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Determinants of Transmigrant Households' Income in Settlement Unit 3 Pagar Banyu, Ulu Talo District, Seluma Regency

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Abstract: In Indonesia, which consists of thousands of islands, it is very likely that there will be population inequality between islands. The government initiated the transmigration program to collectively encourage a more even distribution of the population, especially outside Java. The condition of the transmigration location with agricultural potential has encouraged most of the transmigrants to have their main livelihood as farmers. One of the transmigration destinations in Indonesia is Bengkulu Province, which is spread over eight regencies, but Seluma Regency is the only district that is included in the 3T (Frontier, Isolated, Underdeveloped) in Bengkulu Province which is allocated for the settlement of transmigrants, and the Settlement Unit 3 Pagar Banyu is one of the transmigration destinations since 2007. This study aims to analyze the effect of farm diversification, land size, family labor, and non-farm income on transmigrant household income. The population in this study consists of 50 transmigrant households in the settlement unit 03 Pagar Banyu, Ulu Talo District, Seluma Regency, all selected as respondents. Data were collected through interviews based on questionnaires, which were then analyzed with multiple linear regression. The results of this study indicate that farm diversification, land size, family labor, and non-farm income have a positive and significant effect on the income of transmigrant households. The results imply that transmigrant households should optimize farming in terms of diversification, land size, use of family labor, and engagement in non-farm income opportunities to increase income. Furthermore, the government should provide policies that focus on developing transmigrant farming.

Keywords: household income; migration, farm diversification; land size; family labor, off farm income.

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1. Introduction

In Indonesia, which consists of thousands of islands, there is a high probability for population inequality between islands to occur. Therefore, policies that encourage a more even distribution of the population are needed, one of which is the transmigration program that has been implemented for a long time. Internal migration plays a strategic role in shaping population distribution (Stawarz & Sander, 2019). Transmigration is considered to continue an agricultural development program outside Java which the Dutch colonial government started in 1905 under Colonisatic. This word was used to eliminate all things associated with colonialism, so the word transmigration was deemed appropriate, not emigration or immigration. This is because the displacement occurred between the islands of a sovereign country (Balilatfo - KDPDTT, 2019). More specifically, the definition of transmigration, according to Petersen in Balilatfo - KDPDTT (2020), is the policy of the Indonesian government to move residents from the densely populated island of Java to other sparsely populated areas outside Java. According to the Law of the Republic of Indonesia Number 29 of 2009 concerning an amendment to Law Number 15 of 1997 concerning Transmigration, it is stated in Article 1, paragraphs 2 and 3 that transmigration is a voluntary movement of people to improve welfare and settle in transmigration areas organized by the government. Transmigrants are citizens of the Republic of Indonesia who move voluntarily to transmigration areas.

The objectives, targets, and directions of Transmigration are as stated in Articles 3, 4, and 5 of Law Number 15 of 1997 concerning Transmigration that the implementation of Transmigration aims to improve the welfare of transmigrants and the surrounding community, increase and distribute regional development, and strengthen national unity. The target of implementing Transmigration is to increase the transmigration community's capacity and productivity, build independence, and realize integration in transmigration settlements so that the economy and socio-culture can grow and develop sustainably. The implementation of Transmigration is directed at structuring a harmonious and balanced population distribution with the natural carrying capacity and environmental capacity, improving the quality of human resources, and realizing community integration.

The transmigration program has been implemented over a long period and within the framework of different government policies. Participants who take part in transmigrants from time to time fluctuate. Most migrants were during Pelita IV (1984/1985-1988/1989). The long journey of transmigration is certainly not without obstacles. According to Balilatfo - KDPDTT (2020), common problems often encountered in implementing transmigration are social, economic, infrastructure facilities, and infrastructure gaps between transmigrants and residents and between transmigration locations and surrounding areas. The same applies to welfare issues, although participants in the transmigration program are provided with agricultural land and other means of production to develop the agricultural sector as a livelihood. However, often the land acquired is marginal. As a result, the productivity of agricultural businesses in the transmigration location is lower than in the area of origin. This condition is getting worse due to limited capital.

One of the transmigration destinations in Indonesia is Bengkulu Province which is spread over eight regencies. Still, Seluma Regency is the only district included in the 3T (Last, Frontier, Outermost) in Bengkulu Province, which is the settlement of transmigrants. The Settlement Unit 3 Pagar Banyu has been one of the transmigration destinations since 2007, with a more inland location than other locations. Hence, they tend to make a living as farmers. The capital obtained by the transmigrant community in the settlement unit 3 Pagar Banyu from the government at the beginning of transmigration, such as land allotments, and others, is the same. However, observations at the location showed several differences, including housing conditions. Some were still in the original condition of trans allotment houses, non-permanent houses to semi-permanent houses, and differences in ownership of fixed assets such

as vehicles, furniture, and so on, as well as changes in the area of land owned, both due to sales or purchases. This indicates a difference in income.

