeybee-based businesses to improve local people livelihoods. In this context, there are five types of capital inherent recognized in the concept of “livelihood” (Figure 1) i.e. human, social, physical, financial, and natural capital (Department for International Development

(DFID), 1999). So far, publications of wild honey with Sumbawa Districts as the focused area are very limited and the recent publications in this field focus on specific topics such as problems faced by honey hunters, water content issue, and market chain (Darmawan & Agustarini, 2012; Nugraheni *et al.*, 2014; Utomo & Wahyuni, 2012; Yumantoko, 2013; Yumantoko & Hasan, 2014; Yumantoko & Utomo, 2014). There is still no publication in livelihood context and more specifically assessing supporting programs from the Government. In general, research of wild honeybee in Indonesia is understudied even though MoEF has put it as a superior NTFP. Most of the international publications of wild honeybee particularly rock bee (*Apis dorsata*) are originated from India (e.g. Demps *et al.*, 2012; Kumar & Reddy, 2014; Sharma, 2008).

This paper aims to fill this gap and this topic is needed because Sumbawa honey dependent people seem to have unimproved livelihoods even though this area has been stipulated as a honeybee national cluster. We argue that issue related to farmers’ capital endowment requires more attention. This paper focuses on assessing the effectiveness of the MoEF’s supporting programs using two indicators i.e. livelihood capital development and problems on the ground accomplishment. We believe Government with its resources could help local people in Sumbawan honey-based business development through improving capitals endowment and solving problems faced by actors in the field. Based on the results of this assessment, it further proposes improvements to current practices. This will be helpful beyond the current cluster because, if this initiative is successful, it could be implemented in other areas with potential for honey production.

II. RESEARCH METHOD

A. Location and Data Collection

The study case is located at the Batudulang Village, Sumbawa District, West Nusa Tenggara Province, Indonesia. Almost all inhabitants of productive age work in the forest-farming sector with candlenut and coffee as the main products (Julmansyah, 2010). Wild honey is also a very important product, but only at particular times of the year. Honey is common because this village has a direct border with Batulanteh forest (Batulanteh Production Forest Management Unit, 2014). The village is also claimed to be the learning center for wild honey management in Eastern Indonesia. After working with an NGO, Batudulang has become one of the most advanced villages in Sumbawa Island in terms of its honey-based business.

Data comprised of primary and secondary data. Primary data were gathered through field

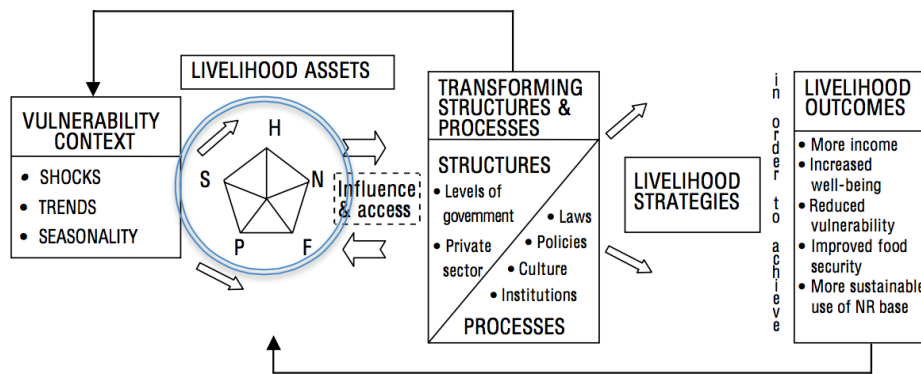


Figure 1. Sustainable Livelihood Framework (Adapted from DFID, 1999)
Gambar 1. Kerangka kerja sumber penghidupan berkelanjutan (Diadaptasi dari DFID, 1999)

observation and key informant interview. Key informants consist of honey collectors, government officials, local leaders in honey business, honey sellers, and some researchers who have conducted studies related to Sumbawan honey. Information including capital endowment owned by farmers/hunters, the current and previous Government's projects, problems occurred on the ground, as well as forms of honey-based business activities were collected. In total, 45 respondents comprised of 30 hunters, 3 cooperative staff, 3 middlemen, 4 government officials, and 5 researchers were interviewed. The fieldworks were conducted in 2010, 2011, and 2015. Purposive sampling approach was used to select the respondent because this is the most common method used by researchers in non-probabilistic sampling (Guest, *et al.*, 2006). To understand the system of honey marketing and actors involved, snowball approach was used. The respondent (the "previous respondent") provides contact information of the next respondent (Noy, 2008). Data reliability depends on the honesty, the truth of the information provided, and competency of the respondents (Tongco, 2007), therefore, how respondents respond and their comfort in answering questions were assessed. The data triangulation was applied in this study. Primary data sources were triangulated, applying the first variation of data triangulation introduced by Denzin (1970). Denzin (1970) divides data triangulation into three variations: (1) time of data collection, (2) place, and (3) from whom data are collected. Lastly, the secondary data were gathered from secondary resources and Government's reports.

