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Research Paper

The Role of Environmental Accounting on Waste Management

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ABSTRACT

Drawing on the role of environmental accounting in waste management as a social responsibility, the present research aims to assess the agency's awareness and implementation of environmental accounting in its waste management practices. Using a descriptive qualitative approach, data were gathered through in-depth interviews with four environmental agency staffs and observations of financial reports. The findings reveal significant gaps in understanding and applying environmental accounting principles, with a lack of integration into financial management practices. Despite an emerging awareness of its importance, the agency's current practices do not fully align with sustainable financial management, particularly regarding environmental conservation and cost accountability. The study suggests that targeted educational initiatives and systematic integration of environmental accounting are essential to improving both environmental stewardship and financial sustainability within the agency. The implications of these findings highlight the need for structural changes in how environmental considerations are accounted for in public sector financial systems, potentially serving as a model for other municipalities aiming to enhance their environmental responsibility.

Introduction

In recent years, environmental sustainability has gained considerable attention globally, prompting organizations and governments to re-evaluate their practices, especially in waste management. Environmental accounting has emerged as a critical tool in this context, offering a way to integrate environmental costs into financial decision-making (Islam, 2023; Marrone et al., 2020). Despite its growing importance, the adoption of environmental accounting in public sector waste management remains limited, particularly in developing regions (Rahmawati et al., 2024). This research focuses on understanding how environmental accounting is being utilized, if at all, in the waste management practices of Surakarta municipality, a rapidly urbanizing city in central java province Indonesia.

Environmental accounting is defined as the process of incorporating environmental costs into financial management practices, ensuring that environmental impacts are considered in budgeting, planning, and reporting (Deegan, 2014; Liu et al., 2018). Waste management, on the other hand, refers to the collection, transportation, and disposal of waste materials in a manner that minimizes their impact on the environment (Ranjbari et al., 2023). Together, these concepts provide a framework for more sustainable management practices that align financial and environmental goals (Latifah & Soewarno, 2023). However, the effective implementation of environmental accounting in waste management requires a thorough understanding of both financial management principles and environmental conservation strategies.

The urgency of conducting research on the role of environmental accounting in waste management stems from the increasing pressure on municipalities to manage waste sustainably while balancing limited financial resources (O'Dwyer, 2021). As cities expand and populations grow, the volume of waste generated rises, placing additional strain on waste management systems (Nicholls, 2020; Ziabina & Acheampong, 2023). Environmental accounting offers a potential solution by enabling municipalities to quantify the environmental costs associated with waste management and incorporate these costs into their financial decision-making processes (Adler et al., 2022; Albizzati et al., 2024). This research aims to explore how environmental accounting can be integrated into waste management practices to enhance sustainability and accountability.

Environmental accounting has become an essential tool for promoting sustainability within waste management practices, particularly by integrating environmental costs into financial reporting (Mata et al., 2018; Zrnić et al., 2020). Recent studies have demonstrated that environmental accounting can significantly enhance transparency in public sector organizations, making the environmental impacts of waste management more visible to both internal and external stakeholders. For example, research conducted by Amalia (2023) and Fusco and Ricci (2019) emphasizes the role of environmental accounting in identifying and communicating environmental costs, which can lead to more informed decision-making and encourage the adoption of sustainable practices across various sectors. These findings suggest that by making environmental costs more explicit, organizations can better align their financial and environmental goals, ultimately contributing to more effective and sustainable waste management.

However, the implementation of environmental accounting in public sector organizations, especially in waste management, is not without challenges. Several studies have identified key barriers that hinder the adoption of environmental accounting, particularly in developing countries. Qian et al. (2021) highlight the lack of awareness and insufficient training among public sector staff as significant obstacles to the effective implementation of environmental accounting. Additionally, inadequate financial systems and the absence of standardized reporting frameworks further complicate the integration of environmental accounting practices (Gunarathne & Lee, 2023; Tatarinov et al., 2018). These challenges suggest that while the potential benefits of environmental accounting are widely recognized, there is still a considerable gap between theory and practice, particularly in contexts where resources and expertise are limited.