Several previous studies were used as references for this research. For example, according to Yusup and Giyarsih (2015), transmigrants are still classified as poor because their main income is still from being a laborer. Sutanto et al. (2019) evaluate the success of transmigration based on questionnaire analysis, in-depth answers through in-depth interviews, and field observations. There are still some very crucial problems, including soil quality, technical aspects of agricultural management, roads, bridges, infrastructure, and economic and social aspects. Another problem, according to Langumadi and La Harudu (2017), is that the condition of the transmigrant community based on socioeconomic indicators, education level, housing conditions, and health of the transmigrant community are mostly categorized as moderate. Still, most of them have low incomes in terms of income conditions. Gupito et al. (2014) stated that the age of transmigrant household heads when transmigrating were all of productive age, the level of education was low, the main type of work was farmers and did not have side jobs, the number of children owned was relatively small, the area of rice fields owned was relatively narrow, and the income level was classified as low.

Kakisina (2011) conducted research on transmigrant income by using age, education level, number of dependents, production costs, land ownership, cultivated land size, food crop income, vegetable crop income, fruit crop income, livestock income, fishery income, income from industry, income from trade, income from civil servants (PNS), and income from private employees. Subsequent research conducted by Yulianti et al. (2014) examined the factors that affect the income of the transmigrant community using the variables of capital, education level, health, and labor wages.

Based on the above background, the authors are interested in researching the determinants of transmigrant household income in the Settlement Unit 3 Pagar Banyu, Ulu Talo District, Seluma Regency, using the independent variables of farm diversification, land size, family labor, and non-farm income. These variables were selected because of the tendency of the transmigrant community, whose main livelihood is farmers, thus indicating a relationship between the variables of farm diversification, family labor, and the income of the transmigrant community. In contrast, non-farm income is generally earned by farmers as an effort to increase household income. This study has similarities with previous studies, such as the use of the independent variable of land size, while the difference is the addition of the independent variables of farm diversification, family labor, and non-farm income.

Farm diversification is an effort to diversify the types of crops/livestock. For example, apart from farming, farmers raise chickens, raise fish, and multiply the types of plants on land. For example, pepper is also planted on land besides corn, which will create more sources of income for households. The study of Kawau et al. (2015) shows that the income of coconut farmers who are processed by horizontal diversification is higher than that of coconut farmers cultivated in monoculture. Horizontal diversification is the diversification of plant species to efficiently use the land to increase household economic resilience and business sustainability. Zahri and Febriansyah (2014) found that business diversification can increase farmers' household income. Asfaw et al. (2019) found that crop diversification had a greater impact on the incomes of the poor in Malawi, Niger, and Zambia. In addition, crop diversification increases food security (Adjimoti & Kwadzo, 2018) and farm income (Mofya-Mukuka & Hichaambwa, 2018). Li et al. (2020) found that cash crop cultivation positively and significantly affects household income. Based on the description above, the first hypothesis in this study can be formulated as follows:

H1: Farm diversification has a positive effect on transmigrant household income.

Because land is the main capital in farming, the area of land cultivated by farmers will greatly affect agricultural yields. Based on the study of Andrias et al. (2017), land size has a positive and significant effect on the production and income of rice farming in Jelat Village, Baregbeg District. Other authors also find similar results (Maryoni,

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2015; Pratiwi et al., 2018; Sofianita et al., 2022). Based on the description above, the second hypothesis in this study can be formulated as follows:

H2: Land size has a positive effect on transmigrant household income.

The use of family labor by farm households will be more efficient in terms of wage costs because family labor is unpaid. Thus, transmigrant households with many family workers will save on wage costs. Based on the study of Fallo et al. (2018), the allocation of family labor for non-agricultural businesses has an impact on improving the welfare of farmer households. Darmawi (2012) found that family labor could economically contribute to the income of cattle farming. Based on the description above, the third hypothesis in this study can be proposed as follows:

H3: Family labor has a positive effect on transmigrant household income.

Farm households who have jobs outside the agricultural sector have the opportunity to have a greater source of income because they seek a variety of jobs. Based on a study conducted by Andajani et al. (2010), there is a difference in the income between rice farmer households that allocate capital and labor to off-farm and non-farm activities with rice farmer households that only focus on rice farming activities. Norfahmi et al. (2017), Ma et al. (2018), Anteneh Astatike and Ganamo Gazuma (2019), Bjornlund et al. (2019), and Komikouma et al. (2021) said that the increased allocation of working time on non-agricultural activities had an impact on increasing farm household income. Cahyono (2017) also reveals that the choice of off-farm work is largely not motivated by the high economic burden on the family but has also created economic and psychological pressures. Off-farm income can contribute to the social welfare of poor farm households. Based on the description above, the fourth hypothesis in this study can be proposed as follows:

H4: The average income of transmigrant households with off farm income is higher than transmigrant households that do not have off farm income.

