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The Effect of Competence, Training and Work Environment on Employee Performance at PT. Bakrie Sumatera Plantations Tbk, Kisaran

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ABSTRACT

The study purpose was to examine the effect of competence, training, and work environment on employee performance at PT. Bakrie Sumatera Plantations Tbk. This study aims to provide empirical evidence regarding factors that influence employee performance in the plantation sector.

Materials and methods. This research employed a quantitative approach with a causal associative design. The population consisted of all employees at PT. Bakrie Sumatera Plantations Tbk, with a total sample of 42 respondents selected using a saturated sampling technique. Data collection was carried out using structured questionnaires, and the data were analyzed using multiple linear regression techniques. Hypothesis testing was conducted through t-test and F-test, supported by classical assumption tests and coefficient of determination analysis.

Results. The findings indicate that competence, training, and work environment each have a positive and significant effect on employee performance. Simultaneously, these variables significantly influence employee performance. The coefficient of determination shows that competence, training, and work environment collectively explain a substantial proportion of the variance in employee performance.

Conclusions. The study concludes that improving employee competence, implementing effective training programs, and creating a supportive work environment are essential factors in enhancing employee performance at PT. Bakrie Sumatera Plantations Tbk.

Keywords: Plantation Industry, Employee Performance, Competence, Training, Work Environment.

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INTRODUCTION

Increasingly intense business competition in the era of globalization requires organizations to possess high-quality human resources capable of making optimal contributions to organizational success. Employee performance is a critical factor determining organizational effectiveness; therefore, efforts to improve performance cannot be separated from effective human resource management. Among the key factors influencing employee performance are individual competence and training, as well as a work environment that supports productivity. These three factors play an essential role in shaping employees' ability to meet job demands, sustain productivity, and achieve organizational objectives.

Employee competence encompasses knowledge, skills, and abilities that fundamentally distinguish one individual from another. Ramadhani & Kuswinarno (2024) describe competence as a combination of capabilities, knowledge, skills, and individual characteristics required to achieve effective performance in the workplace. In this context, competence can be understood as an underlying attribute that influences behavior, reflecting motivation, personal characteristics, self-concept, values, and knowledge possessed by individuals who perform effectively in their jobs.

Training plays an important role in enhancing employees' technical and non-technical capabilities, enabling them to perform their duties in accordance with the operational standards established by the organization. In addition, training serves as a means of updating employees' knowledge so that it remains aligned with technological advancements and evolving job requirements. Gustiana et al., (2022), state that training is designed to improve employee performance by systematically transforming attitudes, knowledge, and work behavior through planned learning processes, thereby fostering skills and experiences that contribute to effective performance and future organizational development.

Beyond competence and training, the work environment is another factor that influences employee performance. A work environment that is comfortable, clean, safe, and socially supportive can enhance work motivation and promote efficiency in task completion. Harahap et al., (2018), emphasize that a conducive work environment is a key determinant of employee productivity, which ultimately leads to improved performance. The physical and non-physical dimensions of the work environment are interrelated and cannot be separated in supporting employees' work activities

PT. Bakrie Sumatera Plantations (BSP) is a national company operating in the plantation and palm oil industry. The company is located on Jl. Ir. H. Juanda, Kisaran, Asahan Regency. This study was conducted at the Gurach Batu Estate, one of the company's operational units, which exhibits distinctive characteristics of plantation work and human resource management that are relevant for empirical investigation.

Table 1. Employee Education Data by Job Position

NO	Job Position	Senior High School		
		SMA/SMK	Bachelor's Degree (S1)	TOTAL
1	Estate Manager	-	1	1
2	Head Clerk	-	1	1
3	Estate Clerk	2	2	4
4	First Supervisor	2	1	3
5	Latex Weighing Clerk	5	-	5
6	Transportation Clerk	-	3	3
7	Tapping Supervisor	21	-	21
8	Harvesting Supervisor	4	-	4
	TOTAL	34	8	42

Source: Primary Data (Processed, 2025).

Human resource data at PT Bakrie Sumatera Plantations Tbk, Gurach Batu Estate, indicate that out of a total of 42 employees, 34 individuals (80.95%) have an educational background at the senior high school/vocational level, while only 8 employees (19.05%) hold a bachelor's degree. This workforce composition is largely dominated by supervisors and field staff who are directly involved in plantation operations. As a result, efforts to improve employee competence are highly dependent on the implementation of training programs and the development of practical technical skills.

In addition, working conditions in the Gurach Batu Estate Division have not yet fully supported optimal job performance. Limitations in work facilities and infrastructure such as the absence of a prayer room (musholla) within the plantation area along with inadequate security and occupational safety protection for employees during field activities, represent ongoing challenges. External environmental factors, including unpredictable weather conditions, difficult terrain, and potential occupational hazards, further affect employee comfort and safety at work. These circumstances suggest that competence, training, and the work environment are critical factors that warrant further investigation, as they are likely to have a significant influence on employee performance within plantation settings.

