Analysis of Sources and Diversification of Farmers' Household Income Around PT Jembayan Muara Bara, Tenggarong Seberang Sub-district, Indonesia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Most farming households depend entirely on sources of income from the agricultural sector, especially on-farm farming, this has the potential for quite a high risk of crop failure which results in a decrease in household income. Diversification of sources of income is aimed at creating wider employment opportunities, improving the economy in the agricultural and rural sectors, as well as developing services and service activities through linkages between agriculture and rural and non-agricultural sectors. The problem in realizing food security today is that the population continues to increase but rice production tends to decrease, thus affecting farmers' income in spending to meet basic needs, namely food. This study was conducted to find out the sources of income earned and the proportion of food expenditure of farmer households around PT Jembayan Muara Bara in

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Tenggarong Seberang subdistrict., Kutai Kartanegara Regency. This research was conducted in Mulawarman, Buana Jaya, Suka Maju, and Bukit Pariaman Villages, Tenggarong Seberang subdistrict. It rans from July 2023 to March 2024. Site selection is done by Purposive Sampling. Sampling using the method (Non Proportional Random Sampling) The number of samples is equalized in each village taking 25 families per village so that the total number of samples is 100 families. The types of data collected are primary data and secondary data. Data collection techniques with observation, and interviews. The results showed that sources of income in the study area, apart from farming activities, namely by working as mining employees, traders, builders, stone diggers, masseurs, farm workers, RT heads, Honorary, and civil servants; The average total family income per month ranges from IDR 2,500,000.00 to IDR 8,800,000.00. The average per capita income per month ranges from IDR 910,152.00 to IDR 1,362,339.00, while the distribution of income per sample capita per month is between IDR 416,667.00 to IDR 2,500,000.00; and the proportion of food expenditure by farmer households ranges from 50.72% - 54.51%, while the proportion of non-food expenditure by farmer households ranges from 45.45 - 49.25%.

1. INTRODUCTION

Sources of rural farming income come from various farming activities, namely household income from farming (on-farm) and outside farming (off-farm). On-farm income, namely the income of people who carry out dry land and wetland farming, consists of income from rice, corn, peanuts, soybeans, and green beans. Meanwhile, off-farm income includes work such as agricultural labor, raising livestock, and others. Apart from the two agricultural subsectors, farmers' income is also obtained from outside agriculture, namely non-farm including employees, brick craftsmen, and others [1].

Rice farming is a source of income and employment opportunities for the community. It requires proper management to use production factors efficiently. If inefficient use of production factors in farming will result in low production and high costs, thereby reducing farmers' income. The research results reported in [2] show that the level of income from on-farm farming in rice farmer households is obtained from a total income of IDR 13,805,120.91/ha minus total production costs of IDR 4,624,434.58, resulting in an average income per hectare amounting to IDR 9,180,686.33. The off-farm contribution is IDR 1,379,800.85 ha/season with a contribution to farmer income of 29.50%. Meanwhile, non-farm income was IDR 2,920,341.39 with a contribution of 53.31%. The limited income of farmers' households is an incentive for farmers to seek additional income from various business sources, both from the farming itself and outside the farming business. The types of businesses that are a source of income for farmers are divided into three subsectors, namely on-farm, off-farm, and non-farm.

Farmer Exchange Rate (FER) is related to farmers' purchasing power in terms of financing household needs. If the farmer's source of income is greater than the increase in agricultural production prices and has an impact on their purchasing power, this will indicate that the farmer's ability has improved or there has been an increase in income. The national FER in 2023 will be 110.20 or down 0.34 percent compared to the previous month's FER. The decrease in FER was due to the price index received by farmers decreasing by 0.02 percent, while the price index paid by farmers increased by 0.32 percent [3].

Income diversification is a pattern in which certain resources are allocated to various activities to create new sources of income. Economic conditions can make income diversification a lifestyle strategy choice for households, especially farming households [4].

