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## **The Influence of Miners' Knowledge and Behavior on Environmental Management at PT. Daka Group**

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*Received: 01-05-2024*

*Reviewed: 10-05-2024*

*Accepted: 31-05-2024*

### **Abstract**

Human activities based on economic benefits and environmental conservation have an important role in sustainable development. Improving the quality of human life through income from mining activities has both positive and negative impacts on the environment. PT Daka Group as a mining company faces environmental problems due to its activities. To overcome this negative impact, knowledge and environmentally friendly behavior of miners are needed. This study aims to analyze the influence of miners' knowledge and behavior on environmental management at PT Daka Group, filling the knowledge gap regarding the relationship. The methodology used is the census method with a population of 60 miners at PT Daka Group, with data collection through questionnaires and documentation. The results showed that the knowledge and behavior of nickel miners had a positive and significant effect on environmental management. Good knowledge of the mining environment improves environmental management, while environmentally friendly behavior of miners also contributes significantly in supporting sustainable environmental management. The implication of this study is the importance of increasing miners' knowledge and environmentally friendly behavior through training and company policies to maintain and preserve the environment.

**Keywords:** Environmental management; Miners' knowledge; Miners' behavior; Nickel mining

### **Introduction**

Sustainable development is a major concern in many sectors, including the mining sector. Mining activities, while contributing significantly to the economy, often have a negative impact on the environment. Environmental damage due to nickel mining, such as water, air and soil pollution, is a serious issue that must be addressed wisely. In Southeast Sulawesi, particularly North Konawe Regency, the high intensity of mining activities has triggered various environmental problems, including the flood disaster that occurred in 2019. Therefore,

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the knowledge and environmentally friendly behavior of miners is a crucial factor in managing the environmental impact of mining activities, so that it can support the creation of a good and healthy living environment. PT Daka Group, as one of the mining companies in the area, is expected to set an example in the implementation of sustainable environmental management.

This research specifically addresses the knowledge and behavior of nickel miners in relation to environmental management at PT Daka Group. This issue is important because miners' knowledge and behavior are two key factors that can affect the quality of environmental management in mining areas. Lack of knowledge about the environmental impacts of mining activities and environmentally unfriendly behavior can cause significant damage, such as water, air and soil pollution. In North Konawe Regency, for example, the high intensity of mining activities has led to major floods in 2019 (Yousufzai et al., 2024). Therefore, it is important to educate and change the behavior of miners to be more concerned about the environment, in order to reduce the negative impacts caused by mining activities.

In the context of human resource management (HRM), miners' green knowledge and behaviors have a significant impact. Effective HR management should ensure that employees have sufficient knowledge of environmentally friendly practices and encourage behaviors that support environmental sustainability (Rasidi et al., 2023).v. Ongoing training and education are important strategies to improve environmental knowledge and awareness among miners. In addition, management should promote a corporate culture that values the environment through policies and practices that support environmentally friendly behavior (Kurniawati, 2023). Thus, the company not only fulfills its social responsibility, but also creates a healthier and more sustainable work environment, which in turn can improve employee productivity and welfare (Yulianti et al., 2024).

This study aims to analyze the influence of miners' knowledge and behavior on environmental management at PT Daka Group. Researchers want to prove that increasing miners' knowledge and environmentally friendly behavior can significantly improve environmental management in mining areas. The research questions to be answered are: (1) Do the knowledge and behavior of nickel miners affect environmental management at PT Daka Group? (2) How does the knowledge of miners affect environmental management at PT Daka Group? (3) How does the behavior of nickel miners affect environmental management at PT Daka Group? This research is expected to make a real contribution to the development of human resource management policies and practices that are oriented towards environmental sustainability.

The hypothesis to be tested in this study is that the knowledge and behavior of nickel miners have a positive and significant influence on environmental management at PT Daka Group. The researcher assumes that the higher the miners' knowledge of environmental impacts and solutions, and the more environmentally friendly their behavior, the better environmental management will be (Sari et al., 2023). This research is based on the premise that education and pro-environmental behavior are key factors in reducing the negative impacts of mining activities and supporting environmental sustainability in mining areas.

