

## Research Article

# Socio-economic Dimensions of Forest Honey (Bees dorsata) Business Development in Hiay Wetar Village, Southwest Maluku

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**Abstract.**

This research aims to 1) Understand the socio-economic characteristics of the community in developing the forest honey business - *Apis dorsata* bees. 2) Analyze the level of income from the forest honey business - *Apis dorsata* bees by the community in Hiay-Wetar village, Southwest Maluku. The research was conducted in Hiay Wetar village, Southwest Maluku in January-February 2024 using a purposive sampling method with 25 families as respondents. Primary and secondary data were taken through direct observation and interviews with respondents. The data obtained were analyzed using a quantitative and descriptive qualitative approach. The research results show that the social characteristics of the community greatly influence the respondents' activities in collecting/harvesting forest honey, namely age, education level, experience in collecting forest honey, number of family dependents, and income. Collecting honey bee hives starts with marking the tree, harvesting and packaging the honey is still done using simple production equipment and traditional techniques based on local knowledge and wisdom from generation to generation. The collection of forest honey by the people of Hiay Wetar village is called "cut wani" which means cut honey" and air wani which means honey bee water. In a year there are two honey harvests (cut wani), namely in April – June and October – December with a total production of 1500 liters per year and total sales of IDR 180,000,000/year. Net income of IDR 169,915,000.00 and R/C return ratio analysis of the honey business has a decent ratio with flat R/C = IDR 18.03.

**Keywords:** economy, *Apis dorsata* bees, income, social, forest honey

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**Published:** 11 November 2024

**Publishing services provided by Knowledge E**

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Selection and Peer-review under the responsibility of the 8<sup>th</sup> Isedu Conference Committee.

## 1. Introduction

Community management of forests and non-timber forest products has the potential to provide great benefits, namely producing multi-product businesses in the forestry and agricultural sectors, increasing competitiveness, increasing community creativity in business, and increasing community income/economy. Multi-business forestry policies are



an effective solution to maximize the benefits of forests in a sustainable manner. Multi-business forestry policy refers to an approach that combines economic sustainability, social sustainability and environmental sustainability in the use of forest resources. This approach aims to achieve a balance between environmental protection and sustainable use of forest resources. Sustainable forest management plays a role in ensuring that the forest management carried out is environmentally appropriate, socially beneficial and economically sustainable [1].

Honey is one of the non-timber forest products, the many types of honey bees found in Indonesia are an advantage for increasing non-timber forest products. Honey is defined as a natural liquid produced by honey bees with a sweet taste that comes from the nectar of flowers or other parts of plants [2]. The Central Statistics Agency (BPS) noted Overall, throughout 2022 the volume of forest honey production in Indonesia will reach 220.06 thousand liters. This great potential must be supported by optimal and sustainable use. This will also provide benefits in increasing Indonesian honey exports as well as increasing people's welfare and income.

In Indonesia, there are basically two ways, namely 1). traditional methods using tikung (artificial nests), lalau (bees nesting in large logs), and repak (bees nesting in any place), and 2). The modern method uses a wooden stup containing a comb frame or wooden box [3]. The Southwest Maluku Regency (MBD) region is one of the districts in Maluku Province which is part of the distribution area for the forest bee *Apis dorsata* [4][5]. Wetar Island, which is located at the southernmost tip of the Maluku Islands, is one of the production centers for forest honey (*Apis dorsata* bees) which is taken from trees in gardens and natural forests as a habitat for forest honey bees. The production and marketing of wetar honey from Hiay village has been carried out by the community, namely its packaging in ceregens. The production flow of forest honey from Wetar is intermittent due to depending on the season. Meanwhile, the factors that influence the production and marketing of honey are production equipment, packaging, long transportation routes, lack of promotion, and competing products. Efforts to develop forest honey from the *Apis dorsata* bee from Hiay-Wetar village have also been carried out by the Social and Environmental Forestry Center for the Maluku Papua Region through Bang Pesona (Indonesian Social Forestry) in 2018, but the assistance and sustainability of this program is not continuous [6].

