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ANALYSIS OF TYPES AND ECONOMIC VALUE OF NON-TIMBER FOREST PRODUCTS OF THE CONSERVATION PARTNERSHIP FOREST FARMER GROUP OF WAN ABDUL RACHMAN FOREST PARK

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ABSTRACT

Non-timber forest products resources are valuable to communities around the forest which are more valuable than wood in the long term and can provide good benefits from the ecosystem for sustainability, conservation and the economy. The aim of the research is to identify the types and economic value of non-timber forest products commodities from Conservation Partnership Forest Farmer Groups in Wan Abdul Rachman Forest Park. Data collection was carried out using interviews, literature studies and documentation. The data that has been collected is then analyzed using a Likert Scale. The method used is to calculate the economic value of each type of non-timber forest products and group it based on the highest commodity. According to the research findings, the primary commodities of Mekar Sari Forest Farmer Group are nutmeg, coffee, and cacao, while Wana Karya Forest Farmer Group's are rubber, *petai*, and king fruit, and Maju Lestari Forest Farmer Group's are king fruit, nutmeg, and coffee. Coffee has an economic impact of 25.01% at Mekar Sari Forest Farmer Group, 30.58% at Wana Karya Forest Farmer Group, and 36.03% at Maju Lestari Forest Farmer Group. The economic values of Forest Farmer Groups are IDR 209,375,000/year, IDR 971,444,000/year, and IDR 313,384,200. According to the calculation method, the average revenue earned from non-timber forest products is IDR 6,979,166/household/year, IDR 28,571,882/household/year, and IDR 10,594,906/household/year.

Keywords: *Wan Abdul Rachman Forest Park, Economic Value, Non Timber Forest Products, Forest Farmer Groups*.

INTRODUCTION

Forests as a means of shelter for living creatures are a function that continues to be preserved. Forests have many benefits for the survival of life on the surface of this earth. There are many forest functions that can be taken, including ecological, economic and social functions (Acin *et al*., 2021). The latest law that regulates forestry is Law Number 32 of 2024. This law aims to strengthen the conservation of biological natural resources and ecosystems, the implementation of conservation of biological natural resources and their ecosystems needs to be strengthened and harmonized aspects of protection, preservation, and sustainable use, funding support in the fields of conservation, law enforcement and community participation. One of the steps taken by the government in an effort to maintain biodiversity in Indonesia is the provision of conservation forest areas in partnership (Deandra & Tridakusumah, 2021).

Based on the World Bank report on forest areas, it shows that the majority of people in rural tropical areas live in or around forests and they are very dependent on the natural resources found in forests (Sirait, 2017). Forests can provide benefits and functions through wood forest products and non-wood forest products. Collection of NTFPs originating from permit holders or forest managers can only be carried out by registered collectors. Non-timber forest products include rattan, latex, honey, resin and sap (Indonesian Ministry of Forestry, 2019). The community takes advantage by taking forest products directly, for example taking NTFPs (Handayani et al., 2021). The existence of this conservation partnership can help prevent erosion and landslides of trees on managed land (Rahman et al., 2017). There are economic functions for the long term and short term. Tree crops such as Multi-Purpose Trees Species (MPTS) can be a source of long-term income considering that the products can only be harvested once a year (Qurniati et al., 2017).

Forest land use can be influenced by community socio-economic factors (Subarna, 2011). The longer you work and the wider the land, the greater the number of types of plants. People increase the number of plant types to obtain harvests from various types of plants, while people who do not increase the number of plant types prefer to develop plants which are the biggest source of income rather than adding other types of plants (Simarmata et al., 2018). This community's income is influenced by the NTFP harvest itself in order to meet living needs.

