GREEN ACCOUNTING AS A CONTROL TOOL COSTS AND RISKS ENVIRONMENT WASTE MEDICAL IN A HOSPITAL

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Abstract

The adoption of green accounting in the healthcare industry, particularly within hospitals, has become a crucial strategy to tackle the challenges of medical waste management, which carries serious health and environmental consequences. This research explores the role of green accounting as a mechanism for controlling costs and mitigating environmental risks associated with medical waste. Employing a descriptive qualitative method, data were obtained through interviews, observations, and document reviews in hospitals implementing eco-friendly waste management practices. Findings indicate that green accounting enables hospitals to better identify and allocate environmental expenses, enhance the efficiency of waste management, and increase transparency in reporting externality costs. Moreover, green accounting contributes to promoting sustainability-focused managerial decisions and adherence to environmental regulations. Therefore, incorporating green accounting principles into hospital management systems represents a strategic measure for controlling costs and minimizing environmental risks linked to medical waste.

Keywords: Finance, Green Accounting, Healthcare Sector, Management Systems

INTRODUCTION

Hospitals, as healthcare service institutions, not only play a role in treating patients but also bear a significant responsibility for the environmental impacts of their operations, particularly from medical waste. Medical waste such as used syringes, leftover chemical materials, and other infectious substances belongs to the category of hazardous and toxic waste that can endanger human health and pollute the environment if not managed properly (Ramdan et al., 2025). This issue has become increasingly complex with the rising volume of medical waste, driven by the expansion of healthcare facilities and the growing number of patients, especially during and after the pandemic.

Effective medical waste management involves not only technical aspects but also requires managerial approaches and accounting tools to comprehensively map costs and risks (Paru et al., 2025). In this regard, green accounting emerges as an approach that emphasizes the importance of recording, reporting, and measuring environmental costs resulting from hospital activities. Through the application of green accounting, hospital management can better understand the extent of their operational impact on the environment and identify how environmental costs can be controlled and minimized.

The implementation of green accounting also enables hospitals to make wiser and more sustainable decisions by integrating environmental considerations into budgeting processes and risk management strategies. Furthermore, increasingly strict government regulations on medical waste management require hospitals to be more transparent and accountable in managing their environmental responsibilities. Therefore, this study aims to investigate how green accounting can serve as an effective tool for cost control and environmental risk mitigation, particularly in the context of medical waste management in hospitals. The research is expected to contribute to the development of environmentally friendly and sustainable hospital management practices.

REVIEW OF LITERATURE

Green accounting, also referred to as environmental accounting, is an approach within the accounting discipline designed to integrate environmental aspects into the processes of recording and reporting an organization's economic and financial activities (Candraningsih & Bayangkara, 2024; Omar et al, 2025). Unlike conventional accounting, which focuses solely on financial data, this approach also includes identifying and measuring the environmental impacts of organizational operations, such as emissions, waste, and the consumption of natural resources. The development of this concept arises in response to growing global awareness of the importance of sustainable development and concerns over environmental degradation resulting from industrial activities that are not environmentally friendly. Accordingly, green accounting is presented as an effort to promote transparency, ecological accountability, and the adoption of more sustainability-oriented decision-making in the long term.

Green accounting involves a systematic set of processes, including the identification, measurement, recording, and reporting of environmental costs arising from an organization's activities (Bagas et al., 2023). Its primary aim is to ensure that all ecological impacts from operational activities are accurately reflected within the accounting information system. These costs are not limited to direct expenditures but also cover pollution prevention, early

detection of potential environmental damage, mitigation of adverse impacts, and restoration or recovery efforts. Thus, green accounting serves not only as a reporting tool but also as a strategic instrument for supporting cost efficiency and environmental sustainability (Abdullah & Amiruddin, 2020).

In the context of hospitals, green accounting plays a vital role as a mechanism for recording and reporting all costs associated with medical waste management, including sorting, storage, transportation, and disposal of hazardous waste (Mutmainnah, 2018). These costs are then incorporated into financial reports and become part of the hospital's annual budget planning. The implementation of green accounting allows hospital management to systematically evaluate the effectiveness of medical waste management, identify potential cost inefficiencies, and design strategies that are more environmentally efficient and sustainable (Tabunan, 2025). Moreover, the practice of green accounting reinforces institutional principles of accountability and transparency, particularly in meeting compliance obligations with environmental regulations such as Law No. 32 of 2009 on Environmental Protection and Management (Hasna et al., 2025). Consequently, green accounting functions not only as a technical accounting tool but also as a policy-support instrument that helps shape hospitals into socially and ecologically responsible institutions.

