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Implementation of Environmentally Based Accounting Information Systems to Support Corporate Sustainability Reporting

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Abstract:

Purpose:
Today's companies are required to not only pursue financial profits but also pay attention to the environmental impact of their operational activities. One of the strategic efforts in supporting sustainability is to adopt an Accounting Information System (AIS) that is oriented towards environmental aspects. This article comprehensively reviews the basic concepts, benefits, and various obstacles in implementing environmentally-based AIS to increase transparency in sustainability reporting.

Methodology:
The research was conducted using a literature study method by reviewing various relevant literature in the fields of environmental accounting, accounting information systems, and corporate sustainability reporting.

Findings:
The results of the study indicate that the integration of environmental data into AIS can improve the quality of sustainability reports, increase the level of corporate accountability, and reduce potential environmental risks in the long term. This article also presents a hypothesis that the implementation of environmental-based AIS has a significant positive impact on the quality of corporate sustainability reporting.

Implication:
In the final section, the article emphasizes the importance of support from management, regulatory clarity, and the development of an integrated reporting system as keys to success in implementing this system.

INTRODUCTION

In the midst of globalization, the business world is undergoing a significant transformation, not only in the context of economic competition but also related to increasing social and environmental responsibility. The international community is now increasingly concerned about the environmental and social impacts caused by corporate activities. This collective awareness encourages companies to not only focus on achieving profits, but also to pay attention to the principle of sustainability in every aspect of their business activities. Pressure from various stakeholders, such as consumers, investors, governments, and non-governmental organizations, requires companies to be more open and responsible in dealing with the social and environmental consequences of their operations (Hamzah, 2024).

In response to these demands, sustainability reporting has become a strategic instrument used by companies to communicate their commitments and performance in economic, social and environmental aspects. Sustainability reporting is no longer seen as merely an administrative obligation, but has developed into an important tool in building a positive image, increasing public trust and strengthening the company's competitive position in the global market. Through the preparation of comprehensive reports, companies are able to demonstrate the implementation of ethical and responsible business principles while supporting the achievement of the Sustainable Development Goals (SDGs).

One of the important breakthroughs in supporting sustainability reporting is the use of an environmentally-based Accounting Information System (AIS), or often referred to as green accounting. Environmentally-based

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AIS is a development of conventional accounting systems that not only record financial transactions, but also include information related to environmental aspects. This information includes energy use, water consumption, waste management, carbon emissions, and costs incurred to maintain environmental sustainability. Thus, this system provides a more comprehensive picture of company performance, covering financial and sustainability aspects simultaneously.

Implementing an Environmentally-focused Accounting Information System (AIS) can yield a number of strategic benefits. First, such a system can increase transparency and accountability in environmental impact management, making it easier for companies to meet applicable regulations and the expectations of stakeholders. Second, thanks to the availability of integrated environmental data, companies can conduct more thorough cost-benefit analyses, identify efficiency opportunities, and minimize environmental risks that could disrupt the company's operations and image. Third, implementing this system helps companies meet international reporting standards, such as the Global Reporting Initiative (GRI), which has become the primary reference for preparing sustainability reports. However, implementing an environmentally-oriented AIS is not without its obstacles. One of the main obstacles is the lack of experts who have competence in environmental accounting. In addition, the high initial investment costs required to build the system, provide training to employees, and collect environmental data are often a barrier, especially for small and medium-sized businesses.

Another challenge is the absence of uniform and integrated environmental reporting standards in Indonesia, so companies have difficulty in determining appropriate indicators and reporting methods. To overcome these various challenges, commitment from company leaders, support from existing regulations, and cooperation with various parties are determining factors for success in implementing environmentally-based SIA. Companies need to continue to innovate and adapt to technological developments and policy changes in order to optimize the contribution of environmentally-based SIA in supporting sustainability reports. With this approach, companies can not only improve environmental performance but also strengthen their position as responsible and sustainable business entities, both nationally and internationally.

