Motivation Of Planters In Conducting Castration
In Crops Immature Period Of Oil Palm In Bandar Island
Distric Asahan Regency

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Abstract

The purpose of this study was to determine the level of motivation and factors that influence planters in performing castration on TBM. This research was conducted in Bandar Pulau District, Asahan Regency from April to June 2023. The data collection method used was observation and interview using a questionnaire that had been tested for validity and reliability, while the data analysis method used a Likert scale and multiple linear regression. The results showed that the level of farmer motivation was 84%. Further testing using the t test showed that the farming experience factor, income, External Knowledge, and the availability of farm business credit had a significant effect while the age and education factors did not have a significant effect with the t value greater than the t table.

Keywords: Bandar Pulau District, Castration, Motivation, Multiple linear regression analysis, Oil Palm

INTRODUCTION

Oil palm is a plantation crop that produces food oil, industrial oil and biofuel (biodiesel). Oil palm has a positive influence on economic and social growth (Fathurrahman & Trimo, 2019). As one of Indonesia's largest agricultural export commodities, palm oil has an important role as a large source of foreign exchange and taxes. In the process of industrial production and processing, oil palm plantations are also able to create opportunities and jobs, especially for rural communities while improving people's welfare (Dirjenbun, 2021).

Bandar Pulau is one of the sub-districts in Asahan Regency, this sub-district has an area of 43,342 hectares (433.42 km^2) consisting of 10 villages namely: 1) Aek Nagali Village, 2) Bandar Pulau Village, 3) Buntu Village Maraja, 4) Gajah Sakti Village, 5) Gonting Malaha Village, 6) Gunung Berkat Village, 7) Huta Rao Village, 8) Padang Pulau Village, 9) Aek Tarum Plantation Village, 10) Padang Pulau Plantation Village. The area of the plantations that produce community oil palm in Bandar Pulau District covers an area of 21,383 ha with an average production of 199,891 tons (BPS, 2021).

Maintenance of oil palm plants after planting on land is divided into two, namely TBM and TM. Oil palm immature plantations are the pre-harvest period (starting from planting until the first harvest) which lasts for 30-36 months old plants (Melis et al., 2016). TBM usually includes plant sanitation, pest and disease control, maintenance of terraced roads, maintenance of crop plates, weed control, castration, and fertilization (Pardamean, 2017).

Of the many oil palm TBM maintenance activities, there is one factor that is often a problem for Planters in oil palm cultivation in Bandar Pulau District, namely the problem of poor growth of oil palm stems and Planters still selling

sandy fruit that is not suitable for processing (Dewandini, 2010). this is because these Planters do not castrate/ablate, the oil palm plants are immature, resulting in the distribution of nutrients between the plants and the sandy fruit of the oil palm.

Castration is the disposal of male and female flowers on TBM. Castration must be carried out if more than 50% of the oil palm trees have produced flowers (male or female). given should be used for plant growth so move to fruit development. If Planters still do not want to castrate TBM, there will be many negative factors that are felt not only in terms of poor cultivation to production that is not yet feasible for production.

Motivation is also influenced by several factors that come from within (internal) and from outside (external) of what? Motivation Is an encouragement due to a stimulus that makes a person want to carry out certain behaviors/activities so that they are better than the previous situation (Uno, 2023).

The factors that cause these activities to be carried out will be identified. Based on the description above, the objectives of this study are (Fauzi et al., 2012):

1. Assessing the level of motivation of smallholders in castration on oil palm immature plantations in Bandar Pulau District, Asahan Regency.
2. Assessing the factors that influence the motivation of smallholders in castration on Immature Palm Oil Plants in Bandar Pulau District, Asahan Regency.

METHODOLOGY

The Final Project activities began in April - June 2023. The place of the assessment was in Bandar Pulau District, Asahan Regency, North Sumatra Province. The selection of the study site was determined purposively with the consideration that the area is the largest plantation land in Asahan Regency and also has the largest Oil Palm TBM land in Asahan Regency.

According to Sujarweni (2014) Quantitative descriptive research is carried out by compiling a list of questions submitted by the sample, used to examine the symptoms of a group or individual behavior and extracting data through questionnaires and interviews. The study aims to collect data and information which is done by compiling a list of questions asked to the sample (Noor, 2012).