Comparative studies have further shown that regions with higher levels of environmental accounting integration tend to exhibit more effective waste management practices. For instance, Burritt et al. (2020) conducted a cross-country analysis, revealing that municipalities with well-established environmental accounting frameworks are better equipped to manage waste sustainably, compared to those without such systems. These findings are supported by research from Bebbington et al. (2023), who found that cities in Europe with advanced environmental accounting practices demonstrate higher levels of recycling and waste reduction. The literature thus indicates a clear correlation between the integration of environmental accounting and the effectiveness of waste management strategies, underscoring the importance of adopting these practices to enhance environmental performance.

Despite these insights, gaps remain in the literature. For example, while many studies have examined the benefits of environmental accounting, few have focused on its application in the context of waste management within developing countries. Moreover, there is limited research on how environmental accounting can be adapted to the specific financial and environmental challenges faced by municipalities in these regions. This study seeks to address these gaps by examining the current state of environmental accounting in Surakarta's waste management practices, identifying barriers to implementation, and exploring potential strategies for improvement.

The novelty of this research lies in its focus on a developing country context, where the challenges of integrating environmental accounting into waste management are particularly pronounced. Unlike previous studies that have primarily focused on developed regions, this research provides insights into how environmental accounting can be applied in a city like Surakarta, which faces unique financial and environmental pressures. The study also contributes to the literature by exploring the role of external contributions, such as Corporate Social Responsibility (CSR) initiatives, in supporting environmental accounting efforts.

The purpose of this study is to investigate the current state of environmental accounting in the waste management practices of Surakarta municipality, central java province of Indonesia, with the aim of identifying gaps and opportunities for improvement. The research questions guiding this study include: (1) What is the level of awareness and understanding of environmental accounting among the staff of the Surakarta Environmental Agency? (2) How is environmental accounting currently being applied, if at all, in the city's waste management practices? (3) What are the barriers to implementing environmental accounting, and how can they be overcome? The findings of this study are expected to contribute to both theoretical and practical knowledge by providing a deeper understanding of how environmental accounting can enhance waste management practices in a developing country context.

Method

This study employs a descriptive qualitative research design to explore the role of environmental accounting in waste management as a form of social responsibility. Descriptive qualitative research is appropriate for this study because it allows for a comprehensive and in-depth understanding of the processes and practices associated with environmental accounting within a specific context. The qualitative nature of this research enables the exploration of the nuanced roles and impacts of environmental accounting in waste management, capturing the perspectives and experiences of those involved in these processes. The research was conducted at the *Dinas Lingkungan Hidup* (Environmental Agency) in Surakarta Municipality, Central Java Province, Indonesia, which is responsible for implementing environmental policies and managing waste within the region.

The informants for this study were selected using purposive sampling, a technique that involves selecting individuals who are most likely to provide rich, relevant, and diverse information related to the research questions. The informants comprised four staff members from the Environmental Agency, Surakarta Municipality, identified as P1, P2, P3, and P4. These individuals were chosen because of their direct involvement in environmental accounting and waste management practices within the agency. Their positions and responsibilities made them well-suited to provide insights into the application of environmental accounting in waste management and its implications for social responsibility.

Data collection involved two primary methods: interviews and observation. The researchers conducted face-to-face interviews with the four selected informants to gather detailed information about their experiences and perspectives on environmental accounting and its role in waste management. The interviews were semi-structured, allowing for a flexible and in-depth exploration of the topics while ensuring that all relevant themes were covered. In addition to the interviews, the researchers also conducted field observations of financial reports at the Environmental Agency to assess whether environmental accounting principles were being implemented. This combination of interviews and observation provided a robust data set, offering both qualitative insights and tangible evidence of environmental accounting practices.

