Analysis of Farmers' Satisfaction Factors on the Use of Palm Oil Sprouts in Indonesian Oil Palm Research Institute (IOPRI)

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Abstract:

This journal reviews the factors that influence farmer satisfaction in procuring IOPRI's oil palm sprouts. This study aims to examine the effect of product quality, price fairness, promotion and service and the ease of obtaining IOPRI's oil palm sprout products on farmer satisfaction. This type of research is causal research. The research instrument is in the form of a questionnaire and the researcher is the key instrument. This research is expected to be useful for IOPRI companies in evaluating marketing mix activities. This research was conducted at the Medan IOPRI Marketing Office. The number of samples in this study was 96 respondents (farmers). This number was taken based on the technique of taking respondents that $n = Z^2 / 4 \ (Moe)^2$. The data analysis method used in this study is the descriptive analysis by measuring the level of importance and product performance using a Likert scale of 1-5. In addition, this study uses a multicollinearity test which is used to determine whether there is a correlation between independent variables. To test the independent variables in this study against the dependent variable multiple linear regression analysis. The results of this study are that the variable perceptions of product quality, perceptions of promotion and service, and perceptions of ease of obtaining products have a positive and significant effect on farmer satisfaction while the perception variable of price fairness has a positive but not significant effect on farmer satisfaction.

Keywords: farmer satisfaction. Palm oil sprouts, Indonesian Oil Palm Research Institute

Introduction:

Indonesia has been one of the prevalent palm oil manufacturers and exporters in the world ever since 2008 (Feintrenie et al., 2010). The high productivity of oil palm is determined by the sprouts used. The use of high-quality certified sprouts is indispensable to obtain maximum yield productivity (Zaimoglu et al., 2004).

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The Indonesian Oil Palm Research Institute (IOPRI) is a research and development institute for oil palm plantations in Indonesia from upstream to downstream sectors. Apart from research institutions, IOPRI is also engaged in the industrial sector (development of research products), one of which is involved in the supply and development of oil palm sprouts. IOPRI produces high-quality sprouts, proven by the fact that IOPRI as one of the favoured producers of oil palm sprouts in Indonesia from 2015 to the present (*Pusat Penelitian Kelapa Sawit*, 2022). Therefore, IOPRI must still be able to maintain consumer satisfaction. Consumers of IOPRI's oil palm sprouts include smallholders, PTPN, to the private sector as the target market. High and low prices are at all times the main concern of consumers when they are looking for a product. Consumers have a propensity for prioritizing affordable products.

Price fairness determines repurchase decisions, if the price is directly proportional to the quality, they will repurchase (Marisa and Rowena, 2020). As a producer of oil palm sprouts, IOPRI also carries out marketing activities to triumph over business competition and become the choice for farmers. Companies must have attractive strategies that are different from competitors so that their products are constantly in demand and purchased by consumers (Harahap, 2015).

Service is a strategic aspect of sales where the better the service, the more opportunities for potential customers to buy the products offered. Furthermore, product availability is also an important factor affecting consumer satisfaction (Kotler and Armstrong, 2014). The existence of product availability certainly makes it easier for consumers to obtain the expected product and consumers feel exultant (Apriando et al., 2019). If oil palm sprouts are not available at the time of planting, farmers will experience disappointment, and farmers may even replace their oil palm sprouts with brands from other companies.

