IMPLEMENTATION OF GREEN ACCOUNTING FOR MSMES IN AND OUTSIDE THE MINING AREAS PALU CITY

Sahrul Ramadhan[1]
Universitas Tadulako, Palu, Indonesia
sahrulramadhan7003@gmail.com

Rudy Usman[2]
Universitas Tadulako, Palu, Indonesia
rudyusman77@gmail.com

Rahayu Indrisari[3]
Universitas Tadulako, Palu, Indonesia
indriasari398@gmail.com

Betty[4]
Universitas Tadulako, Palu, Indonesia
bmanurung389@gmail.com

Abstract

This study aims to analyze the implementation of green accounting in MSMEs operating in the Poboya mining area and outside the mining area in Palu City. The study used a descriptive qualitative approach with data collection techniques through in-depth interviews with six MSME informants from various business types. The results showed striking differences in environmental awareness, waste management, and readiness to implement green accounting. MSMEs in the mining area have a reactive environmental awareness due to exposure to the impacts of pollution, while MSMEs outside the mining area have a normative awareness driven by social values and business image. Waste management practices in MSMEs within the mining area emphasize pollution mitigation, while MSMEs outside the mining area focus on efficient use of materials. The study also found that all MSMEs have not implemented formal environmental cost recording due to limited knowledge and the absence of simple guidelines for green accounting. Nevertheless, all informants stated that the implementation of green accounting is important for business sustainability and environmental preservation. These findings emphasize the need for education, mentoring, and a simple recording model tailored to the capacity of MSMEs to support the implementation of green accounting in the future.

Keywords: Green Accounting; MSMEs; Mining Circle; Outside Mining Circle; Waste Management

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a strategic role as the backbone of the Indonesian economy because they absorb a large workforce and expand business opportunities within the community. For example, research by (Kholifah & Andini, 2024) shows that MSMEs contribute significantly to the national economy by absorbing a large portion of the workforce and supporting regional economic stability. Furthermore, a study by (Suryadi, 2024) suggests that MSMEs can stimulate local economic growth through job creation and efforts to achieve economic equality across various business sectors. Therefore, in Palu City, the development of MSMEs in the culinary, crafts, trade, and services sectors is a positive indicator that MSMEs are not only job providers but also platforms for creativity and innovation among local entrepreneurs, making their presence strategic for sustainable regional development.

However, the dynamics of the business environment in Palu City are not homogeneous. There are quite striking differences in characteristics between MSMEs located in the mining area and those outside the mining area. MSMEs in mining areas face greater environmental pressures due to mining activities, such as water pollution, declining raw material quality, and ecosystem damage. These conditions have the potential to increase operational risks and reduce business efficiency. Conversely, MSMEs in non-mining areas face relatively lower environmental pressures, but still face challenges in maintaining operational sustainability to prevent future environmental damage. These differing regional characteristics require a more adaptive business management approach oriented toward environmental sustainability.

In business sustainability, the concept of green accounting is highly relevant for implementation among MSMEs. Green accounting encourages small and medium-sized enterprises (SMEs) to internalize costs and environmental impacts in their bookkeeping systems, so that decision-making is not solely focused on profit but also considers efficient resource utilization, waste management, energy use, and environmental preservation. Research shows that implementing green accounting in MSMEs can strengthen business ethics and help businesses become more environmentally friendly and more efficient in terms of operational costs (Kusumawardhany, 2022).

Despite its high urgency, the implementation of green accounting among MSMEs in Palu City remains relatively low. Many MSMEs, both in mining and non-mining areas, have not integrated environmental aspects into their financial accounting and management systems. Environmental costs, such as waste management, the use of environmentally friendly materials, and the impact of ecological damage, are still considered external expenses not recorded in financial reports. Even for MSMEs in mining areas directly affected by environmental pollution, there is no accounting system that documents environmental losses or recovery costs as part of operational costs. In non-mining areas, MSMEs generally remain focused on increasing sales volume without considering the environmental impact of production.

The low adoption of green accounting is due to several factors, including a lack of understanding and literacy in environmental accounting, a lack of training and mentoring, low awareness of environmental sustainability among business actors, and suboptimal

regulatory support. This situation indicates a gap between the demands of business sustainability and the accounting practices implemented by MSMEs.