Tahura Wan Abdul Rahman (Tahura WAR) is one of the conservation forest in Lampung Province. One of the roles is in the economy of communities around the Tahura WAR. This forest is an effort to preserve biological natural resources and the balance of the ecosystem, so that it can support improvements in human welfare and quality of life (Purmadi *et al.,* 2020). In the Tahura WAR resource management process, the community formed an institutional Forest Farmers Group (FFG). The existence of this FFG is a form of continuous effort in the sustainable development process. Partnerships or community involvement in forest management is nothing new for the Indonesian Government. Community involvement in forest management has been carried out from the past until now (Prayitno*,* 2020). The aim of this research is to determine the types of commodities and the economic value of NTFPs in several FFG of the Tahura WAR Conservation Partnership.

METHOD

This research was carried out in October 2024. This research took place in the Villages of Wan Abdul Rachman Forest Park, namely Pinang Jaya Village (Mekar Sari FFG), Bogorejo Village (Wana Karya FFG) and Sinar Harapan Village (Maju Lestari FFG). This research was carried out using quantitative methods with questionnaire data collection techniques and direct interviews. Data taken to obtain various types of selected plants planted on cultivated land and income from NTFPs collection descriptively and quantitatively. The economic value of NTFP products per type of plant per year can be calculated by multiplying the total harvest of NTFPs in a year by the product price or can be written using the following formula (Insusanty *et al.,* 2017):

NH= TP X HH

Information:
NH: Value of NTFP products per type (IDR)
TP: Total harvest (units/year)
HH: Price of NTFP products (IDR)

The income contribution from fruit can be calculated by dividing the income from fruit by the respondent's total income then multiplying by one hundred percent or can be written using the formula (Insusanty *et al.,* 2017):

$$\%K = \frac{\text{PBi}}{\sum \text{PT}} \text{x } 100\%$$

Information:
% K: Percentage of revenue contribution (percent)
PBi: NTFP income per type (IDR)
PT: Total income of respondents (IDR)

The formula for calculating the net income of farmers can be seen in the following table:

Total Net Income = Total Income Results - Capital Costs

Information:
Total Net Income : Total Net Income income (IDR)
Total Income Results : All Total Income Results (IDR)
Capital Costs : Total All Capital Costs (IDR)

RESULTS and DISCUSSION

1. Characteristics of Communities Utilizing Non-Timber Forest Products

Men and women have equal opportunities to access and control resources. Decision making patterns in the household are dominated by women, while decision making patterns in the LMDH are dominated by men. Strategies to increase the distribution of gender roles are to involve women and men farmers in productive forestland management activities and to increase the implementation of training or counseling programs for farmers regarding gender equality-based forest management planning (Pratiwi & Widayanti, 2020).

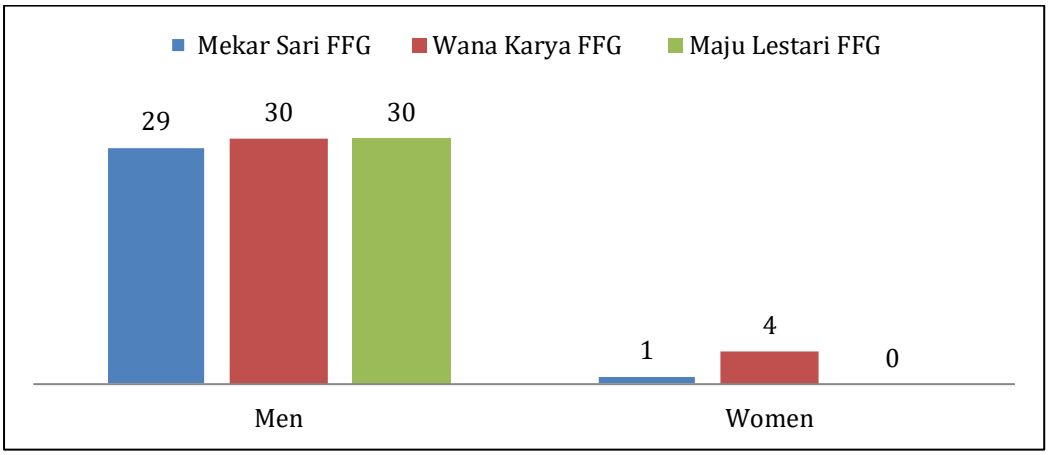

Figure 1. Gender graph of members of Mekar Sari FFG, Wana Karya FFG and Maju Lestari FFG.