Satisfied or dissatisfied farmers will affect product loyalty. Based on Harahap (2015) consumer satisfaction or dissatisfaction with a product will affect subsequent purchasing behavior. If consumers are satisfied, they will most likely make repeat purchases and vice versa. IOPRI must make every effort to provide the best service and provide high-quality products. IOPRI experienced a decline in sales several times, such as in 2010, 2014, 2016 and 2019.
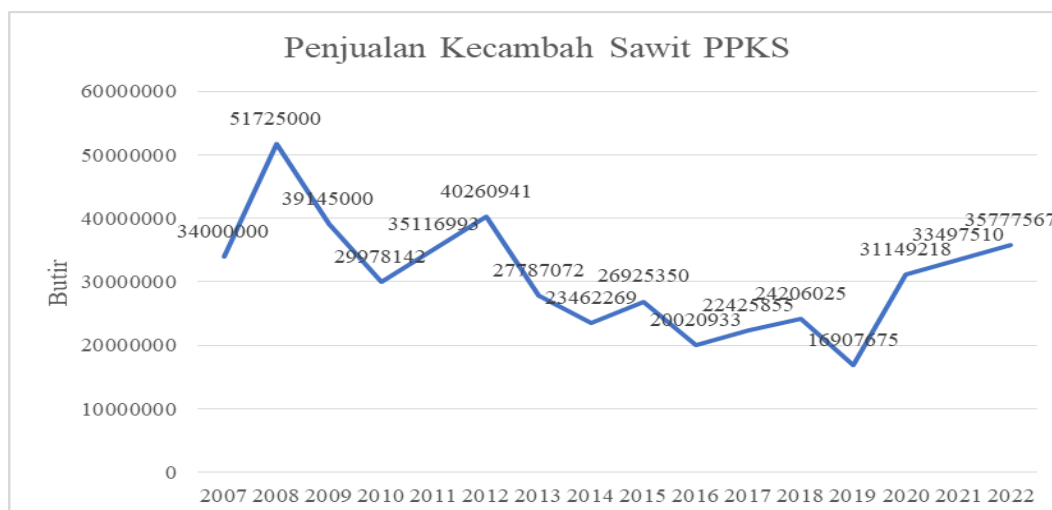
Figure 1: Sales of Oil Palm Sprouts (Harahap, 2015)

The decline in sales, as shown in the figure above, identifies that there has been dissatisfaction from consumers so they are reluctant to buy. Based on this background, the

researcher intends to research the effect of service quality on farmer satisfaction. Farmer satisfaction is measured based on product quality, price fairness, promotions and services, as well as the ease of obtaining products.

Formulation of the problem:

Based on the description of the background of these problems, the research questions that become research in this study are as follows:

i. Does the quality of IOPRI oil palm sprouts have a positive effect on farmer satisfaction?
ii. Does the fairness of the price of IOPRI oil palm sprouts have a positive effect on farmer satisfaction?
iii. Does the promotion and service of IOPRI oil palm sprouts have a positive effect on farmer satisfaction?
iv. Does the ease of obtaining IOPRI oil palm sprouts have a positive effect on farmer satisfaction?

Research purposes:

To find out and analyze the factors of farmer satisfaction with the use of oil palm sprouts from the Indonesian Oil Palm Research Institute (IOPRI).

Literature review:

Oil Palm Sprouts: The role of IOPRI in generating palm oil products and innovations is well-known in the community. IOPRI's vision is "To become a centre of excellence for sustainable palm oil in the world". Based on IOPRI (2022) oil palm sprout varieties consist of Sungai Pancur 1 (Dumpy) DyP, SP540 Drop, Yangambi Drop, DxP Langkat, and DXP 540 NG.

Product quality: A product is a multifaceted characteristic, both tangible and intangible, including packaging, colour, price, company and retailer prestige, and company and retailer services, which are received by buyers to satisfy their wants or needs. The tendency of consumers to repurchase the products offered by the company will increase along with an increase in the level of product quality. This condition will later influence consumer buying behaviour and will have a very significant impact on consumers.

Reasonable Price: Price is the amount of money that has been agreed upon by prospective buyers and sellers in exchange for goods or services in normal business transactions. Price fairness is an assessment of a result and process that can be accepted by consumers. Price fairness is most likely based on a comparison of transactions involving various parties when price differences occur, so the degree of similarity between transactions is an important element in assessing price fairness (Curatman and Hermansyah, 2015), company sales results, or overall business performance.