2. Methods

This study uses a quantitative approach with a survey method. This research was conducted in Settlement Unit 3 Pagar Banyu, Ulu Talo District, Seluma Regency. The population in this study were transmigrant households in the Settlement Unit 3 Pagar Banyu, Ulu Talo District, Seluma Regency, which consisted of 50 households, and all of them were selected as respondents. Primary data includes income, farm diversification, land size, family labor, and off-farm income. Secondary data were obtained from the Statistics Indonesia (BPS) of Seluma Regency and the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration.

In this study, income is the total income earned by household members (head of household, wife, children) per month, measured in rupiah (IDR/month). Farm diversification includes various types of businesses or crops/livestock. For example, farmers, apart from farming, raise chickens and fish, multiply the types of plants in an area or agricultural plants cultivated by farmers, and are measured in units. Land size is the size of agricultural land cultivated by transmigrant households in hectares (Ha). Family labor is the number of workers in the family, measured in persons. Finally, off-farm income is a type of income source measured by a dummy variable, one if there are household members engaged in off-farm income and 0 otherwise.

The primary data in this study were analyzed by multiple linear regression to investigate the effect of farm diversification, land size, family labor, and off-farm income on transmigrant household income. This study's multiple linear regression analysis models can be formulated as follows:

$$Y = a + \beta_1 DIV_i + \beta_2 LAND_i + \beta_3 FL_i + \beta_4 D_{1i} + \varepsilon_i$$

where:
Y   = Transmigrant household's income

a = Intercept
β_1 = Regression coefficient for farm diversification
β_2 = Regression coefficient for land size
β_3 = Regression coefficient for family labor
β_4 = Regression coefficient for off farm income
DIV = Farm diversification
LAND = Land size
FL = Family labor
D_1 = Off farm income
ε = Error term

The regression model above was then tested for classical assumptions consisting of the normality test (Jarque-Bera), multicollinearity (Variance Inflation Factor), and heteroscedasticity (Glejser). After that, the coefficient of determination (R^2), F test, and t test are calculated.

3. Results and Discussion

3.1. Overview of Research Site

Settlement Unit 03 Pagar Banyu is located in Ulu Talo District, Seluma Regency, with an area of 893.99 Ha divided into three hamlets. The SP 03 Pagar Banyu area is topographically plain, with boundaries including the north with the village of Giri Nanto, the south with the village of Pagar Agung, the east with the village of Muara Nibung, and the west with the village of Muara Simpur. The total population of Pagar Banyu Village is 170 people, consisting of 78 males and 92 females, with an age range of 12–64 years consisting of 69 people and the rest consisting of 0–12 and >64 years, with the main livelihood as farmers. The main commodities are rice, palm oil, and coffee. As for education infrastructure, there is one elementary school in the settlement unit 03 Pagar Banyu.

3.2. Description of Research Variables

3.2.1. Farm Diversification

Since the main livelihood of the transmigrant community is farmers, it is very likely to diversify their farming. One factor that encourages diversification is having multiple sources of income. The type and frequency of farming in settlement unit 03 Pagar Banyu vary, including palm oil, coconut, rice, rubber, and coffee. The distribution of respondents based on farm diversification is described in Table 1.

Table 1. Distribution of Respondents by Farm Diversification

Farm Diversification	Frequency	Percentage (%)
0	1	2.32
1	30	69.77
2	10	23.26
3	2	4.65
Total	43	100.00

Table 1 shows that almost all trans SP 03 Pagar Banyu households have more than one type of farming business, but most of the migrants do not diversify their farming. There are even transmigrant households who do not farm at all, instead doing retail business and being an employee; allotted land is only used to build houses and yards.

3.2.2. Land Size

The land is the main capital for farming, so the size of the land will affect the farming yield. The distribution of respondents by land size is described in Table 2.

Table 2. Distribution of Respondents by Land Size

No.	Land Size (Ha)	Frequency	Percentage (%)
1	0.25–2.25	24	55.74
2	2.26–4.25	12	28.00
3	4.25–6.25	5	11.62
4	6.26–8.25	1	2.32
5	8.26–10.25	0	0.00
6	10.26–12.25	1	2.32
	Total	43	100.00

Based on Table 2, the land size cultivated by transmigrant households varies from 0.25 Ha to 10 Ha. Most migrants have expanded their cultivated area by buying or renting land.