The majority of NTFP users at Mekar Sari FFG, Wana Karya FFG, and Maju Lestari FFG are men (94.68%), with only 5.31% being women. This is because the man is the head of the family who has the obligation to earn a living to meet the family's economic needs.

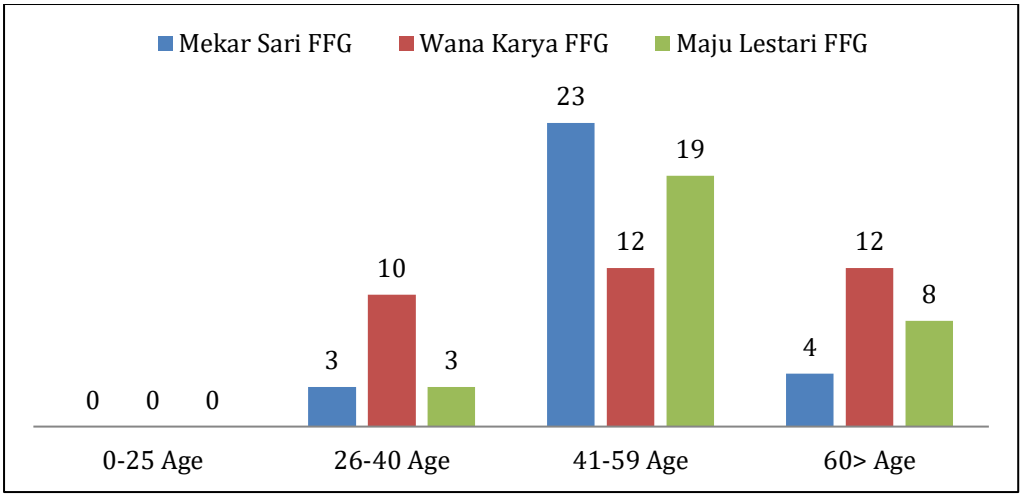

Figure 2. Age graph of members of Mekar Sari FFG, Wana Karya FFG and Maju Lestari FFG.

Meanwhile, in Figure 2, based on age groups, 55.21% of FFG members who use NTFP are in the 41-59 year age class. The high percentage of NTFP users in this age group is because this age group can be categorized as a productive age group. Mantra (2000) found that those classified as productive age were those aged 16-55 years. Limited employment means that people in the 60> age class with a percentage of 16.08% still utilize the natural resources available in the area to meet their needs as well as to be busy in old age.

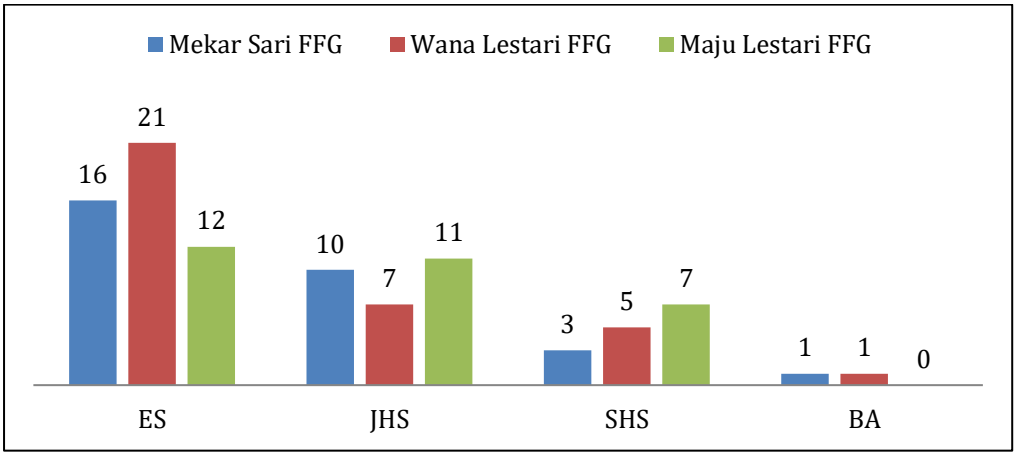

Figure 3. Member Education Graph Mekar Sari FFG, Wana Karya FFG and Maju Lestari FFG.