Based on this description, research was conducted with the title Socioeconomic Dimensions of Forest Honey Business Development (*Apis Dorsata* bees) in Hiay Wetar Village, Southwest Maluku with the aim of: 1) Knowing the socio-economic characteristics of the community in developing the *Apis dorsata* forest-bee honey business, and

2). Analyzing the level of income from the forest honey business - *Apis dorsata* bees by the community in Hiay-Wetar village, Southwest Maluku.

## 2. Method

This research was conducted in Hiay Wetar village, Southwest Maluku Regency in January – February 2024. The method used in this research is quantitative methods, namely research that focuses on numerical data (numbers) which are processed using statistical methods and methods. Qualitative descriptive means describing facts at an early stage, with the aim of revealing complete qualitative symptoms regarding the environmental and economic aspects seen. Data collection was carried out using observation and interview techniques which were carried out using questionnaires. The number of respondents in this research was 25 families out of 62 families or 40% of the number of families in Hiay Wetar village and the key respondents were the village government and related agencies, namely BPSKL. Quantitative analysis was used to obtain an overview of respondents' income levels from the forest honey business - *Apis dorsata* bees. Next, the data obtained was analyzed using a qualitative approach, namely an analysis technique to create a picture of a phenomenon.

The total income of the *Apis dorsata* forest honey business is approximated by equation [7] as follows:

a. Net income is obtained using the following formula:

$$TR - TC = \pi$$

Where :

To calculate net income, you must first know the level of total income and expenses in a certain period (1 year).

$\pi$  = profit

TR = revenue (total revenue)

TC = total cost

b. To find revenue, a formula is used

$$TR = Q \cdot PQ$$

Where:

TR = total cost

PQ = fixed production price

Q = production quantity

c. To find total costs which are part of fixed costs and variable costs, a formula is used

$$TC = FC + VC$$

Where:

TC = total

FC = fixed costs

VC = variable costs

d. One analysis technique that can be used to determine the feasibility of farming is the revenue cost ratio (R/C Ratio) which describes the ratio of income to the total cost value for 1 year. [8] with the following formula:

$$R/C = \sum R / (\sum Cs + \sum Ct)$$

Where ;

R/C = Ratio of income to capital

$\sum R$  = Total income

$\sum Cs$  = Cash costs

$\sum Ct$  = Calculated costs

### 3. Results And Discussion

#### 3.1. Social Dimensions of Forest Honey Business

Respondent characteristics are the respondent's profile of the factors that influence the respondent's development with forest honey business-*Apis dorsata* including age, education level, experience in taking honey, number of dependents, and income. The 25 respondents taken as samples had descriptions of different characteristics in the honey business which described the level of experience and mindset of the respondents.

Different socio-economic profiles are often a factor causing differences in a person's capacity to develop a business. Age, level of education, scale of business, experience in the business world, length of time in business, and level of income influence women's motivation in developing business capacity.[9].[10] The results of the study show the profile of respondents, namely age, level of education, and experience. The length of time it takes to collect honey, the number of dependents in the family, and income also influence people's activities in collecting honey during each harvest season. Respondents in the age category 21 - 40 years were 12 people or 48% who carried out honey collecting activities in the Hiay village forest, followed by 10 people aged 41 - 60 years

TABLE 1: Characteristics of Respondents in Forest Honey Business.

Parameter	Category	Frequency	Percent
Age (Years)	21-40 Years	12	48
	41 – 60	10	40
	> 60 Years	3	12
	Total	25	100
Level of education	Elementary school	15	60
	First Middle School	3	12
	Senior High School	7	28
	Total	25	100
Experience of taking honey	10- 20 years	4	16
	21– 30 years	10	40
	31 – 40 years	4	16
	41 – 50 years	7	28
	Total	25	100
Number of members	4	14	56
	5 – 6	5	20
	> 6	1	4
	Total	25	100
Income (Rp) per month	IDR 500,000 – 1,000,000	22	88
	IDR 1,000,000 – 1,500,000	3	12
	> Rp. 1,500,000	0	0
	Total	25	100

Source: Primary data processing, 2024

and 3 people aged 60 years and over. The people of Hiay village start collecting honey from the age of 12-15 years by following their parents to the garden or forest.