3.2.3. Family Labor

The availability of family labor will increase family income, especially in farm households, because the wages of family labor are usually cheaper or unpaid. The distribution of respondents by family workers is described in Table 3.

Table 3. Distribution of Respondents by Number of Family Labor

Number of Family Labor	Frequency	Percentage (%)
1	18	41.87
2	21	48.83
3	4	9.30
Total	43	100.00

Table 3 indicates that transmigrant households have family workers ranging from one to three persons. Although most have two laborers, 18 households have only one family labor. This is because many other transmigrant family members are housewives or are not yet of productive age.

3.2.4. Off farm Income

More households have off-farm income, although most use their land for farming. The distribution of respondents by off-farm income is described in Table 4.

Table 4. Distribution of Respondents by Off Farm Income

No.	Off Farm Income	Frequency	Percentage (%)
1.	Without off farm income	19	44.19
2.	With off farm income	24	55.81
	Total	43	100.00

Based on Table 4, most of the transmigrant households have off-farm income. Transmigrants who do off-farm work include workers in oil palm plantations, palm oil intermediaries, and rice workers. In contrast, non-farm jobs include food stalls, workshops, private employees, and civil servants. Transmigrants engage in off-farm and non-farm jobs because they are trying to get multiple sources of income. While transmigrants who only do farming want to focus on allocating time for their farming.

3.3. Results

As a country where most of the population relies on the agricultural sector, Indonesia has always prioritized agricultural development, which essentially aims to improve the welfare of the farming community (Syekh, 2013). Based on a survey of the population of transmigrant households' settlement unit 03 Pagar Banyu, there are several types of farming, including palm oil, coffee, rubber, rice, and coconut. The analysis of each farming is described as follows.

3.3.1. Farm Revenue

Farm revenue is all income received by farmers from farming before deducting costs. The average farm income for each crop is described in the following tables.

Table 5. Average Revenue of Oil Palm Farming

No.	Land Size (Ha)	Frequency	Revenue (IDR)
1.	0.25–2.25	21	23,085,714
2.	2.26–4.25	11	62,400,000
3.	4.25–6.25	6	98,400,000
4	6.26–8.25	0	0
5	8.26–10.25	0	0
6	10.26–12.25	1	336,000,000
	Total	39	

Table 5 shows that the wider the land size, the higher the farm income. The average income earned by oil palm farmers is IDR86,647,619.00 per year.

Table 6. Average Revenue of Coffee Farming

No.	Land Size (Ha)	Frequency	Revenue (IDR)
1.	< 0.5	1	1,100,000
2.	0.5–1	5	3,541,625
	Total	6	

Table 6 shows that respondents' landholding varies from 0.5 Ha to 0.75 Ha. The wider the land size, the larger the farm revenue. The average income earned by coffee farmers is IDR3,053,300.00 per year.

Table 7. Revenue of Rubber Farming

No.	Land Size (Ha)	Frequency	Revenue (IDR)
1.	0.25	1	4,500,000
	Total	1	

Table 7 shows that rubber farmers have a land size of 0.25 ha, with an income of IDR4,500,000.00 per year.

Table 8. Average Revenue of Rice Farming September–December 2021 (7 Households)

No.	Land Size (Ha)	Frequency	Revenue (IDR)
1.	< 0.5	2	6,200,000
2	0.5–1	5	9,400,000
	Total	7	

Table 8 shows that the wider the land size, the higher the farm income. The average income obtained by rice farmers is IDR7,800,000.00 per planting season.

Table 9. Revenue of Coconut Farming (1 Household)

No.	Land Size (Ha)	Frequency	Revenue (IDR)
1.	0.5	1	3,000,000
	Total	1	

Table 9 shows that coconut farmers have a land size of 0.5 ha and earn an income of IDR3,000,000.00 per year.

3.3.2. Farm Costs

Farm costs are all components of costs incurred by farmers in the farming process (Arifin, 2015). The cost of farming rice is four months, while the cost of farming oil palm, coffee, rubber, and coconut is one year. The production costs of the five farms include fixed costs and variable costs, including land rent, depreciation of agricultural equipment, labor costs, costs of fertilizers, pesticides, and seeds, especially for rice farming.

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In this study, fixed costs consist of land rent and depreciation of agricultural equipment. However, the transmigrants in settlement unit 03 Pagar Banyu do not pay rent because they own the land, except for rice farming by several transmigrant households. The average rent for rice fields is IDR875,000.00 per hectare per year. Agricultural equipment used by transmigrant households is described in Table 10.

