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(RESEARCH ARTICLE)

Analysis of the effect of oil palm partnership pattern on the selling price and quality of Fresh Fruit Bunches (FFB) at the level of independent farmers in Sumber Rejeki village Sungai Lilin District Musi Banyuasin Regency

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Abstract

The objectives of this research are: (1) To examine the partnership patterns among independent oil palm farmers in Sumber Rejeki Village. (2) To identify factors that influence the price and quality of FFB within the partnership patterns of independent oil palm farmers in Sumber Rejeki Village. (3) To assess the impact of partnership patterns on the price and quality of FFB among independent oil palm farmers in Sumber Rejeki Village. (4) To provide recommendations for a relevant partnership management model to be implemented in the partnership patterns of oil palm farmers in Sumber Rejeki Village. This research was conducted in Sumber Rejeki Village. The research methods used are survey method and purposive sampling method. The number of samples taken is 31 independent oil palm farmers from Sumber Rejeki Village. The sample was determined using the Slovin's method. The research findings indicate that: The partnership model existing in Sumber Rejeki Village is the inti-plasma partnership. The factor that most influences the price of FFB is the quality of the seeds. The factor that most affects the quality of the FFB is the level of ripeness. The analysis has shown that there is a significant impact of the village cooperative unit, core companies, and independent farmers on the price and quality of FFB in Sumber Rejeki Village. The recommended partnership model to be implemented, based on the first priority alternative results, is the core-plasma partnership with a focus on the criteria of capital support.

Keywords: Farming; Independent; Palm Oil; Partnerships

1. Introduction

With its vast area and fertile soil in many regions, Indonesia has great potential to advance agriculture as a main sector. Agriculture plays a crucial role in supplying food and raw materials for industry, contributing to the gross domestic product (GDP), generating foreign exchange, absorbing a large workforce, increasing rural household incomes, providing bioenergy sources, and participating in efforts to reduce greenhouse gas emissions [1]. Plantations are an important aspect of the agricultural sector. One plantation product that has a significant impact on the economy is the oil palm commodity [2].

The oil palm commodity plays a vital role in Indonesia's economy, contributing significantly to the nation's income, foreign exchange earnings, job absorption, and the welfare of farmers. The productivity of oil palm trees generally increases from the age of 3 to 15 years and then decreases after the age of 15 to 25 years. The oil palm fruit ready for harvest is known as Fresh Fruit Bunches (FFB), which are the primary source for the production of Crude Palm Oil (CPO) and Palm Kernel Oil (PKO) [3].

The area of oil palm plantations in South Sumatra is 1,230,966 hectares with a production of 3,449,202 tons. Musi Banyuasin District is the most successful district in South Sumatra in cultivating oil palm, with the largest land area and

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the highest production compared to other districts/cities in the South Sumatra Province [4]. Sungai Lilin district is one of the areas in Musi Banyuasin Regency with the potential for oil palm plantation development. It has an oil palm plantation area of 2,984 hectares and a production amounting to 17,782 tons, with productivity reaching 5.96 tons per hectare [5].

Partnership models are necessary to enhance the capabilities of independent farmers, making them resilient and growing through financial support and training of professional and skilled resources. This can lead to increased income, welfare, and sustainability. Therefore, based on these considerations, the research to be conducted will focus on the impact of partnership models on the price and quality of Fresh Fruit Bunches (FFB) at the level of independent farmers in Sumber Rejeki Village, Sungai Lilin District, Musi Banyuasin Regency, South Sumatra Province.

2. Material and methods

The research was conducted in Sumber Rejeki Village, Sungai Lilin District, Musi Banyuasin Regency. The location was selected purposively, considering that the area is one of the potential areas in Sungai Lilin Subdistrict for plantation, especially oil palm. The sample criteria for this study include independent oil palm farmers with more than 5 years of farming experience and owning a maximum of 3 hectares of land. The total population of oil palm farmers in Sumber Rejeki Village is 102, from which a sample size of 30.95 was obtained, rounded up to 31 independent farmers.

To answer the first objective, which is to analyze the types of partnership patterns of oil palm farmers, the researcher uses descriptive analysis as one of the data processing methods. Descriptive analysis is a data analysis technique that involves presenting collected data in detail and according to its reality, without the intention of concluding or generalizing the findings to a broader population. [6].

To answer the second objective, which is to analyze the factors that influence the price and quality of fresh fruit bunches (FFB) in the partnership pattern of independent palm oil farmers in Sumber Rejeki Village, Sungai Lilin District, Musi Banyuasin Regency, a confirmatory factor analysis (CFA) is used. The measurement indicators of the factors that influence the FFB price in this study are as follows::

- Seed quality (X1)
- Plant age (X2)
- Marketing (X3)
- CPO price (X4)

The measurement indicators of the factors that influence the FFB quality in this study are as follows::

- Maturity level (X1)
- Fruit color (X2)
- Harvest mature (X3)
- Shell thickness (X4)

To answer the third objective, which is to analyze the impact of the partnership pattern of independent palm oil farmers in Sumber Rejeki Village, Sungai Lilin District, Musi Banyuasin Regency on the price and quality of fresh fruit bunches (FFB), data analysis is performed using binary logistic regression.

$$\mathrm{Y} = \log\left(\frac{h}{1-h}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$$

Explanation:
β_0 = Intercept
Y = price and quality of FFB
Y = 1 (Impacted)
Y = 0 (Not Impacted)
X_1 = Goverment
X_2 = Village Unit Cooperative
X_3 = Marketing
X_4 = Core company
X_5 = Farmers in institutions
X_6 = Independent farmers

To answer the fourth objective, which is to formulate relevant partnership pattern recommendations to be applied to the partnership of independent palm oil farmers in Sumber Rejeki Village, Sungai Lilin District, Musi Banyuasin Regency, the analytical hierarchy process (AHP) is used.