The biggest problem in meeting food needs at this time is that the population continues to increase, however, rice production tends to decrease and this has a big impact on the ability of households to meet their basic needs, namely food. The ranking and Food Security Index for East Kalimantan in 2022 is ranked 11th with a score of 77.65. Food availability in Kutai Kartanegara is 79.63, affordability 91.36, and utilization 91.36 with a composite of 84.44. However, this condition is still worrying because

the food consumption situation of the Indonesian people in 2019-2022 is fluctuating and has resulted in a decrease in people's purchasing power, which has implications for changes in people's consumption patterns nationally. In 2021 and 2022 it will start to improve again [5].

Rural farmers in Kutai Kartanegara Regency have an economic orientation in the present, not the future. In the sense of subsistence, household economics tends to only be oriented towards the present and revolves around fulfilling basic needs. The vast and fertile agricultural land used to be able to meet almost all the basic needs of people's lives. However, now that the demands of life are growing, simple land cultivation is no longer able to provide for the livelihood of farmers. As a result, there is an imbalance between the economic needs of farmers and the results of traditional agricultural cultivation, and this results in the creation of poverty [6].

Income in Tenggarong Seberang is still relatively low because most of the population uses more of it to meet their daily food needs. The amount of farmers' income will influence farmers' behavior in spending their income for both food and non-food consumption [7]. This can be used as a reason why residents need to diversify their income or diversify their sources of income.

The presence of the coal mining industry will have a significant influence on aspects of the social life of the surrounding community. Especially in areas that are primarily designated as agricultural areas, it becomes problematic when they have to coexist with coal mining because it can cause agricultural crop production to not be optimal.

Therefore, this research was conducted to find out the sources of income earned and the proportion of food expenditure of farmer households around PT Jembayan Muara Bara in the Tenggarong Seberang subdistrict.

2. METHODOLOGY

2.1 Time and Place

The research was carried out from July 2023 to March 2024 in 5 villages (Separi Mahakam, Mulawarman, Buana Jaya, Suka Maju, and Bukit Pariaman) around the PT Jembayan Muarabara coal mine location, Tenggarong Seberang subdistrict, Kutai Kertanegara Regency, East Kalimantan Province, Indonesia.

PT Jembayan Muara Bara started production around 2007 with an operating age of 25 years. The area coverage being developed includes areas that are directly in contact with PT Jembayan Muara Bara's mining operations which include 5 villages, namely Ring I: Separi Mahakam Village for reasons close to the Stockpile, Mulawarman Village, and Buana Jaya Village for reasons close to mining operations, Ring II includes Suka Maju Village because it is close to Hauling Road, Bukit Pariaman Village because it is a neighboring village. The administrative map of PT Jembayan Muara Bara's target area is presented in Fig. 1.
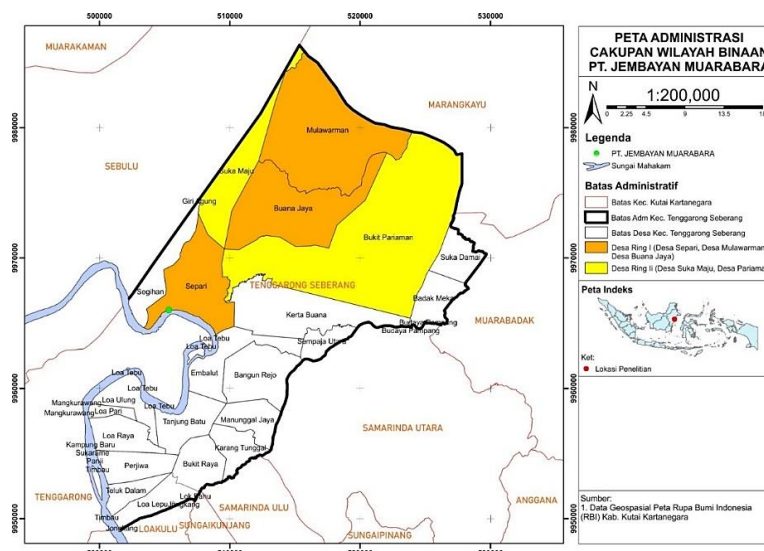

Fig. 1. Administrative map of PT Jembayan Muara Bara's area coverage

2.2 Data Collection Methods

The data collected consists of primary data collected through direct interviews with respondents using a structured questionnaire tool, and secondary data obtained from documents, reports, and official records from the Kerta Buana Village office, Bukit Pariaman Village Office, Buana Jaya Village Office, Office Mulawarman Village, Separi Community Health Center, as well as relevant journals.