B. Data analysis

A value chain analysis theoretical framework from Riisgaard *et al.* (2010) was used to find the aspect(s) required to improve the economic returns of honey collectors. System analysis (Dyball & Newell, 2015) was applied to describe

how the honey market and livelihood capital development are running. To assess the effectiveness of the Government's programs, capital-based classification of the programs was performed to reveal the development of local people's development from time to time. Primary and secondary data were tabulated to identify problems accomplishment. These two results were used as the basis to assess the effectiveness of the Government's programs and analyzed descriptively.

III. RESULT AND DISCUSSION

A. NTFP (honey) and local livelihoods at a glance

NTFPs have socio-cultural importance particularly in tropical countries such as Indonesia (Yadav & Dugaya, 2013). Global concerns about NTFPs arose in the late 1980s and early 1990s, along with increasing concern about environmental issues such as deforestation and rural poverty. There is a relationship between NTFP utilization and poverty alleviation, as NTFPs play an important role in contributing to household income and this has been demonstrated in several countries (e.g., Fu *et al.*, 2009; Mekonnen *et al.*, 2013). NTFPs can open large-scale job opportunities and increase people empowerment particularly for the poorest people in backward regions (Kumar, 2015). In Indonesia, MoEF estimates that around 90% of forest value derives from NTFPs (Forestry Ministerial Decree No. P.21/Menhut-II/2009).

NTFPs are perceived providing many benefits for peoples' livelihoods, however, problems in the field are enormous. Problems such as market constraints, lacking financial support, poor transport facilities, and infrastructure are faced by NTFPs actors throughout the world especially in backward areas (Kar & Jacobson, 2012; Yadav & Misra, 2012). Scholars usually propose solution(s) varies from case to case.

The discourse of negative impacts of NTFP business is still on debate. Some argue that NTFP collection has a negative impact on the environment (Narjes, 2009) and in a sustainable development context, the role of NTFP collection is questionable (Gubbi & MacMillan, 2008). Our object, wild honey, is one of the collected NTFPs. However, we argue that wild honey development, especially in Sumbawa District, is still important for local people empowerment.

B. Stakeholders in Batudulang

There are two groups of honey collectors in Batudulang i.e. those who join the cooperative and those who do not. The cooperative receives assistance from an NGO, in return for a honey business contract. When the cooperative has been able to fulfill the quota of honey in the contract, it can sell the “surplus” honey independently. The cooperative also supports a women’s group. The second group of honey collectors comprises farmers who run honey businesses independently and seek buyers by themselves. Both collector groups are members of the same farmers’ association. However, this farmer group is only active when the Government is implementing projects. Otherwise, the focus of the NGO is only those farmers who are members of the cooperative, and vice versa, whereas the Government seeks to engage with all farmers through the farmers’ association (Figure 2).

In terms of the relationship among local stakeholders in Sumbawa, most of the relationship is just business as usual, except the cooperative. In general, there is still no strong effort to develop the business together and most of the individuals only consider their own interest. Notwithstanding several weaknesses of cooperative regulation, the cooperative has been able to define the rights and obligations of farmers although this breakthrough has not yet accepted by most hunters seemingly caused by cultural constraints.

In 2007, an NGO, the Sumbawa Forest Honey Network (“Jaringan Madu Hutan Sumbawa”, hereinafter SHN) was established. SHN was initiated by a group of people with a similar vision in order to promote Sumbawan honey. Initially, this institution aimed to work with farmers to promote honey to a wider market, whereas in the past, it had only been sold locally, door to door. The role of SHN also developed and expanded to include strengthening local people’s capacity, not only of the honey collectors directly but also that of women’s group producing derivative products, like beeswax and honey soap.

C. Honey Market Chain and Livelihood Capital Development in Batudulang

A system analysis framework was used to illustrate the flow of market chain and the development of livelihood capital (Figure 3). Here, the central capital is natural capital, which consists of forests and honeybee colonies. Actors involved in honey production actually manage this capital.

The lack of continuity in this system is an issue, especially for livelihood capital development (see the left side of Figure 3), while the system of market chains keeps continuing in those patterns (see the right side of Figure 3). Assistance from Forestry Services and NGOs is only incidental to this production system. Therefore, the key to improving local people’s livelihoods from the honey business is not giving them assistance, but ensuring that key actors are able to autonomously harness the benefits of programs to develop their capacity. The two key actors are SHN and the farmer group. SHN tends to be more robust than the farmer group because they have been able to independently find buyers and create a successful business. The farmer group is active only when Government’s programs are running; otherwise, it does not function. In the case of Batudulang, the farmer group does not represent a strong local institution, whereas

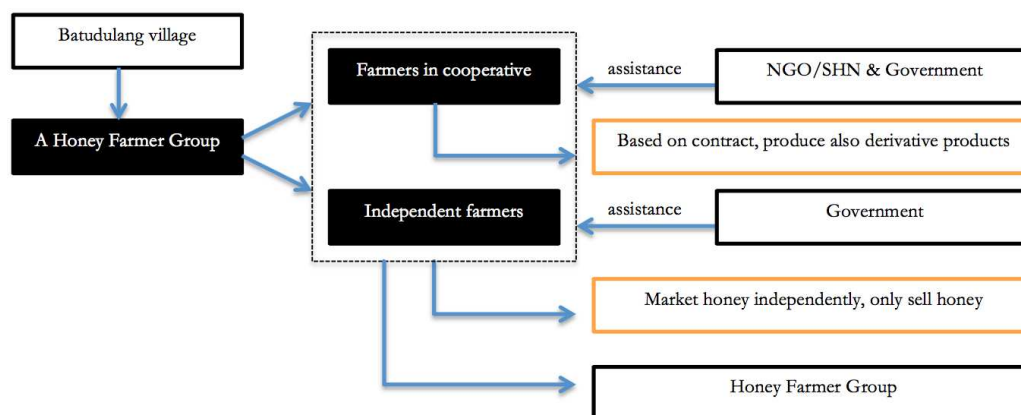


Figure 2. Relationship between honey producer actors in Batudulang
Gambar 2. Hubungan antara para aktor penghasil madu di Batudulang