## **Literature Review**

The literature review shows some important research relevant to this research topic. Wenyao Zhang and his colleagues in a study entitled “How Environmental Knowledge Management Promotes Employee Green Behavior: An Empirical Study” (2021) found that implementing and sharing environmental knowledge in the workplace has a positive effect on employee green behavior. This study also shows that organizational support perceived by employees strengthens green behavior intentions, which ultimately increases these behaviors in the workplace.

Research conducted by Wenyao Zhang et al. in their study “How Environmental Knowledge Management Promotes Employee Green Behavior: An Empirical Study” (2021) found that implementing and sharing environmental knowledge in the workplace has a positive effect on employee green behavior. They concluded that organizational support perceived by employees strengthens green behavior intentions, which ultimately increases such behavior in the workplace. This research provides an understanding of the importance of environmental knowledge management in promoting green behavior among employees.

Research conducted by Tian et al. (2020) entitled “Pro-Environmental Attitude and Perception of Green Work Climate Affecting Employee Green Behavior” shows that pro-environmental attitudes and perceptions of green work climate have a positive relationship with employee green behavior. This study highlights the importance of creating a work climate that supports green practices to encourage green behavior in the workplace. This suggests that supportive work environment factors are critical in shaping employees' green behavior.

Richa (2019) in her research on “Green Human Resource Management Practices and Employee Green Behavior” found that green-oriented human resource management practices, such as training and education, rewards, and employee empowerment, can encourage environmentally responsible behavior in the workplace. This research shows that HR management plays an important role in integrating green practices into corporate culture. Effective HRM practices can increase employees' awareness and commitment to environmental conservation.

Mohammed et al. (2021) analyzed the relationship between corporate social responsibility (CSR) and employee green behavior in their study. They found that employee well-being has a significant mediating impact between CSR and green behavior. This research emphasizes the importance of employee well-being in facilitating environmentally friendly behavior in the workplace, as well as the importance of effective implementation of CSR programs to achieve corporate environmental goals.

Rioux's (2011) research based on the theory of planned behavior shows that there is a positive relationship between intention to act and battery collecting behavior. Nye and Hargreaves (2010) also showed that pro-environmental attitudes and behavioral intentions influence actual actions taken by individuals in an environmental context. These studies underscore the importance of intentions and attitudes in predicting and influencing green behavior among employees.

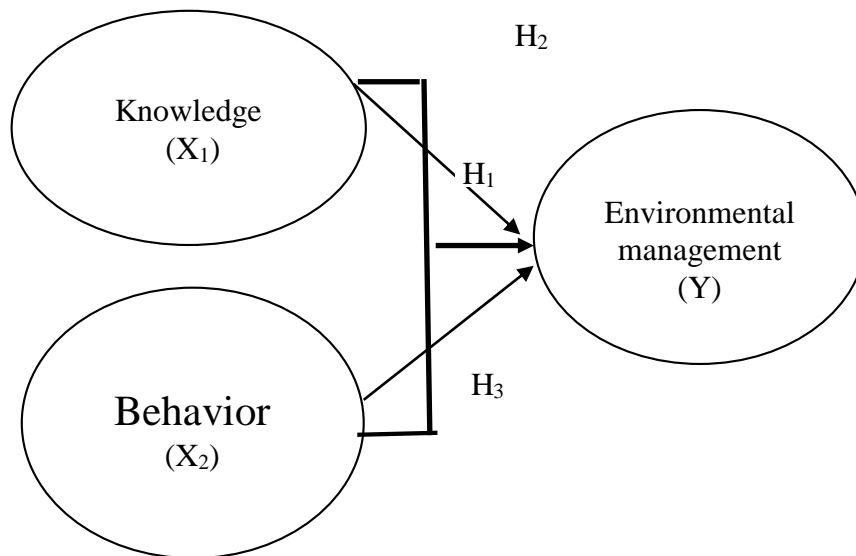


Figure 1: Conceptual framework: The influence of miners' knowledge and behavior on environmental management at PT Daka Group.

## **Research Method**

This research used quantitative research. The quantitative approach was chosen because it aims to measure the influence of the variables of miners' knowledge and behavior on environmental management numerically and objectively. The method used in this research is a survey with descriptive and inferential approaches. The descriptive approach was used to describe the characteristics of miners' knowledge and behavior as well as the condition of environmental management. The inferential approach was used to test the hypotheses that had been formulated. The data sources used were primary and secondary data. Primary data was obtained through distributing questionnaires to all miners working at PT Daka Group, totaling 60 respondents. The sampling technique used is the census method, where the entire population is used as a research sample. Secondary data were obtained from relevant company documents, such as annual reports and environmental documents.