The data analysis followed a descriptive qualitative approach, which involved organizing and interpreting the data to provide a clear and coherent understanding of the research findings. The analysis was conducted in three stages, as outlined by Miles and Huberman (1984): data reduction, data display, and data verification. During the data reduction phase, the researchers summarized and categorized the data according to key themes related to environmental accounting and waste management. The data were then displayed in a structured format, using sentences and direct quotes to illustrate the key findings. Finally, the data were verified by checking for consistency and coherence, ensuring that the analysis accurately reflected the perspectives and practices observed during the research.

Results

Based on the results of interviews and observation, the results section of this research presents a detailed examination of the Surakarta Environmental Agency's understanding and implementation of environmental accounting, particularly in waste management. The analysis is structured around nine key indicators, each shedding light on different aspects of the agency's awareness, practices, and challenges related to integrating environmental accounting into its operations. To easily understand what have yielded by this research, summary of the findings is presented in Table 1. The findings reveal significant gaps in knowledge and application, highlighting areas where targeted interventions, such as education and systematic integration, are needed to enhance the agency's environmental and financial sustainability.

Table 1. Summary of the findings

Indicator	**Findings**	**Key Quotes**	**Implications**
Understanding of Environmental Accounting	Significant gaps in understanding and awareness of environmental accounting among staff.	"We are not familiar with environmental accounting and feel the need to learn more about it." [P1], "It seems necessary to study what environmental accounting is." [P3]	Need for educational initiatives to build knowledge and awareness.
Implementation of Environmental Conservation	Efforts in waste management aligned with environmental conservation principles, but not systematically informed by environmental accounting.	"Our waste management practices are designed to minimize environmental impact." [P4], "Surakarta City has implemented environmental conservation." [P2]	Opportunity to enhance waste management by integrating environmental accounting practices.
Application in Financial Management	Lack of awareness and integration of environmental accounting in financial practices.	"There has been no introduction or discussion about environmental accounting within our financial practices." [P1]	Need for policy changes and training to introduce environmental accounting.
Methods Used in Waste Management	Various strategies implemented for waste management, but not fully incorporating environmental accounting concepts.	"We conduct studies, socialize, provide training, evaluate, maintain infrastructure, coordinate with stakeholders, and propose budgets to the government." [P4]	Potential to optimize waste management by incorporating environmental accounting.
Existence of Specific Funds for Environmental Costs	Absence of dedicated financial mechanisms for environmental accounting.	"There hasn't been any allocation of specific funds for environmental accounting." [P2], "Our budgeting doesn't include designated funds for	Need to establish specific funds and financial mechanisms aligned with environmental accounting principles.

Indicator	Findings	Key Quotes	Implications
		environmental costs." [P3]	
External Contributions	External stakeholders, especially through CSR, contribute to environmental costs.	"CSR contributions play a significant role in our environmental projects." [P1], "We receive funding from various stakeholders to support our environmental initiatives." [P4]	Need for more robust internal financial mechanisms to complement external contributions for long-term sustainability.
Perceived Importance of Environmental Accounting	Emerging recognition of the importance of environmental accounting.	"After learning about environmental accounting, I believe it is important to implement it." [P3], "Understanding environmental accounting could greatly benefit our waste management practices." [P3]	Growing interest needs to be supported by training and resource investment.
Existence of Specific Financial Reports	Lack of specific financial reporting mechanisms for environmental costs.	"Our current financial reports do not include detailed environmental cost analysis." [P1], "There is a need for more comprehensive financial documentation related to our environmental efforts." [P2]	Need for specialized financial reporting tools to capture and communicate environmental costs.
Challenges in Implementation	Major challenge in implementation is the lack of knowledge and training in environmental accounting.	"Lack of awareness and training are significant barriers." [P3], "Without proper knowledge, it's challenging to implement environmental accounting effectively." [P1]	Addressing the knowledge gap through education is crucial for successful implementation of environmental accounting.