Sugiyono (2019) states, data is raw material obtained in the field and then processed to produce information or information facts or descriptions so that it can provide benefits to researchers, based on the source of the data obtained in this study obtained from primary data and secondary dataAccording to Sugiyono (2019), suggesting Population is a generalization area which is an object / subject that has certain quality characteristics set by the author to be studied. Furthermore, to determine the population to be sampled in this study, it is determined with certain considerations or criteria (purposive).

According to Sugiyono (2019), suggests that the sample is a group that represents the population and acts as a sample. The sampling technique used in this study is Proportional random sampling. Taking members of the population is done randomly without regard to the stata in that population. The sampling calculation used is based on the Slovin formula (Rasjidi, 2017). from this formula

the number of samples obtained is 68 from a population of 212 samples.

Validity and reliability tests have been conducted on 15 non-sample planters in Bandar Pulau District, Asahan Regency. The r-count result is greater than the r-table value, it can be concluded that all statements are valid and the Cronbach alpha value is greater than the result of 0.600, indicating that the questionnaire in this study is reliable data.

Data collection techniques were carried out by interviews, observation and filling out questionnaires by the research sample. The data analysis technique for the Motivation rate uses quantitative data obtained from calculating the total score taken as a sample from smallholders who castrate TBM so that it can be interpreted into 5 categories based on level: very low, low, medium, high and very high (Hartono, 2015). For the factors that influence Planters on the use of life support on chili plants using a Likert scale (1-5) and multiple regression tests with the help of SPSS version 25. The regression analysis equation used in this study is as follows (Nugroho, 2019):

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$$

Information:

    Y = Planters motivation
    X1 = age
    X2 = education
    X3 = farming experience
    X4 = income
    X5 = External Knowledge
    X6 = availability of farming credit

RESULTS AND DISCUSSION

Based on the results in the field by distributing questionnaires about motivation which is influenced by two indicators, namely economic motivation and social motivation, the results obtained the level of motivation of planters, namely:

Table 1. Smallholder motivation

Number	Indikator	Score obtained	Maximum Score	Percentage (%)
1	Economic Motivation	1.495	1.700	88 %
2	Social Motivation	1.362	1.700	80%
	Average			84%

Source: Primary Data Analysis (2023)

If it is drawn into a continuum line with score interpretation criteria according to Sugiyono (2019), it will look as follows:
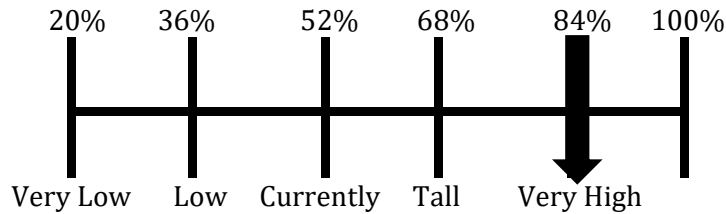

Figure 1. Continuum Line of Planters' Motivation Level in Performing Castration on Immature Plants in Bandar Pulau District.

Based on the results of the assessment conducted by distributing questionnaires to the sample regarding the level of motivation of planters in carrying out castration on immature plants in Bandar Pulau Sub-district is very high (84%) (Ghozali, 2011). Motivation consists of two indicators, namely Economic Motivation with a percentage of 88%, where smallholders are interested in economic terms because smallholders assume that oil palm trees that are castrated when the plants are immature will produce oil palm fruit, the resulting weight per sign is on average the same and also larger and the trunk of oil palm that has been castrated is stronger roots and tree growth is more uniform and also plants are rarely attacked by pests and diseases when the plants are immature (Nurmedika et al., 2015).

Social Motivation with a percentage of 80%, which in the results of interviews with a sample of smallholders knew about castration activities from the lecture method given to smallholders, smallholders thought that castration was profitable if done so. These smallholders share information about castration. The results of this study are in line with the opinion of Van den ban in Suherdi et al. (2015), that counseling is a process of increasing the motivation of smallholders to be able to implement their choices.

Analysis of the factors that influence the motivation of Planters in conducting castration on immature oil palm plantations in Bandar Pulau District: Analysis to determine the factors that influence the motivation of Planters in castrating immature oil palm plantations using multiple linear regression analysis ('Abiid et al., 2021). as for the test used is the normality test, to test whether the resulting residual value is normally distributed or not (Harahap, 2019). Multicollinearity Test This test aims to test whether the regression model found a correlation between the independent variables. The multicollinearity test can be seen from the Tolerance and VIP values (Poluan et al., 2017).

