



Implementation of Environmental Cost Accounting: A Systematic Literature Study and Its Impact on Corporate Profitability

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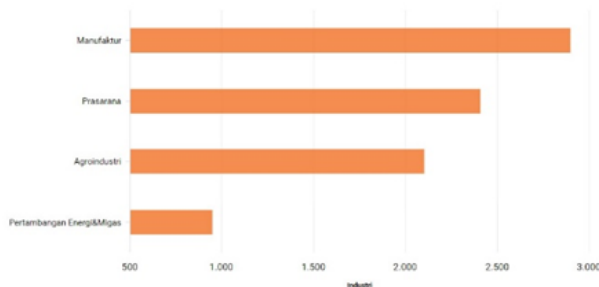
Environmental Costing,
Environmental Cost Accounting,
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Abstract

The role of accounting as a provider of financial information for stakeholders is very important, especially for strategic decision making and policy. Environmental cost accounting is presented as an answer to government policies on hazardous waste management for each industry. This study aims to analyze the application of environmental cost accounting. This study uses the SLR (Systematic Literature Review) method as its research approach, which is a systematic approach to reviewing and analyzing the relevant literature available in a particular research domain. In this study, this method involves the identification, evaluation, and interpretation of relevant previous studies in order to achieve the research objectives. The studies were obtained from the Google Scholar database with a time span of the last 10 years, namely from 2013 to 2023. The results of the research conducted by the researcher show that the impact influenced by the application of environmental cost accounting has a positive impact on acceptance and showing the environmental accounting information system model at PGN, on social responsibility, waste management, affecting the company's profit, and also on the stock market .

1. Introduction

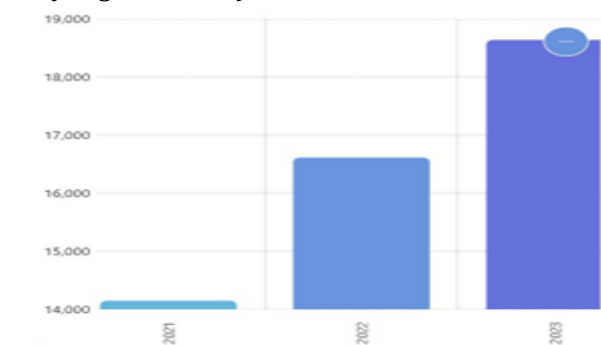
The wheels of a country's economy continue to develop along with population growth. Various needs ranging from clothing, food, shelter to tertiary have become a demand in economic activities. This demand in economic law makes companies and industries increasingly develop. However, as industry and companies continue to experience growth and progress, it turns out that it has an environmental impact in the form of waste.



Source : <https://databoks.katadata.co.id/datapublish/>

Based on the graphic data above, B3 waste, namely hazardous and toxic materials originating from manufacturing companies, produces up to 60 million tonnes of B3 waste. B3 waste is inorganic waste which contributes to environmental pollution. According to data from the Ministry of Environment and Forestry

(KLHK), there are 2,897 manufacturing sector companies that produce waste in 2021. Operational activities carried out by companies have a significant impact on the environment and are one of the factors causing climate change (Arimbi & Mayangsari, 2022).



Source: <https://pslb3.menlhk.go.id/dashboard/pengelolaanLimbahB3>

According to the Directorate General of Waste, Waste and B3 Management of the Ministry of Environment and Forestry, the number of companies reporting B3 waste continues to experience a significant increase. In 2021 there will be 14,142 companies, while in 2022 there will be 16,606 companies. The highest figure will be in 2023, namely 18,632 companies reporting B3 waste. Often, companies ignore environmental issues in their operations, resulting in significant impacts that



can ultimately endanger the long-term survival of their business (Asjuwita & Agustin, 2020).