According to Figure 3, the majority of persons who use NTFP have an elementary school education background, or 49.76%, implying that their educational background is rather poor. Low levels of education result from high levels of contact and community reliance on resources to meet their daily requirements. This circumstance is consistent with Alikodra's (1985) comment that the education level in the villages surrounding the forest is relatively low.

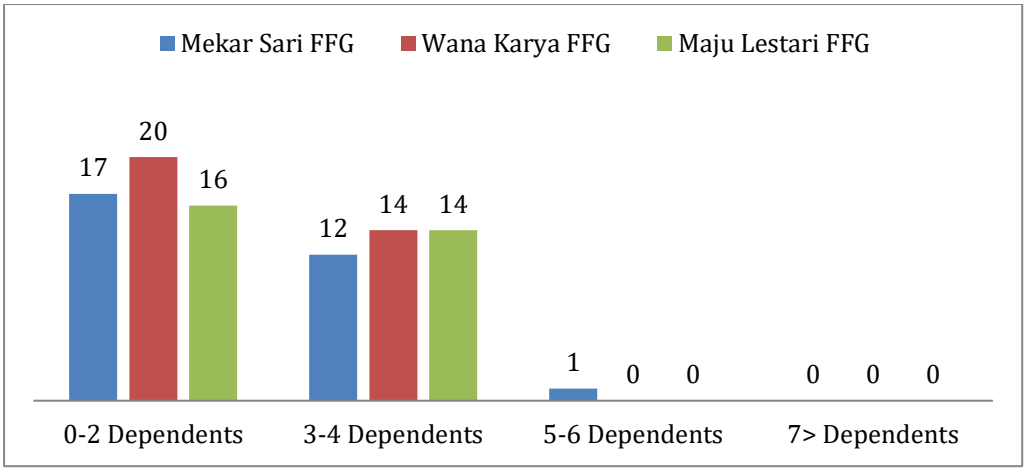

Figure 4. Graph of Number of Dependents of Members Mekar Sari FFG, Wana Karya FFG and Maju Lestari FFG.

Figure 4 shows that the number of dependents in the family changes significantly between Mekar Sari FFG, Wana Karya FFG, and Maju Lestari FFG. Dependents in the family contribute to the family's expanding requirements. The more dependents you have, the higher your monthly and educational expenses would be. The number of dependents must be weighed against income that is sufficient to satisfy demands. The majority of conservation partnership member communities have dependents in classes 0-2 (54.02%), 3-4 (42.55%), and class 5-6 (1.06%).