2.3 Sampling Method

The population in this study were rice farmers in Tenggarong Seberang subdistrict with a total of 2,801 people. Respondents were taken using the method (Non Proportional Random Sampling) and the number of samples to be taken in the research was determined using the Slovin formula method [8]:

$$n = \frac{N}{1 + N(e)^2}$$

Information: n = Number of Population N = Number of Samples; and E = Margin of Error 10%

From the calculation results, 100 respondents were obtained spread across 4 villages (Mulawarman, Buaya Jaya, Suka Maju, and Bukit Pariaman). A sample of 25 respondents was taken from each village.

2.4 Data Analysis Methods

The data processing method in this research was carried out using SPSS 21, nutrisurvey, and Excel software. The general condition of the research area was processed and presented in descriptive form. Economic, educational, and health facilities are presented in tables and narrated descriptively. The socioeconomic characteristics of sample families such as income level are calculated using the following formula:

2.4.1 Farmer household income

Income is income received or generated in the form of money or goods. Farmer household income is the sum of on-farm and off-farm income earned by farming households. The formula used is:

$$Pd = Pd_{on} + Pd_{off}$$

Information: Pd = Farmer Household Income (Rp); Pdon= Income from farming (IDR); and Pdoff= Income from outside farming (IDR)

2.4.2 Household food security

Farming household food security is measured based on the percentage of food expenditure.

Food expenditure percentage: Percentage of food and non-food expenditure, namely the percentage of expenditure on both food and non-food from total expenditure based on total family income which is divided into 3 categories, namely: low (if food or non-food expenditure is <50% of total expenditure), and high food expenditure or non-food 50-60% of total expenditure), and high (if food and non-food expenditure is >60% of total expenditure).

The percentage of expenditure on food and non-food is as follows:

1) Add up monthly expenses
2) Add up non-food expenses per month
3) Calculate the percentage of food or non-food expenditure
4) Categorize food and non-food expenditure into three categories: (a) Low food expenditure <50%; (b)Medium food expenditure 50-60%; and (c) High food expenditure ≥60%.

3. RESULTS AND DISCUSSION

3.1 General Description of the Research Location

The Tenggarong Seberang subdistrict is one of the sub-districts located in the Kutai Kartanegara Regency, East Kalimantan Province. Geographically, Tenggarong Seberang subdistrict is located between 116047'-117004' East Longitude and 0021'0034 South Latitude with an area of 464.25 km².

The Tenggarong Seberang subdistrict area consists of 18 villages, namely, Loa Lepu, Teluk Dalam, Perjiwa, Loa Raya, Loa Ulung, Embuat, Bukit Raya, Manunggal Jaya, Bangun Rejo, Kerta Buana, Separi, Bukit Pariaman, Buana Jaya, Mulawarman, Loa Pari, Sukamaju, Tanjung Batu, Karang Tunggal. The village which is the sub-district capital is Manunggal Jaya village.

Tenggarong Seberang subdistrict had an area of 443.4 km² in 2023. The population is 57,120 people or 18,979 households. The area, number

of households, and population at the research location are presented in Table 1.

Table 1 shows that the largest number of households in Bukit Pariaman Village is 2,265 with a population of 7,532. The smallest number of households is Suka Maju Village at 722 with a population of 2,458 consisting of 31,206 men and 25,914 women.

3.2 Research Results

3.2.1 Farmer's household income

Farmers' household income is grouped into 2, namely farming income (on the farm) and non-farming income (off the farm). The average household income of farmers in the research location can be seen in Table 2.

