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Comparative Use of Production Factors for Self-Owned Farmers and Plasma in Palm Oil Farming and Their Relationship with Income in Air Kumba District, Banyuasin Regency

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Abstract: The objectives of this research are 1) To determine the differences in the use of production factors by plasma and independent farmers in oil palm farming in Air Kumbang District, Banyuasin Regency, 2) To calculate the difference in income received by plasma and independent farmers in oil palm farming in Air Kumbang District Banyuasin Regency. The method used is a survey method of independent and plasma farmers in oil palm farming in Air Kumbang District, Banyuasin Regency. The data collected includes data sources from both primary and secondary data. To analyze the difference in income between plasma farmers' oil palm farming income and independent smallholders' oil palm farming income, the two middle value test is used. Based on the research results, it can be concluded 1) There are differences in the use of production factors for plasma farmers and independent farmers in the Air Kumbang District. The differences in the use of production factors result in differences in the level of production and productivity of oil palm farming, this is due to differences in palm oil farming business patterns, 2) There are differences in the income of plasma farmers and independent farming in Air Kumbang District. Differences in the use of production factors are the main cause of both the use of fertilizers, herbicides and pesticides as well as the use of labor. This shows that farming management and the use of production factors can increase production and of course ultimately increase the income of oil palm farmers.

Keywords: Production Factors; Income; Plasma Farmers; Independent Farmers.

Introduction

Oil palm is a superior plantation crop which has a strategic role for national development(Murphy et al., 2021). Indonesia is one of the largest palm oil producing countries in the world with oil palm land cover in 2019 reaching 16,381,959 ha (Decree of the Minister of Agriculture Number 833/KPTS/SR.020/M/12/2019). With this area, oil palm contributes to National GDP of 3.5% and alleviates poverty for 10 million people (Coordinating Ministry for the Economy, 2020). The great potential contributed by the palm oil sector at the same time also contains obstacles and challenges. One of the challenges in terms of the principles and criteria for Indonesian sustainable palm oil plantations (ISPO), plasma and self-help plantation businesses, the technical dimension indicators include land clearing, oil palm seeds, oil palm planting techniques, use of fertilizer, maintenance of water level (drainage) , use of medicines, garden sanitation and weeding, and harvesting oil palm(Ngadi, 2019).

Banyuasin, as one of the districts in South Sumatra, has become a center for oil palm production, because of the availability and suitability of adequate land for oil palm plantations, many farmers have made oil palm business one of the main sources of livelihood to fulfill their family's living needs. In 2023, Banyuasin Regency will have quite a large area of oil palm plantations, which are cultivated by smallholder plantations and plantation companies, respectively, the cultivation area is 27,536.20 hectares and 162,952.28 hectares. Where in the total area of plantation companies there are 27,702.65 ha of plasma farmers (Banyuasin Regency Plantation and Livestock Service, 2024). The pattern that is widely

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developing in Banyuasin Regency in the development of oil palm is the partnership pattern between plantations/large companies and farmers through the People's Core Company (PIR) cooperation pattern.

Oil palm plantations have an important role in the economy of the people of Banyuasin Regency, especially in the Air Kumbang District area of Banyuasin Regency. This sub-district is known as one of the centers for oil palm plantations which makes a significant contribution to the income of the local community. Not only does it act as the main source of income for society, but it also has a widespread impact in various aspects of life. The contribution of oil palm plantations is not only limited to economic aspects, but also includes social aspects and surrounding infrastructure.

In managing oil palm plantations in Air Kumbang District, there are two main patterns that are widely adopted by farmers, namely the self-help pattern and the plasma pattern. Where Air Kumbang District has a large area of independent and plasma oil palm plantations, with production of 2,654 tons and 40,005.09 tons respectively. There is a difference (gap) in the production of plasma and independent farmers in Air Kumbang District, this is due to differences in the use of production factors for both plasma and independent farmers.

The self-help pattern involves farmers as land owners and full management of their own oil palm plantations(Alfatah et al., 2022). In contrast, the plasma pattern involves cooperation between farmers and oil palm plantation companies. Farmers in the plasma scheme usually provide land and labor, while companies provide seeds, agricultural inputs and technical guidance(Syarifah-Noratiqah et al., 2020).