Heteroscedasticity Test This test aims to test whether in a regression model there is an inequality of variance from residuals in one observation to another The linearity test is used to see whether the model specifications used are correct or not. And also find out whether two variables have a significant linear relationship or not (Rivai, 2010).

To find out the Motivation of Smallholders in Carrying out Castration on TBM, we must know the magnitude of the determination value. Where the coefficient of determination must explain the x variable which is able to explain the adjusted R value. It is known that the R value in multiple linear shows the multiple correlation

between all independent variables, namely, age, education, farming experience, income, External Knowledge, availability of farm credit with the dependent variable, namely economic motivation and sociological motivation. The R value ranges from 0 to 1, if it is close to 1 then the relationship is getting closer, but if it is close to 0 then the relationship is getting weaker (Priyatno, 2012).

The results of the SPSS output above show that the value of the correlation (R) is 0.832a, meaning that the value of multiple correlation is very strong because the value is close to 1. So it can be concluded that there is a strong relationship between all independent variables (age, education, farming experience, income, External Knowledge, availability of farm credit) with the dependent variable (Motivation of smallholders) (Gusti et al., 2022). R Square (R2) or the square of R, indicates the coefficient of determination. The figure will be converted into percent, which means the percentage of influence of the independent variable on the dependent variable. The R Square value of 0.692 means that the percentage of influence of the independent variable with the dependent variable of smallholder motivation in performing castration on TBM is 69.2% while the remaining 30.8% is influenced by other variables (Ismulhadi & Rukka, 2017).

Analysis to determine the factors that influence the motivation of smallholders in castration on immature oil palm plantations uses multiple linear regression analysis. Regression is a method used to predict how much influence the independent variables have on the dependent variable (Sugiyono, 2019).

Table 2. Multiple Linear Regression Analysis Results

No	Variabel	Koefisien Regresi	Koefisien Regresi terstandarisasi	T Count	Sig
1.	Age	0.190	0.116	2.167	0.033
2.	Education	1.638	0.843	15.718	0.000
3.	farming experience	0.105	0.058	2.094	0.039
4.	Income	-0.559	-0.121	-4.340	0.000
5.	External Knowledge	0.724	0.211	7.411	0.000
6.	availability of farming credit	0.073	0.40	1.442	0.153

Source: Primary Data Processing (2023)

Simultaneous effect test (F test)

Overall test (F test) aims to determine the effect of the independent variables, namely age level, education, farming experience, income, External Knowledge, availability of farming credit with the dependent variable the motivation of the planters to castrate simultaneously (together).

Based on Table 2, it is known that the F-test value is 216,401. If the F-test value is compared to the F-table value at a significance level of 0.05 where the degree of the Peling (DF1) = K-1 = 6 and the de So it can be concluded that the value of F-count (22.842)> F-table (2.25) and a significance value of 0,000 <0.05 then H0 is rejected and H1 is accepted. This shows that the variable X simultaneously has a very significant effect on the variable Y. The second hypothesis states that the age, education, income, income, income, cosmopolita, the availability of farming credit has a significant effect on the Y. Oil Palm in Bandar Pulau District, Asahan Regency was accepted. These factors affect the increase in

the motivation of planters in carrying out the castration of plants that have not produced oil palm in Bandar Pulau District. The statistical equations formed from the multiple linear regression analysis according to the partial test results in Table 2 are as follows:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$$

$$y = -9{,}947 + 0{,}130X1 + 0{,}374X2 - 0{,}247X3 + 2{,}029X4 + 1{,}012X5 + 0{,}397X6$$

a. Age

Based on calculations using statistical analysis in table 26, the t-count value is 1.105 < t- table 1.999 with a significant level of 0.273 > 0.05, so H0 is accepted and H1 is rejected. It can be concluded that partially the age variable does not have a real effect on the Motivation of Planters in performing castration on TBM in Bandar Pulau District, Asahan Regency.

Based on the real conditions, the age of the smallholders is a factor that is closely related to the ability to work in carrying out their farming activities even though they are old, the smallholders there are still eager to work on their land even though there are some jobs that they need other people to help them, even though age can be used as a benchmark for the activities carried out by a person at work where a productive age will work optimally. So that in this study the age of the sample has no effect because on average all people play an active role in their farms and have become hereditary habits and are attached to themselves so that they are accustomed to running and managing their business.