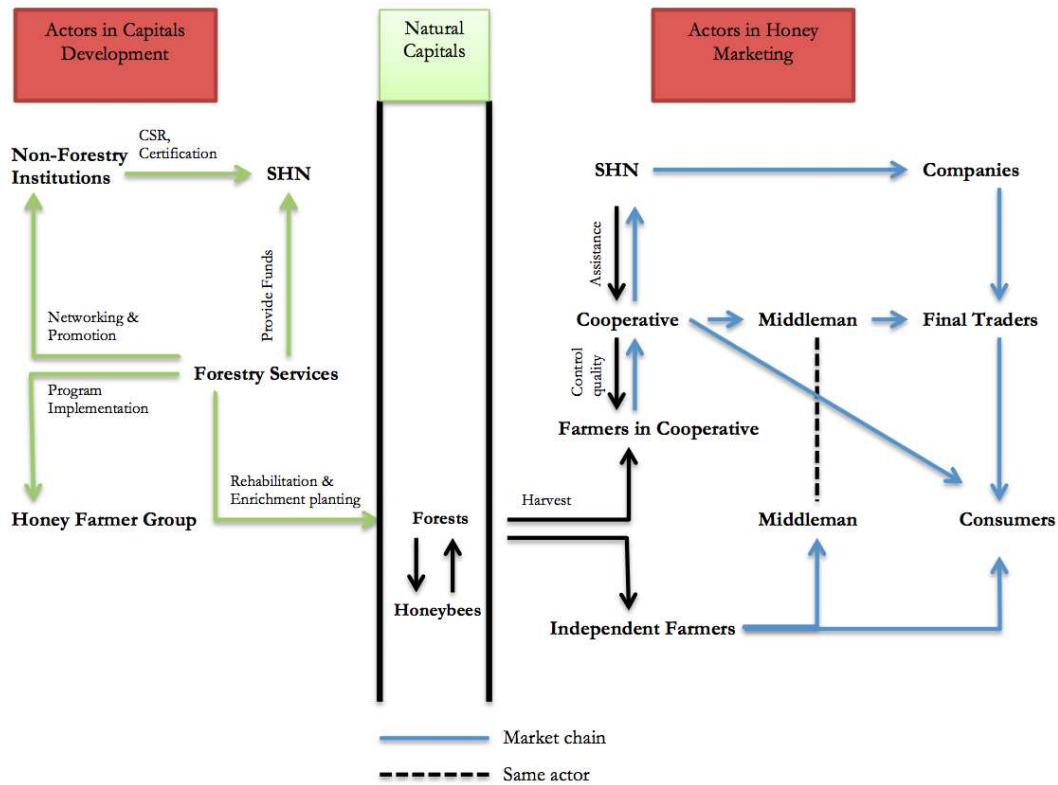


Figure 3. Systems of honey marketing and livelihood capital development in Batudulang
Gambar 3. Sistem perdagangan madu dan pengembangan modal penghidupan di Batudulang

evidence from elsewhere in Indonesia suggests it is actually crucial for livelihood development in rural areas.

In terms of market flow, a business network owned by each actor is influential. Those who have broader networks tend to be easier in honey marketing. As the prices from middlemen or consumers to farmers are based on the negotiation process, we cannot generalize which flow is most beneficial for the seller. However, this direct selling has some drawback because hunters sometimes find difficulties to find consumers. On the other hand, when hunters sell the honey through cooperative, they less worry about the selling process. What they need to do is delivering good quality honey and waiting for the payment from the cooperative. This flow has also some drawbacks in pricing and payment aspects. Hunters tend to get more little income as the buyers pay the honey at a cheaper price compared to the price of direct selling. In addition, in terms of payment aspect, selling honey via cooperative is not reliable when they need a cash as they would be paid when the honey is accepted by the next buyers of the cooperative.

D. Programs for Livelihood Capital Improvement

Before assessing whether the programs in Batudulang are successful or not in developing the

livelihood capital of wild honey producers, it is important to list all programs that have been conducted to support the development of the honey industry. Table 1 and 2 show the actors, description of the program, and the type of capital targeted for improvement.

E. Impacts of Programs for Overcoming Problems Faced by Local People

Based on a communication with a key informant in Sumbawa, there are several problems still occurring with honey production in Batudulang. Table 3 lists the problems before and after implementation of the Government initiative in 2010 to promote livelihood development of wild honey collectors in Sumbawa District. In a global context, obstacles in this sector are not only related to human or hunters but also related to the bees. Oldroyd & Nanork (2009) assert that threats faced by Asian honey bees are deforestation, hunting, loss of nest sites, pests and pathogens, climate change and forest fire, pesticides, street lighting, competition with the introduced species *Apis mellifera*, tourism, and anthropogenic movement. However, those problems are not firmly mentioned during the fieldworks. Respondent mostly mentioned marketing problems. Market constraints are also one of the main problems faced by hunters in India (Klett, 2008).