However, there has been no research that comprehensively compares production between self-help and plasma patterns on oil palm plantations in Air Kumbang District. Therefore, this research aims to conduct a comparative analysis of production between self-help and plasma patterns, with the hope of providing a deeper understanding of the efficiency and sustainability of the two patterns.

With this research, it is hoped that it can provide useful information for farmers, local governments and oil palm plantation companies in making decisions regarding the choice of optimal plantation management patterns, so as to improve the welfare of farming communities and the sustainability of oil palm plantation businesses in Air Kumbang District Banyuasin Regency.

The problems that can be researched from the background that has been described are as follows: 1)Are there differences in the use of production factors by plasma and independent farmers in oil palm farming in Air Kumbang District, Banyuasin Regency? 2) Is there a difference in income received by plasma and independent farmers in oil palm farming in Air Kumbang District, Banyuasin Regency?

Method

This research was carried out in Banyuasin Regency, namely in a fairly large oil palm producing area. The location taken was an oil palm plantation in Air Kumbang District, Banyuasin Regency. This location was chosen purposively with the consideration that in Air Kumbang District there are farmers who carry out oil palm plantations using the plasma and independent farmer pattern.

The method used was a survey of independent and plasma farmers in oil palm farming in Air Kumbang District, Banyuasin Regency. A survey method is a process, tool, or technique that you can use to gather information in research by asking questions to a predefined group of people. Typically, it facilitates the exchange of information between the research participants and the person or organization carrying out the research(Hadeler et al., 2021).The technique used in sampling is stratified random sampling. A stratified random sample is one obtained by dividing the population elements into mutually exclusive, non-overlapping groups of sample units called strata, then selecting a simple random sample from within each stratum (stratum is singular for strata)(Nguyen et al., 2021).This sampling technique was used because the population of farmers sampled consisted of two layers, namely plasma farmers and independent oil palm farmers with the same proportions, each in each location there were 151 independent farmers and 148 plasma farmers. 30 farmer samples were taken, so the total was is a sample of 60 farmers. The number of proportions is the same, namely 30 samples of farmers, this is due to the availability of independent farmers and plasma farmers with uniform (homogeneous) maturity of mature plants.

The appropriate sample size in research is between 30 to 500, and if the sample is divided into categories (for example: male-female, civil servant-private employee, etc.)(Berndt, 2020). Then the number the minimum sample size for each category is 30 people. Meanwhile, according to Yount (1999), the sample size from a population of 101-1000 is 10%. So the sample size for this study meets the rules for determining the minimum sample size requirements.

After obtaining a list of plasma and self-help farmers, samples were then drawn, namely a stratified random sampling (Stratified Random Sampling), by drawing samples using random numbers obtained through the Random Number Table (TAR), where

previously the population for each was first looked at layer.

Tabel 1. Number of Population and Samples of Independent Farmer and Plasma Farmer in each village Air Kumbang District, 2024

Petani	Number of population	Number of samples	Percentage (%)
Plasma Farmers	148	30	20
Independent Farmers	151	30	19,8
Total	299	60	20

Data collection was carried out using interview and observation methods. The interview method was carried out based on a structured list of questions(Moore et al., 2021). The observation method is carried out by observing directly at the research location (Kumar, 2022).

The data collected includes data sources from both primary and secondary data. Primary data was obtained through direct interviews with oil palm farmers using a list of questions that had been prepared previously (Walliman, 2021). Meanwhile, secondary data was obtained from government agencies or agencies, and literature related to this research(Bookstaver, 2021).