3. Results and discussion

3.1. Identity Of Respondents

The independent palm oil farmers who are respondents in this study are the independent palm oil farmers in Sumber Rejeki Village. The population in Sumber Rejeki Village is predominantly working as farmers. The following is an explanation of the identity of the independent palm oil farmers, namely the age of the respondents, farming experience, and land area. The characteristics of the respondents can be seen in Table 1.

Tabel 1 Characteristics of Respondents

No.	Identity	Amount (People)	Percentage (%)
1	Age (Years)		
	23-26	5	16.35
	27-36	7	23.60
	37-46	17	54.60
	47-56	2	7.45
2	Farming Experience (Years)		
	> 5	6	20.50
	10 – 20	21	67.50
	> 20	4	14.00
3	Land Area (Ha)		
	0,5	1	3.22
	1 – 1,5	14	45.16
	2 – 3	16	51.62

Source: Primary Data Processing Results, 2024

3.2. Form of Palm Oil Farmer Partnership in Sumber Rejeki Village

The form of partnership used by KPKS Suka Rezeki under the guidance of PT. Hindoli and palm oil farmers is core-plasma partnership pattern. The inti-plasma partnership pattern is a partnership pattern between palm oil farmers as plasma with a partner company in this case PT. Hindoli as the core. In running the partnership, both the farmers and the company have terms and conditions that must be agreed upon by both parties..

3.3. Factors Affecting the Price of Fresh Fruit Bunches (FFB)

The price of fresh fruit bunches (FFB) at the level of independent farmers is suspected to be influenced by several factors. The factors suspected of influencing the FFB price are seed quality (X1), plant age (X2), marketing (X3), and CPO price (X4). The following are the results of the CFA analysis of the FFB price obtained in Figure 1.

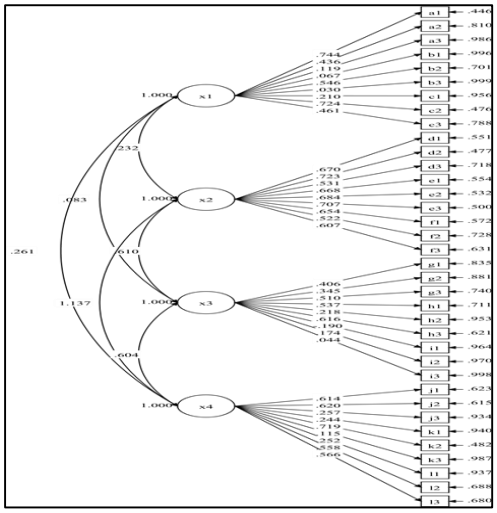

Figure 1 CFA Analysis Model of FFB Price Stage One

Source: Primary Data Processing Results, 2024

A model is said to be fit if it meets several requirements including CMIN/df value ≤ 5, RMSEA value > 0.900, and SRMR value < 0.080. The following are the results of the model fit test in Table 2.

Tabel 2 Goodness of Fit of Confirmatory Factor of FFB Price Stage One

Goodness of Fit	Test Value	Condition	Explanation
CMIN/df	4.748	≤ 5	Fit
RMSEA	0.139	< 0.080	Poor fit
CFI	0.601	> 0.900	Poor fit
TLI	0.559	> 0.900	Poor fit
SRMR	0.112	< 0.080	Poor fit

Source: Primary Data Processing Results, 2024

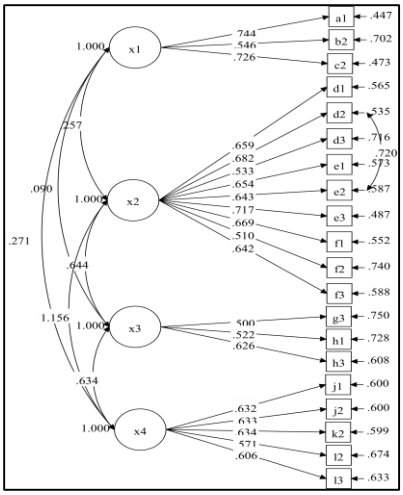

Figure 2 CFA Analysis Model of FFB Price Stage Two

Source: Primary Data Processing Results, 2024

Based on the data in Table 2, it can be concluded that the first stage CFA model is still not fit, as it has not yet been able to meet the requirements of the predetermined fit model. Thus, there needs to be a model modification with the modification options provided by MI (Modification Indices). The results of the second stage CFA analysis of the FFB price can be seen in Figure 2.