The first indicator examined was the understanding of environmental accounting within the Surakarta Environmental Agency. The research findings indicate a significant gap in the understanding and awareness of environmental accounting among the staff of the Surakarta Environmental Agency. Participant P1 remarked, "*We are not familiar with environmental accounting and feel the need to learn more about it.*" [P1]. This statement underscores the agency's current lack of knowledge about environmental accounting principles and the necessity for educational initiatives to address this deficiency. Similarly, P2 stated, "*Environmental accounting seems to require socialization to be recognized by public entities.*" [P2]. This reflects the broader need for systematic efforts to introduce and integrate environmental accounting into public sector practices. Without such initiatives, the concept remains obscure, hindering its potential impact on waste management and environmental conservation. In a similar direction, P3 added, "*It seems necessary to study what environmental accounting is.*" [P3]. This quote highlights the realization within the agency that there is a knowledge gap that needs to be bridged. The acknowledgment of this gap is a positive step towards eventually implementing environmental accounting in the agency's operations.

The data from these quotations suggest that while there is an emerging awareness of the importance of environmental accounting, there is also a clear recognition that the current level of understanding is insufficient. The emerging awareness among the Surakarta Environmental Agency staff regarding environmental accounting marks an important initial step, yet the prevailing lack of comprehensive understanding poses a significant challenge. This recognition of their knowledge gap indicates a willingness to learn and adapt, which is crucial for the successful implementation of environmental accounting practices. However, without targeted educational programs and socialization efforts, this awareness alone may not translate into effective action. The agency's ability to manage waste and uphold its social responsibility hinges on its capacity to integrate these principles into its operations. Environmental accounting, if fully understood and applied, could serve as a powerful tool to enhance the agency's waste management strategies, align financial practices with environmental goals, and foster greater accountability. The current situation, where this potential remains largely untapped, underscores the urgent need for systematic education and engagement to empower the agency in fulfilling its environmental mandate. By addressing these gaps, the Surakarta Environmental Agency could set a precedent for other public entities in adopting environmentally responsible financial practices.

The second indicator evaluated whether environmental conservation, particularly in waste management, is being effectively implemented by the Surakarta Environmental Agency. Participant P2 noted, "*Surakarta City has implemented environmental conservation.*" [P2]. This indicates that the city's waste management practices are aligned with conservation principles. P3 added, *"We are actively engaged in various environmental conservation efforts, particularly in waste management."* [P3]. Additionally, P4 mentioned, *"Our waste management practices are designed to minimize environmental impact."* [P4]. These statements collectively suggest that the agency is committed to integrating environmental conservation into its waste management strategies.

The findings indicate that the Surakarta Environmental Agency has made considerable strides in incorporating environmental conservation into its waste management efforts. However, while the agency's practices appear to align with conservation principles, the degree to which these practices are systematically informed by environmental accounting is less clear. This gap underscores the potential for further enhancement of waste management strategies through the adoption of environmental accounting practices. By aligning financial management with conservation goals, the agency could not only ensure the sustainability of its waste management efforts but also demonstrate a model of responsible environmental stewardship that other municipalities might follow. Therefore, while the current practices are commendable, there remains an opportunity to strengthen them through the systematic integration of environmental accounting, which would provide a more robust framework for achieving long-term environmental and financial sustainability.

The third indicator focused on the application of environmental accounting in the financial management of Surakarta's government. Participant P3 stated, *"We are not aware of environmental accounting and have not implemented it in our financial systems."* [P3]. Similarly, P1 remarked, *"There has been no introduction or discussion about environmental accounting within our financial practices."* [P1]. P4 added, *"Environmental accounting is not something we have been trained on or have considered in our budgeting processes."* [P4]. These quotes reflect a significant lack of awareness and integration of environmental accounting within the government's financial management, suggesting a substantial gap that needs to be addressed.