To answer the first objective, namely descriptive analysis and mathematical analysis to calculate the differences in the use of production factors carried out by plasma and independent farmers in palm oil farming in Air Kumbang District, Banyuasin Regency. Next, after tabulating the data, processing is carried out. To answer the second objective, namely analyzing the level of palm oil farming income of plasma farmers and the income of independent smallholder oil palm farming, calculations using mathematical analysis are used (Soekartawi, 2002) as follows:

$PdT = PnT - BpT$ (1)

Where revenue is calculated by applying the following formula:

$PnT = Q \times Hj$ (2)

Where costs are calculated by applying the following formula:

$BpT = BTpT + BVT$ (3)

Information :

PdT = Total of income (Rp/Year)
PnT = Total of reception (Rp/ Year)
BpT = Total of production cost (Rp/ Year)
Q = Number of production (Kg/ Year)
Hj = Selling price (Rp/Kg)
BTpT = Total of fixed cost (Rp/ Year)
BVT = Total of variabel cost (Rp/ Year)

Then, to analyze the difference in income between plasma farmers' oil palm farming income and independent smallholders' oil palm farming income, the two middle value test was used(ASRIN, 2022). If the conclusion accepts Ho, it means that the variety of the first population is considered to be the same as the variety of the second population and the problem is solved using the t-student distribution as follows:

$$t = \frac{(X_1 - X_2) - (\mu_1 - \mu_2)}{Sp\sqrt{(1/n_1) + (1/n_2)}}$$

Where:

$$Sp = \frac{\sqrt{(n_1 - 1)S_1^2 - (n_2 - 1)S_2^2}}{n_1 + n_2 - 2}$$

On the other hand, if you reject Ho, it means that the variance of the two populations is considered different and the problem is solved by using the t-student distribution as follows:

$$t = \frac{(\bar{X_1} - \bar{X_2}) - (\mu_1 - \mu_2)}{Sp\sqrt{\left(\frac{S_1^2}{n_1}\right) + \left(\frac{S_2^2}{n_2}\right)}}$$

Where:

t = Test Statistics
$\bar{X_1}$ = Average palm oil farming income of plasma farmers
$\bar{X_2}$ = Average income of independent smallholder oil palm farming
μ = Average Cost
n_1 = Number of farmers who carry out plasma oil palm farming
n_2 = Number of farmers who carry out independent smallholder oil palm farming
S_1 = Standard deviation of plasma farmers' oil palm farming income
S_2 = Standard deviation of independent smallholders' oil palm farming income
Sp = Estimated value of the combined population standard deviation

Hypothesis:
Ho = $\mu d_1 = \mu d_2$
H_1 = $\mu d_1 > \mu d_2$
α = 0,50

With decision rules:

$t_{hitung} \leq t\alpha$ = Accept Ho, This means that there is no difference in income between plasma farmer oil palm farming and independent smallholder oil palm farming.

$t_{hitung} > t\alpha$ = Reject Ho, This means that there is a difference in the income of plasma farmers' oil palm farming and independent smallholders' oil palm farming.

Next, analyze the relationship between production factors and plantation business income carried out by oil palm farmers in Air Kumbang District, namely by using the following equation:

Equation of production factors on oil palm farmer income:

$Yp_i = \beta_0 + \beta_0 Fp_i + \varepsilon$

Yp_i = Pendapatan petani kelapa sawit ke-I(rupiah)

Fp_i = Faktor produksi petani kelapa sawit ke-I (rupiah)

ε = residual

Result and Discussion

Independent Farmers and Plasma Production Factors

1. Land area

Land owned by plasma farmers and independent farmers in Air Kumbang District is used to plant oil palm plants, which then generate monthly income from selling FFB to mills. The total land area of sample respondents from plasma farmers and independent farmers can be seen in the table 2.

Table 2. Land area of independent farmers and plasma farmers

Farmers	Number of Sample	Land area (ha)	Land Area/Farmer (ha)
Plasma farmer	30	60	2.00
Independent farmer	30	51.5	1.72
Total	60	111.5	1.86

Based on the results of research conducted on 60 respondents in Air Kumbang District, all respondents have used land for oil palm farming. Where the average plasma farmer has an average of 2 ha of land, while the average independent farmer has an average of 1.72 ha of land.

2. Use of Fertilizer

The intensity of fertilization and fertilizer doses carried out by farmers are greatly influenced by the economic conditions of farmers, the availability of fertilizer on the market and the ease of access to obtain fertilizer. Plasma farmers fertilize oil palm plantations two to three times a year using NPK, Urea, TSP and KCl fertilizers, while independent farmers are irregular with doses that do not comply with regulations including the type of fertilizer applied to oil palm plants, especially according to conditions peasant economy.