Based on Table 2, it can be seen that the highest farming income for farmer households is in Bukit Pariaman Village, amounting to IDR 2,907,173 or 62.30%. This income is obtained from farming income such as the results of working on rice fields and gardening. Non-farming income is obtained from the income of family members who work as mining, trading, agricultural laborers, builders, employees, and teachers. This non-farming income becomes additional income for the household. The largest amount of non-farming income is in Mulawarman Village, amounting to IDR 2,142,308 or 52.73%.

The distribution of sample families based on family income and per capita is presented in Table 3.

Table 3 shows that the average total income of sample families per month ranges from IDR 3,827,017 to IDR 4,554,373, with an average standard deviation between IDR 914,522 to IDR 1,569,862. Table 3 distribution of sample families based on family income per month is between IDR 2,500,000 to IDR. 8,800,000. If family income is divided by the number of family members, per capita income is obtained. The average monthly per capita income of the sample ranges from IDR 910,152 to IDR 1,362,339, with an average standard deviation of between IDR 469,460 to IDR 1,708,250, while the distribution of sample per capita income per month ranges from IDR 416,667 to IDR 2,500,000. The results of this research are no different from those reported by [9] in that the total household income of farmers in Campaka Village, Cigugur District, Pangandaran Regency is IDR 2,356,342. Another research result reported by [10] was that the average total income earned by rice farmers in Sungai Pinang Village was IDR 34,001,240 per year or IDR 2,833,437 per month.

Table 1. Area, number of households, and population of research locations

Village	Area	Number of Households	Total population
Mulawarman	24,7	724	2,387
Buana Jaya	37,0	1,316	4,441
Suka Maju	41,0	722	2,458
Bukit Pariaman	42,1	2,265	7,532
Total number	220,8	1451,179	21,208

Source: BPS Tenggarong Seberang Secondary Data 2023 (processed)

Table 2. Average monthly household income of farmers

No	Village	Origin of Income	Average (IDR)	Percentage (%)
1	Bukit Pariaman	Farming Income	2.907.173	62,30
		Non-Farming Income	1.759.000	37,70
		Amount	4.666.173	100,00
2	Mulawarman	Farming Income	1.919.739	47,27
		Non-Farming Income	2.142.308	52,73
		Amount	4.062.047	100
3.	Buana Jaya	Farming Income	2.953.440	65,00
		Non-Farming Income	1.621.875	35,00
		Amount	4.575.315	100
4.	Suka Maju	Farming Income	2.915.857	64,00
		Non-Farming Income	1.625.000	36,00
		Amount	4.540.857	100

Source: Primary Data 2024 (Processed)

Table 3. Distribution of sample families based on family income and per capita

Income Category	Village	Average (IDR)	Standard Deviation	Minimum	Maximum
Family Income	Mulawarman	3.827.017	914.522	2.500.000	6.833.000
	Buana Jaya	4.122.320	1.093.194	2.800.000	6.200.000
	Suka Maju	4.006.777	996.125	2.500.000	6.500.000
	Bukit Pariaman	4.554.373	1.569.862	3.033.000	8.800.000
Income per capita	Mulawarman	910.152	1.708.250	416.667	1.708.250
	Buana Jaya	1.204.501	469.460	500.000	2.125.000
	Suka Maju	1.169.941	511.746	466.667	2.500.000
	Bukit Pariaman	1.362.339	708.806	766.667	4.400.000

Source: Primary Data 2024 (Processed)

Table 4. Diversification of farmer household work

Jobs/ Livelihood	Village							
	Mulawarman		Buana Jaya		Suka Maju		Bukit Pariaman	
	Husband	Wife	Husband	Wife	Husband	Wife	Husband	Wife
	N	N	n	n	n	n	n	n
I. Farming Work								
1. Farming	12	7	18	3	11	4	17	2
2. Farm laborers	0	0	0	4	0	0	0	2
Subtotal	12	7	18	7	12	4	17	4
II. Non-agricultural work								
1. Builder	2	0	1	0	2	0	1	0
2. Stone digger	0	0	0	0	3	0	0	0
3. Masseur	0	0	2	0	0	0	0	0
4. Head of RT	2	0	1	0	2	0	0	0
5. Housewife	0	11	0	11	0	8	0	7
6. Trading	2	4	0	3	0	2	0	5
Sub-Total	6	15	4	14	7	10	1	12
IV. Professional Worker								
1. Honorary	0	0	0	1	0	0	0	0
2. Civil servants	0	2	0	0	0	0	0	1
3. Private employees	7	0	3	0	6	1	7	1
Sub-Total	7	2	3	1	6	1	7	2
Total : (n)	25	24	25	22	25	15	25	18