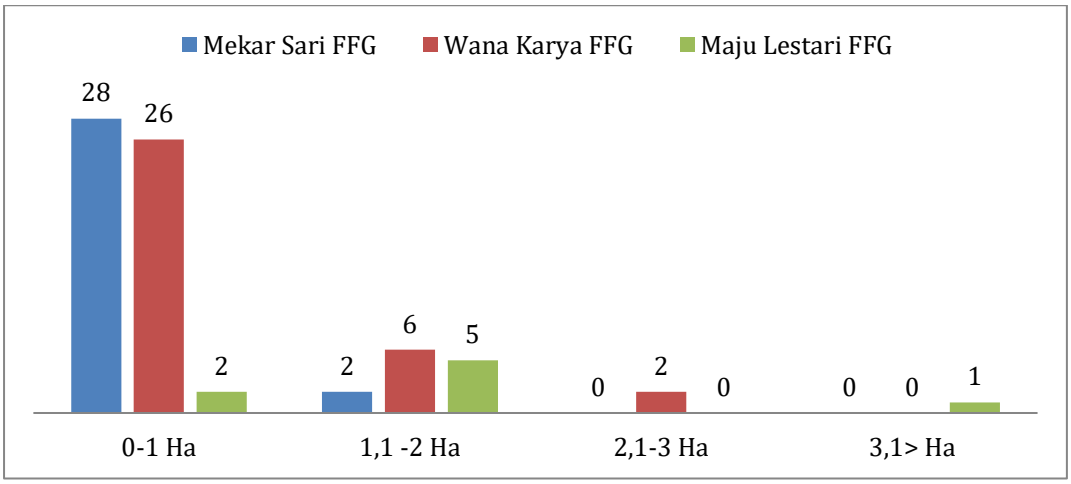

Figure 5. Graph of Member Land Area Mekar Sari FFG, Wana Karya FFG and Maju Lestari FFG.

It can be seen from the data on the area of cultivated land at Mekar Sari FFG, Wana Karya FFG and Maju Lestari FFG in Figure 5. The size of the cultivated land will influence the adequacy of the family's economic needs. The larger the land area, the greater the income generated. Land is one of the most important production factors in agriculture (Singbo & Lokossou, 2024). The largest data obtained from the 0-1 Ha land area class was 59.57%, the 1.1-2 Ha class amounted to 13.31%, the 2.1-3 class amounted to 2.12% and the least arable land area from the 3.1 Ha class was only 1.06%. .

2. Commodities and Economic Value of Communities Utilizing Non-Timber Forest Products

According to Minister of Environment and Forestry Regulation Number 77 of 2019 NTFPs are biological forest products, both vegetable and animal, along with derivative products and cultivation products except wood originating from forests in accordance with statutory provisions. NTFP utilization is an activity to utilize and cultivate non-timber forest products without damaging the environment and without reducing its main function. NTFP collection is an activity to collect non-timber forest products with limits on time, area and/or volume. The following data on commodity crops at Mekar Sari FFG is shown in Figure 6.

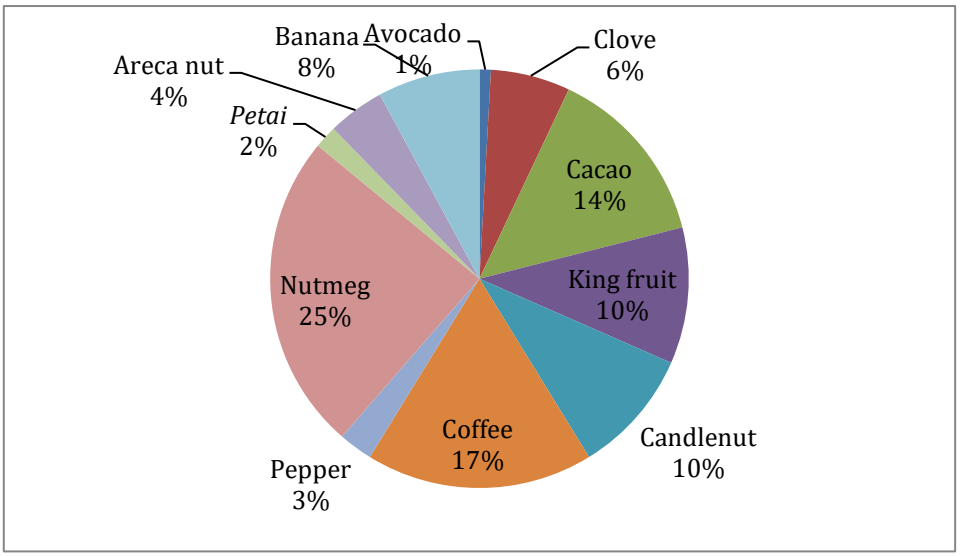

Figure 6. Member Commodity Crops Mekar Sari FFG.