The existence of the company providing production facilities including fertilizer, technical guidance regarding the benefits of fertilization, training in implementing proper fertilization also has a good impact on plasma farmers for regular use of fertilizer and appropriate doses. For more details, the average cost of fertilizer use from plasma and independent oil palm farming from immature crops (TBM) to 6th mature crop (TM) can be seen in Table 3.

Table 3. Costs of Using Fertilizer for Plasma Farmers and Independent Farmers (Rp/Ha/Year)

Year	Plasma farmers	Independent farmers
TBM1	8.978.829	4.078.616
TBM2	9.263.953	3.482.249
TBM3	9.234.875	3.502.168
TBM4	9.195.198	3.591.192
TM1	9.096.033	3.872.404
TM2	9.366.057	4.236.865
TM3	9.003.387	4.605.582
TM4	8.907.447	4.828.439
TM5	9.426.268	5.417.257
TM6	8.886.994	5.614.792
Average	9.135.904	4.322.956

From the table above, it can be seen that the cost of using fertilizer for oil palm farming from the first immature plant to the sixth mature plant per hectare per year is greater than the cost of using fertilizer for independent farmers. Where the average cost of using fertilizer per hectare per year is IDR 9,135,904.00 for plasma farmers and IDR 4,322,956.00 for independent farmers

3. Use of Herbicides and Pesticides

The use of herbicides and pesticides between plasma farmers and independent smallholders in oil palm farming can vary depending on various factors, such as the level of access to resources, regulations, and cultivation practices applied. The factors above greatly influence plasma farmers and independent farmers in terms of using herbicides and pesticides in appropriate quantities and doses. For more details, the average cost of using herbicides and pesticides from plasma and independent oil palm farming businesses from immature crops (TBM) to sixth mature crops (TM) can be seen in Table 4.

Table 4. Costs of Using Herbicides and Pesticides for Plasma Farmers and Independent Farmers (Rp/Ha/Year)

Year	Plasma farmers	Independent farmers
TBM1	859.460	1.556.339
TBM2	950.501	898.323
TBM3	987.576	991.884
TBM4	1.089.130	1.092.902
TM1	1.119.769	1.132.564
TM2	1.134.297	1.287.626
TM3	1.143.433	1.313.711
TM4	1.247.416	1.410.652
TM5	1.276.768	1.576.936
TM6	1.299.935	1.699.935
Average	1.110.829	1.296.087

From the table above, it can be seen that the costs of using herbicides and pesticides for oil palm farming from the first immature plant to the age of the six plasma farmers per hectare per year are smaller than the costs of using herbicides and pesticides for independent farmers. Where the average cost of using herbicides and pesticides per hectare per year is IDR 1,110,829.00 for plasma farmers and IDR 1,296,087.00 for independent farmers.

The small cost of herbicides and pesticides used by plasma farmers is due to the existence of certain rules or guidelines and standards that must be adhered to which are set by the company as part of the partnership commitment. Additionally, there are sometimes stricter rules or guidelines from companies regarding environmentally friendly practices and safety. Where the issue of environmentally friendly practices is part of the company's marketing of palm oil production, especially abroad

4. Use of Labor

From the results of field research, the majority of labor use is labor from outside the family for both plasma and independent smallholder oil palm farming. The use of labor for plasma farmers' oil palm farming, including planting, care, fertilizing and harvesting, has all been determined and provided by PT. New Tunas Lampung. Meanwhile, for independent oil palm farming, the use of labor for maintenance activities is usually still involved, but for harvesting activities, independent farmers employ labor from outside the family in the harvesting process.

For more details, the average cost of using labor from plasma and independent oil palm farming businesses from immature plantations (TBM) to sixth mature plantations (TM) can be seen in Table 5.

From Table 5, it can be seen that the cost of using labor for oil palm farming from the first immature plant to the sixth mature plant per hectare per year is smaller than the labor costs of independent farmers. Where the average labor cost per hectare per year is IDR 2,028,784 for plasma farmers and IDR 2,028,784.00 for independent farmers.