Environmental issues and waste can become a serious problem for companies if they are not addressed immediately. Interested parties such as stakeholders can also take decisions and actions that are influenced by environmental issues and company waste. Management and company internals need to have a good waste management system. However, before that, providing financial information can be the start of a company's preventive steps. The field of social accounting has the responsibility to provide company financial information properly and correctly, as well as reporting it to management.

The preparation of financial report information must of course be in accordance with the PSAK that applies in Indonesia. According to (Betha & Husaini, 2017) corporate social responsibility can be demonstrated by including environmental accounting practices in the organization. The company applies environmental accounting, meaning that the company participates in efforts to save the earth from damage caused by the company's activities.

According to (Risal et al., 2020) accounting can contribute to environmental conservation by including optional disclosure of environmental costs in financial reports. An accounting system that includes accounts specifically dedicated to environmental costs is referred to as Green Accounting or Environmental Accounting. As stated in the International Guidance Document - Environmental Management Accounting by the International Federation of Accountants (2005:38), environmental costs include costs associated with materials used in product output and non-product output, costs associated with controlling waste and emissions, costs for environmental prevention and management, including other related costs, research and development costs, and intangible costs.

Environmental accounting is an accounting science that has the function of

identifying, recognizing, measuring, assessing, presenting and disclosing environmental costs that arise in the context of environmental management (Sukirman-Suciati, 2019). The aim of environmental accounting is to provide incentives to companies to recognize and integrate all estimates of environmental management and ecological costs that arise from their actions and have negative consequences (Rahim, 2020). Environmental accounting in the field of accounting evaluates the efficiency of environmental conservation efforts by analyzing and categorizing the costs associated with these actions (Haryani et al., 2020).

Applying environmental accounting ideas is a wise decision to reduce costs associated with environmental problems. In reducing costs associated with environmental problems. Efficiency in environmental management can be improved by adopting a cost-benefit perspective, which helps minimize cost leakage and optimize resource utilization. Costs can be reduced and resources can be optimized (Prasetyo & Adi, 2020). Environmental Protection and Management Law no. 32 of 2009 mandates that every company must manage the environment effectively in relation to its commercial operations.

With this government regulation, it is hoped that companies that have not implemented environmental accounting and waste management can immediately implement it. Therefore, the role of the government and society is to continue to supervise and control the waste produced by companies. However, the percentage of companies using environmental accounting increased from 10.4% in 1998 to 20.9% in 1999 and 20.7% in 2000. Of this number, 17.3% had implemented and included environmental accounting, while 34% consider implementing it in the near future (Moedjanarko & Frisko, 2013).

Environmental accounting in accounting reveals the actual costs associated with a company's inputs and processes, ensuring cost effectiveness. In addition,



environmental accounting can be used to measure costs related to quality (Jaya, 2015). The position of environmental costs is part of *Corporate Social Responsibility* which must be budgeted by the company. Environmental costs themselves are not CSR funds that are spent if the company makes a profit.

This means that environmental costs are included as a deduction component from gross profit which will reduce company profits. Recording environmental costs separately by creating a special cost report that clearly refers to the cost classification (Yenti et al., 2020) By implementing environmental accounting, companies can effectively manage and mitigate the release of production waste, thereby preventing environmental pollution around the company (Nilasari, 2014). Apart from that, corporate social responsibility towards the environment and society can certainly improve the company's image for the better, so that the company's sustainability will be better and longer.

Based on the explanation above, researchers conducted research on the topic of environmental cost accounting, especially from a philosophical perspective. This study wants to know how environmental cost accounting research can be applied and what factors influence and are influenced by environmental cost accounting. By gaining an in-depth understanding of environmental cost accounting, this research can provide another additional perspective on the factors that may influence environmental cost accounting with the advancement of refined accounting methodologies.