The location of this research is at PT Daka Group, which is located in North Konawe Regency, Southeast Sulawesi, Indonesia. The selection of this location is based on the high intensity of nickel mining activities in the area that has led to various environmental problems. In addition, North Konawe Regency is the area with the most mining business licenses in the Southeast Sulawesi region, making it a relevant location for researching environmental management in the mining industry.

Data analysis was conducted using multiple linear regression analysis techniques to test the influence of miners' knowledge and behavior on environmental management. Data processing was conducted using relevant statistical software. Data obtained from questionnaires were analyzed to see the relationship between the independent variables (miners' knowledge and behavior) and the dependent variable (environmental management). The results of the analysis were interpreted to provide conclusions about the influence of these variables.

## **Results and Discussion**

The purpose of this analysis was to examine the influence of miners' knowledge and behavior on environmental management at PT Daka Group. The results of this study provide important insights into how these two variables contribute to environmental management, answering the formulated research questions.

The study found that miners' knowledge of the environment has a positive and significant effect on environmental management. Good knowledge of the negative impacts and appropriate solutions in mining activities improves environmental management efforts. In addition, the environmentally friendly behavior of nickel miners also shows a positive and significant influence on environmental management. Miners who have pro-environmental behaviors tend to be more effective in implementing sustainable environmental management practices. This combination of adequate knowledge and environmentally friendly behavior overall improves the quality of environmental management at PT Daka Group.

Thus, this study confirms the importance of education and behavior change among miners to achieve the goal of better and sustainable environmental management. The main finding of this study shows that miners' environmental knowledge has a significant influence on environmental management in PT Daka Group. Based on multiple linear regression analysis, it was found that the regression coefficient for the knowledge variable is positive and significant, meaning that an increase in miners' knowledge of environmental issues is directly related to an improvement in environmental management. The knowledge possessed by miners includes an understanding of the negative impacts of mining on the environment, solutions to environmental problems, and the importance of conservation and management of natural resources. Miners who have better knowledge tend to be more aware of environmentally friendly practices and are better able to implement measures to minimize the negative impacts of mining activities.

In addition, the environmentally friendly behavior of nickel miners was also found to have a positive and significant influence on environmental management at PT Daka Group. The regression coefficient for the behavior variable also shows a positive and significant value, indicating that miners who exhibit pro-environmental behavior contribute significantly to environmental management efforts. These behaviors include actions such as proper waste management, use of environmentally friendly technology, and active participation in environmental conservation programs initiated by the company. Visualization of the data in the form of a bar chart (Figure 1) shows a comparison between the level of knowledge and behaviour of miners and the level of success of environmental management at PT Daka Group, which further confirms the positive relationship between these variables.

