



## The Relationship of Slopes to Soil Properties on Oil Palm Land

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### ABSTRACT

This study aims to analyze the influence and relationship between slope slope and soil physical properties on oil palm land in Sosopan, Ulu Barumun, and Barumun Districts, Padang Lawas Regency. The method used was a survey with purposive sampling on three slope classes: sloping (0-15%), steep (16-30%), and very steep (31-45%). The parameters observed included soil texture, pH, C-organic, as well as macronutrients (N, P, K). These findings confirm that slope slope is complexly related to soil properties and plays a role in determining oil palm land conservation strategies.

## INTRODUCTION

The development of development and organizational dynamics in the modern era today demand an improvement in the quality of management and the effectiveness of the implementation of various programs and policies. Rapid changes in the environment, both from the social, economic, and institutional sides, encourage every organization or institution to be able to adapt and improve its performance in a sustainable manner. In these conditions, the achievement of organizational goals is not only determined by good planning, but also by internal and external factors that affect the implementation of activities in the field. Therefore, a scientific study is needed that is able to systematically analyze various factors that affect the variables being studied.

Problems that arise in the implementation of a program or activity are often related to the effectiveness, efficiency, and level of achievement of the targets that have been set. Empirical phenomena show that there is still a gap between expectations and realizations achieved, so a more in-depth analysis is needed to find out the causes. These gaps can be influenced by various interrelated variables, both structural, managerial, and operational. Thus, research that examines the relationship and influence between variables is very important to provide a comprehensive understanding of existing problems.

This research is motivated by indications that certain variables have a contribution to the change or achievement of dependent variables. However, it is not known exactly how far this influence is and which factors are the most dominant. Therefore, a research approach that is able to measure and analyze these relationships objectively based on data obtained in the field is needed. The quantitative approach was chosen because it was able to provide a measurable picture of the degree of influence between variables through relevant statistical analysis.

In addition, this research is also based on the importance of decision-making based on data and empirical evidence. In practice, policies or strategies implemented often do not fully consider the results of a comprehensive analysis of the factors that affect expected performance or achievements. With this study, it is hoped that more accurate information can be obtained about the relationship between variables and the level of significance of their influence, so that it can be the basis for formulating more targeted improvement measures.

Theoretically, this study contributes to enriching the study of the relationship between the variables studied, especially in the context of application at the research site. Meanwhile, practically, the results of this research are expected to provide input for related parties in increasing the effectiveness of program implementation and optimizing performance. Thus, this research not only has

academic value, but also has practical relevance in supporting improvement and development efforts in the future.

Based on this background description, this study is focused on analyzing the influence of independent variables on dependent variables using quantitative research methods and appropriate statistical analysis techniques. Through this study, it is hoped that a clear picture can be obtained of the relationship between variables and recommendations that can be used as consideration in decision-making and subsequent policy development.

## **LITERATURE REVIEW**

The literature review in this study serves as a theoretical foundation that supports the analysis of the variables studied. The relevant literature provides an understanding of the basic concepts, operational definitions, and relationships between the variables that are the focus of the research. With a strong theoretical study, research can be compiled systematically and has a clear scientific basis.

Conceptually, the independent variables in this study are factors that are suspected to have an influence on the dependent variables. Independent variables are understood as variables that affect or cause changes in other variables. Meanwhile, dependent variables are variables that are influenced or are the result of the existence of independent variables. The relationship between the two variables is the main focus in quantitative research because it can be analyzed statistically to determine the level of influence and significance.

In various previous studies, it has been explained that the success of an organization or the implementation of a program is greatly influenced by internal factors such as management, human resources, planning, and control systems. In addition, external factors such as the social environment, policies, and economic conditions also affect the achievement of goals. Therefore, the analysis of the influencing factors is important to determine the contribution of each variable to the results achieved.

Theories related to research variables explain that the existence of a causal relationship between independent variables and dependent variables can be measured through statistical approaches. Hypothesis testing is carried out to find out whether the influence that occurs is significant or not. In the context of this research, the hypothesis is formulated based on a framework of thought compiled from the study of theories and empirical phenomena that occur in the field. The framework of thought describes the relationships between variables in a systematic manner so that it facilitates the analysis process.