Based on Figure 2, it is known that there are parameters that are eliminated because they are considered invalid. The reduced variables are variables that have a loading factor value < 0.500. The reduced variables can be seen in Table 3.

Tabel 3 Results of the CFA Analysis of FFB Price

Variable	Indicator	Loading Factor	P Value	Explanation
Seed Quality (X1)	**Origin of Seed (A)**			
	System of obtaining certified seeds (A2)	0.436	0.000	Not Valid
	Palm seed obtained (A3)	0.119	0.202	Not Valid
	Use of Seeds (B)			
	Type of palm seeds used (B1)	0.067	0.456	Not Valid
	Replacing with superior seeds (B3)	0.030	0.749	Not Valid
	Knowledge About Seeds (C)			
	How to choose quality palm seeds (C1)	0.210	0.018	Not Valid
	Color of palm seed stem and leaves (C3)	0.461	0.000	Not Valid
Marketing (X3)	**Collector Trader (G)**			
	Selling FFB to collector traders (G1)	0.406	0.000	Not Valid
	FFB price from collector traders (G2)	0.345	0.000	Not Valid
	Palm Oil Factory (H)			
	FFB price from palm oil factory (H2)	0.218	0.011	Not Valid
	Alternative Market (I)			
	Changing marketing channels (I1)	-0.190	0.025	Not Valid
	Marketing alternatives other than collector traders or factories (I2)	0.174	0.046	Not Valid
	The effect of changing marketing channels (I3)	0.044	0.615	Not Valid
CPO Price (X4)	**Inflation (J)**			
	Information on CPO inflation for independent palm farmers (J3)	0.257	0.000	Not Valid
	International Market Price (K)			
	Information on the rise and fall of CPO prices in the international market (K1)	0.244	0.000	Not Valid
	CPO price information for independent palm farmers (K3)	0.115	0.081	Not Valid
	Government Policy (L)			
	FFB selling price level (L1)	0.252	0.000	Not Valid

Source: Primary Data Processing Results, 2024

After eliminating some parameters and modifying the model with MI (Modification Indices), the next step is to assess whether the formed model is fit or not. The results of the second stage model fit test can be seen in Table 4.

Tabel 4 Goodness of Fit of Confirmatory Factor of FFB Price Stage Two

Goodness of Fit	Test Value	Condition	Explanation
CMIN/df	1.650	≤ 5	Fit
RMSEA	0.078	< 0.080	Fit
CFI	0.913	> 0.900	Fit
TLI	0.889	> 0.900	Good Fit
SRMR	0.080	< 0.080	Fit

Source: Primary Data Processing Results, 2024

Based on Table 4, it can be concluded that the goodness of fit test results have been fulfilled where the value of CMIN/df is 1.650 ≤ 5, RMSEA 0.078 < 0.080, CFI is 0.913 > 0.900, TLI is 0.889 < 0.900, and SRMR is 0.080 < 0.080. This indicates that the construct in the study has met the model accuracy (goodness of fit).

Tabel 5 Confirmatory Factor of FFB Price

Variable	Loading Factor	P Value	Status	Explanation
Seed Quality (X1)				
Origin of Seed (A)				
Certified Seeds (A1)	0.744	0.000	Valid	Very influential
Use of Seeds (B)				
Harvest results of seeds (B2)	0.546	0.000	Valid	Very influential
Knowledge about seeds (C)				
Shape of palm seed leaves (C2)	0.726	0.000	Valid	Very influential
Plant Age (X2)				
Ready-to-Plant Palm Seeds (D)				
Provisions for the age of seeds planted (D1)	0.659	0.000	Valid	Very influential
Use of fertilizers (D2)	0.682	0.000	Valid	Very influential
Age of oil palm plants (D3)	0.533	0.000	Valid	Very influential
Ready-to-Harvest Plants (E)				
Provisions for the age that produces FFB (E1)	0.654	0.000	Valid	Very influential
Special characteristics of plants (E2)	0.643	0.000	Valid	Very influential
Number of loose bunches (E3)	0.717	0.000	Valid	Very influential
Plant Productivity (F)				
Increase and decrease in results (F1)	0.669	0.000	Valid	Very influential
Climate change factors (F2)	0.510	0.000	Valid	Very influential
Actions to overcome productivity decline (F3)	0.642	0.000	Valid	Very influential
Marketing (X3)				
Collector Traders (G)				

Influence of marketing to collector traders (G3)	0.500	0.000	Valid	Very influential
Palm Oil Factory (H)				
Selling FFB to palm oil factory (H1)	0.522	0.000	Valid	Very influential
Influence of marketing to palm oil factory (H3)	0.626	0.000	Valid	Very influential
CPO Price (X4)				
Inflation (J)				
CPO price inflation (J1)	0.632	0.000	Valid	Very influential
Inflation of CPO prices on income (J2)	0.633	0.000	Valid	Very influential
International Market Price (K)				
Market price of CPO (K2)	0.634	0.000	Valid	Very influential
Government Policy (L)				
Government monitoring (L2)	0.571	0.000	Valid	Very influential
Improvement of land productivity and formation of farmer group cooperatives (L3)	0.606	0.000	Valid	Very influential

Source: Primary Data Processing Results, 2024

Based on the data in Table 5, it can be seen that certified seeds become the most influential parameter on the FFB price with a loading factor value of 0.744. Seeds are a factor that greatly supports the success of palm oil plantations. High-quality certified palm seeds tend to produce FFB with good quality, thus increasing the selling price of FFB. The palm seeds widely used by independent palm oil farmers in Sumber Rejeki Village are certified palm seeds.