The formulation of the problem in the research titled "Analysis of the Application of Environmental Cost Accounting" is as follows: First, how is environmental cost accounting implemented in Indonesia? Second, what factors influence and are influenced by environmental cost accounting? The objective of this research is to analyze the application of environmental cost accounting. This research offers several benefits. The theoretical benefits include identifying factors related to

environmental cost accounting. The practical benefits provide insights to practicing accountants on the importance of environmental cost accounting, assist in developing environmental cost accounting practices and budgeting, and offer information to company stakeholders regarding the implementation of sustainability reporting. Academically, this research lays a foundation for future studies in environmental cost accounting and enhances knowledge and understanding in the field. Lastly, for society, this research aims to increase public awareness of environmental issues and assist in monitoring and controlling industrial waste management by companies.

2. Literature Review

2.1 Agency Theory

Jensen & Meckling (1976) describes agency theory as a dynamic between stakeholders (principals) and management (agents) who have different interests in the organization, both of which aim to optimize their respective utility functions. These differences can result in conflict between the two parties. This conflict arises because the interests between the owner and management are not aligned, resulting in managerial decisions that are not in accordance with the interests of the principal. The agency conflict between management and shareholders arises due to activities carried out by management that deviate from the wishes of shareholders (Rahardjo & Wuryani, 2021).

2.2 Legitimacy Theory

Legitimacy Theory Concept Legitimacy theory explains that companies must consistently evaluate whether they comply with societal norms and ensure that their actions are considered acceptable by external parties (legitimized). The postulates of legitimacy theory state that organizations must not only demonstrate their commitment to protecting investors' rights, but also extend their attention to the rights of the general public (Deegan & Rankin, 1997).



Companies believe that they can gain recognition and legitimacy from society or environment by carrying out social disclosures. This, in turn, will improve the company's operations and reputation (Asjuwita & Agustin, 2020). When a company is considered legitimate, its reputation and credibility will increase in the eyes of the public, leading to increased stakeholder trust. Legitimacy can be a means of establishing oneself in an increasingly sophisticated society (Hadi, 2011)

2.3 Stakeholder Theory

Stakeholder theory explains that interested parties have the right to obtain knowledge about company activities in order to be more confident in making their decisions. Stakeholders have the option not to use this knowledge and cannot participate directly in the organization (Deegan & Rankin, 1997). This is because stakeholders are considered to have the capacity to influence, and are susceptible to being influenced by, the company. Therefore, the support provided by stakeholders to the company has a huge influence on the company's survival. Stakeholders, as defined by (Kasali, 2003), are internal and external groups who have an impact on the success of the company and are willing to take risks for the organization.

According to (Agoes & Ardana, 2014) stakeholder theory states that a company's business function goes beyond a limited number of stakeholders. Currently, companies are seen as social institutions that have the potential to provide benefits and welfare for all stakeholders. Stakeholders are individuals or groups who have the ability to influence or be influenced by a company, and they play an important role in determining the company's success. The relationship between stakeholders and the company is reciprocal.

2.4 Environmental Costs

Environmental costs are costs that arise due to inadequate environmental conditions resulting from the company's manufacturing activities. (Winarno, 2007) defines environmental costs as the results of activities

that have the potential to affect environmental quality which must be quantified and considered from both a financial and non-financial perspective. Cost reporting in the report must be categorized according to the cost classification. This will enable the use of environmental cost reports as a means of evaluating a company's operational performance. Especially those that have an impact on the environment (Gunawan, 2012).

Companies must prioritize the assessment and management of environmental costs resulting from their operational activities to achieve a harmonious balance between environmental interests and company interests.

2.5 Environmental Accounting

Environmental accounting involves incorporating the environmental impacts of an event into a company's reports. This practice aims to provide information regarding company performance in terms of environmental preservation and its relationship with the environment (Astuti, 2012). (Winarno, 2007) defines environmental accounting as the integration of accounting practices in government agencies or company accounting to include environmental costs.

The purpose of environmental accounting is as an effort for environmental management, evaluating the efficiency of management activities by classifying environmental management costs. Environmental accounting functions as a means for public communication, which aims to inform the public about the negative impacts of a company's environmental management operations and its results ((Winarno, 2007)). Based on this view, the aim of developing environmental accounting is as a method or instrument for environmental management and as a tool for communicating with the public by including the results of environmental-related events in reports.