Table 1. Programs since 2007 to support wild honey business in Batudulang
Tabel 1. Program-program pendukung usaha madu hutan di Batudulang sejak 2007

No.	Year (Tahun)	Description (Deskripsi)	Impact (Dampak)
1.	2007	The SHN was established, as a branch of <i>Jaringan Madu Hutan Indonesia</i> (Indonesia Forest Honey Network), which focuses on wild honey trade.	<ul style="list-style-type: none"> • It is a part of financial and human capital development • Opened new markets for honey collectors (indirectly strengthen financial capital). The SHN negotiates contracts with farmers, including some requirements; especially honey quality. Although not all farmers agree to join this association, it has facilitated farmers to find ways of value-adding especially by producing beeswax.
2.	2010	Sumbawa District was stipulated as the cluster of honeybee development at a national level	<ul style="list-style-type: none"> • It is a part of financial capital development • Wild honey attained more attention, not only by MoEF but also from provincial and district governments. This directly and indirectly opened new markets as indirect promotion and news coverage increased. The attention is given to this industry also attracted the attention of academics and students and corporate social responsibility programs.
3.	2010	The MoEF, through Mataram Forestry Research Agency, built a building to decrease the water content of honey, called drying room. It was fully operational in 2011.	<ul style="list-style-type: none"> • It is a part of physical capital development. • The implementation is not optimal. Farmers rarely used this facility.
4.	2011	Mataram Forestry Research Agency carried out research on operating the drying room so they could produce a manual of standard operating procedures for farmers. It was successful in that it resulted in farmers being able to effectively decrease the water content of their honey.	<ul style="list-style-type: none"> • It is a part of human capital development as the manual provides new knowledge for farmers to operate the equipment. As the usage of this building is not optimal, this finding does not mean a lot for livelihood.
5.	2011	A state-owned enterprise (Indonesia National Bank 46) signed a contract with SHN to supply a ton of honey to Jakarta.	<ul style="list-style-type: none"> • It directly strengthens the financial livelihood of farmers as they have a new customer.
6.	2011	Ministry of Justice and Human Rights stipulated that SHN hold a license allowing them to sell honey using the name Sumbawan Honey	<ul style="list-style-type: none"> • This stipulation has benefits for SHN, but in the meantime, there seems to be a monopoly, as the producers outside SHN have no right to put the "Sumbawan Honey" brand on the packaging. For SHN, it indirectly supports financial capital, because it supports their selling as their packaging will be more convincing for the buyers.
7.	2012	The SHN provides training on how to produce soap from the squeezed honeycomb. The targeted party was a women's group.	<ul style="list-style-type: none"> • This program supported human capital development as it increased the knowledge and skills of women's groups.
8.	2013	The Ministry of Research and Technology funded an action research project to increase farmers' capacity, although actually, it only summarized all prior findings and no new knowledge was gained.	<ul style="list-style-type: none"> • This program actually aims to strengthen social capital, especially in strengthening the local institution. However, it tends to target human capital development because the implementation is only training that covers all aspects of honey management, including sustainable harvesting and hygienic honey squeezing.
9.	2013	Introduction of stingless bee for beekeeping, supported by MoEF	<ul style="list-style-type: none"> • This program failed as the colonies fled away.
10.	2014	Forest rehabilitation upstream of the watershed, using tree species, which are well known as the nesting sites of honeybee colonies, especially <i>Tetramales nudiflora</i> . Forestry service carried out this program.	<ul style="list-style-type: none"> • It supported the natural capital, as honey production cannot be separated from healthy forests.

Table 2. Classification of programs to improve honey-based livelihoods in Batudulang
Tabel 2. Klasifikasi program penunjang penghidupan berbasis madu di Batudulang

Before 2010 (Sebelum 2010)	2010 and subsequently (2010 dan setelahnya)
Human Capital (Aset sumberdaya manusia)	
Sustainable honey harvesting (by SHN)	<ul style="list-style-type: none"> • Knowledge of using drying room (Forestry Service)
Producing Beeswax (by SHN)	<ul style="list-style-type: none"> • Knowledge of producing honey soap (SHN) • Introducing a species of stingless bee for beekeeping (Forestry Service) • Creating more informative and attractive labels (by SHN) • Using more hygienic and attractive honey packaging (by SHN) • Introduced a new honey squeezing approach from squeeze honeycombs by bare hands to drying system. Honeycomb is sliced vertically into two parts and honey will flow out autonomously because of the effect of gravitation. This approach minimizes human hands contact (SHN)
Physical Capital (Aset fisik)	
	<ul style="list-style-type: none"> • Establishment of drying house (Forestry Service) • Providing boxes for beekeeping (Forestry Service)
Natural Capital (Aset alami)	
Forest rehabilitation (Forestry Services)	<ul style="list-style-type: none"> • Enrichment planting with honeybee-nesting-tree species (Forestry Service)
Financial Capital (Aset finansial)	
	<ul style="list-style-type: none"> • Stipulating Sumbawa as a center of honeybee development (Forestry Service) • CSR; honey trading contract (Non-Forestry Governmental Institution) • Issuing certification of geographical indicators of Sumbawan honey (Non-Forestry Governmental Institution)
Social Capital (Aset sosial)	
No program to strengthen local institutions/farmer groups	<ul style="list-style-type: none"> • No program to strengthen local institutions/farmer groups