Table 10. Farm Type and the Agricultural Equipment

No.	Farm Type	Agricultural Equipment
1	Palm oil	Egrek, dodos, pushcart, sprayer
2	Coffee	Hoe, sickle, machete, horns, sprayer
3	Rice	Hoe, sickle, horns, sprayer
4	Rubber	Tapping knife, machete, plastic bucket, sprayer
5	Coconut	Sickle, sprayer

Based on Table 10, the five farms have different agricultural equipment. For example, equipment in oil palm farming is used for harvesting fresh fruit bunches. Coffee farm equipment is used in weed removal. In rice farming, equipment is used in land preparation to harvest rice. While in rubber farming, a tapping knife is used as a tool to peel the bark of the rubber tree so that the sap comes out, and in coconut farming, the sickle is used to pick coconuts. In the five farms, a sprayer has the same function as a pesticide sprayer. The average depreciation of agricultural equipment is described in the following tables.

Table 11. Average Depreciation of Equipment in Palm Oil Farming

No.	Equipment	Price (IDR)	Age (years)	Depreciation (IDR)
1.	Egrek	802,342	5	191,527
2.	Dodos	64,679	6	29,676
3.	Pushcart	304,872	5	158,533
4	Sprayer	551,624	7	96,042
	Average			475,778

Table 11 shows that the average depreciation of agricultural equipment in oil palm farming in one year is IDR475,778.00. Although, in general, the agricultural equipment used in oil palm farming is as listed above, not all farmers own them personally, especially egrek and dodos harvesting tools, because there are also options for these tools to be provided by oil palm harvesting workers.

Pushcarts are also not owned by all farmers. Apart from depending on the terrain or conditions of the oil palm land, the use of pushcarts is also usually replaced by motorbike taxis brought by oil palm harvesting workers. Many locations of oil palm land are located in the yard of transmigrant houses, so the condition of the land tends to be clean and does not require a sprayer.

Table 12. Average Depreciation of Equipment in Coffee Farming

No.	Equipment	Price (IDR)	Age (years)	Depreciation (IDR)
1.	Hoe	24,167	5	14,500
2.	Sickle	50,000	5	10,000
3	Machete	28,333	5	11,333
4.	Horns	22,500	4	11,250
5	Sprayer	361,667	7	62,000
	Average			109,083

Table 12 shows that the average depreciation of agricultural equipment in coffee farming in one year is IDR109,083.00. Farmers who do not have a sprayer usually use horns and sickles to clean weeds.

Table 13 shows that the average depreciation of agricultural equipment in rice farming in one growing season or four months is IDR26,249.00. All respondents have these four pieces of equipment.

Table 13. Average Depreciation of Equipment in Rice Farming

No.	Equipment	Price (IDR)	Age (years)	Depreciation (IDR)
1.	Hoe	90,714	5	4,536
2.	Sickle	35,711	5	1,786
3.	Horns	45,000	4	2,250
4	Sprayer	357,143	7	17,857
	Average			26,249

Table 14. Average Depreciation of Equipment in Rubber Farming

No.	Equipment	Price (IDR)	Age (years)	Depreciation (IDR)
1.	Tapping knife	25,000	3	8,333
2.	Machete	50,000	5	10,000
3.	Plastic bucket	25,000	1/6	12,500
4	Sprayer	350,000	5	70,000
	Average			100,833

Table 14 above shows that the average depreciation of agricultural equipment in rubber farming is IDR100,833.00 and most of the farmers own the four pieces of equipment.

Table 15. Average Depreciation of Equipment in Coconut Farming

No.	Equipment	Price (IDR)	Age (years)	Depreciation (IDR)
1.	Sickle	25,000	5	5,000
2.	Sprayer	350,000	7	70,000
	Average			75,000

Table 15 shows that the average depreciation of agricultural equipment in coconut farming in a year is IDR75,000.00, and farmers own both of these types of equipment.

Variable costs are costs whose magnitude varies, the size of which is influenced by variations in output (Arifin, 2015). Variable costs include labor, fertilizers, pesticides, and seeds, especially rice.

Labor costs are all costs incurred by farmers in farming production activities. Details of the labor costs of the five farms are described in Table 16.

Table 16. Farms, Job Specification, and Unit of Cost

Farm Types	Job Specification and Unit of Cost			
Palm Oil	Seedling (per seedling)	Fertilizing (per sack/bag)	Spraying (per liter of pesticide)	Harvesting (per kg fresh fruit bunch)
Coffee	Fertilizing (day/person)	Pruning (day/person)	Spraying (day/person)	Harvesting (day/person)
Rice	Seedling, land preparation, embankment repair, planting, fertilizing, weeding, spraying, and harvesting (day/person)			
Rubber	Fertilizing (per sack/bag)	Spraying (per liter)	Tapping (day/person)	
Coconut	Fertilizing (per sack/bag)	Spraying (per liter)	Harvesting (per unit)	

Table 16 shows the variety of work and unit costs used in farming, so the number of labor costs incurred by farmers will also vary. The average labor costs based on the land area are described respectively in the following table.