Green accounting also serves as a bridge between traditional finance-oriented accounting practices and environmental management approaches that emphasize sustainability. By recording and analyzing environmental costs arising from operational activities, hospital management can gain a more comprehensive understanding of potential ecological risks, particularly those related to hazardous and toxic medical waste. Such information enables hospitals to better map risk areas and develop appropriate mitigation strategies, including improvements in waste treatment infrastructure, workforce training, and the adoption of environmentally friendly technologies. Furthermore, a deeper understanding of environmental cost data assists management in planning investments more carefully and focusing on long-term efficiency. In this way, green accounting provides not only economic benefits but also strengthens institutional commitment to responsible and sustainable environmental management.

RESEARCH METHOD

This study employs a descriptive qualitative approach with the aim of gaining an in-depth understanding of the implementation of green accounting in controlling costs and mitigating environmental risks arising from medical waste in hospitals. This approach was selected because it allows for a comprehensive exploration of phenomena based on real experiences and practices observed in the field.

The data used in this study consist of both primary and secondary sources. Primary data were collected through in-depth interviews with key stakeholders, including financial managers, heads of waste management units, and hospital staff involved in environmental management. Secondary data were obtained from hospital documents such as financial reports, waste management reports, internal policies, as well as government regulations related to environmental and medical waste management.

Data collection techniques included semi-structured interviews, direct observation, and documentation review. The data were analyzed using thematic analysis, which involved

data reduction, data presentation, and conclusion drawing. To ensure the validity of the data, source and method triangulation techniques were applied by comparing the results of interviews, observations, and documentation.

RESULTS AND DISCUSSION

Based on the results of observations and interviews, it was found that green accounting functions as both a cost control tool and an instrument for mitigating environmental risks arising from medical waste through several mechanisms, including the following:

1. Medical Waste Cost Control

Green accounting integrates environmental aspects into the hospital's financial accounting and reporting processes, enabling more detailed recording and monitoring of costs related to medical waste management. Interview data indicate that several green accounting practices assist in cost control, such as:

a. Identifying Medical Waste-Related Costs
Through green accounting, hospitals are able to identify and classify costs directly associated with medical waste management, including sorting, transportation, processing, and disposal. This provides greater transparency regarding total expenditures on medical waste management and helps hospitals identify ways to reduce such costs.

b. Enhancing Efficiency in Waste Management
Efficient medical waste management practices—such as implementing proper waste segregation systems or reusing certain materials—can significantly reduce overall waste management expenses. Green accounting facilitates the monitoring of these expenditures and the identification of more cost-effective practices.

c. Optimizing Resource Utilization
Green accounting also supports the optimization of resource usage, such as energy and standard medical materials, thereby lowering operational costs. For instance, adopting environmentally friendly technologies or more energy-efficient equipment can reduce both operational and waste-related expenses.

2. Environmental Risk Mitigation

Green accounting plays a critical role in mitigating the environmental risks of medical waste, which include soil, water, and air pollution that may harm ecosystems and public health. Some green accounting practices contributing to risk mitigation include:

a. **Environmental Impact Reporting**
Hospitals can report the environmental impacts of their operations, including medical waste management, through green accounting. These reports allow hospital management to understand the extent to which medical waste contributes to environmental pollution and to take corrective actions to reduce its impact.

b. **Investment in Green Technology**
Green accounting encourages hospitals to invest in environmentally friendly medical waste management technologies, such as high-efficiency incinerators or energy recovery systems. These technologies help minimize the environmental impact of medical waste.

c. **Proper Waste Management Practices**

By applying green accounting, hospitals can adopt better waste management principles, such as segregating recyclable medical waste, safely handling hazardous waste, and reducing the use of harmful chemicals that may pollute the environment. This minimizes the risks of soil, water, and air contamination.

d. **Monitoring and Supervision of Environmental Risks**
Through integrated reports, hospitals can routinely monitor different types of medical waste and the related risks while evaluating their waste management policies. Data generated from green accounting provides insights for reducing environmental risks by taking preventive or corrective measures, such as lowering waste volumes or adopting alternative disposal methods.

