THE ANALYSIS OF FACTORS INFLUENCING EMPLOYEE PERFORMANCE IN PALM OIL HARVESTING AT PT. SEMADAM

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ABSTRACT

The palm oil industry has created business potential. Palm oil agribusiness is one of the industrial sectors in Indonesia that possesses a competitive advantage in the global market. The development of the palm oil industry in Indonesia has been carried out with a focus on achieving a balance among social, financial, and environmental aspects. The attention of oil palm plantation employees is crucial for increasing productivity. This research aims to analyze the influence of the harvest premium variables: length of service, age, education level, number of dependents, grants, and geology on the work implementation of oil palm harvesting workers at PT Semadam. This research was conducted in June 2022 at PT. Semadam, Aceh Tamiang. In this research, the survey method was employed. The number of samples was calculated using the Slovin Formula with an error rate of 10% or 0.1. This calculation obtained a sample size of 40 respondents from a population of 45 people. The research results indicate a collective influence of independent factors (premium collection, work involvement, age, education level, number of dependents, aid funds, and geographical location) on the dependent variable (work implementation). However, premium collection, education level, and geography significantly influence worker performance, while work involvement, age, work involvement, and grants do not substantially impact worker performance. The coefficient of determination, 0.825, indicates that the independent variables explain 82.5% of the variance in the dependent variable, while other factors influence 17.5%.

Keywords: employee performance; harvest productivity; palm oil.

INTRODUCTION

The agrarian sector is one sector that can contribute to the national economy (Kifli & Umami, 2017). The agricultural division can be vital in the federal financial progress structure (Li et al., 2020) since farming is always related to space and time (Ramankutty et al., 2018). Supporting sciences such as Soil Science, Meteorology, Agrarian Engineering, Organic Chemistry, and Measurement are also highly concerned with farming (New York and Geneva, 2017). Around 30 percent of Indonesia's land is used for agribusiness (BPS, 2022). The agriculture division in Indonesia consists of two types based on the scale per 1 meter: 1) Expansive agriculture, both state-owned and private. Expansive farming focuses on trading commodities, such as oil palm and rubber. 2) Smallholder production, mostly traditional farming households (Leimona et al., 2015).

Palm oil is a plantation commodity that is important in increasing Indonesia's finances (Irawan & Purwanto, 2020). As the world's largest producer of palm oil, the palm oil industry has provided business opportunities for 16 million workers, both directly and indirectly (Pacheco et al., 2017). Palm oil agribusiness is one of the Indonesian industries with a competitive advantage to compete globally (Tampubolon & Pasaribu, 2017). In 2021, palm oil production reached 45.74 million tons. This year, the total area of oil palm plantations reached 14.62 million hectares. Of the plantation area, 8.04 million hectares, or 55%, are controlled by private plantations. Smallholder plantations own 6.03 million hectares or 41.24% of the oil palm plantations. Meanwhile, the remaining 0.55 million hectares, or 3.76%, are controlled by state plantations (BPS, 2022).
The palm oil industry in Indonesia was built with an approach that prioritizes a balance between social, financial, and natural perspectives (Tampubolon & Pasaribu, 2017). This is in line with the commitment of the Government of Indonesia to make continuous improvements, which has been regulated explicitly in the 2020-2024 National Medium-Term Development Plan (RPJMN). In the 2020-2024 RPJMN, sustainable development has been determined as one of the main aspects that aim to provide equitable and inclusive growth, as well as safeguard the environment, to maintain changes in the quality of life from one era to another (National Development Planning Agency (Bappenas), 2020).

Factors influencing harvesters include their need for appropriate resources from the company so that they can work effectively in oil palm empowerment. If the performance of palm oil harvesting employees is low, it will impact palm oil production in the company (Simanjuntak et al., 2023). This research is needed for plantations, entrepreneurs, agricultural services, communities, and related parties to improve the performance of oil palm plantation employees. Increasing the performance of palm oil employees will have a positive impact on company production. Similar research was also conducted by Tambunan, Dalmiyatun, and Satmoko (2019). Still, it was limited to Bahorok District, North Sumatra, with variables such as salary, incentives, motivation, work environment, training, and development. This variable differs from previous research and is essential in improving employee performance. The variables in this research are the influence of harvest premiums, work experience, age, education level, number of dependents, awards, and topography. A similar analysis has never been conducted in Aceh Tamiang, especially at PT. Semadam. This research aims to analyze the variables that influence the increase in performance of oil palm plantation employees at PT. Semadam, Aceh Tamiang.