Previous studies have consistently identified competence, training, and the work environment as key determinants of employee performance. Empirical findings from research conducted in the retail sector, service industries, and public institutions indicate that these variables have significant effects on employee performance, both individually and collectively. However, variations in results have been observed with regard to the magnitude of influence exerted by each

factor. In general, prior research has predominantly focused on organizations characterized by administrative and service-oriented tasks, operating within relatively controlled, office-based work environments. (Khristian et al., 2025), (Rizanta et al., 2025), (Dewiani et al., 2024), (Apriyanto et al., 2021), (Suganti et al., 2021)

Nevertheless, the findings of earlier studies do not fully capture the unique conditions of the plantation industry, which is marked by field-based work activities, high demands for operational technical competence, greater occupational risks, and work environments strongly influenced by natural conditions and safety concerns. This discrepancy highlights a research gap that necessitates re-examining the influence of competence, training, and the work environment on employee performance within the plantation sector. Accordingly, this study seeks to address this gap by empirically investigating the effects of these three variables on employee performance at PT Bakrie Sumatera Plantations Tbk, Kisaran, specifically at the Gurach Batu Estate.

The novelty of this study lies in its examination of the combined effects of competence, training, and the work environment on employee performance within a plantation industry context, which is characterized by intensive fieldwork, operational technical skill requirements, and elevated occupational risk compared to service and retail sectors. This research adapts variable measurements to reflect plantation-specific conditions, particularly in terms of technical competence, operational and safety-oriented training, and field-based work environments. By doing so, the study expands empirical evidence on human resource management practices in the agribusiness sector, with a specific focus on PT Bakrie Sumatera Plantations Tbk, Kisaran, Gurach Batu Estate.

Based on these considerations, the present study aims to analyze the influence of human resource competence, training, and the work environment on employee performance at PT BSP Tbk Gurach Batu Estate. Academically, the findings are expected to enrich the human resource management literature by providing empirical evidence from the plantation industry, a sector that remains underrepresented in prior research. Practically, this study is anticipated to offer valuable insights for company management in formulating human resource development policies, designing more inclusive and sustainable training programs, and fostering a more productive work environment. From a novelty perspective, this research integrates competence, training, and work environment variables simultaneously within a plantation context and provides new insights into their effects on employee performance at PT BSP Tbk Gurach Batu Estate, an organizational setting that has not been previously examined.

METHOD

Research Design

This study adopts a quantitative approach and is classified as causal associative research, which focuses on examining relationships and cause-and-effect influences between independent and dependent variables.(Sugiyono, 2019) The research is designed to explain both the relationships and causal effects of competence, training, and the work environment on employee performance. This approach is considered appropriate because it enables systematic and objective measurement of research variables, allowing intervariable effects to be analyzed through hypothesis testing.

Population and Sample

The population of this study comprises all employees of PT Bakrie Sumatera Plantations Tbk, Kisaran, at the Gurach Batu Estate, totaling 42 employees. The determination of respondents was based on the size of the available population. When the population size is relatively small, all members of the population are included as research respondents, whereas for larger populations, sampling techniques are typically applied to ensure equal opportunity for selection. Accordingly, this study employs a saturated sampling technique, in which the entire population is used as the research sample.(Ngapiyatun et al., 2025)

Data Collection Techniques

Data collection in this study was conducted using three methods. First, direct observation was employed to obtain firsthand information regarding actual conditions and issues related to the research object. (Silaban & Hasibuan, 2023) Second, documentation was used to collect relevant secondary data obtained from company records and internal reports. Third, data were gathered through the distribution of structured questionnaires administered directly to respondents. Employees were asked to complete the questions and statements provided based on their actual experiences and working conditions. The completed questionnaires were then collected and reviewed by the researcher to ensure completeness and consistency of responses.(Selvi et al., 2024) A five-point Likert scale was applied to capture respondents' perceptions of job competence, training received, work environment conditions, and the level of performance achieved. Prior to data analysis, the research instrument was evaluated to ensure its accuracy and consistency through validity and reliability testing.

Validity and Reliability Testing

Before proceeding with further analysis, the research instrument was assessed for feasibility through validity and reliability tests. Validity testing was conducted to confirm that each statement item accurately measured the intended variables, while reliability testing aimed to determine the consistency of the instrument in producing dependable data. Therefore, validity and reliability testing represent essential steps to ensure that the research instrument generates data that align with the measurement objectives and demonstrate a satisfactory level of consistency.(Subhaktiyasa, 2024)

Descriptive Analysis

Descriptive analysis was employed to present an overview of the research variables, namely competence, training, work environment, and employee performance. This analysis is expressed through measures of central tendency and data distribution to illustrate the general condition of each variable. Descriptive statistical analysis was applied to describe the characteristics of the research data, thereby enabling the identification of data trends and the degree of variability across each research variable.(Simarmata et al., 2025)

Classical Assumption Tests

Classical assumption testing was conducted prior to hypothesis testing to ensure that the regression model met econometric requirements, allowing the results to be interpreted accurately.(Purba et al., 2021) These tests included normality testing, multicollinearity testing, and heteroscedasticity testing, all of which were performed to confirm that the data satisfied the assumptions required for multiple linear regression analysis

Multiple Linear Regression Analysis

Multiple linear regression analysis is an analytical technique used to examine the linear relationship between one dependent variable and two or more independent variables. (Sumbawati et al., 2025) This method enables the researcher to assess the individual influence of each independent variable on the dependent variable

Hypothesis Testing

Hypothesis testing was conducted using the t-test to examine the partial effect of each independent variable on the dependent variable, while the F-test was applied to assess the simultaneous influence of all independent variables on the dependent variable.(Making, 2025)