Source: Primary Data 2024, (Processed)

The income level of the community in the villages supported by PT Jembayan Muara Bara has increased along with the presence of the Company. For those who work as company employees if you look at the wages and work facilities provided by the company. The community also opened businesses in the fields of trade, services, and other businesses. However, it is different for household farmers who are less educated because their agricultural land is getting smaller, fertility is reduced due to exposure to waste, and the community's inability to compete, especially with immigrants.

Central Statistics Agency [3], states that a family is said to be poor if the per capita income in one family is IDR 550,458. From this poverty line, generally, the sample families are not included in the poor family category.

Farmer household income in the research location comes from farming income (on-farm) and non-farming income (off-farm). The type of work at the research location, apart from being a farmer, is also dominated by mining employees. Apart from that, he is also a trader, builder, stone quarry, massage worker, farm worker, RT head, honorary worker, and civil servant. Household

income determines expenditure and is the basis for determining the poverty line. East Kalimantan's economy is still dominated by the mining sector [11]. Household income also partially has a significant effect on food insecurity. People with low income will fall into the poor category and become a cause of food insecurity [12]. Extreme poverty is characterized by low income which can identify the social and economic vulnerability of a family [13].

3.2.2 Income diversification

Households with low economic status tend to diversify their income. If farming households only depend on their livelihood as farmers, their household needs will not be met. This is because farmers only have money after harvest so farmers have difficulty meeting their daily needs. Data regarding the diversification of farmers' work can be seen in Table 4.

Based on Table 4, shows that diversification of sources of income is carried out by farming households to increase family income. The type of work carried out by farming households to increase their source of income other than farming is working as private employees at new coal mining companies around the village where they live. There were 18 respondents interested in working in the agricultural sector or as farmers in Buana Jaya Village and 17 respondents in Bukit Pariaman Village, while in Mulawarman Village there were only 12 respondents because agricultural land had been converted into a mining area. The jobs most often carried out by farming households to increase their income are found in Mulawarman Village, namely construction workers with 2 respondents, head of household with 2 respondents, traders with 2 respondents, and private or mining employees with 7 people. From the calculation of the income diversification index value in Mulawarman Village, it is 3.4, or the high category.

Buana Jaya Village is 1.3 in the medium category, Bukit Pariaman Village is 2.6 in the high category, and Suka Maju Village is 3 in the high category. This shows that the four villages carry out work to increase family income so that the source of income obtained is used to meet daily needs.

3.2.3 Farmer household expenditures

Farmer household expenditures for food and non-food consumption at the research location can be seen in Table 5.

Based on Table 5, shows that the average monthly expenditure of farming households in Bukit Pariaman Village is IDR 2,977,593. The expenditure on food was IDR 1,497,010 and the non-food expenditure was IDR 1,480,583. Food consumption includes grains (rice), tubers, fish, meat, eggs, milk, vegetables, nuts, fruit, oil and fat, ready-to-eat food and drinks, as well as other consumption. The largest food expenditure is on grains, including an average expenditure on rice of IDR 279,800 or 18.69%, corn of IDR 28,800 or 1.92%, rice flour of IDR 11,320 or 0.76%, and wheat flour of IDR 49,720 or 3.32%. The grain group is most consumed because the food pattern of farming households every year is rice so its availability is always there. Apart from that, corn, rice flour, and wheat flour are used as additional ingredients for making side dishes.

Non-food expenses consist of expenses for housing or housing facilities, education costs, health costs, taxes and insurance, and transportation. The largest non-food expenditure is on housing or housing facilities amounting to IDR 616,120 or 41.61% including rent/contracts, electricity, water, gas, and other costs.