MATERIALS AND METHODS

This research was conducted in June 2022 at PT. Semadam, Aceh Tamiang. The method used in this research is the survey method. The survey involved investigating samples from the population using a questionnaire as a guide. The survey consisted of interviewing several employees at PT. Semadam were randomly selected and guided by a prepared questionnaire. The number of samples was calculated using the Slovin Formula with a 10% error rate (0.1). This calculation resulted in a sample size of 40 respondents from a population of 45. The sampling technique used a non-probability sampling method, employing a cluster sampling technique that grouped employees based on their work sections within the company. From each group, several individuals were randomly selected as samples. Sampling within each division was done proportionally. The data collection approach involved direct observation and on-site interviews. The collected data included primary and secondary data. Preliminary data was obtained through employee interviews regarding harvest premiums, work experience, age, education level, the number of dependents, awards, and topography. Secondary data could be obtained by referring to company records or relevant literature. The questionnaire used in this survey consisted of closed-ended questions, and questionnaire measurements were conducted using a Likert scale. Respondents were allowed to express their agreement with statements using answer choices that reflected employee experiences. Harvest premiums were categorized into three groups: a (0-1,000,000), b (1,000,000 - 2,000,000), and c (>2,000,000). Work experience was divided into two categories: a (0 - 2 years) and b (3 - 5 years), while age was categorized as a (20 - 35 years) and b (36 - 50 years). Educational factors were also grouped as a (elementary school), b (junior high school), and c (high school). The number of dependents of workers was divided into a (0 - 2 people) and b (3 - 5 people).

After collecting the data, it will be tabulated using Microsoft Excel. The tabulated data will be analyzed with the help of the SPSS version 25.0 program. The analysis to be carried out consists of descriptive analysis and multiple linear regression analysis. Descriptive research provides an overview or description of the data (Tsige et al., 2020). Classic Assumption Tests: Normality Test, Multicollinearity Test, Heteroscedasticity Test. Multiple Linear Analysis. Hypothesis Testing: Simultaneous Test (F Test); Partial Interest Test (t-Test); Coefficient of Determination Test (R²)

RESULTS AND DISCUSSION

Classic Assumption Test

a. Normality Test

The normality test in a regression model helps assess whether the distribution of residuals arising from the regression has characteristics that are close to or by a normal distribution. A model is
considered optimal if the residual data has a distribution close to normal or conforms to a normal distribution. Based on the table above, it can be seen that the centrality value in the test is 0.793, which can be observed from the Kolmogorov-Smirnov calculation results. This value is much higher than the α value of 0.05 (0.793 ≥ 0.05). Therefore, it is known that the Kolmogorov-Smirnov criticism occurs with an importance value of ≥ 0.05, causing the spread of information in this discussion.

Table 1. Kolmogorov-smirnov one sample test

<table>
<thead>
<tr>
<th></th>
<th>Tes</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kolmogorov-Smirnov</td>
<td>0,793</td>
<td></td>
</tr>
</tbody>
</table>

b. Multicollinearity Test

The results of the multicollinearity test show that the resistance value for all autonomous factors is ≥ 0.1, and the Variance Inflation Factor (VIF) value in Table 1 for all independent aspects is ≤ 10. The Premium harvest VIP value is 3.648, the work experience is 2.301, the age is 2.487, the education level is 1.073, the number of dependents is 1.554, the award is 2.172, and the topography is 1.965. It can be concluded that the relapse symptoms used in this study are accessible from the side effects of multicollinearity.

Table 2. Multicollinearity test results

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvest Premium</td>
<td>0.274</td>
<td>3.648</td>
</tr>
<tr>
<td>Work Experience</td>
<td>0.435</td>
<td>2.301</td>
</tr>
<tr>
<td>Age</td>
<td>0.402</td>
<td>2.487</td>
</tr>
<tr>
<td>Education Level</td>
<td>0.932</td>
<td>1.073</td>
</tr>
<tr>
<td>Number of Dependents</td>
<td>0.644</td>
<td>1.554</td>
</tr>
<tr>
<td>Award</td>
<td>0.460</td>
<td>2.172</td>
</tr>
<tr>
<td>Topography</td>
<td>0.509</td>
<td>1.965</td>
</tr>
</tbody>
</table>

Table 1: Variance Inflation Factor (VIF) values show that the research is worth continuing for analysis. Elbayoumi et al. (2014) stated that if a variable faces multicollinearity problems, it occurs when the Variance Inflation Factor (VIF) value exceeds 10. Research that faces multicollinearity problems can result in inaccuracies in describing situations in the field. In cases where certain parties use research affected by these issues, the resulting impact will likely be affected and become less reliable.

c. Heteroscedasticity Test

The heteroscedasticity test aims to determine whether there is an imbalance in changes from one remaining observation to another in a regression model. The following results were obtained based on the results of the heteroscedasticity tests carried out on palm oil specialists at PT Semadam Aceh Tamiang (Figure 1).