Environmental Accounting. Environmental accounting is an area of accounting that specifically deals with the identification, quantification, recording, and presentation of data related to the ecological effects of a business entity's operational activities. The goal is to support companies in being more efficient in utilizing natural resources and reducing negative effects on the environment. Environmental accounting is not limited to reports related to energy costs and waste management, but also includes the management of environmental risks that can impact the company's image and future profits. According to Ikhsan (2008), environmental accounting has an important function in helping companies deal with environmental issues by measuring activities from the perspective of environmental costs and economic benefits. Furthermore, environmental accounting also involves the dissemination of information on environmental performance that is useful for various stakeholders, both internal and external to the company.

Triple Bottom Line (TBL). Triple Bottom Line (TBL) is a crucial concept in environmental accounting that measures a company's overall performance through three main dimensions: economic, social (people), and environmental (planet). Unlike traditional approaches that only focus on achieving financial profit, TBL emphasizes the importance of assessing a company's success from its contribution to social welfare and environmental sustainability. Thus, TBL presents a more holistic perspective on sustainability, where companies are not only focused on profit, but also on social and ecological responsibility.

In terms of implementation, the economic aspect (profit) includes achieving sustainable profits and efficient resource management. Meanwhile, the social aspect (people) focuses on the company's efforts to improve the quality of life of employees, the surrounding community, and other stakeholders through social responsibility (CSR) activities, protection of workers' rights, and community empowerment. On the other hand, the environmental aspect (planet) reflects the company's commitment to preserving nature, such as energy efficiency, reducing emissions and waste, and conserving natural resources (Kingsley, Endurance, Sunny, & Ozele, 2014).

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The implementation of environmental accounting, which refers to the TBL approach, allows companies to systematically and openly identify, evaluate, and report the impacts of these three aspects. This step not only strengthens the company's accountability to stakeholders but also becomes the foundation in driving the transition to a sustainable green economy. Findings from various studies, including on PT Varia Usaha Beton Sidoarjo and several companies in the Makassar Industrial Area, show that the TBL approach in environmental accounting can help companies manage social and environmental burdens more effectively, as well as increase the company's value and public perception.

Sustainable Accounting Information System. Sustainable Accounting Information System is an approach that manages and integrates financial and non-financial information covering environmental and social aspects into a company's accounting reporting system. This system is designed to provide comprehensive and relevant data so that stakeholders, such as management, investors, regulators, and the public, can make a more comprehensive assessment of the company's sustainability performance. Therefore, this system not only focuses on economic or financial aspects, but also considers the social and environmental impacts of business activities, which are becoming increasingly important in the context of sustainable development and corporate social responsibility.

The implementation of a sustainable accounting information system requires the integration of information technology that is able to manage data efficiently, accurately, and in real time, so as to support the process of collecting, processing, and reporting transparent and accountable information. The use of digital technology, such as cloud-based accounting software and database management systems, allows companies to automate the recording and analysis of sustainability data, while accelerating the reporting process to various stakeholders (Syarifah Zuhra & Dwila Maresti, 2023).

Sustainable accounting information systems also function to improve the quality of financial and non-financial reports, which ultimately support the development of a sustainable innovation ecosystem within the company. With accurate and integrated data, companies can evaluate performance comprehensively, identify risks and opportunities related to sustainability, and formulate business strategies that are more responsive to social and environmental challenges.

Green Accounting Model. Green Accounting is a new way of accounting that combines regular financial reports with social and environmental aspects. So, it is not just about financial figures, but also complete information about the company's financial condition, possible risks, and how the company maintains environmental sustainability, both now and in the future. That way, we know more about how the company's activities affect the environment and society. It also helps company leaders make better and more environmentally responsible decisions (Ashari and Muawanah, 2020).

In practice, green accounting has two important roles. First, it helps companies from within by measuring and analyzing the costs of protecting the environment to be more effective and efficient. It is a tool for management in making decisions at the business level. Second, from the outside, green accounting reports the results of environmental protection activities in the form of measurable accounting data. This information is important for people like investors, customers, and lenders because it influences their decisions. So, green accounting makes companies more open and responsible for the environmental impacts they cause.