The community at Mekar Sari FFG uses 11 types of NTFPs consisting of avocado, cloves, cacao, king fruit, candlenuts, coffee, pepper, nutmeg, *petai*, areca nut and banana with different utilization times according to the harvest season for each NTFP used.

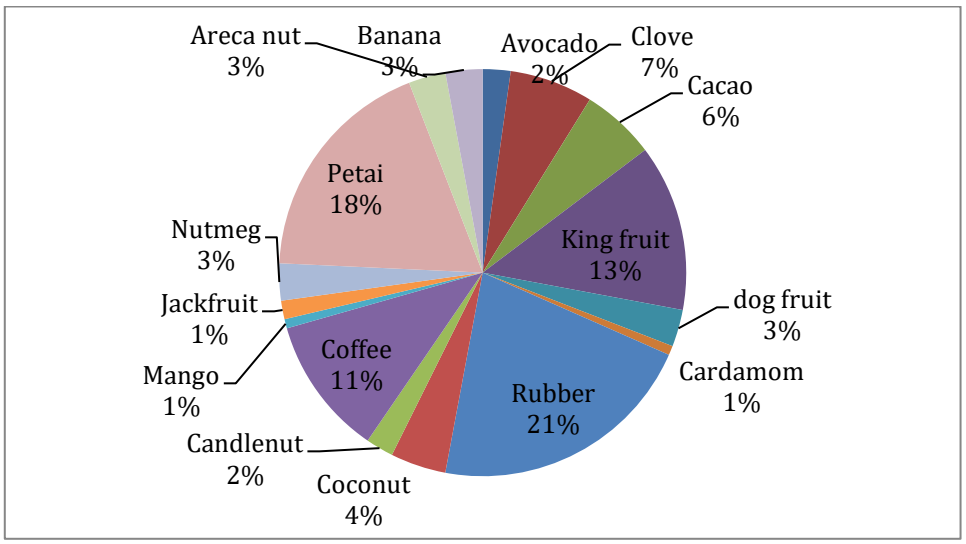

Figure 7. Commodity Crops of Wana Karya FFG.

The community at Wana Karya KTH uses 16 types of NTFPs consisting of avocado, cloves, cacao, king fruit, dog fruit, cardamom, rubber, coconut, candlenut, coffee, mango, jackfruit,

nutmeg, *petai*, areca nut and banana with different utilization times according to harvest season for each NTFP used.

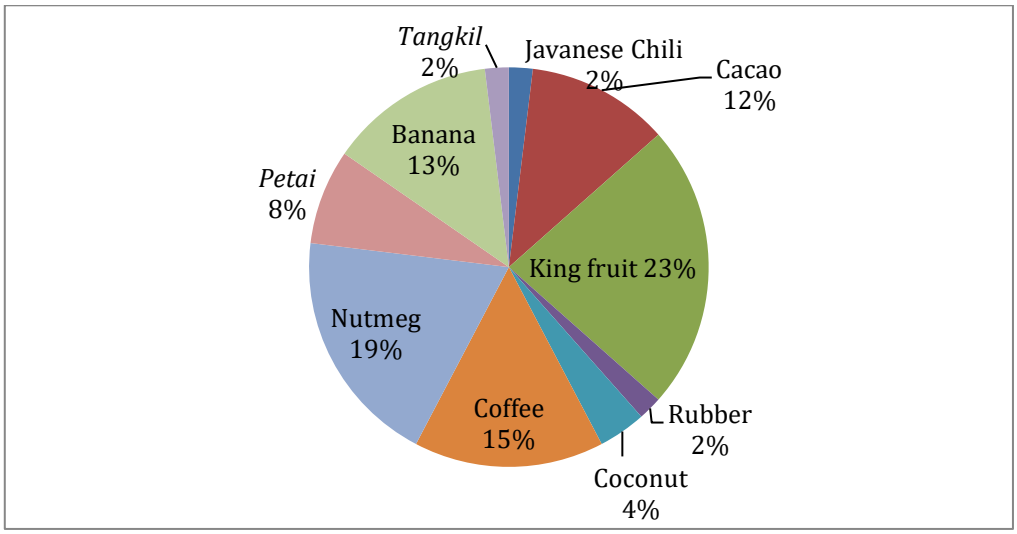

Figure 8. Commodity Crops of Maju Lestari FFG.