![Scatterplot](image)

**Figure 1. Heteroscedasticity test results**
Scatterplot graphs show dots scattered randomly without forming a clear pattern. The points are evenly distributed on the Y-axis on both sides of the number 0. Therefore, there are no signs of heteroscedasticity in the regression model, so the regression model can be used to predict performance based on variables such as harvest premium, work experience, age, education level, number of dependents, and topography.

**Multiple Linear Analysis**

Based on the picture above, it can be seen that there is no straightforward design or pattern. The focus is spread both over and underneath the number on the Y-axis. From this, it can be concluded that there is no heteroscedasticity.

**Table 3. Multiple linear analysis results**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Coefficient</th>
<th>T count</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>20.372,567</td>
<td>5,301</td>
<td>0.000</td>
</tr>
<tr>
<td>Harvest Premium</td>
<td>0,004</td>
<td>3,102</td>
<td>0.004</td>
</tr>
<tr>
<td>Work Experience</td>
<td>1.237,098</td>
<td>1,846</td>
<td>0.074</td>
</tr>
<tr>
<td>Age</td>
<td>-249,329</td>
<td>-1,980</td>
<td>0.056</td>
</tr>
<tr>
<td>Education Level</td>
<td>1.039,204</td>
<td>4,768</td>
<td>0.000</td>
</tr>
<tr>
<td>Number of Dependents</td>
<td>745,550</td>
<td>0,919</td>
<td>0.365</td>
</tr>
<tr>
<td>Award</td>
<td>4.151,097</td>
<td>0,780</td>
<td>0.441</td>
</tr>
<tr>
<td>Topography</td>
<td>-10.678,138</td>
<td>-5,407</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>27,229</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Adjusted R2</strong></td>
<td>0.825</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>R²</strong></td>
<td>0.856</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

\[
Y = a_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + e
\]  

(1)

\[
Y = 20.372,567 + 0.004X_1 + 1.237,098X_2 - 249.329X_3 + 1.039,204X_4 + 745,550X_5 + 4.151,097X_6 - 10.678,138X_7 + e
\]  

(2)

1. \(a_0\) could be a steady value; in this study, the stable value is 20.372.567. This value indicates that if the independent variables (gather premium, work experience, age, education level, number of dependents, grants, geography) are all 0, then the dependent variable (employee performance) is 20.372.567 kg/month.

2. \(b_1\) is the regression coefficient of the independent variable, specifically the gather premium variable. In this study, the contribution of the gather premium variable is 0.004. This means that if the gather premium (X1) increases by Rp.1000, while X2, X3, X4, X5, X6, and X7 are held constant, it will increase the value of the employee performance variable (Y) by 0.004 kg/month.

3. \(b_2\) is the regression coefficient of the independent variable, specifically the work experience variable. In this study, the contribution of the work experience variable is 1,237.098. This means that if the work experience (X2) increases by one year, while X1, X3, X4, X5, X6, and X7 are held constant, it will increase the value of the employee performance variable (Y) by 1,237.098 kg/month.

4. \(b_3\) is the regression coefficient of the independent variable, specifically the age variable. In this study, the contribution of the age variable is -249,329. This means that if the age (X3) increases by one year, while X1, X2, X4, X5, X6, and X7 are held constant, the employee performance variable (Y) will decrease by 249,329 kg/month.

5. \(b_4\) is the regression coefficient of the independent variable, namely the education level variable. In this study, the contribution of the education level variable is 1,039,204. This means that if the education level (X4) increases by one year, while X1, X2, X3, X5, X6, and X7 are held constant, it will increase the value of the employee performance variable (Y) by 1,039,204 kg/month.

6. \(b_5\) is the regression coefficient of the independent variable, precisely the number of dependent variables. In this study, the contribution of the number of dependents variable is 745,550. This means that if the number of dependents (X5) increases by one individual, while X1, X2, X3, X4, X6, and X7 are held constant, it will increase the value of the employee performance (Y) by 745,550 kg/month.
7. \( b6 \) is the regression coefficient of the independent variable, specifically the grants variable. In this study, the contribution of the grants variable is 4,151.097. This means that if the grants (X6) increase by one dummy variable value, while X1, X2, X3, X4, X5, and X7 are held constant, it will increase the value of the employee performance (Y) by 4,151.097 kg/month.