Marketing FFB to palm oil factory tends to provide a high price to farmers, this is because farmers can avoid additional costs usually imposed by collector traders and also because palm oil factory often offers a higher price for FFB with quality that meets their standards. The marketing of FFB carried out by palm oil farmers in Sumber Rejeki Village is to sell FFB directly to the palm oil factory or can market FFB through the village unit cooperative with the selling price of FFB received by palm oil farmers from the palm oil factory in Sumber Rejeki Village amounting to Rp. 2,500/kg, the price is much higher compared to marketing FFB to collector traders which is Rp. 2,300/kg. In addition, there are no alternative marketing options available in Sumber Rejeki Village. There needs to be monitoring carried out by the government regarding the determination of FFB prices that can be unilaterally done by collector traders or palm oil factories to palm oil farmers.

3.4. Factors Affecting the Quality of Fresh Fruit Bunches (FFB)

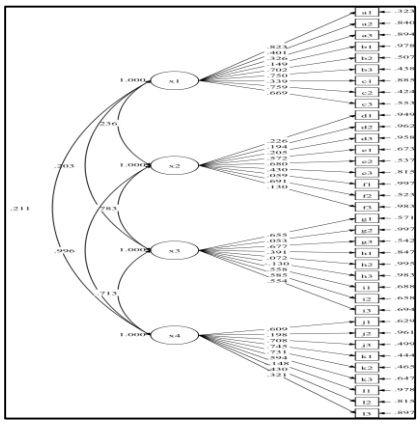

Figure 3 Analysis Model of CFA Quality of Fresh Fruit Bunches (FFB) Stage One.

Source: Primary Data Processing Results, 2024

The factors suspected of influencing the FFB quality are maturity level (X1), fruit color (X2), harvest maturity (X3), and shell thickness (X4). The results of the CFA analysis of the FFB quality obtained in Figure 3 can be seen.

A model is said to be fit if it meets several requirements including CMIN/df value ≤ 5, RMSEA value > 0.900, and SRMR value < 0.080. The results of the model fit test can be seen in Table 6.

Tabel 6 Goodness of Fit of Confirmatory Factor Quality of FFB Stage One

Goodness of Fit	Test Value	Condition	Explanation
CMIN/df	6.319	≤ 5	Poor fit
RMSEA	0.162	< 0.080	Poor fit
CFI	0.619	> 0.900	Poor fit
TLI	0.570	> 0.900	Poor fit
SRMR	0.129	< 0.080	Poor fit

Source: Primary Data Processing Results, 2024

Based on Table 5, it can be seen that the CFA development model has not met the set standard goodness of fit value. Thus, there needs to be a model modification with the modification options provided by MI (Modification Indices). The results of the second stage CFA analysis of the FFB quality can be seen in Figure 4.

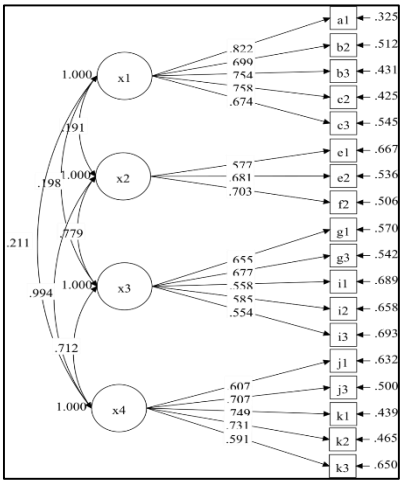

Figure 4 Analysis Model of CFA Quality of Fresh Fruit Bunches (FFB) Stage Two.

Source: Primary Data Processing Results, 2024

Based on Figure 4, it is known that there are parameters that are eliminated because they are considered invalid. The reduced variables are variables that have a loading factor value < 0.500. The reduced variables can be seen in Table 7.

Tabel 7 Results of CFA Analysis of Fresh Fruit Bunches (FFB) Quality.

Variable	Indicator	Loading Factor	P Value	Explanation
Maturity Level (X1)	**Degree of Maturity (A)**			
	Sorting FFB based on maturity level (A2)	0.401	0.000	Invalid
	Action on FFB that is not ripe but has been harvested (A3)	0.326	0.000	Invalid
	Harvest Schedule (B)			