The absence of environmental accounting in Surakarta's financial practices indicates that the government's approach to environmental issues, particularly waste management, may not be fully aligned with sustainable financial management principles. The lack of awareness and training among staff highlights the need for educational initiatives and policy changes to introduce and implement environmental accounting. This gap suggests that current financial practices may not be capturing the true environmental costs associated with waste management, potentially leading to inefficiencies and missed opportunities for environmental stewardship. Integrating environmental accounting could provide a more comprehensive framework for financial planning, ensuring that environmental impacts are accounted for and managed more effectively.

The fourth indicator explored the methods used by Surakarta's government in handling waste management. Participant P4 mentioned, *"We conduct studies, socialize, provide training, evaluate, maintain infrastructure, coordinate with stakeholders, and propose budgets to the government and CSR programs."* [P4]. P2 added, *"Our strategies include continuous training and infrastructure maintenance, which are crucial for effective waste management."* [P2]. Additionally, P3 stated, *"We engage with various stakeholders, including the government and private sector, to enhance our waste management efforts."* [P2].

These findings indicate that while Surakarta's government has implemented various strategies to manage waste, these efforts have not yet fully incorporated environmental accounting concepts. The existing waste management practices demonstrate a commitment to environmental conservation, but the lack of integration with environmental accounting suggests that these efforts may not be fully optimized. By incorporating environmental accounting into their financial and operational strategies, the government could better align their waste management practices with broader environmental and financial sustainability goals. This integration would not only enhance the effectiveness of waste management but also ensure that the associated environmental costs are fully recognized and addressed within the financial management system.

The fifth indicator investigated the existence of specific funds related to environmental accounting within Surakarta's financial management. Participant P1 commented, *"We are not aware of any special accounts for waste management."* [P1]. P2 echoed this by stating, *"There hasn't been any allocation of specific funds for environmental accounting."* [P2]. P3 added, *"Our budgeting doesn't include designated funds for environmental costs."* [P3]. These quotes reveal a significant gap in Surakarta's financial strategy, highlighting the absence of a dedicated financial mechanism for environmental accounting. The lack of specific funds indicates that environmental considerations are not being systematically integrated into the city's financial planning. This gap suggests that while the agency may be engaging in waste management activities, these efforts are not being financially supported in a way that aligns with environmental accounting principles. Implementing a structured financial approach with dedicated funds could ensure more sustainable and accountable waste management practices.

The sixth indicator assessed the role of external contributions in funding environmental costs. Participant P2 noted, *"There are external parties contributing to environmental costs, such as CSR."* P4 added, *"We receive funding from various stakeholders to support our environmental initiatives."* [P4]. P1 stated, *"CSR contributions play a significant role in our environmental projects."* [P1]. These findings demonstrate the involvement of external stakeholders, particularly through Corporate Social Responsibility (CSR) initiatives, in supporting the city's environmental efforts. The reliance on external funding indicates that the agency recognizes the importance of collaborative efforts in addressing environmental challenges. However, while these contributions are valuable, they also highlight a potential vulnerability in the agency's financial independence. To ensure sustainable funding, the agency may need to develop more robust internal financial mechanisms that complement external contributions, thereby securing long-term support for its environmental initiatives.

The seventh indicator explored the perceived importance of environmental accounting. Participant P3 remarked, *"After learning about environmental accounting, I believe it is important to implement it."* [P3]. P2 stated, *"Understanding environmental accounting could greatly benefit our waste management practices."* [P3]. P4 noted, *"Environmental accounting could enhance our financial reporting and accountability."* [P4]. These data indicate a growing recognition within the agency of the value that environmental accounting could bring to their operations. The participants' statements suggest that while there has been limited exposure to environmental accounting, there is an emerging interest in its potential benefits. This newfound awareness reflects a shift in perspective, where environmental accounting is seen not just as a technical requirement but as a strategic tool that can improve both environmental stewardship and financial transparency. To capitalize on this interest, the agency will need to invest in training and resources to build capacity in environmental accounting, ensuring that its principles are effectively implemented.