Promotions and Services: In marketing, an activity introduces the product and convinces and enhances the benefits of the product back to target buyers in the hope that they will be moved and voluntarily buy the product. Companies use sales promotion techniques such as exhibitions

and demonstrations as part of the promotion mix for consumer goods, namely sales, which consist of various promotional tools designed to stimulate a faster and stronger market response (Kurniadi, 2013).

Ease of Obtaining Products: One of the factors that influence consumer buying interest is the product availability factor. The existence of product availability certainly makes it easier for consumers to obtain the expected product (Kotler and Armstrong, 2014). Consumers can feel happy if the desired product is easy to obtain or available. Therefore, the product must be distributed by the company properly so that the product is easily obtained by consumers. That is, product availability is a fast and appropriate way to realize what consumers want and expect in a way that is easily accepted (Apriando et al., 2019).

Farmer Satisfaction: Satisfaction is a person's feeling of pleasure or disappointment as a result of a comparison between the perceived performance or product and the expected one. The creation of customer satisfaction can provide several benefits, including the influence between companies and consumers to be harmonious, providing a good basis for repeat purchases creating customer loyalty, and forming a word-of-mouth recommendation that is profitable for the company.

Customer/consumer satisfaction: Consumer satisfaction is an important element that reflects the success of producers of goods or services. Consumer satisfaction is the difference between expectations and perceived performance or results. All activities carried out by a company ultimately lead to the value provided by customers regarding perceived satisfaction (Handayani et al., 2022). If consumers are satisfied with a product or brand, they tend to continue to buy and use it and tell others about their pleasant experience with the product.

Research Methods:

Types of research: This research is included in the type of causal research which has the aim of knowing the influence between variables in a phenomenon (Sugiyono, 2010). This study aims to examine a particular population or sample by collecting data using research instruments. Then the data is analyzed quantitatively to test the hypothesis so that the relationship between the independent variables and the dependent variable can be seen.

Place and time of research: Research Locations This research was conducted at the Medan IOPRI Marketing Office, Jl. Brigadier General Katamso No. 51, Kp. Baru, Kec. Medan Maimun, Medan City, North Sumatra 20158. As well as field visits to oil palm farmers in locations that are still accessible in North Sumatra, such as Medan, Deli Serdang, Tebing Tinggi, and Pematang Siantar. The time of the research was carried out from January to May 2023.

Population and Research Sample: The population is defined as the entirety of individuals who will be used in research where these individuals are limited by the same characteristics (Cooper and Schindler 2017). The determination of the minimum number of samples can be calculated by the formula:

$$n = Z^2 / 4 (Moe)^2$$

Descriptions:

n = number of samples
Z = level of confidence required
Moe = margin of error
with a confidence level of 95% or Z = 1.96 and Moe = 10% (0.1)
then: n = (1.96)2/4 (0.1)2 = 96.4

From the results of the calculation above, the number of samples or respondents who must be studied is 96.4 respondents, but to facilitate research, the researchers took a sample of 96 respondents.

Data collection technique: Source of Data Primary data is used as the main data source in this study. Primary data was obtained through the results of filling out the questionnaire given to the respondents, in this case, the oil palm farmers when filling out the survey. Data collection was carried out using questionnaires which were distributed in person and also online.

Research Data Instruments: The instrument used in this study was a questionnaire or questionnaire in the form of a list of structured statement items with the nature of a closed-ended question questionnaire statement submitted to respondents. Responses to the variables in this study were recorded using a Likert scale consisting of five points as follows:

Strongly Agree or "SS" with a score of 5,
Agree or "S" with a score of 4,
Neutral or "N" with a score of 3,
Disagree or "TS" with a score of 2 and,
Strongly Disagree or "STS" with a score of 1.