3.2.4 Proportion of food consumption expenditures to total expenditures of farmer households

The percentage of food and non-food expenditure is divided into 3 categories, namely the low category with the percentage of expenditure on food <50% of the total family expenditure per month, the medium category if the percentage of expenditure on food is 50-60% of the total family expenditure per month, the high category if the percentage food expenditure >60% of total expenditure per month. The proportion of food consumption expenditure to total expenditure is presented in Table 6.

Table 5. Average food and non-food expenditures per month for farmer households in Bukit Pariaman village

No.	Type of Expenditure	Average (IDR)	Percentage (%)
1.	Food Expenditures		
	a. Grains		
	1. Rice	279.800	9
	2. Corn	28.800	1
	3. Rice Flour	11.320	0
	4. Wheat Flour	49.720	2
	b. Tubers		
	1. Cassava	6.120	0
	2. Sweet Potatoes	9.200	0
	3. Potatoes	30.240	1
	c. Fish	33.920	1
	d. Meat	26.250	1
	e. Eggs and milk	59.280	2
	f. Vegetables	217.960	7
	g. Nuts	147.760	5
	h. Fruits	147.760	5
	i. spices	127.040	4
	j. Oil and fat	132.200	4
	l. Finished food and drinks	171.640	6
	m. Other consumption	18.000	1
	Total	1.497.010	
2.	Non-food expenditures		
	a. Housing and home facilities	616.120	21
	b. Cost of education	136.400	5
	d. Health Costs	76.600	3
	e. Taxes and insurance	114.583	4
	f. Transportation	536.880	18
	Total	1.480.583	
Total Food + Non-Food Expenditures		2.977.593	100

Source: Secondary Data 2024 (Processed)

Table 6. Proportion of farmers' home food and non-food expenditures in research locations

	Information	Nominal (IDR/month)	Proportion (%)
Mulawarman	Food Expenditures	1.707.640	50,72
	Non-Food Expenditures	1.656.560	49,25
	Total	3.364.200	100
Buana Jaya	Food Expenditures	1.820.520	52,19
	Non-Food Expenditures	1.627.600	47,81
	Total	3.448.120	100
Suka Maju	Food Expenditures	1.757.940	51,06
	Non-Food Expenditures	1.684.840	48,94
	Total	3.442.780	100
Bukit Pariaman	Food Expenditures	1.893.700	54,51
	Non-Food Expenditures	1.580.440	45,49
	Total	3.474.140	100

Source: Primary Data 2024 (Processed)

Table 6 shows that the highest average total expenditure was in Bukit Pariaman Village, IDR 3,474,140, for food IDR 1,893,700 (54.51%) and non-food IDR 1,580,440 (45.49%). Meanwhile, the lowest average total expenditure was in Mulawarman Village at IDR 3,364,200 for food at IDR 1,707,640 (50.72%) and non-food at IDR 1,656,560 (49.25%). The results of other research reported by [9], on farmer households in Campaka Village, Cigugur District,

Pangandaran Regency. The average expenditure of farmer households is IDR 1,320,000 per month, the allocated costs for non-food needs are IDR 830,000, and for food needs of IDR 490,000 total household expenditure or in other words, the proportion of farmers' food expenditure is lower than the proportion of non-food expenditure.

Hamid et al. [14] stated that high income usually supports someone to buy more than enough. The ability of a household to provide good nutritional intake for its family depends on its purchasing power and the number of dependent household members and is related to the level of household income.

The distribution of farming families based on the percentage of food and non-food expenditure is presented in Tables 7 and 8.

Table 7 shows the distribution of respondent families based on the percentage of food expenditure and income categories seen in the family category < Rp. 3,536,506 (UMK) with the highest low level, namely in Mulawarman Village with 2 respondents or 8%. The medium level in Mulawarman Village was 7 respondents or 28%, the low level was 4 respondents per village except Buana Jaya Village with 6 respondents or 24%. The income category is > IDR 3,536,506 (UMK) with a low level, namely in Buana Jaya Village as many as 3 respondents or 12%, a medium level in Bukit Pariaman Village as many as 12 or 48%. Meanwhile, the highest level was in Suka Maju Village, namely 10 respondents or 40%.