The community at Maju Lestari FFG uses 10 types of NTFPs consisting of Javanese chilies, cacao, king fruit, rubber, coconut, coffee, nutmeg, *petai*, banana and *tangkil* with different utilization times according to the harvest season of each NTFPs used.

Commodities in each FFG are different due to the selected plants used. However, in general, the 3 FFG commodity crops that influence the economy are coffee, nutmeg, cacao, rubber, *petai* and king fruit. Some of the influences of coffee plants being the commodity of choice are because coffee plants (*Coffea sp*) are one of the non-timber forest products (NTFPs) which have quite high economic value seen from the sales price (Wijaya & Oktalina, 2021). There are several units in commodities such as *Petai* in empong or when converted it is around 10 kg/*Empong* and king fruit per hand or containing 2 pieces when converted is around 5 kg/ hand in hand.

2. Economic Value of Communities Utilizing Non-Timber Forest Products

NTFPs as the economic value of forest resources have quite high resource value. Thus, it can be said that NTFPs are a source of income for communities who are members of conservation partnerships. Community members have started to receive direct benefits and contribute to income to cover daily living and educational costs. The calculation results show that the total NTFPs collection can be seen in Table 1 at Mekar Sari FFG, Table 2 at Wana Karya FFG and Table 3 at Maju Lestari FFG.

Table 1. Economic Value of Types of NTFPs in Mekar Sari FFG

No	Types of NTFPs	Amount	Result	Unit price (IDR)	Total (IDR/ household/ year)	Proportion (%)
1	Avocado	1	0 kg	20,000	0	0
2	Clove	7	212 kg	65,000	13,780,000	5,68
3	Cacao	16	742 kg	35,000	26,005,000	10,70
4	King fruit	12	700 *gandeng*	25,000	17,500,000	7,21
5	Candlenut	11	610 kg	9,500	5,795,000	2,38
6	Coffee	20	1.103 kg	55,000	60,665,000	25,01

7	Pepper	3	150 kg	80,000	12,000,000	4,94
8	Nutmeg	28	3,506 kg	30,000	105,180,000	43,36
9	*Petai*	2	15 *empong*	75,000	1,125,000	0,46
10	Areca nut	5	100 kg	0	0	0
11	Banana	9	505 kg	1,000	505,000	0,20
	Total				242,520,000	100

The influence of commodities on farmers' income is highly dependent on the selling price of the NTFPs themselves. From the data obtained, the commodities that affect farmers' income are nutmeg at 43.36%, coffee at 25.01% and cacao at 10.70%.

Table 2. Economic Value of NTFP Types in Wana Karya FFG

No	Types of NTFPs	Amount	Result	Unit price (IDR)	Total (IDR/ household/ year)	Proportion (%)
1	Avocado	3	210 kg	20,000	4,200,000	0,37
2	Clove	9	341 kg	65,000	22,165,000	1,99
3	Cacao	8	580 kg	35,000	20,300,000	1,82
4	King fruit	18	895 gandeng	25,000	22,375,000	2,01
5	Dog fruit	4	650 kg	2,500	1,625,000	0,14
6	Cardamom	1	10 kg	50,000	500,000	0,04
7	Rubber	29	79,056 kg	11,000	869,616,000	78,26
8	Coconut	6	315 kg	1,000	315,000	0,02
9	Candlenut	3	66,5 kg	9,500	631,750	0,05
10	Coffee	15	1694 kg	55,000	93,170,000	8,38
11	Mango	1	300 kg	9,000	2,700,000	0,24
12	Jackfruit	2	0	0	0	0
13	Nutmeg	4	280 kg	30,000	8,400,000	0,75
14	*Petai*	25	859 *empong*	75,000	64,425,000	5,79
15	Areca nut	4	0	0	0	0
16	Banana	4	360 kg	2,000	720,000	0,06
Total					1,111,142,750	100

Commodities in each FFG vary and the more variations there are, the more it will affect farmers' income. From the data obtained by Wana Karya FFG, the commodities that affect farmers' income are rubber 78.26%, coffee 8.38% and *petai* 5.79%.