Table 17. Average Labor Costs Incurred by Palm Oil, Coffee, Rice, Rubber, and Coconut Farming by Land Size

No.	Farm Type	Land Size (Ha)	Average Labor Costs (IDR)
1	Palm Oil	0.25–1.25	2,671,888
		2.25–3.25	7,759,154
		4.25–5.25	10,962,365
		6.25–7.25	0
		8.25–9.25	0
		10.25–11.25	37,767,221
2	Coffee	< 0.5	360,000
		0.5–1	2,357,000
3	Rice	< 0.5	3,942,250
		0.5–1	5,488,080
4	Rubber	0.25	1,450,000
5	Coconut	0.5	530,000

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Farmers commonly do the process of fertilization in farming. Fertilization for oil palm is generally 3–4 times a year, 1–2 times in one growing season for rice, and two times a year for rubber, coconut, and coffee. The fertilizers used by farmers vary, including urea, NPK, KCL, phonska, and Sp 36. The average cost of fertilizer based on land area is described in Table 18.

Table 18. Average Fertilizer Cost in Palm Oil, Coffee, Rice, Rubber, and Coconut Farming

No.	Farm Type	Land Size (Ha)	Average Labor Costs (IDR)
1	Palm Oil	0.25–1.25	678,864
		2.25–3.25	2,737,500
		4.25–5.25	11,028,333
		6.25–7.25	0
		8.25–9.25	0
		10.25–11.25	13,180,000
2	Coffee	< 0.5	30,000
		0.5–1	296,000
3	Rice	< 0.5	292,500
		0.5–1	628,000
4	Rubber	0.25	4,500,000
5	Coconut	0.5	340,000

Farmers generally use pesticides to eradicate pests and weeds. In rice farming, farmers use pesticides to eradicate pests, but in oil palm, it is used to spray weeds. The types of pesticides used are varied, including explore, klensect, dangke, Kontak, kleenup, supertop, raja brantas, bablas, gramoxone, and bitop. The price range of pesticides varies, from IDR30,000 to IDR150,000.00 per liter/pack/bottle. However, some farmers do not use pesticides to spray weeds because farmers usually prefer the option of cleaning the weeds with a horn, machete, or sickle.

Transmigrant households engaged in rice farming obtain seeds from fellow farmers using an exchange system, from their rice or buying them at a shop. The number of seeds is based on land size. The average use of seeds and their average cost by size are presented in Table 19.

Table 19. Seed Cost

No.	Land Size (Ha)	Seed (kg)	Price (IDR/kg)
1.	< 0.5	23.33	16,000
2.	0.5–1	32.50	15,833

Based on Table 19, the average use of seeds per hectare is 29 kg, with various types, including Serang, Manggis, Ciherang, and Cenggilis.

Table 20. Total Costs in Palm Oil, Coffee, Rice, Rubber, and Coconut Farming by Land Size

No.	Farm Type	Land Size (Ha)	Fixed Costs (IDR)	Variable Costs (IDR)	Total Costs (IDR)
1	Palm Oil	0.25-1.25	197,928	3,404,757	3,602,685
		2.25-3.25	359,375	10,494,260	10,853,635
		4.25-5.25	495,381	22,081,651	22,577,032
		6.25-7.25	0	0	0
		8.25-9.25	0	0	0
		10.25-11.25	545,000	55,947,221	56,492,221
2	Coffee	< 0,5	70,000	890,006	960,006
		0,5 – 1	69,350	1,346,508	3,300,969
3	Rice	< 0.5	25,875	4,974,750	5,000,625
		0.5 – 1	376,100	7,016,080	7,392,180
4	Rubber	0.25	100,883	1,850,000	1,950,883
5	Coconut	0.5	75,000	1,110,000	1,185,000

3.3.3. Farming Profit

Table 21. Average Profit of Palm Oil, Coffee, Rice, Rubber, and Coconut Farming by Land Size

No.	Farm Type	Land Size (Ha)	Revenue (IDR)	Total Costs (IDR)	Profit (IDR)
1	Palm Oil	0.25-1.25	23,085,714	3,602,685	19,483,029
		2.25-3.25	62,400,000	10,853,635	51,546,365
		4.25-5.25	98,400,000	22,577,032	75,822,968
		6.25-7.25	0	0	0
		8.25-9.25	0	0	0
		10.25-11.25	336,000,000	56,492,221	279,507,779
2	Coffee	< 0,5	1,100,000	960,006	139,994
		0,5 – 1	3,541,625	3,300,969	240,656
3	Rice	< 0.5	6,200,000	5,000,625	1,199,375
		0.5 – 1	9,400,000	7,392,180	2,407,820
4	Rubber	0.25	4,500,000	1,950,883	2,549,117
5	Coconut	0.5	3,000,000	1,185,000	1,815,000

Table 21 shows that oil palm, coffee, and coconut farming is profitable for farmers because of TR > TC. The bigger the land size, the bigger the profit.