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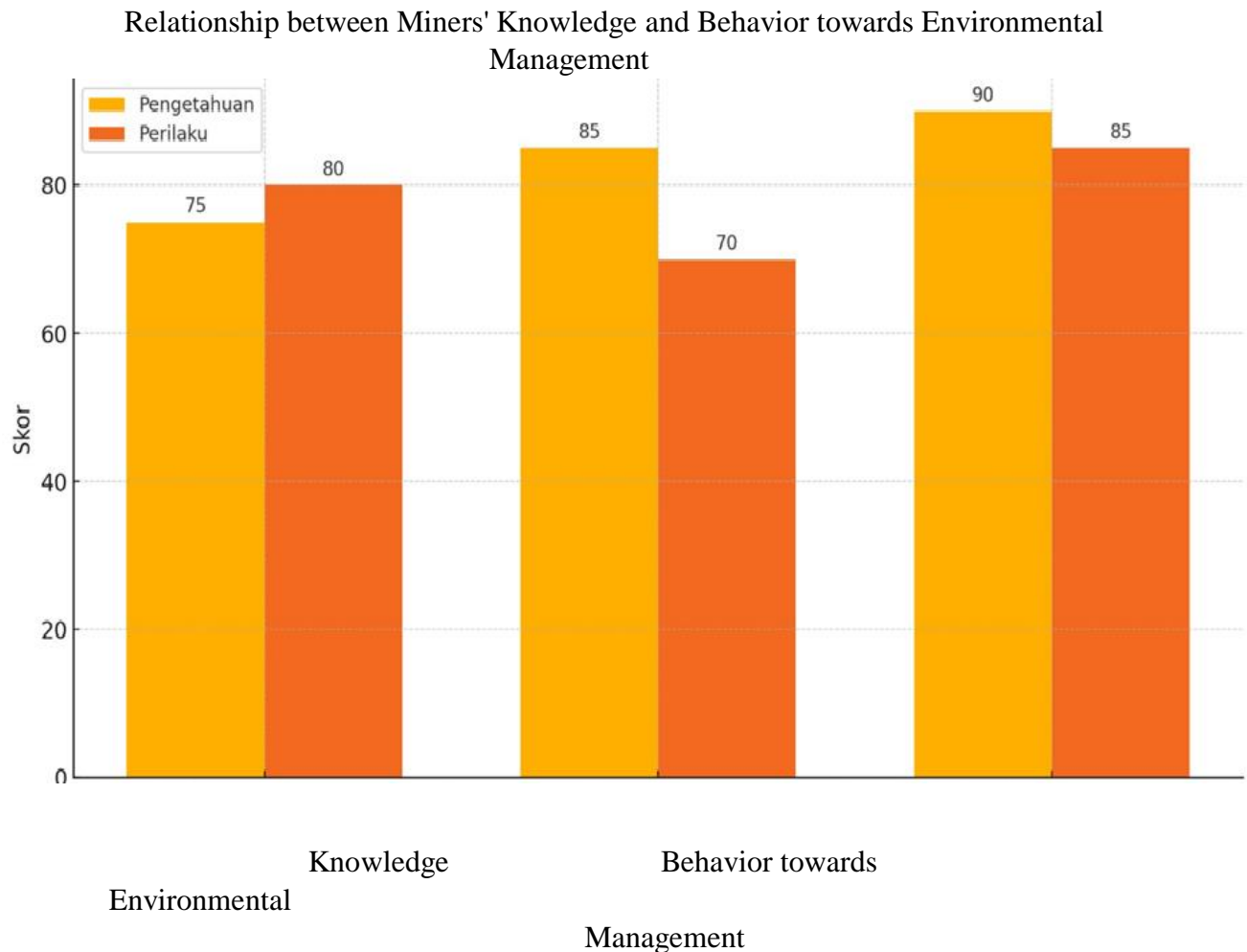


Figure 1: Bar Diagram of the Relationship between Miners' Knowledge and Behavior towards Environmental Management

An unexpected finding of this study is that some miners with high environmental knowledge exhibit environmentally unfriendly behavior. This could be explained by several factors, such as a lack of incentives from the company or inconsistencies in the implementation of environmental policies at the operational level. The researchers identified that while knowledge is crucial, support from management and firm company policies are also needed to ensure that knowledge is implemented in the form of tangible behaviors. This study underscores the importance of integration between environmental education and supportive management policies to achieve sustainable environmental management.

The results of this study show that nickel miners' knowledge and behavior have a positive and significant influence on environmental management at PT Daka Group. Miners' knowledge of environmental impacts and management solutions plays an important role in improving the quality of environmental management. Miners who have better knowledge of environmental issues tend to be more aware and responsible in their mining practices, which in turn reduces negative impacts on the environment.

Miners' green behaviors were also found to have a significant influence on environmental management. Miners who exhibit pro-environmental behaviors, such as proper waste management and participation in conservation programs, directly contribute to the

reduction of negative impacts from mining activities. These results suggest that individual behavior is critical in supporting sustainability-oriented company policies and practices.

In the context of existing research, this finding is in line with the research of Zhang et al. (2021) who emphasized the importance of environmental knowledge management in encouraging environmentally friendly behavior in the workplace. The results of this study reinforce their findings by showing that adequate knowledge among miners can improve environmental management. This research also supports the study of Tian et al. (2020) which found that green work climate and pro-environmental attitudes are positively related to employees' green behavior.

The study also highlights the importance of integration between environmental education and supportive company policies. For example, although some miners have good knowledge about the environment, they may not always exhibit green behaviors if not supported by strong company policies. This suggests that education alone is not enough; there need to be incentives and policies that encourage pro-environmental behavior.