	Harvesting FFB according to the set schedule (B1)	0.149	0.044	Invalid
	Loose Bunches (C)			
	Picking up loose bunches (C1)	0.339	0.000	Invalid
Fruit Color (X2)	**FFB Color Category (D)**			
	FFB color category raw (D1)	0.226	0.003	Invalid
	FFB color category half ripe (D2)	0.194	0.008	Invalid
	FFB color category ripe (D3)	0.205	0.006	Invalid
	Plant Treatment (E)			
	Treatment produces evenly ripe FFB color (E3)	0.430	0.000	Invalid
	Quality Harvest Color (F)			
	Knowing the quality FFB color to be harvested (F1)	0.059	0.448	Invalid
	Harvesting uneven color FFB (F3)	0.130	0.084	Invalid
Harvest Maturity (X3)	**Harvest Preparation (G)**			
	Harvesting labor FFB (G2)	0.053	0.509	Invalid
	Harvest Tools (H)			
	Harvest tools on FFB quality (H1)	0.391	0.000	Invalid
	Harvest tools affect FFB maturity (H2)	0.072	0.370	Invalid
	Harvest tools improve FFB quality (H3)	-0.130	0.099	Invalid
Shell Thickness (X4)	**Dura (J)**			
	Shell thickness of dura type FFB is the ideal FFB quality (J2)	0.198	0.007	Invalid
	Pisifera (L)			
	Shell thickness of pisifera type FFB affects FFB quality (L1)	-0.148	0.044	Invalid
	Shell thickness of pisifera type FFB is the ideal FFB quality (L2)	0.430	0.000	Invalid
	Sorting of pisifera type FFB (L3)	0.321	0.000	Invalid

Source: Primary Data Processing Results, 2024

After eliminating some parameters and modifying the model with MI (Modification Indices), the next step is to assess whether the formed model is fit or not. The results of the second stage model fit test can be seen in Table 8.

Tabel 8 Goodness of Fit of Confirmatory Factor Quality of FFB Stage Two

Goodness of Fit	Test Value	Condition	Explanation
CMIN/df	2.064	≤ 5	Fit
RMSEA	0.073	< 0.080	Fit
CFI	0.873	> 0.900	Good Fit
TLI	0.854	> 0.900	Good Fit

SRMR	0.071	< 0.080	Fit

Source: Primary Data Processing Results, 2024

Based on Table 8, it can be concluded that the goodness of fit test results have been fulfilled where the value of CMIN/df is 2.064 ≤ 5, RMSEA 0.073 < 0.080, CFI is 0.873 < 0.900, TLI is 0.854 < 0.900, and SRMR is 0.071 < 0.080. This indicates that although it has not reached the ideal value, the construct in the study has shown model accuracy (goodness of fit).

Tabel 9 Confirmatory Factor of FFB Quality

Variable	Loading Factor	P Value	Status	Explanation
Maturity Level (X1)				
Degree of Maturity (A)				
Standard factory maturity criteria (A1)	0.822	0.000	Valid	Very influential
Harvest Schedule (B)				
Storing FFB (B2)	0.699	0.000	Valid	Very influential
How to store FFB (B3)	0.754	0.000	Valid	Very influential
Loose Bunches (C)				
Selling loose bunches (C2)	0.758	0.000	Valid	Very influential
Loose bunches affect the quality (C3)	0.674	0.000	Valid	Very influential
Fruit Color (X2)				
Plant Treatment (E)				
Plant fertilizer (E1)	0.577	0.000	Valid	Very influential
Plant pesticide (E2)	0.681	0.000	Valid	Very influential
Quality Harvest Color (F)				
Harvesting evenly colored FFB (F2)	0.703	0.000	Valid	Very influential
Harvest Maturity (X3)				
Harvest Preparation (G)				
Quality of FFB before harvest (G1)	0.655	0.000	Valid	Very influential
Ancak harvest (G3)	0.677	0.000	Valid	Very influential
Harvest System (I)				
Simultaneous FFB harvest (I1)	0.558	0.000	Valid	Very influential
Direct sale of harvested FFB (I2)	0.585	0.000	Valid	Very influential
Fallen bunches are still sold (I3)	0.554	0.000	Valid	Very influential
Shell Thickness (X4)				
Dura (J)				
Shell thickness of dura type affects FFB quality (J1)	0.607	0.000	Valid	Very influential
Sorting of dura type FFB (J3)	0.707	0.000	Valid	Very influential
Tenera (K)				
Shell thickness of tenera type affects FFB quality (K1)	0.749	0.000	Valid	Very influential
Shell thickness of tenera type is the ideal FFB quality (K2)	0.731	0.000	Valid	Very influential
Sorting of tenera type FFB (K3)	0.591	0,000	Valid	Very influential

Source: Primary Data Processing Results, 2024

Based on Table 9, it can be seen that the maturity criteria of fresh palm fruit bunches (FFB) that comply with factory standards are the parameters that most influence the quality of FFB with a loading factor value of 0.822. The right maturity affects the CPO yield, where fruit that is too raw has an oil yield below the standard, while fruit that is too ripe can increase the FFA level which reduces the quality of the oil.

Harvesting FFB in Sumber Rejeki Village is done by choosing to harvest FFB with even color using the ancak giring method. This is done to reduce the risk of mechanical damage that can occur in fruit that is not ripe or too ripe, thus maintaining the quality of FFB. However, the color of the fruit can vary depending on environmental factors, genetics, and growth conditions. Therefore, there is a need for further knowledge about the quality of FFB to be harvested.