Benefits of Environmental Accounting Implementation in Sustainability Reporting. The implementation of environmental accounting integrated into the accounting information system provides various strategic benefits for companies. First, this system allows companies to identify and manage environmental risks more effectively, such as risks related to greenhouse gas emissions, waste management, and natural resource utilization. With a deeper understanding of the risks, companies can take appropriate mitigation steps to reduce the possibility of financial losses and maintain long-term operational continuity.

In addition, environmental accounting contributes to increased operational efficiency through more optimal resource management. For example, companies can reduce energy and waste usage, which not only saves costs

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but also significantly reduces the company's ecological footprint. Research shows that companies that implement environmental accounting are able to save significant costs through recycling programs and reduced energy use.

Another important benefit is encouraging sustainable innovation. With accurate and integrated environmental data, companies are encouraged to create more environmentally friendly products and processes, support the circular economy, and increase competitiveness in a market that is increasingly concerned about sustainability issues (Nurita & Sisdianto, 2025).

Hypothesis. An accounting information system that combines environmental aspects can provide more accurate, relevant, and transparent data related to a company's environmental performance. With a structured and environmentally-based system, companies can be more efficient in managing and reporting sustainability information more effectively, improving the quality of reporting as a basis for accountability and the company's reputation in the eyes of stakeholders. This information system supports the transparency of environmental information disclosure, which is the company's obligation in accordance with Law No. 40 of 2007 concerning Limited Liability Companies, which regulates the company's social and environmental responsibilities. Adequate reporting also meets international sustainability reporting standards such as GRI (Global Reporting Initiative), making it easier for companies to meet the expectations of investors and the wider community.

H1: The implementation of an environmentally-based accounting information system has a significant positive effect on the quality of the company's sustainability reporting.

Environmental accounting information systems help companies systematically identify, measure, and manage environmental risks and impacts from their operational activities. With the right information and accurate and real-time data, companies can take control and improvement steps that support sustainable environmental performance improvement. Research shows that the implementation of environmental accounting that considers physical aspects has a significant positive impact on environmental performance, although monetary aspects sometimes do not show a strong influence (Jumaidi, Lestari, & Rahman, 2021).

H2: The implementation of an environmental-based accounting information system has a positive effect on the company's environmental performance.

Positive environmental performance is the foundation for companies in preparing credible and comprehensive sustainability reports. Companies that have measurable and well-managed environmental performance are able to provide transparent and reliable information, thereby increasing trust and support from stakeholders such as investors, the community, and regulators. Reporting based on real environmental performance also strengthens the company's social legitimacy and supports the fulfillment of legal demands and business ethics (Noviani & Suardana, 2019).

H3: Environmental performance has a positive effect on reporting quality.

METHODS

This study uses the Systematic Literature Review (SLR) method, which is an organized and structured approach to collecting, assessing, and synthesizing various relevant studies related to the implementation of environmental accounting information systems and corporate sustainability reporting. The initial stage in SLR is to determine the right keywords, such as "environmental accounting information systems", "sustainability reporting", and "green accounting", which are then used to search for literature from various credible scientific sources, such as Google Scholar, Scopus, and national and international journals. The next process is filtering the literature based on inclusion and exclusion criteria, such as restrictions on the year of publication, suitability of the theme, and the quality of the article, so that only studies that meet these criteria are analyzed further.

The analysis was conducted by grouping important findings from selected articles, while identifying research trend directions, gaps in previous studies, and best practices in the application of environmental accounting information systems and sustainability reporting. The findings are presented systematically to provide a comprehensive overview of the development of theory and implementation in the field. The SLR method was

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chosen because it is able to present a comprehensive theoretical basis and minimize the potential for bias in literature selection, making it an appropriate method for emerging topics such as environmental accounting and accounting information systems that support sustainability (Sari, 2021).