Data analysis method: Data was collected by interview using a questionnaire. Analysis of the collected data will be descriptive statistical analysis. For descriptive statistical analysis use frequency, percentage, maximum value, minimum, average and standard deviation. The variables formulated will be the basis for measuring the level of farmer satisfaction. Measuring the level of interest and product performance uses a Likert scale of 1 – 5. The Likert scale is used to measure attitudes, opinions, and perceptions of a person or group of people about social phenomena (Sugiyono, 2017).

Multiple Linear Regression Analysis: To test the independent variables in this study against the dependent variable, multiple linear regression analysis was used. The equations in the regression analysis, linear, and multiple are shown as **Y = a +xb1X1 +xb2X2 +xb3X3+…bnXn+e** with information namely:

Y = n Dependent Variable
a = z Intercept
b = Slopes
X1,2,3….n = Independent Variable

e = Error terms

The multiple linear regression models were used when testing hypotheses 1, 2, 3 and 4. The independent variables (X) in the multiple regression models were perceived product quality, fairness, price, promotion and service, and ease of obtaining the product. As for the dependent variable (Y) in the linear regression model, this multiplier is the farmer's satisfaction.

Results:

Data Validity Test: This research was tested for the validity of the data using the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA) and Bartlett's Test of Sphericity. The limit for the degree of confidence of the sample or the KMO value used must have a value of more than 0.50 to select question items based on factor analysis. Testing the validity of the data in this study is shown in Table 1.

Table1: KMO Analysis Results and Bartlett's Test[2]

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0,854
Bartlett's Test of Sphericity	Approx, Chi-Square	1,364E3
	Df	300
	Sig.	0,000

In Table 1, the KMO value is 0.854, which means that if the KMO value is above 0.50, the factor analysis can be used. The value of Barlett's Test of Sphericity shows a significance of 0.000 where if the value of Barlett's Test of Sphericity <0.05 then the variables in this study have fulfilled the validity test. Overall, with the KMO value showing 0.845 and the Barlett's Test of Sphericity showing a significance of 0.000, factor analysis can be used, so that the variables in this study have fulfilled the validity test.

Data Reliability Test: This research was conducted to test the reliability of the data to obtain reliable data. Cronbach Alpha (α) is used as an indication of a research instrument that has adequate reliability, indicating if the Cronbach Alpha coefficient (α) has a value greater than or equal to 0.70. Reliability testing in this study is shown in Table 2.

Table 2: Reliability Test Results[3]

Variable	Number of items	Cronbach's alpha value	Inferences
Product Quality (KP)	5	0,810	Reliable
Reasonable Price (KH)	5	0,753	Reliable
Promotion and Services (PP)	5	0,723	Reliable
Ease of Obtaining Products (KMP)	5	0,709	Reliable
Farmer Satisfaction (KPP)	5	0,760	Reliable

The test results show that all variables have an adequate Cronbach Alpha coefficient (α), which is greater than 0.70 (Table 2). So it can be stated that the concept of measuring each

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[2] Source: Primary data processed (2023)
[3] Source: Primary data processed (2023)

variable from the questionnaire is reliable. Then, the items on each of these variable concepts can be used as a measuring tool in proper research.

Descriptive Analysis: Descriptive analysis in this study aims to describe or provide an overview and see the characteristics of the variables studied, namely each data collected from various respondents. In this study, respondents answered referring to the Likert scale, with the highest score of 5 (Strongly Agree) and the lowest score of 1 (Strongly Disagree). The purpose of the descriptive statistical analysis was to determine the maximum, minimum, mean and standard deviation values for each variable. Table 3 shows the descriptive results of the variable product quality, price fairness, promotion and service, and farmer satisfaction based on the answers of 96 respondents.