According to PSAK No. 1 Paragraph 9 in Financial Accounting Standards, companies have the option to submit environmental reports and value added reports separately from their financial reports. This is particularly



relevant for industries where environmental considerations have a significant impact. Any additional reports are outside the boundaries of Financial Accounting Standards. To ensure that costs associated with environmental accounting are taken into account in the reporting process.

2.6 Environmental Cost Categories

The International Guidance Document for Environmental Management Accounting prepared by IFAC (2005) provides a categorization of environmental costs, as follows:

- 1) The cost of materials used to produce the output of a product. Includes costs associated with acquiring resources that will be converted into finished goods, by-products, and packaging materials.
- 2) Costs associated with materials used to produce output that is not a product. Includes costs associated with acquiring and processing resources and other materials that produce non-product output, such as waste and pollution.
- 3) Expenditures related to managing and reducing waste and emissions. Expenditure factors related to the management, processing and elimination of waste and emissions; expenditure related to remediation and compensation for environmental damage, as well as any expenditure resulting from compliance with relevant government regulations.
- 4) Costs associated with prevention and other forms of environmental management. Includes costs arising from proactive environmental management measures. In addition, these costs also include various costs related to environmental management, such as preparing environmental improvement plans, measuring environmental quality, involving the community, and carrying out other related tasks.
- 5) R&D (Research and Development) costs include costs arising from research and development initiatives related to environmental issues.

- 6) Intangible Costs Include intangible costs both inside and outside the organization. Examples include costs incurred as a result of having to comply with government regulations to prevent potential future environmental problems, costs incurred to uphold a company's reputation, costs incurred to maintain relationships with stakeholders, and external costs.

2.7 Environmental Cost Accounting from a Philosophical Perspective

The development of accounting science from accounting as a work to accounting as a science cannot be separated from the way of thinking/philosophy of science, especially the understanding of the philosophy of logical positivism. At the beginning of its development, accounting was approached normatively, wanting to answer what accounting should do in daily practice. This normative approach has apparently created a gap between what is taught in college and the reality of daily practice in companies.

To overcome this gap, accounting was developed with a positive accounting approach which wanted to descriptively understand the functioning of accounting in real practice (Ghozali, 2004). As humans who live in the world, we are obliged to preserve and protect the place where we live as our environment. The occurrence of damage to the destruction of the environment caused by humans results in the environment being damaged and even beyond repair. The sustainability of the earth and the environment is threatened, and its continuity cannot even be guaranteed for the next generation. So our rational pattern as humans regarding the threat of destruction of the natural environment is the basis that this information must be conveyed, especially to stakeholders.

Environmental accounting costs contained in the budget and financial report information must be incurred as an effort to process waste that will damage the environment. These costs cannot be said to reduce company profits, because the company's



social responsibility is not only towards humans but also the environment. Apart from that, this will ultimately have an impact on the continuity of the company.

2.8 The Qur'anic Perspective on the Environment

Before the emergence of various thoughts and philosophies regarding the beginnings of how humans tried to maintain and care for their homes as their environment well. In the Al-Qur'an there are several verses about how we as humans have an obligation to protect, care for and preserve the natural environment as a form of gratitude for Allah SWT's creation.