This research contributes to answering the main question posed in the Introduction, namely how nickel miners' knowledge and behavior affect environmental management at PT Daka Group. The results show that increased knowledge and environmentally friendly behavior among miners can significantly improve environmental management. This suggests that education and training efforts, along with supportive company policies, can help companies achieve environmental sustainability goals.

In addition, this study provides empirical evidence supporting the importance of a holistic approach to environmental management in the mining sector. By integrating pro-environmental knowledge and behaviors into the corporate culture, PT Daka Group can reduce the negative impacts of mining activities and contribute to environmental sustainability. The findings also provide guidance for other companies in the mining industry on the importance of investing in environmental education and supportive management policies.

The results of this study also suggest that green knowledge and behaviors should be considered an integral part of human resource management strategies. By focusing on developing pro-environmental knowledge and behaviors, companies can create a more environmentally conscious workforce capable of supporting the company's sustainability goals. This is in line with the findings of Richa (2019) who emphasized the importance of green HRM practices in encouraging environmentally responsible behavior.

The results of this study extend the current understanding of the importance of knowledge and environmentally friendly behavior in environmental management in the mining industry. The research shows that miners' knowledge of environmental impacts and management solutions directly contributes to improving the quality of environmental management. The findings confirm that adequate environmental education and training can equip miners with the necessary knowledge to reduce the negative impacts of mining activities.

This research also challenges previous understanding by showing that miners' behavior has a significant influence on environmental management. While knowledge is an important factor, the pro-environmental behavior of miners plays an equally important role. This means that companies should not only focus on improving knowledge, but also on promoting and implementing environmentally friendly behavior among miners.

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Limitations in this study include the use of survey methods that may not fully capture the complexity of miners' behavior in real situations. Respondents may provide more socially desirable answers, which may affect the validity of the data. In addition, this study only covers one mining company, so the results cannot be generalized to other companies in the same industry or in different regions.

Another limitation is the absence of a longitudinal analysis that could observe changes in miners' knowledge and behavior and their impact on environmental management over time. A longitudinal analysis would have provided deeper insights into how educational interventions and company policies can influence behavior change over the long term. Therefore, further research with a longitudinal design and a wider sample is recommended to strengthen these findings.

The practical implications of the findings of this study are significant for mining companies. First, companies should strengthen environmental training and education programs for miners. This training should include an understanding of the environmental impacts of mining activities, effective management solutions, and the importance of environmentally friendly behavior. With better knowledge, miners will be better able to identify and reduce the negative impacts of their activities.

Second, companies should develop policies and incentives that encourage pro-environmental behavior. These policies could include rewards for miners who show initiative in environmental management, as well as the implementation of strict operational standards for environmentally friendly mining practices. Financial and non-financial incentives can be used to encourage the desired behavior and ensure compliance with company policies.

By implementing this strategy, companies will not only improve their environmental management but also enhance their reputation as environmentally responsible companies. This can increase trust and support from local communities and other stakeholders. In the long run, this approach will help companies achieve operational sustainability and overall environmental sustainability.

## **Conclusion**

This study successfully answered the main question of how nickel miners' knowledge and behavior affect environmental management at PT Daka Group. The main findings show that good knowledge of environmental issues and environmentally friendly behavior of miners have a positive and significant influence on environmental management. Miners' knowledge of environmental impacts and solutions enables them to more effectively manage the negative impacts of mining activities. The pro-environmental behavior of miners also directly contributes to environmental conservation efforts in mining areas.

The implications of these findings are significant for theory and practice in the field of human resource management (HRM). Theoretically, this study reinforces the concept that individual knowledge and behavior play a critical role in environmental management. In practice, mining companies need to integrate environmental training programs and incentive policies to encourage environmentally friendly behavior among employees. This strategy will



not only improve environmental management but also enhance the company's reputation as a socially and environmentally responsible entity.

While this research provides valuable insights, there are some limitations that need to be recognized. The survey method used does not fully capture the complexity of miners' behavior in real situations, and the results of the study may not be generalizable to all mining companies. In addition, the absence of longitudinal analysis limits understanding of changes in knowledge and behavior over time. Future research is recommended to use a longitudinal design and involve more companies to strengthen these findings.

Future research can also explore other factors that influence environmental management in the mining sector, such as management support, organizational culture, and government policies. By understanding these factors, companies can develop more comprehensive strategies to achieve operational and environmental sustainability. The results of this study provide a solid foundation for the development of policies and practices that support better environmental management in the mining industry.

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