8. \( b7 \) is the regression coefficient of the independent variable, namely the geography variable. In this study, the contribution of the geography variable is -10,678.138. This means that if the geography (X7) increases by one dummy variable value, while X1, X2, X3, X4, X5, and X6 are held constant, it will decrease the value of the employee performance (Y) by 10,678.138 kg/month.

Based on the table, the \( F_h \) value is 27.229 with an importance level of 0.000\(^a\), and the F table value is 3.367. According to the test results, the \( F_h \) value is greater than the F table (27.229 \( \geq \) 3.367). Considering the significance level, it can be concluded that when the critical importance of \( F \leq \alpha \) (0.000\(^a\) \( \leq \) 0.05), the decision-making criteria are to reject \( H_0 \) and accept \( H_1 \). This means that all independent factors (collect premium, work experience, age, education level, number of dependents, grants, and geography) collectively and simultaneously influence the dependent variable (employee performance).

Based on the table above, it can be seen that the coefficient of assurance (Balanced R square) of the independent variables (gather premium, work involvement, age, education level, number of dependents, grants, and geography) simultaneously has an impact on the value of the dependent variable, which is 82.5%. The remaining 17.5% is affected by other variables not tested in this study.

a. Harvest Premium

The oil palm harvest premium is a financial incentive paid to palm oil workers for their role in harvesting palm fruit. It is an additional payment made by palm oil companies to their workers, usually on top of their regular wages, as a reward for their hard work and productivity (Barmas Indah Sari et al., 2020). The premium is typically calculated based on the weight of the harvested fruit and is designed to incentivize workers to maximize their output while maintaining high-quality standards. The oil palm harvest premium is essential for promoting sustainable and responsible palm oil production. Oliphant and Simon (2022) encourage workers to adhere to best practices and ensure they are fairly compensated for their efforts. This can help improve working conditions and reduce poverty among palm oil workers, often among society's most marginalized and vulnerable members. Based on the results of research conducted at PT. Semadam, Aceh Tamiang, it can be seen that the harvest premium for workers is still low. This is because education will significantly affect everyone's work and income.

b. Work Experience

Work experience can significantly impact the performance of employees harvesting oil palms (Ratnawati et al., 2020). Harvesting oil palm involves a series of complex tasks that require skill, knowledge, and physical endurance. Experienced workers performing these tasks for a long time will likely have developed the necessary skills, techniques, and strategies to achieve them efficiently and effectively (Andresen et al., 2022). Experienced workers are likely to have developed a deep understanding of the oil palm plant and the best practices for harvesting it. They may have developed techniques for identifying the most productive bunches and the best way to cut them without damaging the tree. They may also have developed strategies for working quickly and safely, minimizing the risk of injury or accidents. Experienced workers are likely to have developed physical endurance and stamina that enables them to work for extended periods without experiencing fatigue or exhaustion. This can translate into higher productivity and efficiency, as they can work longer without breaks or rest periods (Masyudi & Lizam, 2019). Work experience is also highly preferred at PT. The Semadam of Aceh Tamiang Regency shows that workers have an average experience ranging from 3-5 years.

c. Age

Age is an essential factor in determining the performance of oil palm harvesters. Several studies have investigated the effect of age on workers' physical abilities, including strength, endurance, and flexibility. The following explanation provides an overview of the impact of age on the performance of oil palm harvesting employees based on the relevant literature. A study by Bery Heriyanto et al., (2020) found that the performance of oil palm harvesters decreases with age. The results show that older workers have lower grip strength, balance, and flexibility levels than their younger counterparts. These physical abilities are essential for effective oil palm harvesting, which involves carrying heavy loads and working in rugged terrain.
The productive life of oil palm workers refers to the period during which these workers can perform physically demanding tasks related to cultivating and harvesting oil palms. This period is usually marked by workers' physical fitness and ability to perform the required tasks efficiently. The productive life of oil palm plantation workers can vary depending on several factors, including age, gender, and overall health. For example, younger workers may be able to work more efficiently for extended periods. In comparison, older workers may need to take more frequent breaks or work at a slower pace—the average age of the oil palm harvesting workers at PT. The Semadam of Aceh Tamiang District ranges from 36 to 50 years old. Research on the productive life of oil palm plantation workers has primarily focused on the physical demands of their work and the factors that affect their productivity. For example, one study found that workers equipped with tools and an ergonomic workplace could increase their productivity by up to 20% (Musa et al., 2021). Other studies have explored the impact of heat stress on worker productivity and the effects of work-related musculoskeletal disorders on workers' ability to perform physically demanding tasks (Rasdan Ismail et al., 2020). Older workers took longer to complete tasks, had a higher error rate, and experienced more fatigue than younger workers. These findings suggest that age-related declines in physical abilities can negatively affect the productivity of palm oil harvesting employees.