وَلَا تُفْسِدُوا فِي الْأَرْضِ بَعْدَ إِكْمَالِهَا كَدُّ لِمُحْسِنِينَ

Meaning: "Do not cause damage to the earth after it has been properly regulated. Pray to Him with fear and hope. Indeed, Allah's mercy is very close to those who do good." (Al-A'raf verse 56)

ظَهَرَ الْفَسَادُ فِي الْبَرِّ وَالْبَحْرِ بِمَا كَانُوا يَรْجِعُونَ

Meaning: "There has been visible damage on land and at sea caused by the actions of human hands. (Through that) Allah makes them feel some of the (consequences of) their actions so that they return (to the right path)." (Ar-Rum verse 41)

3. Research Methodology

The literature review method was chosen for this research, with data collected using Google Scholar by searching the title "Environmental Cost Accounting," which yielded approximately 286,000 articles and journals. After selecting relevant materials, two articles were deemed directly applicable to the research. From the broader search process, the composition of articles was categorized as follows: six articles focused on the application of environmental cost accounting, four on environmental cost accounting as a form of social responsibility, three on environmental cost accounting for waste management, five on the impact of environmental cost accounting on company profits, one on environmental cost accounting's influence on the stock market, and

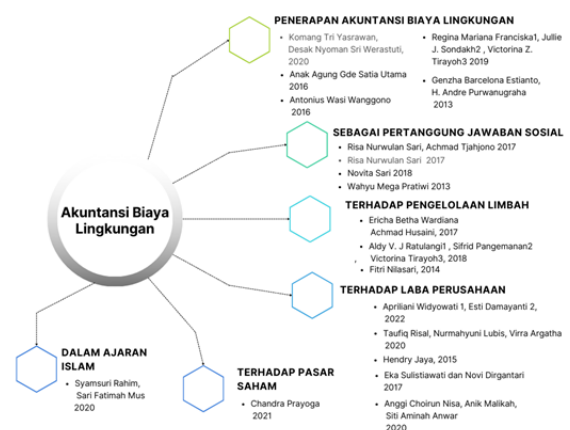
one on environmental cost accounting within Islamic teachings.

The author reviewed and sorted through these articles to ensure their relevance to the research theme and selected the most up-to-date materials, resulting in 20 research articles. Among these, four articles focus on environmental cost accounting as a social responsibility, six on its application, three on its role in waste management, five on its impact on company profits, one on its influence on stock market reactions, and one article discussing the actualization of environmental costs within Islamic teachings.

4. Results and Discussion

After mapping the topics regarding environmental cost accounting, there are six journals of which are relevant to environmental cost accounting in its application, environmental cost reporting, how it is implemented in Indonesia and environmental cost accounting as an information system, four journals that show relevance to environmental cost accounting in social responsibility, three journals research environmental cost accounting on waste management with studies in several companies in Indonesia, five journals research environmental cost accounting how it affects company profits, one journal examines the effect of environmental accounting on stock market reactions how it affects stock returns and one journal regarding the actualization of environmental costs in Islamic teachings, the explanation can be seen in Figure 1

Figure 2





Application of Environmental Cost Accounting. Based on the examination that has been carried out, there are four articles/journals regarding the application of environmental cost accounting. With exploration results, the costs incurred by the company are linked to ecological quality in order to avoid environmental damage due to the production process. Environmental costs are introduced along with accounts related to the production process, especially in the cost of goods sold and administrative and general expenses listed in the company's profit and loss statement and especially in the notes to the financial statements (Saputro, 2016). In addition, research by Estianto, et al (2013) and Franciska, et al (2019) shows that organizations have not prepared financial reports explicitly regarding environmental cost expenditure reports.

Application of Environmental Cost Accounting in Indonesia. Based on the results of the literature review, there is one article/journal about the application of environmental cost accounting in Indonesia. According to Yasrawan, et al (2022), testing the value of the costs and benefits of externalities resulting from industrial processes is difficult to do in green accounting because it is difficult to estimate losses that impact the surrounding community and the natural environment caused by air pollution, liquid waste, nuclear cylinder leaks, and ammonia. . cylinder leaks, or other externalities. Tragically, in practice, some changes often do not report the losses they face, so they cannot report expenses properly.

Application of Environmental Cost Accounting as an Information System . Based on research that has been carried out, there is an article/journal about the application of environmental cost accounting in an information system, the results of research on the National Gas Company (PGN) based on annual financial reports, the company has implemented environmental accounting and explains that environmental costs make a positive contribution to the company shown through the environmental accounting

information system model in the organization (Utama, 2016).