Table 3. Problems experienced by honey collectors before and after 2010

Tabel 3. Permasalahan yang dihadapi kolektor madu sebelum dan sesudah 2010

Before 2010 (Sebelum 2010)	2010 and subsequently (2010 dan setelahnya)
Problems in the field (Permasalahan di lapangan)	
Unfair trade	Likely to continue, but data uncertain
Not all honey produced is absorbed by market	Likely to continue, but data uncertain
Price of honey was low	Price is increasing
No ownership of honeybees-nesting trees	No change
Unsustainable honey harvesting	No change

While Table 3 indicates that the Government's programs have not addressed all challenges, there have been some improvements to all types of livelihood capital. Therefore, some elements of the program have been useful, particularly the establishment of a drying room, rehabilitation and enrichment planting, and introducing beekeeping. In some cases, beekeeping businesses have been shown to improve standard of living of beekeepers,

especially in rural areas (e.g. Affognon *et al.*, 2015; Chazovachii *et al.*, 2013)

The drying room has allowed farmers to improve the quality of their honey. It also contributes to one type of capital as it promotes high-quality honey. The most important indicator of honey quality is water content. According to the Indonesian National Standard, the maximum water content in honey is 22%. Based on the field observation, as long as the honey is ready to reap, the water content is below 22%. An indicator easily applied for hunters to predict the ripe honey is when honeybees have covered the hexagons of beehives. As honey absorbs the humidity, water content must increase during the storage. The drying room is the most common approach to reduce the water content of honey. Rehabilitation and enrichment planting is also important. Giant honeybee colonies nest in a group, often in the same tree, and they prefer certain tree species. Therefore, by planting more honeybee-nesting trees, farmers can manage the likely location of nest sites; for example, to be nearer to their houses. Tree planting can also support more manageable honey harvesting

between hunters, as plantation ownership is clear. The area of forested land within and around Batudulang is relatively stable (adapted from Global Forest Watch, n.d.), which means that the natural capital represented by forests is not diminishing, although forest quality including for honey production could be improved by replanting. The last program is introducing stingless bee beekeeping. Although this program has not yet been successful, it remains an important part of the Government's initiative, because it offers the opportunity to broaden the scope of honeybee-based business development in the Sumbawa District beyond wild honey. This approach is worthwhile because beekeeping is more manageable than wild honey harvesting, and human intervention within this industry tends to be more measurable.

However, notwithstanding the efforts of the Forestry Service to develop greater resilience at a local level in terms of honey businesses, major problems persist. Interventions do not yet seem to have created a robust wild honey business in Batudulang, or other places in Sumbawa District.

The programs have only apparently had a significant impact on increasing the price of honey (Table 3). Before 2007, the price of each bottle of honey (c. 600 - 620 milliliters) was Rp15,000. In 2007, the price of honey increased to Rp25,000 per bottle. After honey marketing was pooled by SHN, the bargaining power of cooperatives with third parties increased. Today, the honey price per bottle is Rp100,000 - Rp120,000. This situation also benefits independent producers, because they can adjust the price to the price of SHN. The reason for the increase of the price is not only because of SHN but also because Sumbawan honey has become more well known amongst the public; thus, the market is stronger and producers have more networks of buyers. This means they can sell honey at a higher price. It is noteworthy that the current price is relatively cheap compared to honey in supermarkets in cities. More tourists visiting Sumbawa also increase the selling of Sumbawan honey, and more suppliers in cities are choosing to market honey by communicating directly with producers.

Four other problems remain and can be categorized into two major terms related to livelihood capital i.e. financial and social capital issues. Unfair trade and surplus honey production are financial capital issues, and 'no ownership of honeybee-nesting trees' and unsustainable harvesting practices are categorized as social capital issues.

The reasons for the constraints to honey sales are, firstly, that there are a limited number of buyers and, secondly, that the product does not fulfill the market's requirements, especially in

terms of packaging. Both groups of producers (cooperative and independent) experience the constraints of limited buyers, but the packaging limitation is only experienced by independent groups. Another problem in terms of financial capital is a traditional local credit system that persists. This system uses honey as a bartered product. When the farmers need cash to meet the costs of daily necessities, a third party will provide a loan, which the farmer then repay with honey when they have harvested it from the forest. However, although the price paid under this system is relatively low, farmers sometimes do not have a choice but to sell their honey in this way. So far, no official financial institution is willing to provide credit assistance for honey collectors because there is no guarantor for the loan.

In terms of honey harvesting, other collectors are competitors. There is no tradition of collective ownership of trees. Collective ownership is possible; for example, it has been implemented for a long time in a village in another district in Sumbawa Island. The reason behind the successful implementation of collective ownership is that local institutions impose regulations to determine which group has a right to manage and harvest the honey from certain trees, for a defined period (usually a year). Once the local institution has chosen a group, other groups will be in the queue to manage the trees in subsequent years. This system does not exist in Batudulang as there is no strong local institution. Having a strong local institution is also helpful in obliging all farmers to apply sustainable harvesting techniques because people tend to be more obedient if a social sanction awaits them when they break the collective consensus.