Table 22. Total Transmigrant Household Income per Month

No.	Income (IDR)	Frequency	Percentage (%)
1	< 3,000,000	25	58.14
2	3,000,000–9,000,000	13	30.23
3	> 10,000,000	5	11.63
	Total	43	100.00

Table 22 shows that 58.14 percent of respondents are classified as low-income, while households with medium and high income are only 30.23 percent and 11.63 percent, respectively.

3.3.4. Determinants of Farming Profit

This paper aims to determine the extent to which farm diversification (X_1), land size (X_2), family labor (X_3), and off-farm income (X_4) explain the variation in farming profit (Y). Primary data from respondents was calculated using E-views 9 with multiple linear regression results as follows.

Table 23. Estimation Results of Multiple Linear Regression

Variable	Coefficient	Standard Error	P-Value
C	13.78891	0.146793	0.0000
DIV	0.370824	0.061621	0.0000
LogLAND	0.514969	0.060439	0.0000
FL	0.252366	0.075392	0.0018
D1	0.175237	0.084539	0.0450
Coefficient of Determination R2 : 0.977755			
F statistic = 4.175645 P-Value = 0.000000			

Based on the output, the multiple linear regression equation can be written as follows:

$$LogY = 13.78891 + 0{,}370824DIV + 0.514969LogLAND + 0.252366FL + 0.175237D_1$$

The classical assumption test has been performed, including normality, multicollinearity, and heteroscedasticity tests. The normality test tests whether the regression model's standardized residual value is usually distributed. The residual value is said to be normally distributed if the standardized residual value is mostly close to the average value. The normality test used in this study is the Jarque-Bera method. The Jarque-Berra value is 4.097572 with a p-value of 0.128891, greater than 0.05, meaning that data is normally distributed.

The multicollinearity test aims to test whether, in the regression model, there is a high or perfect correlation between the independent variables. The detection of multicollinearity in this study was carried out by looking at the value of the Variance Inflation Factor (VIF) of each independent variable on the income variable. The output of the multicollinearity test in this study is as follows.

Table 24. Result of Multicollinearity Test

No.	Independent Variables	VIF
1.	Farm diversification	2.512
2.	Land size	7.613
3.	Family labor	4.353
4.	Off farm income	3.328

Based on Table 24, the VIF value of each independent variable is <10, indicating that the regression model in this study does not have symptoms of multicollinearity.

The heteroscedasticity test is to see if there are unequal variances in the regression model. The method used to detect heteroscedasticity problems in this study is the glejser method, which is done by regressing all independent variables to the absolute value of the residual. The results of the glejser test show a probability value of >0.05, so it can be concluded that the variance is the same or homoscedastic.

The coefficient of determination in this study is 0.977, meaning that farm diversification, land size, family labor, and off-farm income were able to explain the variation in income by 97.0%, while other variables outside the model explained the rest.

Table 25. Result of F Test

F-statistic	4.175645
Prob(F-statistic)	0.000000

Based on Table 25, the F-statistic value is 4.175645 with a p-value of 0.000000 <0.05, meaning that farm diversification, land size, family labor, and off-farm income significantly affect income.

Individual testing is used to test whether each independent variable significantly affects the dependent variable. The output of the t-test in this study is as follows.

Table 26. Result of t Test

Variables	Coefficients	t-Statistic	P-value
Farm diversification	0.370824	6.017788	0.0000
Land size	0.514969	8.520486	0.0000
Family labor	0.252366	3.347393	0.0018
Off farm income	0.175237	2.072861	0.0450

Based on Table 26 the error probability value for all variables ≤0.05 and has a positive sign, meaning that farming diversification, land size, family labor and off-farm income have a positive and significant effect on transmigrant household income.