Based on this phenomenon, research is needed to analyze the extent of green accounting implementation among MSMEs in the mining area and outside the mining area of Palu City, as well as to compare its effectiveness in these two different environmental conditions. The results of this study are expected to provide an empirical basis as a reference for MSMEs, local governments, and other stakeholders in promoting the implementation of green accounting as a strategy for business sustainability and environmental preservation.\

REVIEW OF LITERATURE

Legitimacy Theory

Legitimacy Theory explains that organizations or companies need to gain recognition and support from society so that their operations are considered legitimate and socially acceptable. In the context of environmental accounting, this theory states that companies or MSMEs that implement environmentally friendly practices, such as green accounting, will more easily gain legitimacy in the eyes of the public, government, and other stakeholders. For MSMEs, implementing green accounting is not only a matter of regulatory compliance but also a strategy to demonstrate social and environmental responsibility. According to experts (Dowling & Pfeffer, 1975), organizations strive to ensure that their activities and outputs align with prevailing social values and norms so that they can maintain their viability in society. This perspective reinforces the understanding that MSMEs need to demonstrate alignment with societal expectations, particularly regarding environmental issues.

Stakeholder Theory

Stakeholder Theory emphasizes that organizations are responsible not only to their owners but also to all parties who have an interest in or are impacted by their activities, such as consumers, employees, the government, the surrounding community, suppliers, and the environment. (Freeman, 1984) states that an organization's sustainability depends heavily on its ability to meet the needs and expectations of these stakeholders. In the context of green accounting, this theory explains that MSMEs need to consider the interests of those affected by business activities, particularly regarding resource use and environmental impact. Society expects businesses to avoid environmental pollution, the government monitors compliance with environmental regulations, and customers now demand more environmentally friendly products. By implementing green accounting, MSMEs can measure and report their environmental impact transparently, thereby increasing accountability, building public trust, and strengthening stakeholder support for business sustainability.

Environmental Accounting and Green Accounting

Environmental accounting is a system for recording and reporting costs related to the impact of a company's activities on the environment. Green accounting is a development of environmental accounting that emphasizes the measurement, reporting, and internalization of environmental costs in managerial decisions. According to Gray et al. (1995), green accounting includes recording the costs of preventing, controlling, and remediating environmental damage resulting from business activities. In the context of MSMEs, green accounting helps businesses: Identify costs associated with environmental impacts, Measure

and manage resource consumption (energy, water, raw materials), and Assess contributions to sustainability and social responsibility.

Micro, Small, and Medium Enterprises (MSMEs)

Micro, Small, and Medium Enterprises (MSMEs) play a vital role in the local economy, including Palu City. MSMEs are characterized by limited capital, a small workforce, and simple management. Environmental conditions around business locations, such as the presence of mines, can impact MSME operations, the quality of raw materials, and worker health. Therefore, implementing green accounting can help MSMEs assess environmental costs and improve business sustainability. Research (Putra & Katuruni, 2025) shows that green accounting contributes to improving MSME operational efficiency and encouraging more sustainable business practices.

MSMEs are a crucial pillar of the Indonesian economy because they absorb a large workforce, improve community welfare, and contribute to Gross Domestic Product (GDP). According to Law No. 20 of 2008, MSMEs are productive businesses owned by individuals or business entities that meet certain criteria based on total assets and annual turnover. Based on Government Regulation No. 7 of 2021 concerning the Facilitation, Protection, and Empowerment of Cooperatives and Micro, Small, and Medium Enterprises (PP UMKM), the definition of micro, small, and medium enterprises is as follows.

(1) Micro Enterprises are productive businesses owned by individuals and/or individual business entities that meet the criteria for Micro Enterprises as stipulated in this Government Regulation. (2) Small Enterprises are independent productive economic enterprises, carried out by individuals or business entities that are not subsidiaries or branches of companies owned, controlled, or are part of, directly or indirectly, a Medium Enterprise or Large Enterprise that meets the criteria for Small Enterprises as stipulated in this Government Regulation. (3) Medium Enterprises are independent productive economic enterprises, carried out by individuals or business entities that are not subsidiaries or branches of companies owned, controlled, or are part of, directly or indirectly, a Small Enterprise or Large Enterprise that meets the criteria for Medium Enterprises as stipulated in this Government Regulation.

In this study, MSMEs in mining and non-mining areas have different characteristics. MSMEs in mining areas generally face greater environmental challenges due to mining activities, while MSMEs in non-mining areas experience relatively less environmental impact. Therefore, the implementation of green accounting in both areas can provide insight into the extent to which environmental awareness influences MSME operational performance. This aligns with research (Indraswari et al., 2024), which shows that the level of environmental understanding and concern is an important factor in encouraging the implementation of green accounting in MSMEs.