The dominant palm varieties used by palm oil farmers in Sumber Rejeki Village are the PPKS 540, PPKS 718, langkat, and simalungun varieties. These varieties are superior varieties in palm oil plantations due to the good characteristics of the plants and the higher yield potential. The use of superior varieties for palm oil plantations is very important for the efficiency and productivity of palm oil plantations.

3.5. Impact of Independent Palm Oil Farmer Partnership Patterns on the Price and Quality of Fresh Fruit Bunches (FFB)

Data processing to determine the impact of partnership patterns on the price and quality of fresh fruit bunches (FFB) uses IBM SPSS Statistics 25 and Microsoft Excel 2016 software with the model used being logistic regression. This study has 6 variables that affect the price and quality of FFB, including the government (X1), village unit cooperative (X2), marketing (X3), core company (X4), farmers in institutions (X5), and independent farmers (X6). The results of binary logistic regression can be seen in Table 10.

Tabel 10 Results of Logistic Regression on the Impact of Partnership Patterns on Price and Quality of Fresh Fruit Bunches (FFB**)**

Variable	B	S.E	Wald	Df	Sig.	Exp(B)
Goverment	1.810	1.121	2.608	1	0.106	6.113
Village Unit Cooperative	1.939	0.974	3.967	1	0.046	6.953
Marketing	1.060	0.963	1.212	1	0.271	2.886
Perusahaan Inti	-0.990	0.492	4.057	1	0.044	0.372
Farmers in institutions	0.014	0.385	0.001	1	0.971	1.014
independent farmers	1.273	0.613	4.309	1	0.038	3.571
Constant	-49.406	32.564	2.302	1	0.129	0.000

Source: Primary Data Processing Results, 2024

Based on Table 10, the results of the regression analysis, the following logistic regression equation is obtained:

$$g(x) = \ln\left[\frac{\pi(x)}{1-\pi(x)}\right] = -49{,}406 + 1{,}810X_1 + 1{,}939X_2 + 1{,}060X_3 - 0{,}990X_4$$

$$+0{,}014X_5 + 1{,}273X_6$$

From the variables resulting from the modeling, the variables that show the impact of the partnership pattern at the level of independent farmers on the price and quality of FFB are variables with significance less than α = 0.050. The interpretation of the regression coefficient based on the odd ratio value is as follows:

3.5.1. Village Unit Cooperative (X2) = exp(1,939) = 6,953

Based on the results of the binary logistic regression test on the village unit cooperative (X2) variable, it can be seen that the odd ratio value is 6.953. If the government variable (X1), marketing (X3), core company (X4), farmers in institutions (X5), and independent farmers (X6) are considered zero. The odds of the partnership pattern increase by 6.953 times when the village unit cooperative is present compared to when it is not. It can be concluded that the

presence of the village unit cooperative has a positive relationship with the partnership pattern at the level of independent palm oil farmers in Sumber Rejeki Village towards the price and quality of FFB.

3.5.2. Core Company (X4) = exp(-0,990) = 0,372

Based on the results of the binary logistic regression test on the core company variable (X4), it can be seen that the odd ratio value is 0.372. if the government variable (X1), village unit cooperative (X2), marketing (X3), farmers in institutions (X5), and independent farmers (X6) are considered zero. The odds of the partnership pattern increase by 0.372 times when the core company is present compared to when it is not. It can be concluded that the presence of the core company has a positive relationship with the partnership pattern at the level of independent palm oil farmers in Sumber Rejeki Village towards the price and quality of FFB.

3.5.3. Independent Farmers (X6) = exp(1,273) = 3,571

Based on the results of the binary logistic regression test on the independent farmer variable (X6), it can be seen that the odd ratio value is 6.113. If the government variable (X1), village unit cooperative (X2), marketing (X3), core company (X4), and farmers in institutions (X5) are considered zero. The odds of the partnership pattern increase by 3.571 times when independent farmers are present compared to when they are not. It can be concluded that the presence of independent farmers has a positive relationship with the partnership pattern at the level of independent palm oil farmers in Sumber Rejeki Village towards the price and quality of FFB.

3.6. Relevant Partnership Patterns to be Applied in Sumber Rejeki Village

The analysis of priority assessment criteria for relevant palm oil partnership patterns to be applied in Sumber Rejeki Village are criteria for marketing guarantees, capital support, management, and production facilities. The results of the priority assessment of partnership pattern criteria can be seen in Figure 5.

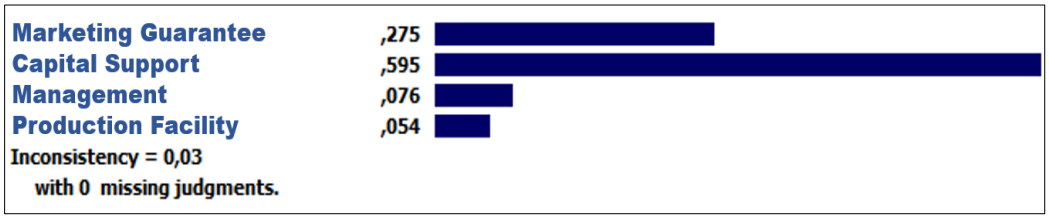

Figure 5 Priority Criteria for Partnership Patterns

Source: Primary Data Processing Results, 2024

Based on Figure 5, it is known that the results of the priority assessment of partnership pattern criteria show that of the 4 criteria compared, capital support occupies the first priority with a value of 0.595 or 59.5%.