3.4. Discussion

The findings of this study indicate that farm diversification has a positive and significant effect on the income of SP 03 Pagar Banyu transmigrants, Ulu Talo District, Seluma Regency. This shows that the location of transmigration has a great opportunity for farming. The results of this study support the research of Ega et al. (2021), who concluded that agricultural diversification of nutmeg, cloves, and bananas had a significant effect on income. Mu'min et al. (2014) also found that agricultural diversification has a relatively high impact on farmers' incomes in Belawang Village, Belawang District. Herdiansyah et al. (2018) argue that fishermen can diversify their businesses, such as cultivating mangroves and seaweed, to mitigate climate change. Asfaw et al. (2019) find that crop diversification has a greater impact on the poor group in Malawi, Niger, and Zambia. Furthermore, crop diversification increases food

security (Adjimoti & Kwadzo, 2018) and farm income (Mofya-Mukuka & Hichaambwa, 2018). Li et al. (2020) find that cash crop farming has a positive and significant effect on household income.

Subsequent findings in this study indicate that land size has a positive and significant effect on the income of SP 03 Pagar Banyu transmigrants, Ulu Talo District, Seluma Regency. This is very reasonable because almost all transmigrant households allocate their land only for farming. The research findings support Alitawan and Sutrisna (2017), who found that land size has a positive and significant effect on the income of citrus farmers. The findings of Daini et al. (2020) conclude that land size has a positive and significant effect on the income of coffee farmers. The result of this study supported Andrias et al. (2017) and Harini et al. (2019) that land size has a large effect on the production and income of rice farming. The larger the scale of corn farming, the higher the profit (Jastra, 2015; Pratiwi et al., 2018; Sofianita et al., 2022).

This study found that family labor had a positive and significant effect on the income of SP 03 Pagar Banyu transmigrants, Ulu Talo District, Seluma Regency. Most transmigrant households work as farmers and have their farms, and the presence of family workers directly contributes to farming activities. Darmawi's research (2012) found that family labor contributed to the income of cattle farming. Zahri and Febriansyah (2014) found that family labor participation significantly affected farmer household income.

This study found that off-farm work had a positive and significant effect on the income of SP 03 Pagar Banyu transmigrants, Ulu Talo District, Seluma Regency. The availability of off-farm and non-farm jobs at transmigration locations such as grocery stalls, workshops, and laborers can be alternatives to farming. Norfahmi et al. (2017), Ma et al. (2018), Anteneh Astatike and Ganamo Gazuma (2019), Bjornlund et al. (2019), and Komikouma et al. (2021) conclude that the higher the allocation of household work on non-agricultural activities, the higher the income earned. According to Anang et al. (2020), as part of income diversification, off-farm work has an impact on increasing the income of corn farmers. Daulay (2013) also recommends the importance of life skill training to increase income.

4. Conclusion

Based on data analysis, it is concluded that farm diversification has a positive and significant effect on the income of transmigrant households. The higher the number of farming businesses owned by transmigrant households, the higher the income earned. Land size has a positive and significant effect on the income of transmigrant households. The bigger the land size cultivated by transmigrant households, the higher the income earned. Family labor has a positive and significant effect on the income of transmigrant households. The more the use of transmigrant household labor, the higher the income earned. Jobs other than on-farm have a positive and significant effect on the income of transmigrant households. This means that the average income of transmigrant households involved in off-farm activities is higher than the average income of transmigrant households that do not have off-farm income. The variable that has the greatest influence on the income of transmigrant households is the land size. This is because almost all transmigrant households allocate their land to farming, so this will have a significant impact on farm yields. Therefore, technology that can increase agricultural production from available land plots will greatly assist farmers in increasing income (Subarna, 2013). Wordofa et al. (2021) emphasize the need for multiple and complementary technologies for smallholders.

All independent variables have a positive and significant effect on the income of transmigrant households in SP 03 Pagar Banyu. Thus, transmigrants are expected to be able to maximize their farms in terms of diversification, land size, use of family labor, and taking advantage of off-farm opportunities. Therefore, the government should provide policies that focus on developing transmigrant farming. This requires physical, socio-economic, and ecological carrying capacity (Muhlisin et al., 2015).

Land size is the variable that has the greatest influence on the income of transmigrant households in SP 03 Pagar Banyu. Therefore, the government needs to pursue a policy of distributing a larger share of transmigration land. Transmigrants must try to maintain ownership of their allotted land, even invest in buying new land. In line with this, the conversion of agricultural land for non-agricultural purposes should be prohibited (Febrina, 2017). Off-farm income also has a significant positive effect on transmigrant household income. Therefore, various skills improvement programs for processing agricultural products are crucial to increasing added value and income.

This study has limitations because the authors only used four variables, namely farm diversification, land size, family labor, and off-farm work, due to the tendency of migrants to work as farmers. At the same time, the factors influencing farming income are more diverse. In addition, the diversification of farming by some transmigrant households shows that each crop has different characteristics, so the factors that affect production are also different.

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