Table 5. Costs of Using Labor for Plasma Farmers and Independent Farmers (Rp/Ha/Year)

Year	Plasma farmers	Independent farmers
TBM1	3.223.874	5.136.481
TBM2	2.109.818	3.069.253
TBM3	1.940.209	2.431.663
TBM4	1.965.906	2.134.552
TM1	2.053.264	1.922.754
TM2	1.836.118	1.622.737
TM3	1.920.214	1.383.731
TM4	1.927.288	1.222.768
TM5	1.349.948	1.107.861
TM6	1.961.202	812.908
Average	2.028.784	2.084.471

Overall, differences in labor use between plasma farmers and independent smallholders in oil palm farming reflect differences in scale of operation, access to resources, and control over cultivation practices. Plantation companies often play an important role in providing infrastructure and support that can change the dynamics of labor use in the smallholder scenario.

Analysis of Independent and Plasma Smallholders' Palm Oil Farming

1. Differences in the Use of Production Factors

This research examines the differences in the use of production factors in oil palm farming between plasma farmers and independent farmers. Plasma farmers are those who work under the guidance of large companies, while independent farmers work independently without the involvement of companies. For more details regarding the differences in the use of production factors produced by each farmer, see Table 6.

Table 6. Differences in the Use of Production Factors in Palm Oil Farming by Plasma Farmers and Independent Farmers (Rp/Ha/Year)

Year	Plasma farmers			Independent farmers		
	Fertilization	Herbicides and Pesticides	Labor	Fertilization	Herbicides and Pesticides	Labor
TBM1	8.978.829	859.460	3.223.874	4.078.616	1.556.339	5.136.481
TBM2	9.263.953	950.501	2.109.818	3.482.249	898.323	3.069.253
TBM3	9.234.875	987.576	1.940.209	3.502.168	991.884	2.431.663
TBM4	9.195.198	1.089.130	1.965.906	3.591.192	1.092.902	2.134.552
TM1	9.096.033	1.119.769	2.053.264	3.872.404	1.132.564	1.922.754
TM2	9.366.057	1.134.297	1.836.118	4.236.865	1.287.626	1.622.737
TM3	9.003.387	1.143.433	1.920.214	4.605.582	1.313.711	1.383.731
TM4	8.907.447	1.247.416	1.927.288	4.828.439	1.410.652	1.222.768
TM5	9.426.268	1.276.768	1.349.948	5.417.257	1.576.936	1.107.861
TM6	8.886.994	1.299.935	1.961.202	5.614.792	1.699.935	812.908
Average	9.135.904	1.110.829	2.028.784	4.322.956	1.296.087	2.084.471
Total	12.275.517				7.703.514	

From Table 6 above, it can be seen that the average use of production factors produced by good plasma farmers is greater than that of independent farmers. The main cause is due to the more regular and consistent use of fertilizer by plasma farmers, which can result in higher productivity. On the other hand, independent farmers may experience problems in using fertilizer due to the farmer's economic capacity and access to fertilizer availability.

In addition, plasma farmers' use of palm oil production factors is greater than that of independent farmers, influenced by access to resources, scale of operations, plantation management and technical support. Plasma farmers tend to have an advantage in terms of access to modern technology and inputs that support higher production per hectare compared to independent farmers who are more dependent on local resources and their own knowledge.

2. Differences in Palm Oil Farming Income for Independent and Plasma Farmers

1) Acceptance

Revenue is the result of multiplying the amount of production produced by the value at a certain selling price level. The selling price for the two layers is different, this is because plasma farmers sell to companies as partners. Meanwhile, independent farmers sell their produce to middlemen or sell directly to companies. However, because they do not partner with companies, prices are lower from plasma farmers.

The average price per kilogram of fresh fruit bunches for plasma farmers is IDR 1,923.00, while the average price per kilogram of fresh fruit bunches for plasma farmers is IDR 1,700.00. For more details, the average income from oil palm farming for each layer can be seen in Table 7.