F. Value Chain Analysis

Where producers are selling to markets, their livelihood is strongly dependent on the product value chain. Value chain analysis provides an approach to analyze the required interventions in order to create more robust, effective, and sustainable businesses (Riisgaard *et al.*, 2010). Value chain analysis aim to increase the benefits of an actor in a market chain, therefore, the strategy between actors will be different. In terms of honey producers in Batudulang, the benefits that need to be improved are increasing the profit of honeybee-based selling and ensuring all honey produced can be absorbed by the market.

Based on Riisgaard *et al.* (2010), there are three strategies for enhancing value in a market chain for small producers:

1. Improve process, product or volume

Improving the process means making the process more efficient. This includes delivery

schedules, invoicing, reducing wastage, and improving customer management. Improving the product means moving to a more “sophisticated” product, which could involve (for example, by certification) creating value-added products, or better packaging. Volume improvement means increasing the yield.

Applying this strategy to Batudulang honey production, some valued-added products have been produced by some farmers, including soap and beeswax. This is a part of waste management. The cooperative has also adopted more “sophisticated” honey packaging and used a more informative and attractive labeling. They also have a drying room to increase the quality of their honey. The yield of honey is relatively stable, except under extreme conditions such as during extreme rain periods as occurred in 2010 (Mataram Forestry Research Agency, 2010) when the production decrease due to limited flowers/nectar. Unfortunately, so far, as the market cannot absorb all the honey currently collected, increasing yield is not an effective option.

2. Change and/or add functions

This means actors could change their function in the value chain. For example, a farmer could not only be a producer, but also a trader.

Applying this strategy to Batudulang honey production, some farmers will also have roles as honey processors. They prepare the honey before they market it, especially those that join a cooperative. Some farmers also have roles in producing derivative products, like those produced in women’s groups, although these products are often difficult to sell.

3. Improved value chain coordination

A characteristic of commodity transactions in developing countries is that they tend to increase risks and/or reduce the rewards for producers. Therefore, strategies to benefit producers often depend on improving coordination, through vertical and/or horizontal integration.

Vertical integration means, “getting a better deal”; with business contracts for example. There will be an agreement that sets the rights and obligations of producers and buyers. Horizontal integration means there is an agreement among the same actors. For example, all honey collectors in Batudulang agree to join an association or a farmer group to arrange the ownership of tree-nesting sites, look after the continuity of honey production by applying sustainable harvesting, and pool all honey before selling to the agreed buyers. The function of this kind of association is crucial to increase farmers’ bargaining power, and so far, farmer groups in Batudulang have not been able to run this function.

For this reason, institutional change at the local level is required in Sumbawa, as others have noted (e.g. Yumantoko, 2013). This institutional change is probably the main challenge to improving the natural resource-based livelihoods of local people in the case study district. The situation in Sumbawa is different from that described by Riisgaard *et al.* (2010) because the ownership of resources here is equivocal. In the agricultural sector, the subject of Riisgaard *et al.* (2010) study, ownership is based on land ownership, and who owns what is clear. However, in the honey gathering industry currently, access to honey resources is based on competition between hunters. How the Government responds to this situation will be important for the future of the wild honey business in Sumbawa.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

The Sumbawa District is well known for wild honey production; Batudulang is the village that is most successful in developing a honey business. Sumbawa has been identified as a “cluster” for honeybee development in Indonesia. However, challenges to improving honeybee-based livelihoods remain, and it is important to understand how Government’s initiatives could best ease the problems facing the industry. In general, based on two indicators applied, Government’s supporting programs gave fewer effects on local people’s livelihood capitals development and actors in Sumbawan honey business are still experiencing some problems in the field. To sum up, Government’s programs in developing local people’s livelihoods through honey business development need to be improved.

On the basis of value chain analysis and assessment of current programs, the form of capital that needs most development is social capital and in Batudulang, this can be achieved by forming farmer groups. Based on our experience in Sumbawa, farmer group establishment should be initiated by themselves, not by the Government. They must be conscious that farmer group establishment is important to all members. Groups established by the Government tend to rely on the Government’s aids and fail. Farmer groups are important as they minimize the uncertainty of resource ownership, support transformation from traditional business approaches to more modern ones and are able to manage the whole business independently consistent with socio-cultural values. A solid farmer group could improve market organization and initiate product standardization. Here, the Government has a function as a facilitator.

Strengthening the role of farmer groups is one of the three proposed improvements to local honeybee-based livelihood systems. Another improvement is changing from wild honey gathering to beekeeping, because the latter tends to be easier to control and manage, and ownership is clearer. The third improvement is to increase Government intervention in vertical contract agreement. The Government should make a marketing linkage between producers and potential buyers and initiate collective business ownership establishment. Hopefully, by focusing on these improvements, honeybee-based businesses in Sumbawa generally, and particularly in Batudulang, will be improved and provide better and more resilient livelihoods for the people. If this transformation is successful, it could be emulated in other places which in turn strengthening honey production in Indonesia.