Table 3: Descriptive Analysis Results[4]

Variable	N	Min Value	Max Value	Mean	Std. Deviation
Product Quality (KP)	96	3,00	5,00	3,9583	0,47940
Reasonable Price (KH)	96	3,00	5,00	3,8854	0,43213
Promotion and Services (PP)	96	3,00	5,00	3,8854	0,38030
Ease of Obtaining Products (KMP)	96	3,00	5,00	3,8542	0,38331
Farmer Satisfaction (KPP)	96	3,00	5,00	3,8438	0,39278
Valid N (list-wise)	96				

The mean values of the Likert scale respectively 3.96; 3.89; 3.89; 3.85; and 3.84. All variables have an average above 3, which means that respondents generally agree that the quality of PPKS oil palm sprouts is perceived to be of good quality, have reasonable prices, good promotion and service, farmers can easily get products or are well distributed, and in general, provide good satisfaction to farmers.

Multicollinearity Test: The multicollinearity test is one of the classic assumption tests that aim to find out whether the independent variables correlate. The VIF (Variance Inflation Factor) value and Tolerance value are used to see whether or not there is a correlation or the presence of multicollinearity between the independent variables to see whether the regression model can be said to be good. The VIF value can be said to be good when the value shows a value below 10 and a tolerance value above 0.1, so if the value meets then it is said that there is multicollinearity in this study.

Table 4: Multicollinearity Test Results[5]

Variable	Tolerance	VIF
Product Quality (KP)	0,350	2,859
Reasonable Price (KH)	0,337	2,966
Promotion and Services (PP)	0,254	3,933
Ease of Obtaining Products (KMP)	0,411	2,432

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[4] Source: Primary data processed (2023)
[5] Source: Primary data processed (2023)

The results of the multicollinearity test are shown in Table 4. Of all the independent variables in this study, the tolerance value was greater than 0.1 and the VIF value was less than 10. The test results concluded that the study variables did not show any signs of multicollinearity.

Multiple Linear Regression Analysis:

Determination Coefficient Test: Measurement of how far the independent variables in the model can pass the coefficient of determination test (R2). If the value of the coefficient of determination shown is small, it means that there is a limitation of the independent variable. Based on Table 5 the coefficient of determination (Adjusted R Square) has a value of 0.820 which can be interpreted that in this study 82% of farmer satisfaction can be explained by the independent variable the remaining 18% is explained by other factors outside the variables not included in the study.

Table 5: Test Results for the Coefficient of Determination (R2) Multiple Linear Regressions[6]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,910a	0,828	0,820	1,00898
Dependent variable: farmer satisfaction				
Independent variables: product quality, price fairness, promotion and service, ease of getting the product				

Test t: The t-test was conducted to find out how far the influence exerted on each independent variable individually explains the variation of the dependent variable itself. The t-test is also used to test the significance that occurs in the multiple linear regression models. If the significant value < 0.05 or t count $>$ t table, there is an influence of the independent variable on the dependent variable. Based on Table 6 using a confidence of 95% ($\alpha = 0.05$), the number of independent variables (k) = 4, and the number of samples (n) = 96, then by entering into the formula t table = t ($\alpha/2$; n – k – 1) = t (0.025; 91) will get a t table of 1.986.

Table 6: Multiple Linear Regression t-Test Results[7]

Variable	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	0,636	1,051		0,605	0,547
Product Quality (KP)	0,539	0,071	0,557	7,573	0,000
Reasonable Price (KH)	0,053	0,075	0,053	0,708	0,481
Promotion and Services (PP)	0,245	0,089	0,237	2,746	0,007
Ease of Obtaining Products (KMP)	0,146	0,069	0,143	2,107	0,038
Dependent Variable: Farmer Satisfaction					

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[6] Source: Primary data processed (2023)
[7] Source: Primary data processed (2023)

In the perceived product quality variable, the significance value is 0.000 <0.05 and the t count is 7.573 > t table 1.986, so it can be concluded that product quality has a positive and significant influence on farmer satisfaction. This means that the higher the quality level of PPKS oil palm sprouts, the higher the level of farmer satisfaction.