RESULTS AND DISCUSSION

Based on the literature review, it was found that the implementation of an environmentally oriented accounting information system (AIS) has a significant positive effect on improving the quality of corporate sustainability reporting. By integrating data related to environmental aspects into the accounting system, companies are able to present information in sustainability reports in a more transparent, accurate, and relevant manner. This system also supports companies in identifying and managing various environmental risks, such as waste management, emission reduction, and efficient use of natural resources. In addition, the implementation of environmentally-based AIS also helps companies meet global reporting standards such as the Global Reporting Initiative (GRI), so that the resulting sustainability reports are more systematic and accountable (Jayawarsa et al., 2025; Saputra, Dewi, et al., 2025).

Research also reveals that companies that have integrated environmental accounting into their accounting information systems gain benefits such as operational efficiency and cost reduction, through programs such as more effective waste management and energy savings (Saputra, Dewi, et al., 2025; Saputra, Laksmi, et al., 2025). The availability of real-time and accurate environmental data encourages sustainable innovation in company operations. From an external perspective, companies that implement this system tend to experience an increase in reputation, gain greater trust from investors, and are able to maintain compliance with applicable environmental regulations.

Despite providing various benefits, the implementation of environmental-based SIA also faces a number of challenges, including a limited workforce with competence in this field, high technology investment costs, and the absence of uniform environmental reporting standards in Indonesia. Therefore, it is necessary to increase human resource capacity, develop adequate technology, and collaborate with regulators and professional organizations to overcome these obstacles (Saputra & Dharmawan, 2025b, 2025a).

The research discussion confirms that the implementation of environmentally friendly AIS is not just a financial recording system, but also acts as a managerial tool that presents a comprehensive picture of the company's performance in economic, social, and environmental aspects. The quality of reporting produced through this system will increase the company's transparency, strengthen its legitimacy in the eyes of stakeholders, and encourage competitiveness in the global arena (Jayawarsa & Saputra, 2025; Saputra & Jayawarsa, 2025).

Thus, to optimize the benefits of this system, companies need to get full support from top management and have supporting regulations. Overall, the findings of this study confirm that the implementation of environmentally-based SIA significantly improves the quality of sustainability reporting and becomes an important foundation for the transformation of companies towards responsible and sustainable business practices.

CONCLUSION

The implementation of an environmentally-based Accounting Information System (AIS) is an important strategy in facing the dynamics of modern business. This system is not only used to record financial transactions, but also integrates environmental data such as energy consumption, waste management, carbon emissions, and utilization of natural resources into the company's reporting system. This integration allows companies to increase transparency and accountability in managing environmental impacts while meeting regulatory requirements and stakeholder expectations. In addition, environmentally-based AIS also supports a more precise cost-benefit analysis process, helps companies identify potential efficiencies, and reduces environmental risks that can affect the continuity of operations and the company's image. The presence of this system also strengthens the company's

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ability to prepare reports that comply with international standards such as the Global Reporting Initiative (GRI), which is now widely used as the main reference in sustainability reporting (Marsono & Dewayanto, 2025).

Despite offering various benefits, the implementation of environmentally-based SIA faces a number of challenges. One of the main obstacles is the limited workforce with expertise and in-depth understanding of environmental accounting. In addition, high initial costs for information system development, personnel training, and accurate environmental data collection are often obstacles, especially for small-scale companies. The absence of consistent and integrated environmental reporting standards in Indonesia also complicates the implementation process. To address these challenges, a strong commitment from top management, clear policy support from the government, and active collaboration with various parties, such as regulatory agencies, educational institutions, and the general public, are required.

With the right approach, the implementation of an environmentally-based SIA can not only provide long-term benefits for increasing the company's efficiency and reputation but also make a real contribution to sustainable development efforts. Companies that successfully implement this system effectively will gain a stronger position as a responsible business entity, adaptive to change, and highly competitive, both at the national and global levels.

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