d. Education Level
Knowledge is essential for developing skills and improving job performance in any industry, including palm oil harvesting. The more knowledge an employee has, the better equipped they are to perform their job effectively and efficiently, leading to higher productivity and job satisfaction. At the same time, the workers are harvesting oil palm at PT. Semadam Aceh Tamiang Regency has low education. The majority of workers are elementary school graduates. The palm oil workers here prioritize labor in harvesting oil palm, so more workers must have good skills in oil palm harvesting.

One study by Mohd Hanafiah et al. (2022) found that knowledge and skill training programs positively impact the performance of palm oil harvesting employees in Malaysia. The study showed that employees who received training on best practices for harvesting and processing palm oil demonstrated improved knowledge and skill levels, which ultimately led to increased productivity and a reduction in work-related accidents. Another study by Hasibuan et al. (2020) investigated the impact of knowledge and experience on the performance of palm oil harvesting employees in Indonesia. The study found that employees with a higher level of expertise and experience had significantly better job performance, including higher productivity and better quality of work.

e. Number of Dependents
The influence of dependents on the performance of palm oil harvesting employees can be explained in the context of the family responsibilities of these employees. Palm oil harvesting is a labor-intensive job that requires physical strength and stamina. However, the performance of employees can be affected by their personal and family circumstances, including the number of dependents they have to support. At PT. Semadam of Aceh Tamiang Regency, Palm Oil Harvesting Employees are more dominant in having responsibilities ranging from 3-5 people, so the company will try to help workers so that they work more actively. This can be seen based on the high awards given by PT. Greetings to the workers. Studies have shown that family responsibilities, such as caring for children, elderly parents, and other family members, can affect the performance of workers in various industries, including agriculture (Asbari et al., 2020). In the case of palm oil harvesting employees, the need to balance work and family responsibilities can lead to stress, fatigue, and reduced productivity. To address this issue, some palm oil companies have implemented policies and programs to support their employees' families, such as providing daycare services, flexible work arrangements, and health benefits. These interventions can help alleviate the burden of family responsibilities and improve the performance of palm oil harvesting employees (Thotawatte & Samarakoon, 2021).

f. Awards
Research on rewards' effect on oil palm harvester employees' performance is limited. However, some studies have investigated the impact of tips on employee performance in general. One study found that rewards can positively affect employee performance as they serve as a form of recognition and validation of employees' hard work and achievements (Harrison & Jepsen, 2015). In addition, rewards can boost employee morale and motivation, leading to increased productivity (McCormick et al., 2019). Almost 100% of Palm Oil Harvester employees at PT Semadam Aceh Tamiang Regency have never received an award. The workers only receive work wages according to the stipulated salary. The PT Semadam Aceh Tamiang workers need an award demonstrating the family relationship between the office and the workers. Another study found that rewards can also
signal organizational values and expectations, which can encourage employees to align their behavior with those values (Augustinus & Halim, 2021). This alignment can increase job satisfaction and a sense of belonging, improving performance.

g. Topography

Topography can significantly impact the performance of employees harvesting oil palm. The terrain and slope of the plantation can affect the efficiency and safety of the harvesting process. On flat terrain, harvesting can be done using machines, increasing productivity and reducing labor costs. However, devices may not be practical on sloped terrain, and manual labor may be required. This can result in slower harvesting rates and increased labor costs.

Furthermore, the steepness of the terrain can increase the risk of accidents and injuries for workers. The results showed that PT Semadam Aceh Tamiang Regency had 80% sloping land, which significantly affected the performance of the palm oil workers. Work carried out on sloping ground will require extreme caution. A study conducted in Malaysia found that workers on steeper terrain had a higher incidence of slips, trips, and falls, which can result in severe injuries and lost productivity (Mohd Hanafiah et al., 2022). Additionally, the fatigue and physical strain of working on steep slopes can result in decreased productivity and job satisfaction (Asamoah-Appiah & Aggrey-Fynn, 2017).

CONCLUSIONS AND SUGGESTION

Partially, the harvest premium, education level, and topography significantly affect employee performance. In contrast, work experience, age, number of dependents, and awards do not considerably affect employee performance. Overall, improving the performance of oil palm harvest workers requires a comprehensive approach that considers various factors, including training, remuneration, working conditions, and demographic characteristics.

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