In the perceived price fairness variable, the significance value is 0.481 > 0.05 and t count 0.708 <t table 1.986, so it can be concluded that price fairness has a positive effect, but not significantly on farmer satisfaction. This means that the higher the price fairness of the PPKS oil palm sprouts, the higher the level of farmer satisfaction, but not significantly.

In the variable perception of promotion and service, the significance value is 0.007 <0.05 and the value of t count is 2.746 > t table 1.986, so it can be concluded that promotion and service have a positive and significant influence on farmer satisfaction. This means that by increasing the quality of PPKS promotions and services, the level of farmer satisfaction with PPKS oil palm sprouts will also be higher.

In the perceived ease of obtaining products, the significance value is 0.038 <0.05 and the t count is 2.107 > t table 1.986, so it can be concluded that the ease of obtaining products has a positive and significant effect on farmer satisfaction. This means that the easier it is for farmers to get PPKS oil palm sprout products, the higher the level of farmer satisfaction.

To test the independent variables (X) on the dependent variable (Y) multiple linear regression analysis was used. The equation in multiple linear regression analysis is $Y = a + xb_1X_1 + xb_2X_2 + xb_3X_3 + \ldots bnX_n + e$. So we get the equation $Y = 0.636 + 0.539 X_1 + 0.053 X_2 + 0.245 X_3 + 0.146 X_4$. This means that the product quality variable is the most dominant factor.

The coefficient of the product quality variable is 0.539, meaning that when the product quality value increases by 1, the farmer's satisfaction level increases by 0.539 assuming other variables are constant. The price fairness variable coefficient is 0.053, meaning that when the price fairness value increases by 1, the level of farmer satisfaction increases by 0.053 assuming other variables are constant. The coefficient of promotion and service variables is 0.245, meaning that when the value of promotion and service increases by 1, the level of farmer satisfaction increases by 0.245 assuming other variables are constant. The coefficient of the variable ease of obtaining products is 0.146, meaning that when the value of the ease of obtaining products increases by 1, the level of farmer satisfaction increases by 0.146 assuming other variables are constant.

F test: The F test was conducted to find out how much influence all independent variables have on the dependent variable. The F test is also used to test the significance that occurs in the multiple linear regression models. If the significant value is <0.05 or F count > F table, then there is a simultaneous influence of the independent variables on the dependent variable.

Table 7: Multiple Linear F Test Results[8]

Model*	Sum of Squares	df	Mean Square	F	Sig.
Regression	444,764	4	111,191	109,220	0,000a
Residual	92,642	91	1,018		
Total	**537,406**	**95**			

*Dependent variable: farmer satisfaction

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[8] Source: Primary data processed (2023)

**Independent variables: product quality, price fairness, promotion and service, ease of getting the product

Based on Table 7, using a confidence of 95% ($\alpha = 0.05$), the number of independent variables (k) = 4, and the number of samples (n) = 96, then by entering into the formula F table = F (k, n – k) = F (4; 92) will get an F table of 2.47. The simultaneous significance value is 0.000 <0.05 and the calculated F value is 109.220 > F table 2.47, so it can be concluded that simultaneously the independent variables are product quality, price fairness, promotion and service, and ease of obtaining the product simultaneously give a positive and significant influence on farmer satisfaction.

Discussion:

Effect of Product Quality on Farmer Satisfaction: The results of descriptive data analysis seen from the average value of the product quality variable showed that respondents generally agreed that the quality of PPKS oil palm sprouts was perceived to be of good quality. This is important because PPKS oil palm sprouts are a product that will be used by farmers as input in the oil palm farming business. Farmers certainly perceive that the higher the quality of the product, the higher the yield they will get so they can meet their gardening needs (Mohanty et al., 2017).