If you count backwards for the education level category, the age category over 60 years has the last level of education, namely elementary school. A total of 15 respondents or 60% had elementary school education, 3 respondents or 12% had junior high school education and 7 respondents or 28% had high school education. This occurs because of the low income level of the community, the distance to school and limited access, as well as the low level of public opinion about the importance of education. As time went by and road access opened to Ilwaki village, the capital of Wetar sub-district and the opening of a copper mine on Wetar Island, there was a

change in parents' views about the importance of education for children because to be accepted for work you need a diploma.

Based on the experience category, of the 25 respondents, 10 respondents or 40% have 21 - 30 years of experience, 7 respondents or 28% have 41 - 50 years of experience, 4 respondents or 16% have 31 - 40 years of experience and 4 respondents or 16% have experience 10 – 20 years of taking forest honey. The business experience factor is one of the factors that determines business success[10][11]. Generally, the people of Hiay village who look for forest honey are men who started following in their parents' footsteps when they were teenagers. So the older a person is, the longer and more experience they gain in the process of extracting forest honey from *Apis dorsata* bees.

The category of number of family members also influences the respondent's activities to earn a living. Where 14 respondents or 56% have 1-4 people, 5 respondents or 20% have 5-6 family members and 1 respondent has 1 family member. Increasing the number of family members can make work easier and also increase respondents' motivation to run their business. In addition, increasing the number of family members causes family needs to also increase so that motivation to try also increases in order to obtain greater income. [10]

The people of Hiay – Wetar village generally earn their living as subsistence farmers. They spend their time cultivating the garden as a source of income. The income obtained from managing the garden is just enough to meet the daily needs and education of the children. Of the 25 respondents, 22 respondents or 88% had an income of IDR 500,000 – IDR 1,000,000 / month and 3 respondents or 12% had an income of > IDR 1,000,000. When the honey season arrives in April–June and October–December, the people of Hiay village go to the gardens and surrounding forests to hunt and collect honey and sell the results to increase their family income.

### 3.2. Process of Extracting *Apis dorsata* Forest Honey

Harvesting forest honey bee hives, starting from knowing the right time to collect to the production equipment used, is still done traditionally using simple techniques based on local knowledge and wisdom that has prevailed in the community for generations. Before the honey harvest season arrives, the people of Hiay Wetar village will hunt for beehives in gardens and in the forest and if found, the tree is marked/coded so that if someone sees the sign, they will know that the nest belongs to someone else.

The people of Hiay - Wetar village know that honey is ready to be harvested, namely 2 weeks after the flowers in the forest trees have fallen and the hives have thinned

out. People in groups will go to gardens and forests to collect honey. The honey taken comes from the nests of the stinging forest honey bee *Apis dorsata* which makes its nests in trees in gardens and natural forests. The nesting habitats of *Apis dorsata* bees are in the pulai tree (*Alstonia scholaris*), banyan tree (*Ficus benjamina*), mango tree (*Mangifera indica*), kesambi tree, (*Schleichera oleosa*) breadfruit tree (*Artocarpus communis*), salawaku tree (*Albizia falcate*), and on rock cliffs so that it can affect the taste, color and water content. Differences in vegetation in bioregions are thought to have an influence on the characteristics of the honey produced, such as sucrose, fructose, glucose, water content, diastase enzymes and insoluble solids. The flowering schedule is influenced by soil type, climate and vegetation conditions which then influence the quality and quantity of nectar secretions produced [12][13].