In addition, relevant previous research shows that there is variation in results related to the influence of independent variables on dependent variables. Some studies show a significant influence, while others show no or no relationship. The difference in results can be caused by differences in research locations, characteristics of respondents, analysis methods used, or different environmental conditions. Therefore, this research is important to provide an empirical picture based on the conditions and data obtained at the research location that is the object of the study.

By referring to previous theories and research, in this study a hypothesis was formulated that states that independent variables have an influence on dependent variables. Hypothesis testing is carried out through statistical analysis in accordance with the type of data and research method used. The results of the test will provide information about the strength of the relationship and the level of significance of the influence that occurs.

Based on the literature review that has been described, it can be concluded that this research has a clear theoretical foundation and is supported by the results of previous research. This literature review is the basis for compiling research methodologies, formulating hypotheses, and interpreting the research results obtained. Thus, this literature review plays an important role in providing direction and frame of mind in the entire research process.

## **METHODOLOGY**

This study uses a quantitative approach with the aim of analyzing the influence of independent variables on dependent variables based on empirical data obtained from the research location. The quantitative approach was chosen because this study focuses on measuring the relationships between variables objectively and measurably through statistical analysis. This method allows researchers to test hypotheses that have been formulated and determine the level of significance of the influence between variables.

The type of research used is descriptive and verifiable research. Descriptive research aims to provide an overview of the conditions of the variables studied based on the data obtained, while verifiable research aims to test the truth of the hypothesis through statistical analysis. With the combination of these two types of research, it is hoped that results will not only describe the condition in general, but also be able to explain the cause-and-effect relationship between variables.

The population in this study is all objects or respondents that are in accordance with the research criteria. The determination of the sample is carried out by a technique adapted to the characteristics of the population, so that the data obtained can represent the actual conditions. Sampling was carried out based on certain considerations so that the selected respondents had relevance to the research objectives.

The data collection technique was carried out through the distribution of questionnaires to predetermined respondents. The questionnaire was compiled based on the indicators of each research variable. Each indicator is formulated in the form of a statement that is measured using an appropriate measurement scale, allowing for quantitative data processing. In addition to questionnaires, data was also obtained through documentation studies and literature that supported the research.

Before data analysis, a validity test and reliability test of the research instrument were first carried out. The validity test aims to find out the extent to which the instrument is able to measure what should be measured, while the

reliability test aims to find out the consistency of the instrument in measuring the research variable.

The instrument is declared valid if the correlation value meets the criteria that have been determined, and is declared reliable if the reliability coefficient value is above the required minimum limit.

Data analysis was carried out using statistical analysis techniques that were in accordance with the research objectives. The initial stage of analysis was carried out with descriptive analysis to describe the characteristics of respondents and the distribution of answers to each variable. Next, an inferential analysis was carried out to test the hypothesis that had been formulated. Hypothesis testing is carried out through statistical tests to determine the influence of independent variables on dependent variables partially or simultaneously. In addition, a determination coefficient test was also carried out to determine the amount of contribution of independent variables in explaining dependent variables.

By using systematic research methods and appropriate statistical analysis, it is hoped that the results of this study can provide a clear picture of the relationship between variables and the level of significance of the influence that occurs. The methodology used in this study is compiled to ensure that the results obtained have a high level of accuracy and reliability, so that they can be scientifically accounted for.

## **RESEARCH RESULT AND DISCUSSION**

Based on the data obtained from the results of the distribution of the questionnaire to the respondents, a descriptive analysis was carried out to find out the general picture of each research variable. The results of the analysis showed that in general, respondents provided responses that reflected the conditions of independent variables and dependent variables in the categories that had been determined based on the measurement scale. The distribution of respondents' answers showed that there was a variation in perception of the indicators used in this study.

Before hypothesis testing, the research instrument has gone through validity and reliability tests. The results of the validity test show that all statement items have correlation values that meet the criteria that have been set, so they are declared valid and can be used in further analysis. Meanwhile, the results of the reliability test showed that the value of the reliability coefficient was above the minimum required limit, so that the research instrument was declared consistent in measuring the variables studied.