Coefficient of Determination

The coefficient of determination is used to evaluate the extent to which the independent variables in the regression model explain variations in the dependent variable. The RI value ranges between 0 and 1, where values closer to 1 indicate a stronger explanatory power of the model, while values approaching 0 reflect a weaker ability to explain the relationship among variables. In regression models involving multiple independent variables, the Adjusted RI value is commonly used for interpretation, as it accounts for the number of predictors and degrees of freedom, thereby providing a more accurate representation of the model's explanatory quality.(Japina et al., 2025)

RESULTS AND DISCUSSION

Respondent Characteristics Based on Age

Table 2. Based on Age

Age		F	%
Valid	< 30	12	28,57
	31-40	9	21,43
	41-50	11	26,19
	> 51	10	23,81
	Total	42	100.0

Source: Primary Data (Processed, 2025)

Table 2 presents the age distribution of respondents at PT BSP Tbk Gurach Batu Estate. The data show that employees aged under 30 years account for 28.57% of the respondents. Those aged between 31–40 years represent 21.43%, while employees aged 41–50 years constitute 26.19%. Respondents aged over 51 years make up 23.81% of the total sample. These findings indicate that the workforce is relatively balanced across age groups, with a slight concentration in the productive working-age range.

Respondent Characteristics Based on Gender

Table 3. Based on Gender

Jenis Kelamin		F	%
Valid	Man	42	100.0
	Total	42	

Source: Primary Data (Processed, 2025)

As shown in Table 3, all respondents involved in this study are male employees, accounting for 100% of the total sample. This composition reflects the nature of plantation operations, which are predominantly field-based and physically demanding, resulting in a workforce largely dominated by male employees.

Respondent Characteristics Based on Educational Level

Table 4. Based on Educational Level

Educational Level		F	%
Valid	Junior or Senior High School (SMP/SMU)	34	80,95
	Bachelor's Degree (S-1)	8	19,05
	Total	42	100.0

Source: Primary Data (Processed, 2025)

Table 4 illustrates the educational background of the respondents. The majority of employees, amounting to 80.95%, have completed secondary education at the junior or senior high

school level (SMP/SMU). Meanwhile, 19.05% of respondents hold a bachelor's degree (S1), and none have a diploma-level qualification (D3). This distribution suggests that the workforce is primarily composed of employees with secondary-level education, highlighting the importance of training and skill development to enhance employee competence and performance.

Respondent Characteristics Based on Job Position

Table 5. Based on Job Position

Job Position	F	%
Estate Manager	1	2,38
Head Clerk	1	2,38
Estate Clerk	4	9,52
Latex Weighing Clerk	5	11,90
Transportation Clerk	3	7,14
First Supervisor	3	7,14
Tapping Supervisor	21	50,00
Harvesting Supervisor	4	9,52
Total	42	100.0

Source: Primary Data (Processed, 2025).

Table 5 summarizes the distribution of respondents according to job position. The largest proportion of employees are Deres Supervisors (Mandor Deres), accounting for 50% of the total respondents. Other positions include Estate Manager (2.38%), Head Clerk (2.38%), Estate Clerks (9.52%), Latex Weighing Clerks (11.90%), Transport Clerks (7.14%), First Supervisors (Mandor 1) (7.14%), and Harvest Supervisors (Mandor Panen) (9.52%). This composition indicates that the majority of respondents are directly involved in operational and supervisory activities in the plantation, reinforcing the relevance of competence, training, and work environment factors in influencing employee performance.

Validity and Reliability Testing

Validity and reliability testing were conducted to ensure that the research instrument was capable of measuring the study variables accurately and consistently. This testing was carried out prior to further data analysis to confirm that the questionnaire was appropriate for use as a data collection tool. A total of 30 employees from PT Bakrie Sumatera Plantations Tbk, Tanah Raja Estate, were involved in this testing process and served as comparison respondents for instrument evaluation. All respondents were asked to provide responses to 18 statement items included in the research questionnaire.

Validity Test

According to Sugiyono (2019), a valid research instrument reflects a high level of accuracy in measuring the variables under investigation. Validity testing was conducted to assess the extent to which each questionnaire item effectively measured the intended variables. Item validity was evaluated using the corrected item–total correlation (r-calculated), which was obtained through data processing using SPSS version 27.0. An item was considered valid when the calculated correlation value exceeded the critical value from the correlation table (r-table).

The r-table value was determined based on the number of respondents involved in the pilot test, with a degree of freedom (df) of n = 30 and a significance level of 5% (0.05) using a two-tailed test, resulting in an r-table value of 0.361. When the correlation value of each statement item met this criterion, the item was deemed valid and suitable for inclusion in the study. The results of the validity testing for each variable are presented in the following table.

Table 6. Validity Test of the Competence Variable

Instrument	r_{hitung}	r_{tabel}	Result
P1	0,516	0,361	Valid
P2	0,619	0,361	Valid
P3	0,530	0,361	Valid
P4	0,381	0,361	Valid

Source: Primary Data (Processed, 2025).

Based on the validity test results presented in Table 6, all statement items used to measure the competence variable are declared valid. This is evidenced by the calculated correlation values (r-calculated) for all items, which range from 0.381 to 0.619, exceeding the critical r-table value of 0.361. These results indicate that each item is able to accurately represent and measure the competence construct, and therefore all items are suitable for further analysis in this study.

Table 7. Validity Test of the Training Variable

Instrument	r_{hitung}	r_{tabel}	Result
P1	0,697	0,361	Valid
P2	0,781	0,361	Valid
P3	0,782	0,361	Valid
P4	0,811	0,361	Valid
P5	0,613	0,361	Valid

Source: Primary Data (Processed, 2025).