The Effect of Price Fairness on Farmer Satisfaction: The results of descriptive data analysis seen from the average value of the price fairness variable stated that respondents generally agreed that PPKS oil palm sprouts had a reasonable price, were quite affordable and were by the farmers' abilities. Based on Konuk (2019) when a customer evaluates the price paid for a product as reasonable, acceptable, and expected, there will be an increase in the perceived value of the product.

The Influence of Service and Promotion on Farmer Satisfaction: The results of descriptive data analysis seen from the average value of the promotion and service variables, in general, farmers agree that the promotion and service activities for PPKS oil palm sprouts carried out by PPKS are good. Promotional activities carried out by PPKS marketers are generally educational. Promotional activities emphasize the provision of technical information about the advantages of the product which is packaged in the form of advertisements and counselling activities. PPKS has a YouTube channel "PPKS TV" which contains product explanations to education on technical cultural activities in oil palm to help farmers in oil palm cultivation. In terms of services, PPKS has the Palm Oil Program for the People (PROWITRA) which can reach farmers in remote areas to obtain quality oil palm sprouts and education on technical palm oil culture (PPKS, 2022).

Effect of Ease of Obtaining Products on Farmer Satisfaction: The results of descriptive data analysis were seen from the average value of the ease of obtaining product variables. In general, farmers agreed that farmers could easily get PPKS oil palm sprout products. Products must be distributed by companies properly so that products are easily obtained by consumers (Apriando et al., 2019). In product distribution, PPKS has 3 main marketing offices at Medan PPKS Marihat PPKS in North Sumatra and Parindu PPKS Sub Station in West Kalimantan. In addition, PPKS also has PPKS Outlets which are used as a means of outreach, consultation, ordering, and

selling of PPKS oil palm sprouts. PPKS outlets are spread throughout Indonesia, such as Samarinda (East Kalimantan), Banjarmasin (South Kalimantan), Tarakan (North Kalimantan), Palangkaraya (Central Kalimantan), Mamuju (West Sulawesi), and Morowali (Central Sulawesi).

Effect of Product Quality, Price Fairness, Promotion and Service, and Ease of Obtaining Products on Farmer Satisfaction: The results of descriptive data analysis generally provide good satisfaction to farmers. The results of subsequent data analysis show that product quality, price fairness, promotion and service, and the ease of obtaining products simultaneously have a positive and significant impact on farmer satisfaction. The satisfaction obtained by a consumer can encourage him to repurchase and become loyal to the product or loyal to the store where he bought the item so that consumers can tell good things to others.

Conclusion:

Based on the analysis of research data and discussion that has been done, the conclusions obtained are as follows:

i.   Product quality has a positive and significant influence on farmer satisfaction. This means that the higher the quality level of PPKS oil palm sprouts, the higher the level of farmer satisfaction.

ii.   Price fairness has a positive but not significant effect on farmer satisfaction. This means that the higher the level of fairness in the price of PPKS oil palm sprouts, the level of farmer satisfaction increases, but not significantly.

iii.   Promotion and services have a positive and significant impact on farmer satisfaction. This means that by increasing the quality of PPKS promotions and services, the level of farmer satisfaction with PPKS oil palm sprouts will also be higher.

iv.   The ease of obtaining products has a positive and significant effect on farmer satisfaction. This means that the easier it is for farmers to get PPKS oil palm sprout products, the higher the level of farmer satisfaction.

v.   Taken together, the independent variables, namely product quality, price fairness, promotion and service, and ease of obtaining products simultaneously have a positive and significant influence on farmer satisfaction.

Recommendations:

Recommendations that can be given in this research are as follows:

i.   Product quality is the most dominant factor, so to be able to further increase farmer satisfaction with PPKS oil palm sprouts, the variables of price fairness, promotion and service, and ease of obtaining products need to be improved.

ii.   Although all variables simultaneously have a positive and significant effect on farmer satisfaction, price fairness does not have a significant effect. Therefore, PPKS should need to evaluate the fairness of the price of PPKS oil palm sprouts to increase farmer satisfaction.

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