Environmental Cost Accounting as Social Responsibility. Based on the studies that have been carried out, there are four articles/journals regarding the application of environmental cost accounting in social responsibility. Implementing environmental accounting in a company is a form of social responsibility (Wardana, et al., 2016). The results of Sari's (2017) research based on the application of environmental cost accounting studies at RSI Hidayatullah do not present environmental costs clearly.

Environmental costs are presented in the income statement as sub-Patient Service Costs and sub-Administrative & General Costs. Likewise, research by Sari (2018) shows that companies reflect that environmental costs are categorized as a component of production costs because the emergence of waste comes from the production process. Meanwhile, only SAPRAS (Facilities and Infrastructure) costs and Salary & Wage costs are recognized in Sari's (2017) research regarding the identification of environmental costs reported by hospitals. This means it does not support Hansen and Mowen's theory.

Environmental Cost Accounting for Waste Management . Based on the research that has been conducted, there are three articles/journals about the application of environmental cost accounting in waste management. Wardiana (2017), a case study at the Pesantren Baru Sugar Factory, concluded that the classification of environmental cost components was in accordance with the quality model, while at the reporting stage environmental costs (waste) had not implemented the 2007 and 2015 PSAK properly. Ratulangi (2018) case study at the GMIM Pancaran Kasih Hospital explains that they have managed their waste according to regulations, this can be seen from the environmental costs incurred.

The organization has carried out its obligations under Law no. 32 of 2009 concerning environmental protection and



management. Nilasari (2014) concluded that the Djatiroto Sugar Factory had carried out waste management well as well as the accounting treatment stages.

Environmental Cost Accounting for Company Profits . There are five articles/journals about the application of environmental cost accounting for company profits. The environmental cost variable has a negative and significant impact on profitability (ROA) in PROPER participating manufacturing companies listed on the Indonesia Stock Exchange in 2017-2019, according to research by Widyowati (2022), indicating that the higher the environmental costs incurred in implementing social and environmental obligations a company, the greater the influence on the decline in company productivity (ROA).

However, in contrast to Risal's (2020) research, the implementation of cost accounting had a positive impact with an increase in revenue of 21% from 2016-2017. However, the PT Subur Makmur Aracondong Organic Fertilizer Processing Factory experienced a decline in 2016-2017 due to an increase in the cost of goods sold. amounted to 22.1%, and operational expenses incurred also increased by 20% even though revenue only increased 21%. Three other studies argue that environmental costs impact business profits.

Environmental Cost Accounting for the Stock Market . Based on research that has been conducted, there is an article/journal about the application of environmental cost accounting for the stock market. The results of Prayoga's research (2021) show that environmental costs and reporting have an effect on stock returns. This is in line with environmental costs which influence company profitability.

Environmental Cost Accounting in Islamic Teachings. Based on the research that has been carried out, there is an article/journal about the application of environmental cost accounting in Islamic teachings. Rahim's (2020) research results show that environmental concerns include good energy use and waste recycling. Apart from that, managers are also

responsible for the environment in the form of using environmentally friendly energy and recycling. In reporting the close relationship between nature and humans, in Islamic teachings humans must carry out their duties as caliphs to preserve the environment and not damage nature/the environment.

5. Closing

Based on the results of the literature review, it was found that in implementing environmental cost accounting, the costs provided by the organization are linked to avoiding environmental damage caused by the activities carried out by the company. The costs of products, procedures, systems, or facilities that are important in management decision making are essentially environmental costs.

The implementation of environmental cost accounting has had a positive impact on the acceptance and display of the environmental accounting information system model at Perusahaan Gas Negara. This also impacts social responsibility, waste management, corporate profits and the stock market. In the open perspective, managers have a share of ecological costs that includes both human and natural perspectives. By including the value of monotheism, Islamic teachings expect humans to save the climate as one of the caliph's obligations.

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