B. Suggestion

We suggest three areas of focus to improve local people's livelihoods based on honeybees in Batudulang. Work in these areas should be undertaken simultaneously. The first and second areas are strengthening contract agreement both horizontally and vertically, and the third area is modifying the direction of the current program. Strengthening horizontal integration means strengthening local institutions. Giant honeybee management in Sumbawa is generally strongly related to socio-cultural aspects of the local community. In this field, the programs of the Government are not sufficiently clear and systematic. Other places in Indonesia have successfully transformed their local institutions, mostly by their own initiatives, and sometimes without the need for Government support. However, relying on emerging local initiatives to autonomously create a robust local institution seems not feasible. Engaging local leaders to formulate local institutional arrangements for managing wild honey is recommended, as the aspirations and rules of locally developed institutions tend to be more respected by local people.

The second area of focus is changing the majority of honeybee based- development programs from wild honeybees to beekeeping. Under current arrangements, Sumbawa may not be a sufficiently strong cluster for honeybee-based development because the wild honey business has several uncertainties and allows only limited management options, especially in the honey production.

ACKNOWLEDGEMENT

We owe sincere thank NTFP Research and Development Center that has given me chances to join the research projects in 2010 and 2011. We

also express my appreciation to Henricus Tegar Panuntun who helped us during the fieldwork in 2015.

REFERENCES

- Affognon, H.D., W. Kingori, A. Omondi, M. Diiro, B. Muriithi, S. Makau, and S. Raina. (2015). Adoption of modern beekeeping and its impact on honey production in the former Mwingi District of Kenya: Assessment using theory-based impact evaluation approach. *International Journal of Tropical Insect Science*, 35(2), 96 – 102.
- Batulanteh Production Forest Management Unit. (2014). Resort Pengelolaan Hutan Batudulang dan Ai Ngelar. <http://kphpbatulanteh.blogspot.co.id/2014/06/resort-pengelolaan-hutan-rph-menjawab.html>. Accessed 1 October 2015.
- Chazovachii, B., M. Chuma, A. Mushuku, L. Chirenje, L. Chitongo, and R. Mudyariwa. (2013). Livelihood resilient strategies through beekeeping in Chitanga Village, Mwenezi District, Zimbabwe. *Sustainable Agriculture Research*, 2(1), 124 – 132.
- Darmawan, S. and R. Agustarini. (2012). Penurunan kadar air madu hutan alam Sumbawa. In A.P. Tampubolon, T. Rostiwati, B. Leksono, T.K. Waluyo, M. Turjaman, R. Effendi, and S. Bustomi (Eds.), *Proceeding of Seminar Nasional Peranan Hasil Litbang Hasil Hutan Bukan Kayu dalam Mendukung Pembangunan Kehutanan*. Mataram: BPTHBK.
- Demps, K., F. Zorondo-Rodriguez, C. Garcia, and V. Reyes-Garcia. (2012). The selective persistence of local ecological knowledge: Honey collecting with the Jenu Kuruba in South India. *Human Ecology*, 40, 427 – 434.
- Denzin, N.K. (1970). *The Research Act: A Theoretical Introduction to Sociological Methods*. Chicago: Aldine Pub. Co.
- DFID (Department for International Development). (1999). *Sustainable Livelihoods Guidance Sheets*. United Kingdom: DFID.
- Directorate Forestry Utilization Development. (2012). *Penetapan Hasil Hutan Bukan Kayu (HHBK) Unggulan*. Jakarta: Ministry of Forestry Republic of Indonesia.
- Dyball, R. and B. Newell. (2015). *Understanding Human Ecology: A Systems Approach to Sustainability*. Hoboken: Routledge Ltd.
- FAO. (1999). Towards a harmonized definition of non-wood forest products. In S.A. Dembner and A. Perlis (Eds.), *Unasylva No. 198 - Non-wood Forest Products and Income Generation*, 63 – 64.
- FAO. (2006). *Better Forestry, Less Poverty. A Practitioner's Guide*. Rome: FAO.
- Forestry Ministerial Decree No. P. 21/ Menhut-II/ 2009, *Criteria and Indicators of Stipulating Prioritised NTFPs*.