The eighth indicator examined the existence of specific financial reports for environmental costs related to waste management. Participant P4 noted, *"We do not know about any special financial reports for waste management costs."* [P4]. P1 stated, *"Our current financial reports do not include detailed environmental cost analysis."* [P1]. P2 mentioned, *"There is a need for more comprehensive financial documentation related to our environmental efforts."* [P2]. These findings underscore the lack of specific financial reporting mechanisms dedicated to environmental costs within the agency. The absence of detailed reports suggests that environmental costs are not being fully captured or communicated in the agency's financial documentation. This gap highlights the need for the development of specialized financial reporting tools that can provide a clearer picture of the environmental costs associated with waste management. By implementing such tools, the agency could enhance its financial transparency and ensure that environmental costs are adequately reflected in its financial management processes.

The ninth indicator explored the challenges faced in implementing environmental accounting. Participant P2 stated, *"We do not know about environmental accounting."* [P2]. P3 added, *"Lack of awareness and training are significant barriers."* [P3]. P1 noted, *"Without proper knowledge, it's challenging to implement environmental accounting effectively."* [P1]. These statements reveal that the primary challenge in implementing environmental accounting is the lack of knowledge and understanding among the agency's staff. The absence of training and awareness creates a significant barrier to the adoption of environmental accounting practices. This challenge underscores the need for comprehensive educational initiatives to build capacity in environmental accounting. By addressing this knowledge gap, the agency can overcome the obstacles to implementation and begin to integrate environmental accounting into its financial and operational strategies. Such efforts are essential to ensuring that the agency can fulfill its social responsibility and manage waste in a more sustainable and accountable manner.

The triangulation process, involving the 2021-2023 Surakarta Regional Government Financial Report (henceforth LKPD), served as a crucial step in validating the interview data obtained during the research. By cross-referencing the financial report with the insights from the interviews, the researchers aimed to corroborate the claims made by the Surakarta Environmental Agency staff regarding the non-existence of environmental accounting practices within the city's financial management system. The findings from the LKPD were telling; there was a complete absence of any disclosure or mention of environmental accounting, which not only confirmed the agency's lack of awareness but also highlighted a significant gap in the city's approach to financial management as it pertains to environmental sustainability. This lack of integration underscores the need for structural changes in how environmental considerations are accounted for within the city's financial systems.

The absence of environmental accounting practices in the LKPD report reinforces the notion that environmental issues, particularly those related to waste management, are not being financially quantified or managed within Surakarta's broader financial framework. This omission is critical because it suggests that environmental costs, such as those associated with waste management, are potentially overlooked or underrepresented in the city's budgeting and financial planning processes. Without formal recognition and reporting of these costs, the city may struggle to make informed decisions that balance environmental and financial sustainability. The triangulation results point to an urgent need for the integration of environmental accounting into the city's financial systems, ensuring that environmental impacts are transparently and comprehensively documented, thereby enhancing accountability and enabling more strategic resource allocation in support of environmental goals.

To sum up, the findings from this research reveal a clear gap in the Surakarta Environmental Agency's understanding and implementation of environmental accounting. Despite emerging awareness of its importance, there is a lack of comprehensive knowledge and application, particularly in financial management and waste management practices. The results underscore the need for targeted educational initiatives and the development of specific financial mechanisms to integrate environmental accounting effectively. By addressing these gaps, the agency could improve its environmental stewardship and set a model for sustainable financial practices in public sector management.

Discussion

The findings of this study highlight significant gaps in the understanding and implementation of environmental accounting within the Surakarta Environmental Agency, particularly in relation to waste management. These gaps are not just academic but have practical implications for how the agency manages its environmental responsibilities. The lack of awareness and knowledge about environmental accounting among the staff underscores the need for targeted educational initiatives. This finding suggests that without a foundational understanding of environmental accounting, it is unlikely that the agency will be able to implement these practices effectively, thereby missing an opportunity to improve both environmental stewardship and financial management.