Based on the validity test results for the training variable, all statement items exhibit calculated correlation values that exceed the r-table value of 0.361. This indicates that each item is capable of accurately measuring the intended construct. Therefore, all items representing the training variable are considered valid and appropriate for use as data collection instruments in this study.

Table 8. Validity Test of the Work Environment Variable

Instrument	r_{hitung}	r_{tabel}	Result
P1	0,525	0,361	Valid
P2	.0,456	0,361	Valid
P3	0,562	0,361	Valid
P4	0,494	0,361	Valid

Source: Primary Data (Processed, 2025).

The validity test results for the work environment variable show that all statement items have calculated correlation values exceeding the r-table value of 0.361. This indicates that each item appropriately measures the intended construct. Therefore, all items related to the work environment variable are considered valid and suitable for use as data collection instruments in this study.

Table 9. Validity Test of the Performance Variable

Instrument	r_{hitung}	r_{tabel}	Result
P1	0,550	0,361	Valid
P2	0,552	0,361	Valid
P3	0,637	0,361	Valid
P4	0,789	0,361	Valid
P5	0,641	0,361	Valid

Source: Primary Data (Processed, 2025).

The results of the validity test for the performance variable indicate that all statement items have calculated correlation values greater than the r-table value of 0.361. This demonstrates that each item effectively measures the performance construct. Accordingly, all items associated with the performance variable are deemed valid and appropriate for use as data collection instruments in this study.

Reliability Test

Reliability testing was conducted to assess the consistency of the research instrument in producing stable and dependable data. The reliability analysis was performed using Cronbach's

Alpha coefficient with the assistance of SPSS software. A variable is considered reliable when its Cronbach's Alpha value exceeds 0.60, indicating satisfactory internal consistency among the statement items. This criterion is consistent with Ghozali (2018), who argues that a Cronbach's Alpha value above 0.60 reflects an instrument that meets reliability standards and is appropriate for further statistical analysis.

Table 10. Uji Realibilitas Variabel

Variabel	*Cronbach's alpha*	Reliabel	Result
Competence (X_1)	0,753	> 0,60	Reliable
Training (X_2)	0,737	> 0,60	Reliable
Work Environment (X_3)	0,826	> 0,60	Reliable
Performance (Y)	0,775	> 0,60	Reliable

Source: Primary Data (Processed, 2025).

The reliability test results indicate that all research variables have Cronbach's Alpha values above the minimum threshold of 0.60. The variables of competence, training, work environment, and performance each demonstrate a good level of internal consistency, thus declaring all instruments used as reliable. Consequently, the research questionnaire is considered dependable for measuring the studied variables and is feasible for use in further data analysis.

Descriptive Analysis

Descriptive analysis was conducted to provide a general overview of the respondents' response trends toward each research variable. Through this analysis, the mean values, data distribution, and respondents' response tendencies regarding competence, training, work environment, and employee performance can be identified.

Table 11. Descriptive Test

		Competence	Training	Work Environment	Performance
N	Valid	42	42	42	42
	Missing	0	0	0	0
Mean		15.45	19.33	15.48	19.69
Median		16.00	20.00	16.00	20.00
Mode		16	21	16	20[a]
Std. Deviation		2.319	2.675	2.287	2.279
Range		10	13	9	10
Minimum		9	11	10	13
Maximum		19	24	19	23

Multiple modes exist. The smallest value is shown

Source: Primary Data (Processed, 2025)

The competence variable shows a mean value of 15.45, with a median of 16 and a mode of 16. A standard deviation of 2.319 indicates that respondents' perceptions of competence are relatively homogeneous. The narrow range of values suggests that the employees' level of competence falls into a fairly good category and is relatively evenly distributed.

The training variable has a mean value of 19.33, with a median of 20 and a mode of 21. A standard deviation of 2.675 indicates variations in respondent answers that remain within reasonable limits. These results illustrate that the training received by employees is rated as fairly good, although differences in perception among respondents still exist.

The work environment variable has a mean value of 15.48, with both the median and mode at 16. A standard deviation of 2.287 indicates a relatively stable data distribution. This indicates that the working environment conditions are perceived as fairly good by most respondents, despite some variation in assessments.

The employee performance variable shows a mean value of 19.69, with a median of 20 and a mode of 20. A standard deviation of 2.279 suggests that respondents' perceptions of performance are relatively uniform. These results indicate that the overall level of employee performance is in the good category.

Classical Assumption Test

The classical assumption test is conducted to ensure that the research data meets the basic requirements for the use of multiple linear regression analysis, so that the obtained results are reliable and unbiased. This testing aims to determine whether the data is free from statistical issues such as data distribution deviations, relationships between independent variables, and inconsistency in error variance. By fulfilling the classical assumptions, the regression model used is considered feasible for accurately testing the influence of independent variables on the dependent variable.