*Apis dorsata* honey comb usually attached to branches about 20 meters (66 ft) above the ground. At least 10 colonies can live on a tree. The length of *Apis dorsata* nests varies from 1.5 meters on a tree branch to a height of 3 to 20 meters. The nest of *Apis dorsata* consists of a single comb hanging from tree branches and rocky cliffs [14]. The people of Hiay – Wetar village take forest honey in a simple way and have maintained it from generation to generation, which is called “campur wani” which means cut honey” and oir wani which means honey bee water. The honeycomb is first smoked with coconut fiber to repel bees so that it is easy to harvest and avoid bee stings. Generally, people hunt for honey in groups because according to local beliefs in Hiay village, it is forbidden to “pamali” if you go into the garden or forest alone because there is a “Kamolang” who is believed to be the guardian of the Wetar forest. After the honey extraction process is complete, the community will work together to clean the beehive/extract honey water from the hive using a simple technique that does not guarantee the hygiene of the product. The honey is then packaged in ceregen-ceregen and sold to security forces or buyers who come directly to buy in Hiay village and sell it in Ilwaki - the sub-district capital, even in Ambon city and Kupang city at a price of Rp. 70,000/bottle if converted to Rp. 120,000/liter . Apart from that, the people of Hiaywetar village like to consume honey to maintain health and as medicine. People consume a lot of honey because it is a natural product that has medicinal properties and nutritional value. Honey is a natural substance produced by bees from flower nectar and plant secretions [15].





**Figure 1:** Process of Collecting Forest Honey From *Apis dorsata* Bees by the Hiay-Wetar Village Community.

### 3.3. Dimensions of Forest Honey Business

Income is the difference between production results and production costs obtained by the forest honey business group in Hiay - Wetar Village. The income in question is income from the forest honey business - *Apis dorsata* bees within a period of one year which is obtained from the difference between receipts and expenses. As for the results of the calculation can be seen in Table 2.

Based on the calculation results, the total net income from the forest honey business is equal to IDR 169,915,000 / year which is the result of selling 1,500 liters in a period of 1 year with total sales proceeds of IDR 180,000,000 / year. Meanwhile, the average profit ratio (Revenue/Cost) is IDR 18.03. This means that for every expenditure of IDR 1,-, IDR 18.03 will be received so that the respondent makes a profit of IDR 17.03. Based on the analysis results of the R/C value, the return ratio for the R/C forest honey business is  $> 1,3$  meaning is feasible. The higher the profit ratio, the more effective the forest honey business is in managing costs associated with sales.

The profits obtained from the forest honey business increase the family's income. In a year there are 2 harvests of forest honey and while waiting for the harvest, the community can farm and manage the land and gardens. The main products from the garden are corn, mangoes, oranges and wood. The availability of food sources will ensure the survival of the people in Hiay village, most of whom make their living as subsistence farmers.

Dimensions of socio-economic life of the village community a Hiay Wetar MBD, through its *Apis dorsata* forest honey business, continues to experience development



TABLE 2: Calculation Results of Income and Profits from the *Apis dorsata* Forest Honey Business.

Respondent No	Total cost	Total Production (liter)	Total Sales (Receipts)	Net Income (Profit)	R/C
1	355,000	60	7,200,000	6,845,000	19.28
2	355,000	60	7,200,000	6,845,000	19.28
3	355,000	40	4,800,000	4,445,000	12.52
4	355,000	20	2,400,000	2,045,000	5.76
5	355,000	80	9,600,000	9,245,000	26.04
6	455,000	20	2,400,000	1,945,000	4.27
7	335,000	40	4,800,000	4,465,000	13.33
8	355,000	20	2,400,000	2,045,000	5.76
9	735,000	40	4,800,000	4,065,000	5.53
10	355,000	40	4,800,000	4,445,000	12.52
11	735,000	20	2,400,000	1,665,000	2.27
12	355,000	80	9,600,000	9,245,000	26.04
13	355,000	100	12,000,000	11,645,000	32.80
14	385,000	40	4,800,000	4,415,000	11.47
15	355,000	140	16,800,000	16,445,000	46.32
16	395,000	60	7,200,000	6,805,000	17.23
17	395,000	80	9,600,000	9,205,000	23.30
18	355,000	100	12,000,000	11,645,000	32.80
19	435,000	120	14,400,000	13,965,000	32.10
20	355,000	60	7,200,000	6,845,000	19.28
21	395,000	60	7,200,000	6,805,000	17.23
22	455,000	40	4,800,000	4,345,000	9.55
23	395,000	50	6,000,000	5,605,000	14.19
24	355,000	80	9,600,000	9,245,000	26.04
25	355,000	50	6,000,000	5,645,000	15.90