Table 3. Economic Value of Types of NTFPs in Maju Lestari FFG

No	Types of NTFPs	Amount	Result	Unit price (IDR)	Total (IDR/ household/ year)	Proportion (%)
1	Javanese Chili	1	3 kg	145,000	435,000	0,17
2	Cacao	6	1470 kg	30,000	44,100,000	17,75
3	King fruit	12	4475 *gandeng*	20,000	89,500,000	36,03
4	Rubber	1	400 kg	10,000	4,000,000	1,61
5	Coconut	2	280 pieces	2,500	700,000	2,81
6	Coffee	8	975 kg	58,000	56,550,000	22,77

7	Nutmeg	10	1202 kg	40,000	4,800,000	19,36
8	*Petai*	4	20 *empong*	60,000	1,200,000	0,48
9	Banana	7	1500 kg	1,250	1,875,000	0,75
10	Tangkil	1	200 kg	9,500	190,000	0,76
Total				248,340,000		100

The commodities in this FFG are not very varied but the income obtained is not inferior to other FFG. Such as the high influence of king fruit on the economy by 36.03%, coffee by 22.77% and nutmeg by 19.36%. So it takes a lot of variety of commodities to help increase farmers' income. From the Wana Karya FFG data, it was obtained that the commodities that affect farmers' income are coffee by 30.58%, rubber by 21.33% and *petai* by 21.14%.

The collection of NTFP carried out by the community is a traditional economic activity that is still ongoing. The income from NTFP is calculated by comparing the income from NTFP that will affect the standard of living of the community. The following are the calculation results obtained from the study:

Mekar Sari FFG
Total Net Income = IDR. 253,799,000 - IDR. 26,904,000
Total Net Income = IDR. 209,375,000
Then the average income of members is IDR. 6,979,166/household/year.

Wana Karya FFG
Total Net Income = IDR. 1,002,937,500 – IDR. 27,703,000
Total Net Income = IDR. 971,444,000
Then the average income of members is IDR. 28,571,882/ household/year.

Maju Lestari FFG
Total Net Income = IDR. 344,987,000 – IDR. 30,006,000
Total Net Income = IDR. 314,981,000
Then the average income of members is IDR. 10,499,366/ household/year.

CONCLUSIONS and RECOMMENDATIONS

The research findings revealed that Mekar Sari FFG used 11 types of NTFPs, Wana Karya FFG used 16 types of NTFPs, and Maju Lestari FFG used 10 types of NTFPs. Commodities that affect the income of Mekar Sari FFG farmers are nutmeg (43.36%), coffee (25.01%), and cacao (10.70%); Wana Karya FFG obtained commodities that affect farmers' income, namely rubber (78.26%), coffee (8.38%), and petai (5.79%); and Maju Lestari FFG obtained king fruit (36.03%), coffee (22.77%), and nutmeg (19.36%). The economic value of Mekar Sari FFG is IDR. 209,375,000, with an average income of IDR. 6,979,166/household/year; Wana Karya FFG is IDR. 971,444,000, with an average income of IDR. 28,571,882/household/year; and Maju Lestari FFG is IDR. 971,444,000, with an average income of IDR. 10,594,906/household/year. It is vital to improve farmers' management and marketing skills for NTFP, which continues to have a high selling value among other commodities. Future study should look at how the economy affects the psychological effect and resilience of the partnering community.

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