Normality Test

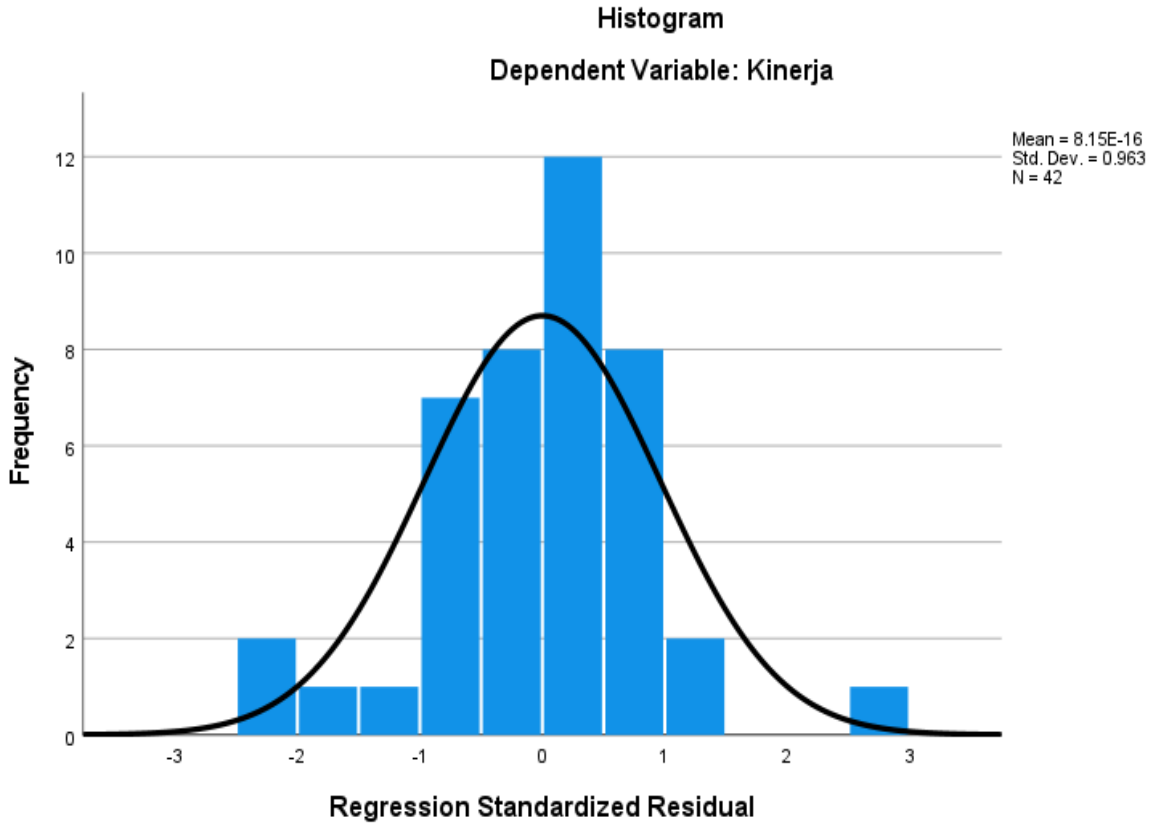


Figure 1. Histogram Graph

Based on the standardized residual histogram, it can be seen that the residual distribution in the regression model involving competence, training, and work environment variables on employee performance forms a pattern that closely approximates a normal distribution. The residuals are largely centered around the mean and spread relatively symmetrically to both sides, without showing any significant deviations. This indicates that the normality assumption in the regression model has been met, thus allowing the multiple linear regression analysis to proceed.

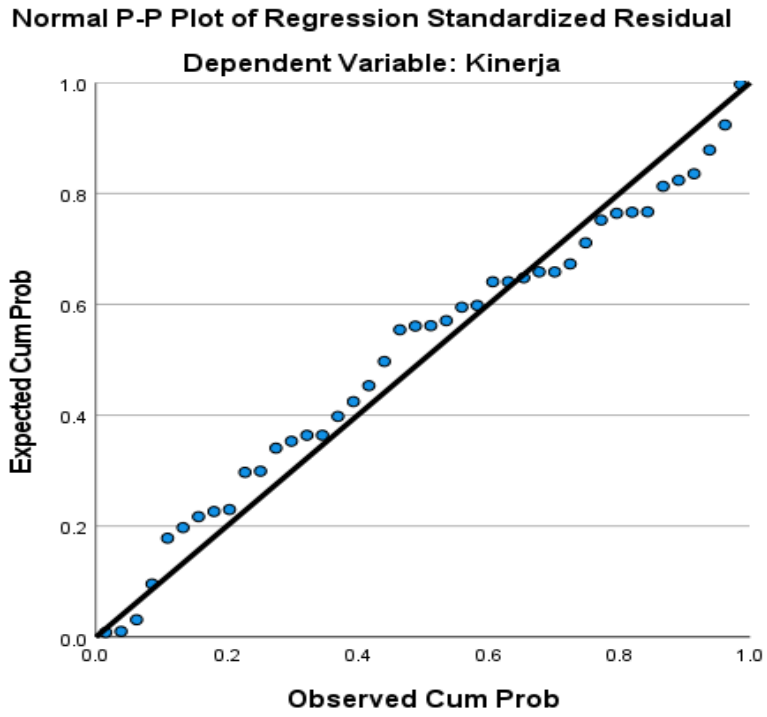


Figure 2. Normal P-Plot

Based on the Normal P–P Plot graph, the residual points in the regression model involving the variables of competence, training, and work environment on employee performance are seen to spread around and follow the direction of the diagonal line. This pattern indicates that the residual distribution approximates a normal distribution, leading to the conclusion that the normality assumption in the regression model has been satisfied.