Green Accounting

(Rahman et al., 2019) states that environmental accounting is the process of collecting, analyzing, and preparing reports related to environmental and financial data with the aim of reducing the impact and costs of environmental damage. This form of accounting is also important in various government policies. Thus, environmental accounting has become a key element of sustainable business and responsible economic development. This concept began to develop in Europe in the 1970s, and in the 1980s, research related to green accounting issues increasingly flourished in the literature (Hasanah & Widiyati, 2023). In

developed countries such as Japan and Europe, awareness of environmental issues has grown rapidly, both in theory and practice. This phenomenon is manifested in the adoption of several regulations related to environmental issues. Green accounting is used by companies as a tool to evaluate numerical data related to environmental costs and impacts.

The application of this environmental accounting concept encourages companies to improve their capabilities in mitigating the environmental problems they face (Nuryanti et al., 2015). The implementation of green accounting by companies is not only a form of responsibility towards stakeholders but also an effort to meet stakeholder expectations regarding the company's concern for the environmental impact of its operational activities. Stakeholders today focus not only on financial values but also on environmental values, such as the extent to which a company cares about the environmental impact of its business operations.

Laws addressing environmental costs in the mining sector are outlined in PSAK No. 33, now ISAK 29, concerning stripping costs during the production phase of open-pit mining, and Government Regulation No. 78 of 2010 concerning recovery and post-mining. These guidelines explain that companies (PT) directly involved in climate change are expected to assume responsibility by making commitments to social, community, and climate issues (Rosaline & Wuryani, 2020). In this context, the allocation of environmental costs incurred by a company each year is considered an indicator of green accounting accounting variables (Riyadh et al., 2020). Green accounting is a recording system that focuses not only on financial records but also includes environmental activities and impacts. The purpose of green accounting is to reduce the costs of ecological impacts, eliminating the need for companies to incur these costs, assuming these costs were anticipated from the outset (Magablih, 2017).

Green accounting serves as a tool for measuring environmental performance in relation to a company's social role, encompassing environmental revenues and regulatory costs. These environmental factors include the costs of ecological protection and the financial benefits derived from nature conservation activities. The application of green accounting in financial reporting opens up opportunities to improve financial performance through operational efficiency and positive transparency in the market.

RESEARCH METHOD

This study uses a qualitative and comparative approach to explore green accounting practices in depth among MSMEs in the mining and non-mining areas of Palu City. According to Creswell (2016), a qualitative approach allows researchers to deeply understand the meanings emerging from the subjects' experiences, especially when the phenomena being studied are contextual. This approach is based on the positivist paradigm, which views truth as constructed through interpretation of empirical reality and social context. A comparative case study was chosen because it demonstrates differences in business environmental conditions, particularly between areas impacted by the Poboya mine and more ecologically stable areas. This design allows researchers to understand how MSMEs manage environmental costs, control waste, and adapt sustainability practices based on the ecological pressures they face. This approach positions the researcher as the primary instrument in the exploration of the meanings and experiences of MSME actors.

Table 1.
List of Research Informants

No	Name	Type of business	Area Description
1	Aftar	Filling Gallons	Mining Circle
2	Lim	Workshop	Mining Circle
3	Ami	Furniture	Mining Circle
4	Rasim	Workshop	Outside the Mining Circle
5	Wahyudin	Furniture	Outside the Mining Circle
6	Fatmawati	Filling Gallons	Outside the Mining Circle

Source: Researched by Researchers, 2025

Data collection was conducted through in-depth interviews, direct observation, and documentation. According to Sugiyono (2019), in-depth interviews are the primary technique in qualitative research to gather broad and in-depth information based on participants' experiences. The research informants consisted of six MSME owners/managers from three types of businesses (gallon water refilling, repair shops, and furniture) selected using purposive sampling based on the following criteria: having been operating for at least one year, maintaining simple financial records or awareness of environmental costs, and willingness to be interviewed. Semi-structured interviews were conducted to obtain information regarding the informants' understanding of green accounting, waste management practices, the use of environmentally friendly raw materials, and the impact of the surrounding environment on operational costs. Field observations were used to verify informants' statements through observations of production processes, energy use, and waste management strategies. Documentation in the form of financial records, photographs of business activities, and supporting documents were used to strengthen the validity of the findings.

Data analysis was conducted using the Miles and Huberman model, which includes three stages: data reduction, data presentation, and conclusion drawing. (Miles et al., 2014) emphasized that data reduction is necessary to simplify information into meaningful categories so that patterns can be discovered. In the reduction stage, interview and observation data are selected, coded, and categorized based on themes such as environmental costs, sustainability practices, and business location impacts. In the reduction stage, interview and observation data are selected, coded, and categorized based on relevant themes such as environmental costs, sustainability practices, and business location impacts. The data are then presented narratively to map the differences in patterns between mining and non-mining MSMEs. The conclusion-drawing process is carried out inductively, considering the consistency of findings from various data sources. Validity is maintained through method and source triangulation, so that the resulting interpretations truly reflect the conditions and practices occurring in the field.