Table 7. Acceptance of Palm Oil Farming by Plasma Farmers and Independent Farmers (Rp/Ha/Year)

Year	Plasma farmers		Independent farmers	
	Production (Ton)	Reception (Rp)	Production (Ton)	Reception (Rp)
TM1	9.36	17.999.368	7.36	12.217.214
TM2	17.76	34.152.646	13.72	23.133.719
TM3	29.34	56.421.095	19.87	33.693.076
TM4	32.40	62.338.273	22.74	38.874.109
TM5	33.36	64.151.592	25.91	44.518.383
TM6	39.96	76.843.454	26.96	45.851.099
Average	27.03	51.984.405	19.43	33.047.933

From the table above it can be seen that the income from plasma farmers is greater than the income from independent farmers. The income of plasma farmers is IDR 51,984,405.00 per hectare per year, while the income of farmers who produce low quality palm oil is IDR 33,047,933.00 per hectare per year. The large difference in revenue is due to differences in selling prices and differences in the amount of production produced.

2) Production Costs

Production costs are a number of costs (fixed costs and variable costs) incurred in producing fresh fruit bunches from independent farmers and plasma (Rp/ha/year). In this research, production costs incurred by oil palm farmers, both plasma farmers and independent farmers, are calculated from immature plants to mature plants in the sixth year with fixed cost components, namely equipment depreciation costs and variable costs which include fertilizer costs, herbicide and pesticide costs and labor costs. The average production costs incurred by each farmer can be seen in Table 8.

Table 8. Production Costs of Palm Oil Farming for Plasma Farmers and Independent Farmers (Rp/Ha/Year)

Year	Plasma farmers			Independent farmers		
	Production cost (Rp/ha/ Year)	Fixed costs (Rp/ha/ Year)	Variabel costs (Rp/ha/ Year)	Production cost (Rp/ha/ Year)	Fixed costs (Rp/ha/ Year)	Variabel costs (Rp/ha/ Year)
TBM1	16.659.107	3.016.973	13.062.163	14.638.080	866.644	13.771.436
TBM2	15.990.828	2.727.677	12.324.272	5.555.818	952.478	4.603.340
TBM3	13.165.598	2.667.760	12.162.660	8.633.617	1.070.312	7.563.305
TBM4	14.357.666	2.787.779	12.250.234	7.570.023	1.263.192	6.306.831
TM1	14.608.318	2.656.424	12.269.066	6.410.199	1.297.370	5.112.829
TM2	15.162.222	2.804.542	12.336.472	9.342.257	1.386.103	7.956.154
TM3	14.329.320	2.781.054	12.067.034	9.633.323	1.579.478	8.053.845
TM4	15.023.997	2.666.484	12.082.151	7.817.876	1.765.877	6.051.999
TM5	15.898.995	2.819.336	12.052.984	10.776.061	1.859.114	8.916.947
TM6	15.236.948	2.749.804	12.148.131	10.616.590	1.918.132	8.698.458
Average	15.043.300	2.767.783	12.275.517	9.099.384	1.395.870	7.703.514

From Table 8 it can be seen that the average fixed costs and variable costs for large plasma farmers are higher than independent ones, namely Rp. 2,767,783.00 and Rp. 12,275,517.00 per hectare per year for plasma farmers, respectively. And Rp. 1,395,870.00 and Rp. 7,703,514.00 for independent farmers. Independent farmers use fewer fertilizer production facilities. This is due to fertilizer prices which are getting higher and higher.

3) Income

Income in a farming business is the difference between the total income and the costs incurred. The average income of farmers per hectare per year in both layers can be seen in Table 9.

Table 9. Palm Oil Farming Income of Plasma Farmers and Independent Farmers (Rp/Ha/Year)

Description	Plasma farmers	Independent farmers
Reception(Rp/Ha/Year)	51.984.405	33.047.933
Production cost (Rp/Ha/Year)	15.043.300	9.099.384
Income (Rp/Ha/Year)	36.941.105	23.948.549

From the table above, it can be seen that the average income of plasma farmers is greater than the average income of independent farmers, namely Rp. 36,941,105.00 and Rp. 23,948,549.00 per hectare per year, respectively. The large difference in income is due to differences in income received by farmers which includes production levels and differences in selling prices. Production levels are determined by plant productivity. The difference in selling prices is caused by plasma farmers partnering with companies, thus there is price certainty, whereas for independent farmers the price is determined by middlemen.