The results of this study are in line with the research of Ardi & Effendi (2018) which states that age has no effect on the motivation of smallholders in conducting watermelon farming in Sumber Sari Village. This is because the average age of the sample is above 40 years old, an age where the physical ability and energy of the sample begins to decrease so that the Planters motivation to farm watermelon in Sumber Sari Village is reduced.

b. Education

Based on calculations using statistical analysis in table 26, the t-count value is 1.025 < t- table 1.999 with a significant level of 0.309 > 0.05, then H0 is accepted and H1 is rejected. It can be concluded that partially the education variable has no significant effect on the Motivation of Planters in performing castration on TBM in Bandar Pulau District, Asahan Regency.

Based on the results of interviews in the field to samples in this study where the sample is dominated by samples whose education period is 12 years or equivalent to Senior High School where during this education period the sample already understands reading, writing and communicating. The results in the field show that even though the average education is at the high school level. and does not affect the Motivation of Smallholders in performing castration on TBM in Bandar Pulau District, Asahan Regency. this is because Smallholders need more education through skills training outside of the education experienced during their childhood in order to improve their skills in oil palm cultivation to hone their abilities in determining good oil palm cultivation, besides that education outside formal education can provide greater stimulation in making decisions and doing things.

c. farming experience

Based on calculations using statistical analysis in table 26, the t-test value is - 2.062> t-table 1.999 with a significant level of 0.044 <0.05, then H0 is rejected and H1 is accepted (Ravik, 2017). It can be concluded that partially the farming experience variable has a significant effect on the Motivation of Smallholders in performing castration on TBM in Bandar Pulau District, Asahan Regency. and it can be concluded that the length of farming business has a negative effect on the Motivation of Smallholders in performing castration. Also reinforced by research by Asfiati & Sugiarti (2021), there is a significant negative effect on the level of motivation of smallholders in rice breeding farming. This is because the majority of smallholders have 5-10 years of farming experience (still relatively low), with this experience smallholders are more motivated to develop their rice nursery farms.

Based on the results of interviews in the field, the longer the planters have been farming and the more often they cultivate oil palm plants, the more they feel that they have often received failures from their efforts, so their motivation is lost. In addition, experience has a negative effect because the longer the experience of smallholders in oil palm cultivation, the more comfortable they feel with the cultivation techniques that have been carried out for generations, so that they are reluctant to change their cultivation techniques of smallholders in oil palm farming, the more comfortable they are with the cultivation techniques that have been carried out for generations, so they are reluctant to adopt existing innovations, while smallholders who have little experience are more willing to accept innovations and are more motivated to develop their farms.

This is reinforced by Dillon & Hardaker (2006), statement that long farming experience makes smallholders more mature and more careful in making decisions about their farming business. Meanwhile, less experienced smallholders are generally quicker in making decisions because they are more willing to take risks.

d. Income

Based on calculations using statistical analysis in table 26, the t-test value is 3.287> t-table 1.999 with a significant level of 0.002 <0.05, then H0 is rejected and H1 is accepted. It can be concluded that partially the Income variable has a real effect on the Motivation of Planters in performing castration on TBM in Bandar Pulau District, Asahan Regency (Pambela, 2017).

Based on the results of interviews in the field, one of the factors that planters want to be motivated by new innovations is because they want to increase their income, that the average income of oil palm planters ranges from 2.6 to 5 million. Therefore, smallholders want to increase their income because of the many economic needs they want to fulfill. And they are motivated because they know what benefits will be obtained if they carry out castration. Planters assume that if TBM are castrated, they will get benefits such as greater fruit growth and uniform weight and oil palm trunks that have been castrated are stronger and sturdier, this is what motivates planters.

This is in line with research by Rosyid (2021), which states that there is a significant influence between income and physiological needs motivation. This shows that both small and large income planters have the same desire to be able to improve family physiological needs and improve family welfare or the urge to cooperate or exchange opinions with planters with higher incomes, relatives and neighbors.

Income shows all money or other material results achieved from doing work in the form of goods or services received by a person within a certain period of time in an economic activity (Ningsih, 2019).

e. External Knowledge

Based on calculations using statistical analysis in table 26, the t-test value is 8.952> t-table 1.999 with a significant level of 0.000 <0.05, then H0 is rejected and H1 is accepted. It can be concluded that partially the External Knowledge variable has a real effect on the Motivation of Planters in performing castration on TBM in Bandar Pulau District, Asahan Regency.