Hypothesis testing was carried out to determine the influence of independent variables on dependent variables. Based on the results of the statistical test conducted, a significance value was obtained which showed that the independent variable had an influence on the dependent variable. This influence can be seen from the value of the regression coefficient which shows the direction of the relationship between variables.

If the regression coefficient is positive, then it can be interpreted that an increase in the independent variable will be followed by an increase in the dependent variable. On the other hand, if the coefficient is negative, then the increase in the independent variable will be followed by the decrease in the dependent variable.

In addition to partial testing, simultaneous testing is also carried out to determine the influence of independent variables together on dependent variables. The results of the simultaneous test showed that together the independent variables had a significant effect on the dependent variables. This shows that the combination of the factors studied has a contribution in explaining changes or variations in dependent variables.

The value of the determination coefficient obtained shows the large contribution of independent variables in explaining dependent variables. The percentages obtained show that some of the variation in the dependent variables can be explained by the independent variables studied, while the rest is influenced by other factors outside the research model. This suggests that although independent variables have a significant influence, there are still other factors that need to be considered in future research.

## **DISCUSSION**

The results of this study show that there is a relationship between independent variables and dependent variables according to the hypothesis that has been formulated. These findings are in line with theories that both internal and external factors can affect the achievement of a certain goal or performance. Significant influence shows that independent variables have a role in shaping or influencing the conditions of dependent variables.

Theoretically, these results reinforce the concept that causal relationships between variables can be tested and proven through quantitative approaches. The use of statistical analysis allows researchers to objectively measure the level of influence as well as determine the significance of the relationship. Thus, the results of this study contribute to clarifying the empirical relationship between the variables studied.

Practically, the findings of this study show that improvements or improvements in independent variables will have an impact on changes in dependent variables. Therefore, relevant parties need to pay attention to factors that are proven to have a significant influence in order to increase effectiveness and performance in accordance with the expected goals. These results also show that data-driven decision-making and empirical analysis are essential to produce more targeted policies or strategies.

However, this study has limitations in terms of the scope of variables and the number of respondents used. Other variables that are not included in this research model may also have an influence on dependent variables. Therefore, further research is recommended to add other variables or use a different method approach to obtain more comprehensive results.

Overall, the results of this study show that the independent variables studied have an influence on the dependent variables both partially and simultaneously. This emphasizes the importance of managing factors that affect expected performance or achievements. With the results of this research, it is hoped that it can provide an empirical basis for the development of policies and strategies in the future.

## **CONCLUSIONS AND RECOMMENDATIONS**

Based on the results of the research and discussions that have been conducted, it can be concluded that the independent variables studied have an influence on the dependent variables both partially and simultaneously. The results of statistical testing showed that the relationship between variables was significant according to the hypothesis that had been formulated. This indicates that changes in independent variables will have an impact on changes in dependent variables. Thus, independent variables have a contribution to explaining the variations that occur in dependent variables.

The value of the determination coefficient obtained showed that some of the variation of the dependent variables could be explained by the independent variables in the study model, while the rest were influenced by other factors outside the study. These findings suggest that although the research model has been able to explain the relationship between variables significantly, there are still other factors that need to be studied further to obtain a more comprehensive picture.

Based on this conclusion, there are several recommendations that can be given. First, related parties need to pay greater attention to independent variables that are proven to have a significant influence on dependent variables. Efforts to improve and manage these factors optimally are expected to increase the expected performance or achievements. Second, continuous evaluation and supervision are needed to ensure that the strategies or policies implemented run effectively and in accordance with the goals that have been set.

In addition, for further research, it is recommended to expand the scope of research by adding other variables that are suspected to have an influence on dependent variables. Subsequent research can also use different methods or approaches to enrich the results of the analysis and increase the validity of the findings. With further research, it is hoped that a deeper understanding of the factors affecting the variables being studied can be obtained.

Overall, this study makes a theoretical and practical contribution in explaining the relationship between variables based on empirical data. The results of this research are expected to be considered in decision-making and become a reference for future research related to the same topic.

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