3. Enhancing Sustainability and Regulatory Compliance

Green accounting also helps hospitals comply with environmental regulations. By incorporating environmental costs and risks into financial reporting, hospitals not only meet established accounting standards but also ensure that their operations align with increasingly strict environmental policies.

4. Data-Driven Decision-Making

The integration of green accounting data into hospital reports enables more informed decision-making in medical waste management. Hospital managers can assess the effects of waste management initiatives, such as whether waste processing costs can be reduced through investment in specific technologies or whether limiting the use of hazardous chemicals can lower potential environmental risks.

The Role of Green Accounting in Cost Control and Environmental Risk Mitigation from Medical Waste in Hospitals

Green accounting serves as an essential tool for both cost control and the mitigation of environmental risks caused by medical waste in hospitals (Alifiana, 2024). It represents a branch of accounting that integrates financial and non-financial information related to environmental aspects into an organization's financial recording and reporting systems (Sahab, 2019; Pratama & Sisdianto, 2024).

According to the United Nations Division for Sustainable Development, green accounting encompasses the recording of costs and benefits from organizational activities that affect the environment, thereby supporting more environmentally friendly and sustainable decision-making (Wijayanto et al., 2021). Within the hospital context, green accounting enables more detailed and systematic recording, monitoring, and evaluation of medical waste management costs (Harfika, 2023).

Cost Control

In terms of cost control, green accounting helps hospitals identify and classify various direct expenses associated with medical waste management, including costs of sorting, transportation, processing, and disposal. This identification provides transparency regarding hospital cost structures, thereby enabling efficiency improvements. For instance, adopting more effective waste segregation systems or replacing disposable medical materials with reusable alternatives allows hospitals to reduce expenditures. Additionally, green accounting supports the optimization of resource use, such as energy, water, and standard medical supplies, ultimately contributing to a reduction in overall operational costs (Utari, 2020).

Environmental Risk Mitigation

Green accounting also plays a strategic role in environmental risk mitigation. According to the World Health Organization (WHO), medical waste includes infectious, pathological, chemical, radioactive, and sharp materials that, if improperly managed, may contaminate land, water, and air, and endanger public health (Amaly, 2023). Through green accounting reports, hospitals can assess the environmental impacts of their medical activities, including the volume of hazardous waste generated. This information provides a basis for policy formulation and impact reduction programs, such as investing in environmentally friendly technologies like low-emission incinerators or standardized medical waste recycling systems.

Furthermore, green accounting encourages safer and more responsible waste management practices. Examples include separating hazardous from non-hazardous waste, reusing sterilizable medical equipment, and reducing the use of toxic chemicals with high pollution potential. Data generated from green accounting systems allow for systematic monitoring and supervision of environmental risks, enabling hospitals to take timely preventive and corrective actions. This aligns with Environmental Management Accounting (EMA), an approach that incorporates environmental data into cost management and strategic decision-making.

Compliance and Strategic Decision-Making

The implementation of green accounting also strengthens hospital compliance with environmental regulations issued by the Ministry of Health, the Ministry of Environment, and relevant international bodies (Wirawan & Angela, 2024). By incorporating externality costs and environmental risks into financial reports, hospitals not only fulfill legal responsibilities but also demonstrate a commitment to sustainable practices. The integrated data produced by green accounting systems serve as a foundation for evidence-based managerial decision-making, particularly in investment choices, program planning, and innovations in medical waste management. Thus, green accounting functions not only as an administrative tool but also as a strategic instrument for developing hospitals that are more efficient, compliant with regulations, and socially and environmentally responsible.

CONCLUSION

Based on the results of observations and interviews, it can be concluded that green accounting plays a vital strategic role in both cost control and environmental risk mitigation related to medical waste in hospitals. By integrating environmental aspects into financial accounting and reporting systems, green accounting enables hospitals to record, monitor, and manage medical waste management costs in a more detailed and transparent manner. This facilitates the identification of key expenses, improves waste management efficiency, and optimizes resource use, thereby reducing the financial burden on healthcare institutions.

Moreover, green accounting contributes to lowering environmental risks through environmental impact reporting, investment in eco-friendly technologies, and the implementation of proper and sustainable waste management systems. Hospitals that adopt green accounting are not only more compliant with environmental regulations but are also better equipped to make accurate, data-driven decisions that balance cost efficiency with ecological responsibility. Thus, green accounting emerges as an essential approach in

promoting hospital practices that are not only economically efficient but also environmentally friendly and sustainable.

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