Source: Primary Data Processing Results, 2024

with the intervention of related agencies, namely BPKSL, Maluku Province Industry and Trade Center and academics in an effort to increase production and marketing of forest honey. The formation of the Sion Wetar Forest Farmers Group (KTH) in 2018 was a forum for coordinating forest honey production and marketing activities, initially from each individual to a business group. The impact of the formation of KTH Sion Wetar is building relationships with buyers from outside Wetar Island, wider market reach so that forest honey from Wetar becomes more famous, increasingly competitive

prices, product size variations, having a BPOM permit, and procurement of production equipment to maintain quality and product hygiene. Furthermore, forest honey products from Hiay - Wetar are temporarily being processed to have Intellectual Property Rights (HAKI) from the Ministry of Law and Human Rights. Efforts to develop the Apis dorsata forest honey bee business will provide optimal results if carried out sustainably to improve the welfare of the Hiay-Wetar village community and Wetar honey increasingly has economic value and is well known among Indonesian people [6].

## References

- [1] Standardization LH. Sustainable Forest Management Standards: A Guarantee of the Availability of Water Resources Across Generations, Standard: Better Standard Better Living – 2024;3(2)
- [2] National Standardization Agency. [SNI]. Indonesian National Standard. 2018;(8664):2018.
- [3] Kurniawan TA, Rafiq A. Difference between forest honey and livestock honey. Jakarta: Tempo; 2015.
- [4] Lamerkabel JS, Bersabi A, Pentury Ch. Nesting Trees, Honey Color and Productivity of Forest Bees (Apis dorsata FABRICIUS) on Sermata Island. Oral presentation material. 2013.
- [5] Pattikawa HR, Lamerkabel SA, Hasinu J. 2014 Distribution and Morphological Characteristics of the Forest Honey Bee Apis dorsata (F) on Sermata Island, Southwest Maluku Regency. Agrosilvopasture-Tech Journal. 2023;2(2):394–402.
- [6] Sahureka M, Siahaya ET, Imlabla, NW, 2019, Development of Production and Marketing of Wetar Honey. Journal of Small Island Forests, Volume 3 Number 2
- [7] Soekartawi. 1995. Business Analysis. UI. Jakarta.
- [8] Rahim, Abd and Hastuti, Diah Retno Dwi SYSTEM. 2017. 110 Agribusiness Management Systems Agribusiness Management Systems
- [9] Nurfazreen AMN, Redzuan M, Rahman Abd R Abd. 2013. Factors contributing to individual capacity building levels among women entrepreneurs. Social Sciences & Humanities.21(2): 435-448.
- [10] Inta PN. Damanik, 2013, Strengthening the Capacity of Traditional Sago Processors to Support Food Diversification in Maluku. Bogor Agricultural Institute Dissertation (Unpublished)
- [11] Mani M. Motivation, challenges and success factors of entrepreneurs: empirical analysis. Social Sciences & Humanities. 2013;21(2):667–76.

- [12] Pribadi MA, Wiratmoko E. 2018, Characteristics of Forest Bee Honey (*Apis Dorsata Fabr.*) From Various Bioregions in Riau. *Forest Products Research*. 2019 Nov;37(3):185–200.
- [13] Bhalchandra W, Baviskar RK, Nikam TB. Diversity Of Nectariferous And Polleniferous Bee Flora At Anjaneri And Dugarwadi Hills Of Western Ghats Of Nasik District. *J Entomol Zool Stud*. 2014;2(4):244–9.
- [14] Bertoni, R. (2013). Comparison of Body Part Sizes of *Apis dorsata* Worker Bees (Forest Bees) at Four Locations.
- [15] Samarghandian S, Farkhondeh T, Samini F. Honey and health: a review of recent clinical research. *Pharmacognosy Res*. 2017;9(2):121–7