- Fu, Y., J. Chen, H. Guo, H. Hu, A. Chen, and J. Cui. (2009). Rain forest dwellers' livelihoods: Income generation, household wealth and NTFP sales, a case study from Xishuangbanna, SW China. *International Journal of Sustainable Development & World Ecology*, 16(5), 332 – 338.
- Global Forest Watch. (n.d.). GWF Interactive Map Indonesia.
http://www.globalforestwatch.org/ap/16/-8.49/117.20/IDN/grayscale/loss,forestgain/600?begin=2001-01-01&end=2015-01-01&threshold=30&dont_analyze=true. Accessed 8 October 2015.
- Guest, G., A. Bunce, and L. Johnson. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1), 59 – 82.
- Gubbi, S. and D.C. MacMillan. (2008). Can non-timber forest products solve livelihood problems? A case study from Periyar Tiger Reserve, India. *Oryx*, 42(2), 222 – 228.
- Julmansyah, 2010. *Madu Hutan Menekan Deforestasi Jalan Lain Konservasi DAS dan Adaptasi Perubahan Iklim*. Sumbawa: Jaringan Madu Hutan Sumbawa.
- Kar, S.P. and M.G. Jacobson. (2012). Market constraints in NTFP trade: Household perspectives in Chittagong Hill Tracts of Bangladesh. *International Forestry Review*, 14(1), 50 – 61.
- Klett, K. (2008). Honey hunting in India as a way of life. *American Bee Journal*, 148(9), 823 – 826.
- Kumar, V. (2015). Role of Non Wood Forest Products (NWFPs) on tribal economy of Gujarat, India. *International Journal of Forest Usufructs Management*, 16(1), 67 – 75.
- Kumar, S.S. and M.S. Reddy. (2014). Indigenous methods of honey harvesting from Rock Bee (*Apis Dorsata*) colonies by Siddhi Tribes of Uttar Kannada District, Karnataka, India. *Insect Environment*, 19(4), 236 – 242.
- Mataram Forestry Research Agency. (2010). *Analisis Margin Tataniaga Madu Alam Sumbawa: Research Project Report*. Mataram: Mataram Forestry Research Agency. Unpublished.
- Mekonnen, Z., A. Worku, T. Yohannes, T. Bahru, T. Mebratu, and D. Teketay. (2013). Economic contribution of gum and resin resources to household livelihoods in selected regions and the national economy of Ethiopia. *Ethnobotany Research and Applications*, 11, 273 – 288.
- Narjes, M.E. (2009). *Is Beekeeping a Viable Additional Income for the Rural Poor?* Master Thesis. Stuttgart, Germany: University of Hohenheim.
- Noy, C. (2008). Sampling knowledge: The hermeneutics of snowball sampling in qualitative research. *International Journal of Social Research Methodology*, 11(4), 327 – 344.
- Nugraheni, Y.M.M.A., S. Darmawan, N. Wahyuni, and R. Agustarini. (2014). Peran BPTHHBK dalam peningkatan kualitas madu alam di Batudulang, Sumbawa. In S. Latifah, H. Idris, and B. Setiawan (Eds.), *Proceedings of Seminar Sehari Penelitian Balai Penelitian Teknologi Hasil Hutan Bukan Kayu* (pp. 3 – 15). Mataram: BPTHHBK.
- Oldroyd, B.P. and P. Nanork. (2009). Conservation of Asian honey bees. *Apidologie*, 40(3), 296-312.
- Riisgaard, L., S. Bolwig, S. Ponte, A. Du Toit, N. Halberg, and F. Matose. (2010). Integrating poverty and environmental concerns into value-chain analysis: A strategic framework and practical guide. *Development Policy Review*, 28(2), 195 – 216.
- Sharma, K. (2008). Honey hunting in the Nilgiri Biosphere Reserve. *Bees for Development Journal*, 87, 6 – 7.
- Tongco, M.D.C. (2007). Purposive sampling as a tool for informant selection. *Ethnobotany Research & Applications*, 5, 147 – 158.
- Utomo, M.M.B. and N. Wahyuni. (2012). Pengaruh metode ekstraksi terhadap mutu madu Sumbawa. In A.P. Tampubolon, T. Rostiwati, B. Leksono, T.K. Waluyo, M. Turjaman, R. Effendi, and S. Bustomi (Eds.), *Proceedings of Seminar Nasional Peranan Hasil Litbang Hasil Hutan Bukan Kayu dalam Mendukung Pembangunan Kehutanan*. Mataram: BPTHHBK.
- Yadav, M. and D. Dugaya. (2013). Non-timber forest products certification in India: Opportunities and challenges. *Environment, Development and Sustainability*, 15(3), 567 – 586.
- Yadav, M. and S. Misra. (2012). Sustainable development: A role for market information systems for non-timber forest products. *Sustainable Development*, 20, 128 – 140.
- Yumantoko. (2013). Peningkatan pengusaha madu di Klaster Madu Sumbawa. In S. Latifah, H. Idris, and B. Setiawan (Eds.), *Proceedings of Seminar Sehari Hasil Penelitian Balai Penelitian Teknologi Hasil Hutan Bukan Kayu* (25 – 35). Mataram: BPTHHBK.
- Yumantoko and M.M.B. Utomo. (2014). The utilisation of honey by nearby forest community in Sumbawa Island. In G. Lukmandaru, R. Pujiarti, R. Widyorini, W.D. Nugroho, D. Irawati, and T. Listyanto (Eds.), *Proceedings of Seminar Nasional Peranan dan Strategi Kebijakan Pemanfaatan Hasil Hutan Bukan Kayu (HHBK) dalam Meningkatkan Daya Guna Kawasan (Hutan)*. Yogyakarta: Fakultas Kehutanan Universitas Gadjah Mada.
- Yumantoko and R.A. Hasan. (2014). Distribusi nilai tambah pada rantai nilai madu hutan Sumbawa: Studi kasus di Desa Batudulang dan Semongkat, Kec. Batulanteh, Kabupaten Sumbawa. In K.A. Hendarto, H. Idris, K. Usman, H.B. Santoso, I.K. Surata, and I.W.W. Susila (Eds.), *Proceedings of Seminar Nasional Hasil Penelitian HHBK* (pp. 369 – 380). Mataram: BPTHHBK.