Based on the results of interviews in the field, one of the factors that smallholders want to be motivated by new innovations is because the sample smallholders are already open to external innovations. The average sample smallholder has a cellphone and television, and they also like to look for information about oil palm cultivation, including the importance of castration in oil palm plants (Pakpahan et al., 2021). In Bandar Pulau sub-district and its surroundings, there are many companies in the plantation sector that are close to villages where they also often exchange information and share experiences about oil palm cultivation. And many planters in the village also work in surrounding plantation companies, the company has applied castration to immature plants, that's where planters see clear evidence that castration is profitable when applied, that's where planters want to try and practice directly on their oil palm land. And not only from there, planters in the village often hold gatherings with extension workers and many of these planters are very enthusiastic about the counseling provided.

This research is also in line with the research of Widiyanti et al. (2016), External Knowledge has a positive effect on the motivation of smallholders in implementing innovations in hybrid corn varieties, high External Knowledge nature will increase the motivation of smallholders in implementing an innovation (Charina et al., 2018). External Knowledge nature is an individual trait that tends to receive information about innovations. According to Rogers (1983) in Widiyanti et al. (2016), smallholders who have a high External Knowledge nature are characterized by having many relationships among individuals, groups and institutions, high social participation and actively seeking information in various mass media. Planters who have a low External Knowledge level will obtain less information from things in their environment (Syifa' et al., 2020).

f. availability of farming credit

Based on calculations using statistical analysis in table 2, the t-test value is 3.751> t-table 1.999 with a significant level of 0.000> 0.05, then H0 is rejected and H1 is accepted. It can be concluded that partially the availability of farm credit has a significant effect on the motivation of Planters in castrating TBM in Bandar Pulau District, Asahan Regency.

Based on interviews with smallholders, the availability of farm credit is very helpful for oil palm smallholders, especially when the plants are still in the Non-Producing Plant TBM stage, where the funds will help smallholders to meet their family needs and also for capital to open other businesses while waiting for their oil palm plants to enter the Producing Plant TM stage. In looking for capital to plant oil palm, a guaranteed source of funds is needed, to lend capital on farm credit,

while what is often used as collateral by smallholders is their land title, so that smallholders will be even more persistent in finding money so that the land title that has become collateral can be redeemed, so that the capital provided will be used by smallholders to open agricultural businesses and other businesses.

This research is also in line with the research of Susanto et al. (2023), the variable availability of farm credit has a positive influence on improving the welfare of smallholders, the welfare of smallholders will not be achieved without agricultural credit. Agriculture is based on the substantial welfare of smallholders. In order to efficiently function the productivity of smallholders, internal or external financial constraints play a role.

According to Shinta (2011), smallholders are often in debt and unreachable by credit institutions and production facilities, even though credit is one source of capital for smallholders.

RECOMMENDATIONS

a. Conclusions

Based on the results of a study conducted regarding the motivation of planters in castration on immature oil palm plantations in Bandar Pulau District, Asahan Regency, the following conclusions can be drawn:

1. The motivation level of the Planters in castrating the immature oil palm plantations in Bandar Pulau District, Asahan Regency is in the very high category (84%).
2. There is a simultaneous significant effect of the independent variable (X) on the dependent variable (Y), namely the motivation of the planters in casting TBM in Bandar Pulau District, Asahan Regency. Partially, the variable (X) has a significant effect on the motivation variable. farmer (Y) is the variable Farming Experience (X3), Income (X4), External Knowledge (X5) and Availability of farm credit (X6). Meanwhile, the variables Age (X1) and Education (X2) did not have a significant effect on the motivation of Planters in casting TBM in Bandar Pulau District, Asahan Regency.

b. Suggestions

Based on the studies that have been carried out regarding the existing conditions in the field, some suggestions are given from the author as follows:

1. It is hoped that farmer extension workers will increase assistance in the field and get closer to Planters so that Planters are even more motivated in applying castration to immature plants in accordance with the instructions/directions in carrying out castration, and establishing a close relationship between Planters and extension workers.
2. Provision of information regarding good oil palm cultivation to increase the success and welfare of smallholders in the oil palm plantation sector.
3. high level of External Knowledge between fellow Planters and outsiders is expected to
4. exchange information about oil palm cultivation in order to further increase knowledge and skills.
5. Further research is carried out to find out other factors that can motivate smallholders to castrate oil palm immature plantations.

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