The absence of environmental accounting in the financial practices of Surakarta's government is particularly concerning. Environmental accounting offers a framework for integrating environmental costs into financial decision-making, which is crucial for sustainable development (Mahmood et al., 2018; Romero-Carazas, 2024). The study's findings indicate that the current financial management practices do not capture the true environmental costs associated with waste management. This gap may lead to inefficiencies and missed opportunities for more sustainable waste management practices (Agyemang et al., 2024). The lack of specific funds for environmental accounting further exacerbates this issue, as it suggests that environmental considerations are not prioritized in the city's financial planning (Egedegu et al., 2024).

In terms of waste management practices, while the agency has implemented various strategies that align with environmental conservation principles, these efforts are not systematically informed by environmental accounting (Koapaha, 2024). This gap reveals a disconnect between the agency's operational strategies and its financial management practices. The integration of environmental accounting could enhance the effectiveness of these strategies by providing a more comprehensive understanding of the environmental and financial impacts of waste management (Rahmawati et al., 2024; Shmarova & Ignatova, 2023). This would enable the agency to make more informed decisions that balance environmental sustainability with financial efficiency.

The involvement of external contributions, particularly through Corporate Social Responsibility (CSR) initiatives, indicates that the agency recognizes the importance of collaborative efforts in addressing environmental challenges. However, the reliance on external funding also highlights a potential vulnerability in the agency's financial independence. While CSR contributions are valuable, they should complement, not replace, robust internal financial mechanisms (Angotti et al., 2024). The lack of internal financial support for environmental accounting suggests that the agency may struggle to sustain its environmental initiatives in the long term without developing more secure and independent funding sources (Gunarathne et al., 2023).

The growing awareness of the importance of environmental accounting among the agency's staff is a positive development, but it must be supported by practical steps towards implementation. The findings suggest that while there is an interest in the potential benefits of environmental accounting, this interest has not yet translated into action. The agency must invest in training and resources to build capacity in environmental accounting, ensuring that these principles are effectively integrated into its operations (Ranjbari et al., 2023). This would not only improve the agency's environmental and financial management practices but also demonstrate a commitment to sustainability that could serve as a model for other municipalities (Adler et al., 2022).

In conclusion, the results of this study contribute significantly to both theoretical and practical fields. Theoretically, they underscore the importance of integrating environmental accounting into public sector financial management as a means of achieving sustainable development. Practically, the study highlights the urgent need for targeted educational initiatives and the development of specific financial mechanisms to support the implementation of environmental accounting in Surakarta's government. By addressing these gaps, the Surakarta Environmental Agency has the potential to set a precedent for other public entities, demonstrating how environmental and financial sustainability can be achieved through the systematic integration of environmental accounting practices.

Conclusion

This research aimed to examine the understanding and implementation of environmental accounting within the Surakarta Environmental Agency, with a particular focus on waste management. The findings reveal significant gaps in the agency's knowledge and application of environmental accounting, underscoring the need for educational initiatives and the integration of these principles into their financial management practices. The study contributes to the theoretical understanding of environmental accounting in the public sector and highlights practical steps that can enhance the agency's environmental and financial sustainability. However, the research has limitations that should be acknowledged. The study was conducted within a specific municipal context, which may limit the generalizability of the findings to other regions. Additionally, the reliance on interview data, while insightful, may not capture the full complexity of the agency's practices. Future research should consider a broader geographical scope and incorporate quantitative methods to complement the qualitative findings. Practical suggestions for future studies include exploring the development of specific financial mechanisms for environmental accounting and assessing the long-term impact of educational initiatives on the integration of these practices in public sector management.

Authors' Declaration

The authors made substantial contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation and discussion of results. The authors read and approved the final manuscript.

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