Table 7. Distribution of respondent families based on percentage of food expenditure

Income Category	Food Expenditure Percentage	Mulawarman		Buana Jaya		Suka Maju		Bukit Pariaman		Total	
		n	%	n	%	n	%	n	%	n	%
< Rp. 3.536.506	Low (<50%)	2	8	1	4	0	0	0	0	3	3
	Medium (50-60%	7	28	4	16	0	0	1	4	12	12
	High (>60%)	4	16	4	16	6	24	1	4	15	15
> Rp. 3.536.506	Low (<50%)	4	16	3	12	4	16	4	16	15	15
	Medium (50-60%	2	8	11	44	5	20	12	48	30	30
	High (>60%)	6	24	2	8	10	40	7	28	25	25
Total		25	100	25	100	25	100	25	100	100	100

Source: Primary Data, 2024 (processed)

Table 8. Distribution of respondent families based on percentage of non-food expenditure

Income Category	Food Expenditure Percentage	Mulawarman		Buana Jaya		Suka Maju		Bukit Pariaman		Total	
		n	%	n	%	n	%	n	%	n	%
< Rp. 3.536.506	Low (<50%)	2	8	6	24	7	28	2	8	17	17
	Medium (50-60%	0	0	4	16	0	0	0	0	4	4
	Tinggi (>60%)	0	0	0	0	0	0	0	0	0	0
> Rp. 3.536.506	Low (<50%)	20	80	12	48	16	64	20	80	68	68
	Medium (50-60%	3	12	3	12	2	8	3	12	11	11
	High (>60%)	0	0	0	0	0	0	0	0	0	0
Total		25	100	25	100	25	100	25	100	100	100

Source: Primary Data 2024 (processed)

Table 8 shows that the distribution of farming families based on the percentage of non-food expenditure and income category shows that for the family category < IDR 3,536,506 (UMK) with a low level, namely in Mulawarman Village there are 2 respondents or 8%. The highest medium level was in Buana Jaya Village with 4 respondents or 16%. A high level does not exist. Meanwhile, for the income category > IDR 3,536,506 (UMK) with a low level, namely in Buana Jaya Village, there were 12 respondents or 48%. The lowest medium level was highest in Suka Maju Village, namely 2 respondents or 8%. Meanwhile, in the income category > IDR 3,536,506 (UMK), none of the villages has a high level of non-food expenditure. In general, the research results show that the proportion of farmers' food expenditure in the research location is higher than the proportion of non-food expenditure, which shows that farming households are still not prosperous. As stated by [15], the welfare of the population greatly influences household economic access to food so that it can influence the quantity and quality of food consumed.

4. CONCLUSIONS AND RECOMMENDA-TIONS

Based on the research results, conclusions can be given as follows:

1. Sources of income in Mulawarman, Buana Jaya, Suka Maju, and Bukit Pariaman Villages, apart from farming activities, namely by working as mining employees, traders, builders, stone diggers, masseurs, farm workers, RT heads, Honorary, and civil servants.
2. The average total family income per month ranges from IDR 2,500,000.00 to IDR 8,800,000.00. The average per capita income per month ranges from IDR 910,152.00 to IDR 1,362,339.00, while the distribution of income per sample capita per month is between IDR 416,667.00 to IDR 2,500,000.00.
3. The proportion of food expenditure by farmer households ranges from 50.72% - 54.51%, while the proportion of non-food expenditure by farmer households ranges from 45.45 - 49.25%.

Based on the results of the research and discussion, suggestions that can be given are as follows:

1. Education regarding food security, such as outreach to the public, especially housewives, regarding good food consumption patterns, the proportion of food expenditure needs to be increased due to the low energy and protein consumption of households in the region.
2. The government must limit and determine the amount of land used for agriculture so that land conversion can be controlled.
3. To increase the breadth of income diversification, the government must continue efforts to generate income opportunities in the region and support farmers to increase productivity through supportive policies including input utilization and creating markets for their products.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that No generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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