Table 12. Kolmogorov-Smirnov (K-S) Test

One-Sample Kolmogorov-Smirnov Test

			Unstandardized Residual
N			42
Normal Parameters[a,b]	Mean		.0000000
	Std. Deviation		1.40332272
Most Extreme Differences	Absolute		.104
	Positive		.084
	Negative		-.104
Test Statistic			.104
Asymp. Sig. (2-tailed)[c]			.200[d]
Monte Carlo Sig. (2-tailed)[e]	Sig.		.300
	99% Confidence Interval	Lower Bound	.289
		Upper Bound	.312

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.
e. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 2000000.
Source: Primary Data (Processed, 2025)

Based on the results of the normality test using the Kolmogorov–Smirnov method, the Asymp. Sig. (2-tailed) value obtained is 0.200, which is greater than the significance level of 0.05. This indicates that the residual data in the regression model involving the variables of competence,

training, and work environment on employee performance is normally distributed. Thus, the normality assumption has been satisfied, making the regression model feasible for further analysis.

Multicollinearity Test

Table 13. Multicollinearity Test

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Kompetensi	0,601	1,664
	Training	0,928	1,077
	Lingkungan Kerja	0,586	1,706
a. Dependent Variable: Kinerja			

Source: Primary Data (Processed, 2025).

The multicollinearity test results show that all independent variables competence, training, and work environment have tolerance values above 0.10 and Variance Inflation Factor (VIF) values below 10. These findings indicate that there is no strong linear relationship among the independent variables within the regression model. Consequently, the regression model used is free from multicollinearity issues and is feasible for multiple linear regression analysis.

Heteroscedasticity Test

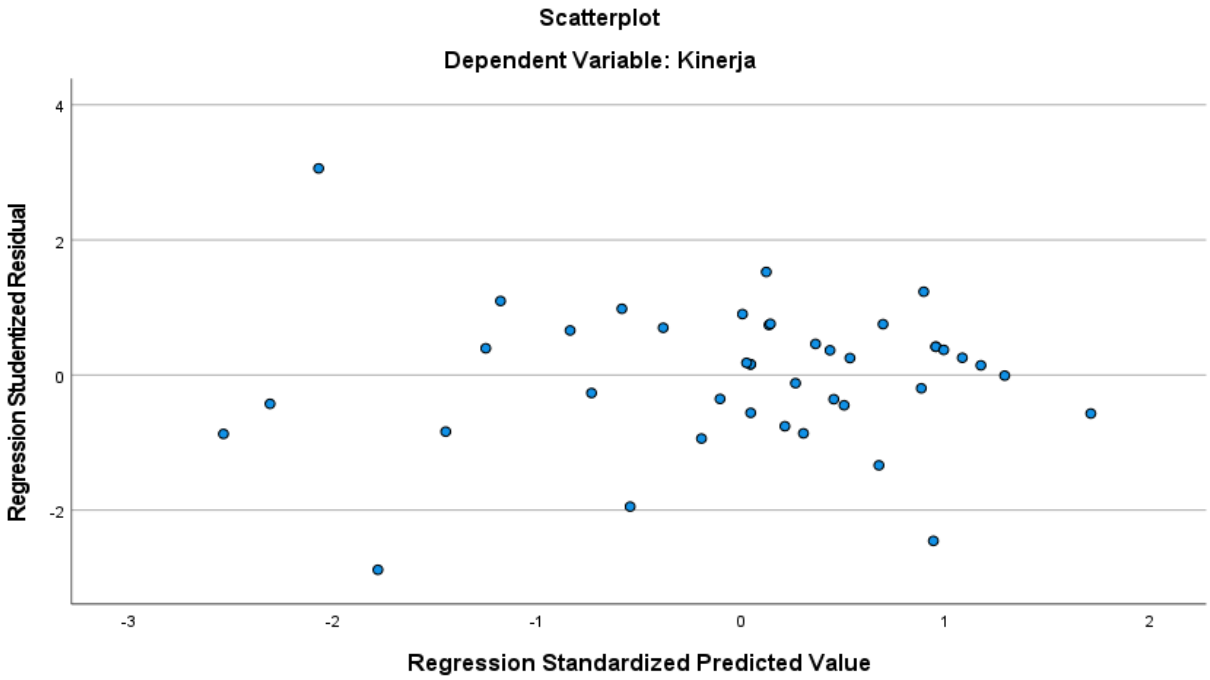


Figure 3. Residual Scatterplot

Based on the scatterplot graph, the residual points in the regression model involving competence, training, and work environment variables on employee performance are seen to be randomly scattered above and below the zero line and do not form any specific pattern. This condition indicates that the residual variance is constant, leading to the conclusion that the regression model does not exhibit symptoms of heteroscedasticity. Consequently, the heteroscedasticity assumption has been satisfied, and the regression model is feasible for further analysis.

Multiple Linear Regression Analysis

Multiple linear regression analysis is used to determine the extent of the influence of competence, training, and work environment variables on employee performance. This method allows researchers to measure the direction and magnitude of the influence of each independent variable on the dependent variable by controlling for other independent variables within a single analytical model.

The multiple linear regression model in this study is formulated as follows:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + e,$$

Where Y represents employee performance, X_1 is competence, X_2 is training, and X_3 is the work environment. The constant (a) indicates the value of performance when all independent variables are zero, while the regression coefficients (b_1, b_2, b_3) describe the changes in employee performance resulting from an increase in each independent variable.

$$Y = 3{,}839 + 0{,}430X_1 + 0{,}233X_2 + 0{,}303X_3$$

A constant value of 3.839 indicates that if the variables of competence, training, and work environment are considered constant or valued at zero, then the level of employee performance stands at 3.839. This value reflects the baseline performance level of employees without being influenced by the three independent variables.