RESULTS AND DISCUSSION

Based on interviews with informants, this study found that the implementation of green accounting among MSMEs in and around the mining area has not been formally implemented. However, it has manifested itself in the following environmental awareness,

waste management, and environmental cost recording practices. Each of these findings will be explained in detail:

Environmental Awareness of MSMEs

Environmental awareness among MSMEs in the mining area has developed as a coping mechanism against the direct impacts of mining activities. Businesses recognize that the presence of mine dust has consequences for business viability and customer comfort. Therefore, environmentally friendly actions emerge as a practical response to real-world problems. This awareness is functional and stems from daily operational experiences that are directly influenced by environmental conditions.

Table 2.
Environmental Awareness of MSMEs in Mining Circle and Outside Mining Circle Areas

Aspect	Mining Circle MSMEs	MSMEs Outside the Mining Circle
Environmental conditions	Direct exposure to the impacts of mining activities (dust, pollution)	Not directly exposed to the impacts of mining
Forms of environmental awareness	Reactive and functional	Preventive and ethical
Driving factors	Ecological pressures and direct experience of pollution	Social values, ethics, and business image
Form of action	Dust suppression, waste oil storage, and environmental impact control	Reducing waste, using materials as needed, and maintaining environmental cleanliness
Main orientation	Efforts to survive and maintain business viability	Customer comfort and harmony with the surrounding environment
The basis for the formation of awareness	Day-to-day operational experience	Internal awareness and social responsibility

Source: Researched by Researchers, 2025

"The environment here is already polluted... so I spray the yard with water to reduce the impact of dust from the poboya." (Aftar)

"As MSMEs, when we produce waste from motorbikes... we immediately store the oil in storage bins so it's not wasted carelessly." (Lim)

Meanwhile, MSMEs outside the mining area demonstrate a preventative and ethical awareness. They understand the importance of protecting the environment because they realize that a clean business improves customer satisfaction and business reputation. Their awareness stems not from external pressure, but from internal values and a desire to protect the community's environment.

"We continue to strive to protect the environment... we don't want our business to disturb the surrounding community." (Wahyudin)

"We have a basic awareness of the importance of protecting the environment... we strive to reduce waste and use materials as needed." (Fatmawati)

These findings indicate that MSMEs' environmental awareness is influenced by the level of environmental threats they face. MSMEs located in areas with high ecological pressure tend to develop reactive awareness in response to direct experiences, while MSMEs in areas with lower environmental pressures demonstrate normative awareness driven by ethical and social values. This pattern aligns with Dagvadorj et al., 2018, and Saputra and Sueb (2020), who assert that environmental experiences and values shape the environmentally conscious behavior of business actors.

Waste Management and Environmentally Friendly Efforts

MSMEs within the mining sector manage waste with a focus on mitigating the negative impacts of existing pollution. They strive to ensure that their business activities do not exacerbate environmental conditions already impacted by mining activities. Some implement simple recycling, material reuse, and hazardous waste storage using basic procedures they understand practically. These waste management practices demonstrate MSMEs' responsibility to ensure that their business activities do not further worsen the environmental conditions surrounding the mining area.

Table 3.
Waste Management and Environmentally Friendly Efforts of MSMEs in Mining Circle and Outside Mining Circle Areas

Aspect	Mining Circle MSMEs	MSMEs Outside the Mining Circle
Environmental conditions	The environment has been impacted by pollution due to mining activities	The environment is relatively unaffected by mining activities
Waste management orientation	Mitigating the impact of pollution	Business efficiency and resource utilization
Main motivation	Prevent environmental conditions from getting worse	Reduce material waste and operational costs
Forms of waste management	Simple recycling, gallon recycling, waste oil storage, and used tire sales	Collection of wood waste, material reuse, sale to collectors, and use of used water
Character practice	Adaptive and reactive to environmental conditions	Preventive and efficiency-oriented
Basis for taking action	Practical experience and operational needs	Economic considerations and resource utilization

Source: Researched by Researchers, 2025

"We give the waste gallons to craftsmen who use them to make flower vases." (Aftar)

"We store the oil directly in barrels... we sell the used tires to collectors." (Lim) "We can't reduce waste... unless we stop working, then we stop." (Ami)

In contrast, MSMEs outside the mining area focus on material optimization as a form of business efficiency. Waste recycling practices are oriented more towards cost savings and resource utilization, rather than responding to pollution. These efforts are born from the perspective of reducing material waste.