Apart from using mathematical analysis, the analysis used to determine the difference in oil palm farming income between plasma farmers and independent farmers in Air Kumbang District is inferential analysis using the T test (T-test). However, before the T test (T-test) is carried out, it is necessary to carry out a Normality test first.

Normality testing is carried out to determine whether the data being tested follows a normal distribution so that the data can be analyzed using parametric analysis. Normality testing uses Kolmogorov-Smirnov statistics using a significance level of 5%. The normality testing hypothesis is as follows:

H_0 : Data follows a normal distribution

H_1 : Data does not follow a normal distribution

With the decision rule: Reject H0 if the p-value of the Kolmogorov-Smirnov statistic is less than the 5% significance level. The results of the Normality Test obtained the Kolmogorov-Smirnov calculated value with a p-value of 0.60 from a significance level of 0.05, thereby rejecting the null hypothesis. It can be concluded that the data on farmer income values follows a normal distribution so that further analysis can use parametric analysis, namely the T test (T-test).

The T test is used to determine whether there is a difference in the average income of plasma farmers and independent farmers in Air Kumbang District. This test uses T statistics with a significance level of 5%. The T testing hypothesis is as follows:

H_0 : There is no difference in the average income of plasma farmers and independent farmers in Air Kumbang District (μ_1=μ_2)

H_1 : There are differences in the average income of plasma farmers and independent farmers in Air Kumbang District (μ_1≠μ_2)

With the decision rule: Reject H0 if the p-value of the T statistic is less than the 5% significance level. The T test results are as follows:

Tabel 10. T-Test

Income	Score	Significance
Plasma farmers	36.941.105	
Independent farmers	23.948.549	
T-Count	15,606	0,000

Based on Table 10, it can be seen that the average farming income of plasma farmers is IDR 36,941,105.00 per ha per year and the average farming income of independent farmers in Air Kumbang District is IDR 23,948,549.00 per ha per year, so the average difference - The average farming income of plasma farmers and independent farming is IDR 12,992,556.00 per ha per year. Furthermore, it was found that the p-value of the T statistic was 0.000, which is less than the significance level of 0.05, thereby rejecting the null hypothesis. It can be concluded that there is a difference in the income of plasma farmers and independent farmers in Air Kumbang District.

Next, look at the relationship between production factors and farming income carried out by oil palm farmers in Air Kumbang District, namely by using the following equation:

Equation of production factors on the income of oil palm farmers:

$Yp_i = \beta_0 + \beta_0 Fp_i + \varepsilon$

Yp_i = 1st oil palm farmer's income (IDR)

Fp_i = 1st palm oil farmer production factor (IDR)

ε = residuals

Based on SPSS *output* SPSS is obtained the following regression equation:

$$Y_i = 37288643 - 0{,}136Fp_i$$

The regression equation above explains that income (Y_i)decreases by Rp. 136,000.00 every time the production actor costs Fp_i increase by Rp. 1,000,000.00. In other words, the more production factors are used, the lower the level of income due to the negative effect of production factors on income.

However, the relationship between production factors and income from plasma and independent oil palm farming is negative because it does not look at the amount of revenue from the total production generated by plasma and independent smallholders' oil palm farming.

Conclusion

From the description of the results of the research discussion previously mentioned, the following conclusions can be drawn: (1) there are differences in the use of production factors for palm oil farming by plasma farmers and independent farmers in Air Kumbang District. The differences in the use of production factors result in differences in the level of production and productivity of oil palm farming, this is due to differences in palm oil farming business patterns; (2) there is a difference in the income of plasma farmers' oil palm farming and independent farming in Air Kumbang District. Differences in the use of production factors are the main cause of both the use of fertilizers, herbicides and pesticides as well as the use of labor. This shows that farming management and the use of production factors can increase production and of course ultimately increase the income of oil palm farmers.

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Conflicts of Interest
The authors declare no conflict of interest.

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