Priority assessment of alternative palm oil partnership patterns against marketing guarantee criteria, The results of the alternative partnership pattern assessment against marketing guarantee criteria can be seen in Figure 6

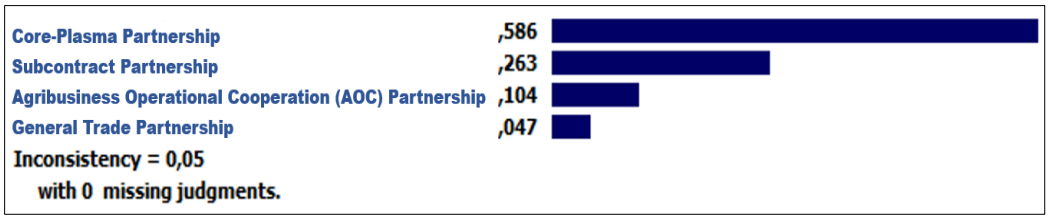

Figure 6 Priority of Alternative Partnership Patterns Against Marketing Guarantee Criteria

Source: Primary Data Processing Results, 2024

Based on Figure 6, it can be seen that the priority assessment of partnership patterns against marketing guarantee criteria, the core-plasma partnership gets the highest weight value of 0.586 or 58.6%.

Priority assessment of alternative palm oil partnership patterns against capital support criteria. The results of the alternative partnership pattern assessment against capital support criteria can be seen in Figure 7.

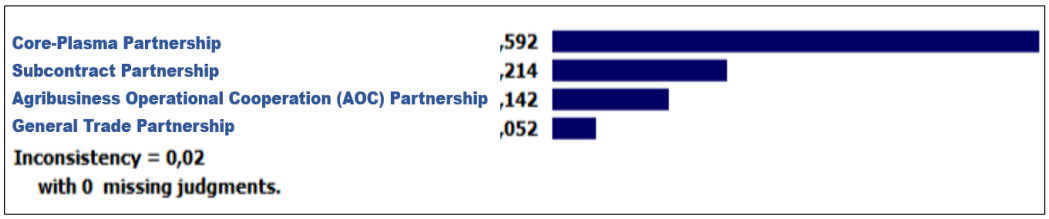

Figure 7 Priority of Alternative Partnership Patterns Against Capital Support Criteria

Source: Primary Data Processing Results, 2024

Based on Figure 7, it can be seen that the priority assessment of partnership patterns against capital support criteria, the core-plasma partnership gets the highest weight value of 0.592 or 59.2%.

Priority assessment of alternative palm oil partnership patterns against management criteria. The results of the alternative partnership pattern assessment against management criteria can be seen in Figure 8.

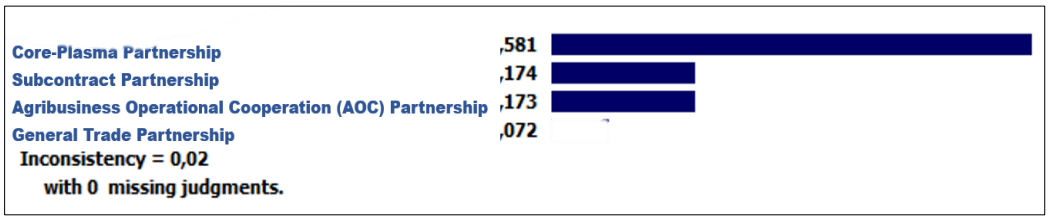

Figure 8 Priority of Alternative Partnership Patterns Against Management Criteria

Source: Primary Data Processing Results, 2024

Based on Figure 8, it can be seen that the priority assessment of partnership patterns against management criteria, the core-plasma partnership gets the highest weight value of 0.581 or 58.1%.

Priority assessment of alternative palm oil partnership patterns against production facility criteria. The results of the alternative partnership pattern assessment against production facility criteria can be seen in the Figure 9.

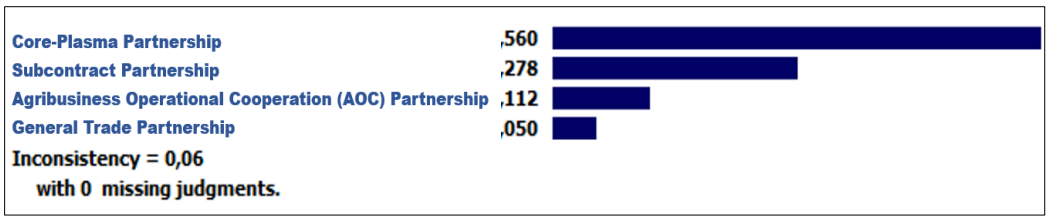

Figure 9 Priority of Alternative Partnership Patterns Against Production Facilities Criteria

Source: Primary Data Processing Results, 2024

Based on Figure 9, it can be seen that the priority assessment of partnership patterns against production facility criteria, the core-plasma partnership gets the highest weight value of 0.560 or 56%.