The regression coefficient for the competence variable of 0.430 indicates that every one-unit increase in competence, assuming training and work environment variables remain constant, will increase employee performance by 0.430 units. This indicates that competence has a positive influence on employee performance.

The regression coefficient for the training variable of 0.233 means that a one-unit increase in training, with competence and work environment variables held constant, will drive an increase in employee performance by 0.233 units. This finding shows that training contributes positively to performance improvement.

The regression coefficient for the work environment variable of 0.303 indicates that every one-unit increase in work environment conditions, assuming other variables remain constant, will increase employee performance by 0.303 units. This confirms that a better work environment plays a role in enhancing employee performance.

Hypothesis Testing

t Test

The t-test is used to determine the partial influence of each independent variable namely competence, training, and work environment—on employee performance. This test aims to assess the significance of the effect of each independent variable on the dependent variable, assuming that other independent variables remain constant.

Decision-making in the t-test is conducted using two approaches: through the significance value (Sig.) and by comparing the t-statistic (t-count) with the t-table value. The test uses a significance level of 5% (0.05). If the Sig. value is less than 0.05, the hypothesis stating that the independent variable influences employee performance is accepted. Conversely, if the Sig. value is greater than 0.05, the hypothesis is rejected.

The t-table value is determined by referring to the t-distribution table based on the degrees of freedom (df). The df value is obtained using the formula df = n – k – 1, where n is the sample size and k is the number of independent variables. In this study, with 42 respondents and 3 independent variables, the df value is 42 – 3 – 1 = 38. Furthermore, the t-table value at df = 38 with a 5% significance level (two-tailed test) is 2.024. If the t-statistic is greater than the t-table value, the hypothesis is accepted.

The results of this t-test are used to explain the extent to which each variable competence, training, and work environment individually contributes to enhancing employee performance.

Table 14. t-Test Results

Model		t	Sig.
1	(Constant)	1,815	0,077
	Competence	3,397	0,002
	Training	2,641	0,012
	work environment	2,332	0,025

a. Dependent Variable: Performance

Source: Primary Data (Processed, 2025)

The t-test results show that the competence variable has a t-statistic of 3.397 > t-table 2.024, with a significance level of 0.002 < 0.05. This indicates that competence has a positive and significant effect on employee performance; therefore, the hypothesis stating that competence influences employee performance is accepted.

The training variable has a t-statistic of 2.641 > t-table 2.024 and a significance value of 0.012 < 0.05. These results indicate that training has a significant effect on employee performance; thus, the hypothesis stating that training influences employee performance is accepted.

The test results show that the work environment variable has a t-statistic of 2.332 > t-table 2.024, with a significance level of 0.025 < 0.05. This finding indicates that the work environment has a significant effect on employee performance; therefore, the hypothesis stating that the work environment influences employee performance is accepted.

Based on the t-test results, all independent variables competence, training, and work environment are proven to partially and significantly influence the performance of employees at PT. Bakrie Sumatera Plantations Tbk.

F Test

The F-test is used to determine whether the variables of competence, training, and work environment collectively have a significant influence on employee performance. This test aims to assess the feasibility of the regression model and to observe the simultaneous effect of all independent variables on the dependent variable.

The decision-making criteria for the F-test involve comparing the F-statistic (F-count) with the F-table value, as well as observing the significance value (Sig.) at a 95% confidence level or a 5% error level (0.05). If the F-statistic > F-table and the Sig. value < 0.05, the hypothesis stating that there is a simultaneous influence of the independent variables on employee performance is accepted. Conversely, if the F-statistic □ F-table and Sig. □ 0.05, the hypothesis is rejected. Meanwhile, the F-table value for df1 = (k-1) = (4-1 = 3) and df2 = (n-k-1) = (42-3-1 = 38) at a 5% significance level is 2.852.

The results of this F-test provide an overview of whether the regression model involving competence, training, and work environment variables is simultaneously capable of explaining the variation in employee performance at PT. Bakrie Sumatera Plantations Tbk.

Table 15. F-Test Results

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	132.234	3	44.078	20.745	.000[b]
	Residual	80.742	38	2.125		
	Total	212.976	41			

a. Dependent Variable: Performance

b. Predictors: (Constant), Work Environment, Training, Competence

Source: Primary Data (Processed, 2025)

Based on the F-test results in the ANOVA table, an F-statistic of 20.745 was obtained, which is greater than the F-table value of 2.852, with a significance value of 0.000 < 0.05. These results indicate that the variables of competence, training, and work environment simultaneously have a significant effect on employee performance. Thus, the hypothesis stating that there is a collective influence among the independent variables on employee performance is accepted.

Coefficient of Determination Test

The coefficient of determination test is used to determine the extent to which competence, training, and work environment variables can explain the variations in employee performance. The coefficient of determination value reflects the contribution level of the regression model to the dependent variable, while the remainder is influenced by other factors outside the scope of this study.

The r^2 value ranges from 0 to 1. A higher r^2 value indicates a stronger ability of the independent variables to explain the dependent variable. Conversely, a small r^2 value suggests that there are other variables affecting employee performance that were not included in the research model. In multiple linear regression analysis, interpretation typically emphasizes the Adjusted R Square, as this value has been adjusted for the number of independent variables and the sample size.