"We usually collect wood waste... anything that can still be used is reused." (Wahyudin)

"The waste is collected before being sold to collectors." (Rasim)

"We use dirty water to water the yard in the evening." (Fatmawati)

These results indicate that waste management among MSMEs is carried out with different motivations. MSMEs in the mining area emphasize pollution mitigation efforts to avoid worsening environmental conditions, while MSMEs outside the mining area are more focused on efficiency and resource reuse. This finding is in line with (Indrawati & Surtikanti, 2024), which shows that small business actors carry out practical waste management to reduce environmental impacts while maintaining business sustainability.

Environmental Cost Recording Practices (Green Accounting)

MSMEs, both inside and outside the mining area, have not implemented specific environmental cost recording. Cleaning, environmental protection, and waste management costs are still grouped together as general operational costs. This indicates that green accounting is not yet understood as a formal accounting component, but rather as an operational activity without separate financial documentation.

Table 4.
Environmental Cost Recording Practices (Green Accounting) of MSMEs in Mining Circle and Outside Mining Circle Areas

Aspect	Mining Circle MSMEs	MSMEs Outside the Mining Circle
Implementation of environmental cost recording	Not yet implemented specifically	Not yet implemented specifically
Types of environmental costs	Combined in the general operating costs	Combined in the general operating costs
Form of recording	There is no dedicated environmental expense account.	There is no dedicated environmental expense account
Understanding green accounting	Understood as an operational action, not a bookkeeping system	Understood as an operational action, not a bookkeeping system
Environmentally friendly practices	It has been done informally	It has been done informally
Measurability of economic impact	Economic impacts not identified in the financial statements	Economic impacts not identified in the financial statements
Implications of reporting	The contribution of the business environment is not measurable economically	The contribution of the business environment is not measurable economically

Source: Researched by Researchers, 2025

"Currently, there's no record keeping... there's no recording of costs incurred outside the environment." (Aftar)

"There's no record keeping... we dispose of waste without recording the costs." (Ami)

"We don't have any specific environmental records... everything is still mixed with regular operational costs." (Wahyudin)

"There's no record keeping... we don't use that method yet." (Rasim)

This finding indicates a gap between environmentally friendly practices and environmental reporting in MSMEs. Although various environmentally friendly measures have been implemented in daily operations, the lack of environmental cost recording means their economic impact is not reflected in financial reports. This situation indicates that the sustainability practices implemented have not been accompanied by an adequate environmental cost recording system. In line with (Gray et al., 1995) and (Bayana & Praditha, 2023), the lack of environmental cost recording results in the environmental contribution of businesses being economically intangible; the potential operational efficiencies that can be gained through the implementation of green accounting are not being optimally utilized by MSMEs.

Table 4.
Summary of Interview Results

Theme	Within the Mining Circle (Informants 1-2-3)	Outside the Mining Circle (Informants 4-5-6)
Environmental awareness	High due to the direct impact of mining pollution	There is awareness, but not much urgency.
Impact of mining pollution	Strongly felt: dust, water, waste	Minimal or not immediately felt
Waste management	Focus on preventing additional pollution	Focus on material efficiency & recycling
Environmental cost recording	No special records	No special records
Barriers to implementing green accounting	Lack of knowledge, no guidance, no training	Lack of knowledge, not yet a priority
Perception of the importance of green accounting	Very important because of the high risk of pollution	Important for the future and regularity of the business

Source: Researched by Researchers, 2025

CONCLUSION

This study concludes that the implementation of green accounting among MSMEs in the mining and non-mining areas of Palu City has not yet been formally implemented, despite the implementation of environmentally friendly practices in daily activities. MSMEs within the mining area exhibit a reactive environmental awareness due to exposure to pollution and ecological disturbances, while MSMEs outside the mining area demonstrate a normative awareness driven by social values and business image. Waste management practices also differ: MSMEs within the mining area focus on mitigating pollution impacts, while those outside the mining area emphasize efficiency and material reuse. All MSMEs

have not yet recorded environmental costs due to limited knowledge and the lack of simple guidelines, but they have a positive perception of the importance of green accounting for business sustainability and environmental preservation.

MSMEs are advised to begin implementing simple environmental cost recording by separating environmental expenses from general operational costs, while simultaneously improving environmentally friendly practices such as waste management, material reuse, and proper storage of hazardous waste. Local governments and supporting institutions need to provide training, outreach, and green accounting guidelines that are easy to understand and implement for small-scale MSMEs. Academics are also expected to play a role in providing mentoring and developing practical environmental recording models. Further research is recommended to expand the number of informants and develop a simple application-based green accounting implementation model to facilitate consistent environmental recording by MSMEs.

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