The priority assessment of alternative palm oil partnership patterns is obtained from the analysis at the previous research stage which forms the basis for determining the priority of alternative palm oil partnership patterns against all partnership pattern criteria using the Expert Choice application. The results of the priority assessment of alternative palm oil partnership patterns can be seen in Figure 10.

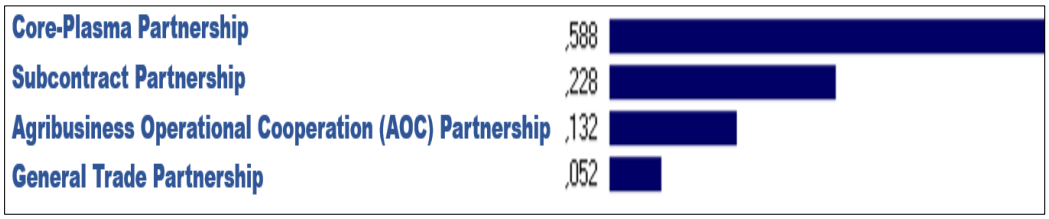

Figure 10 Evaluation of Priority of Alternative Partnership Patterns Against All Partnership Criteria

Source: Primary Data Processing Results, 2024

Based on Figure 10, it is known that the priority assessment of partnership patterns against all criteria, the core-plasma partnership gets the highest weight value of 0.588 or 58.8%.

The decision hierarchy in this study is the result of previous research analysis and interviews with farmers and the government of Sumber Rejeki Village. The results of the decision hierarchy analysis can be seen in Figure 11.

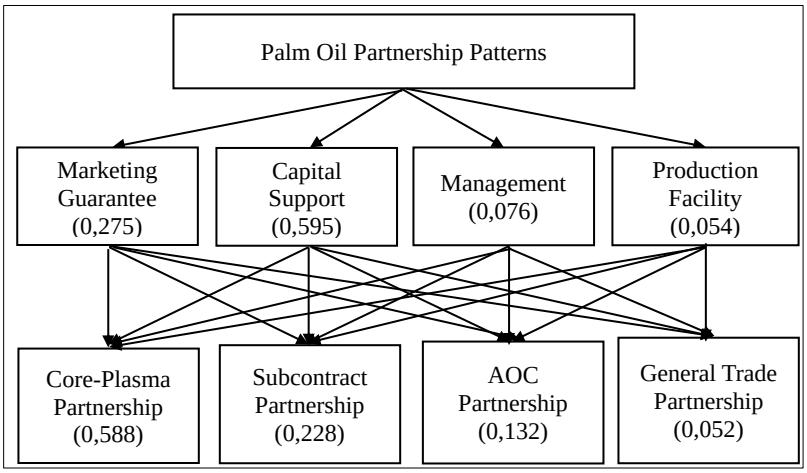

Figure 11 Hierarchy and Weight of Priority of Oil Palm Partnership Patterns in Sumber Rejeki Village.

Source: Primary Data Processing Results, 2024

Based on Figure 11, it is known that the first priority alternative of partnership patterns in the analysis using AHP is the core-plasma partnership (0.588) prioritizing the capital support criteria (0.595). Based on the element that has the first priority weight, the core-plasma partnership pattern can be applied in Sumber Rejeki Village. Capital support allows farmers to gain access to the financial resources needed to start and maintain their plantation operations. This includes costs for rejuvenating plants, which is important to ensure long-term productivity.

The core-plasma partnership pattern is needed in Sumber Rejeki Village to benefit from increased capacity, better market access, and more professional garden management. However, other hierarchy elements cannot be ignored, as they are interrelated and can influence the realization of mutually beneficial partnership patterns in Sumber Rejeki Village, Sungai Lilin District, Musi Banyuasin Regency.

4. Conclusion

The partnership pattern in Sumber Rejeki Village, Sungai Lilin District, Musi Banyuasin Regency is a collaboration between KPKS Suka Rejeki and oil palm farmers using the core-plasma partnership pattern with PT. Hindoli. In this pattern, the business partner group acts as plasma, while the partner company acts as the core. The factor that affects the price of fresh fruit bunches (TBS) with the highest loading factor value is the seed quality factor with certified seed parameters. Meanwhile, the factor that affects the quality of fresh fruit bunches (TBS) with the highest loading factor value is the maturity level factor with maturity criteria parameters of TBS that meet factory standards. The impact of the partnership pattern on the price and quality of fresh fruit bunches (TBS) in Sumber Rejeki Village, Sungai Lilin District, Musi Banyuasin Regency in the binary logistic regression model, there are 3 significant variables, namely village

unit cooperatives (KUD), core companies, and independent farmers. Based on the results of the analysis that has been carried out, it is found that the relevant partnership pattern to be applied is the core-plasma partnership pattern with a weight assessment of (0.588) prioritizing the capital support criteria with a weight assessment of (0.595). Therefore, the relevant partnership pattern recommendation to be applied in Sumber Rejeki Village, Sungai Lilin District, Musi Banyuasin Regency is the core-plasma partnership pattern.

Compliance with ethical standards

Disclosure of Conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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