The results of the coefficient of determination test are subsequently used to assess how effectively the regression model involving competence, training, and work environment explains employee performance at PT. Bakrie Sumatera Plantations Tbk.

Table 16. Coefficient of Determination Test Result

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.788[a]	.621	.591	1.458

a. Predictors: (Constant), Work Environment, Training, Competence

b. Dependent Variable: Performance

Source: Primary Data (Processed, 2025)

Based on the coefficient of determination analysis, the Adjusted R Square value obtained is 0.591. This indicates that after adjusting for the number of independent variables and sample size, the effective contribution of the regression model in explaining employee performance is 59.1%. This result demonstrates that the regression model used has a sufficiently strong ability to explain the variation in employee performance at PT. Bakrie Sumatera Plantations Tbk.

Discussion

The Influence of Competence on Employee Performance

The hypothesis testing results show that competence has a positive and significant effect on employee performance. This is evidenced by the t-statistic being greater than the t-table value and a significance value of less than 0.05. These findings indicate that an actual increase in employee competence is capable of driving performance improvements in the execution of work tasks and responsibilities.

In the context of PT. Bakrie Sumatera Plantations Tbk, employee competence—particularly among foremen and field staff plays a vital role in supporting the smooth operation of the plantation. Employees possessing adequate work knowledge and skills tend to be more capable of completing tasks effectively, reducing work errors, and adapting to operational demands in the field, thereby optimizing the resulting performance.

These findings are consistent with the view of Rizanta et al., (2025), which suggests that the presence of employee competence must be supported by proper organizational management to provide an optimal contribution to performance. The competence possessed by employees does not automatically improve performance if the organization has not provided sufficient support, facilitation, and development opportunities to optimize that potential.

The Influence of Training on Employee Performance

Based on the partial hypothesis test results, training is proven to have a positive and significant effect on employee performance. This is demonstrated by a t-statistic greater than the t-table value and a significance level below 0.05. These results indicate that the training provided to employees directly contributes to enhancing work capabilities and employee performance.

Within the plantation company environment, the implementation of training serves as a vital tool for improving employees' understanding of work procedures, equipment utilization, and occupational safety standards. When training is conducted in a planned and sustainable manner, employees become better prepared to face job challenges in the field, which in turn impacts productivity and the quality of work output.

Previous research by Dewiani et al., (2024) indicates that the training variable has a significant influence on employee performance, as shown by test statistics exceeding the critical threshold and significance levels below the established requirements. Consequently, the hypothesis stating that training influences employee performance is accepted and supported by the research data.

The Influence of Work Environment on Employee Performance

The test results show that the work environment has a positive and significant influence on employee performance. This is evidenced by a t-statistic greater than the t-table value and a significance value below 0.05. These findings indicate that a favorable work environment is capable of driving improvements in employee performance.

In practice, the work environment at PT. Bakrie Sumatera Plantations Tbk encompasses not only physical conditions but also safety aspects, supporting facilities, and work comfort in the field. A safe and supportive work environment increases employees' focus and motivation, ensuring that the resulting performance becomes more optimal and sustainable.

These findings are in line with research conducted by Apriyanto et al., (2021), which states that the work environment influences employee performance. This demonstrates that better work environment conditions will significantly drive an increase in employee performance.

The Influence of Competence, Training, and Work Environment on Employee Performance

Based on the simultaneous test results (F-test), it was found that competence, training, and work environment collectively have a significant influence on employee performance. This is evidenced by an F-statistic greater than the F-table value and a significance level of less than 0.05. These findings indicate that the three independent variables collectively play a crucial role in enhancing employee performance.

In the context of a plantation company, employee performance is not merely influenced by a single factor but is the result of the interaction between individual competence, the training received, and work environment conditions. When these three aspects are managed in an integrated manner, the company will be able to cultivate employees who are competent, skilled, and working within a supportive environment, thereby allowing employee performance to be improved sustainably.

These results support the findings of Suganti et al., (2021), which state that simultaneous testing shows an F-statistic greater than the F-table, accompanied by a significance level below the 0.05 threshold. This finding indicates that training, competence, and work environment collectively provide a significant influence on the performance of employees at PDAM Tirtanadi Sei Agul.

CONCLUSION

This study aims to analyze the influence of competence, training, and work environment on employee performance at PT. Bakrie Sumatera Plantations Tbk. This research was conducted to obtain an empirical overview of the internal organizational factors that play a role in enhancing employee performance, particularly within the plantation sector.

Based on the results of partial and simultaneous hypothesis testing, it can be concluded that competence, training, and work environment have a positive and significant influence on employee

performance. Furthermore, the regression analysis results indicate that these three variables collectively explain a significant portion of the variation in employee performance, thus confirming that the research model used is feasible and relevant.

It is expected that PT. Bakrie Sumatera Plantations Tbk will continue to enhance employee competence through planned and sustainable training programs, as well as improve work environment conditions to ensure they are safer and more supportive of operational activities. These efforts are expected to drive optimal and continuous improvements in employee performance.

This research is expected to provide a scientific contribution as a reference for the development of human resource management studies, particularly regarding employee performance in the plantation sector. The findings of this study can also serve as a reference for researchers and practitioners in understanding the relationship between competence, training, work environment, and performance.

For future researchers, it is suggested to include other variables that potentially influence employee performance such as work motivation, leadership, or work discipline—as well as to expand the research object and the number of respondents. In doing so, future research results are expected to provide a more comprehensive overview.

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