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IMPLEMENTING ENVIRONMENTAL MANAGEMENT ACCOUNTING INFORMATION SYSTEMS TO STRENGTHEN ESG PRACTICES AND BUSINESS SUSTAINABILITY: AN INTERNATIONAL COMMUNITY ENGAGEMENT AT NUTSAFIR COOKIES SME, INDONESIA

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Abstract

The growing emphasis on Environmental, Social, and Governance (ESG) performance has encouraged export-oriented Small and Medium Enterprises (SMEs) to strengthen sustainability governance through more comprehensive accounting practices. Nevertheless, many SMEs still face challenges in integrating environmental and social information into their accounting systems, limiting their ability to evaluate sustainability performance and communicate ESG achievements to stakeholders. This international community engagement program was conducted at Nutsafir Cookies SME, Indonesia, to develop and implement an Environmental Management Accounting Information System (EMAIS) that supports ESG practices and sustainable business management. The program employed a participatory community engagement approach consisting of needs assessment, system design, capacity-building workshops, technical training, mentoring, and implementation evaluation. The developed EMAIS integrates financial transactions with environmental and ESG-related information, enabling the systematic recording of environmental costs, monitoring of sustainability indicators, and preparation of sustainability-related information for managerial decision-making. The implementation enhanced participants' competencies in Environmental Management Accounting and ESG practices, improved the quality of environmental information management, and strengthened organizational transparency and accountability. In addition, the integrated accounting information system supported more effective resource management, facilitated sustainability reporting, and reinforced long-term business competitiveness. The program demonstrates that integrating Environmental Management Accounting with digital accounting technologies provides an effective and replicable approach for strengthening ESG implementation and sustainability governance among export-oriented SMEs.

Keywords: Environmental Management Accounting Information System; Environmental Management Accounting; ESG Practices; Sustainability Governance; Export SMEs.

INTRODUCTION

Small and Medium Enterprises (SMEs) play a significant role in promoting inclusive economic growth, employment, and innovation. As sustainability becomes an increasingly important consideration in global markets, SMEs are expected to adopt business practices that balance economic performance with environmental responsibility and social accountability. The Environmental, Social, and Governance (ESG) framework has emerged as an important benchmark for evaluating corporate sustainability and long-term competitiveness, particularly for export-oriented enterprises that must comply with international market expectations (OECD, 2023; IFAC, 2023).

Environmental Management Accounting (EMA) has been recognized as an effective management tool for supporting sustainable business practices by identifying, measuring, and analyzing environmental costs associated with organizational activities. Unlike conventional accounting systems, EMA integrates financial and environmental information to improve resource efficiency, reduce environmental impacts, and support strategic decision-making. Previous studies

have shown that the implementation of Environmental Management Accounting contributes positively to environmental performance, green innovation, and organizational sustainability (Burritt & Schaltegger, 2014; Qian et al., 2018; Huynh & Nguyen, 2024).

Recent developments in digital accounting technologies have further enhanced the implementation of Environmental Management Accounting through Environmental Management Accounting Information Systems (EMAIS). These systems enable organizations to integrate environmental information with accounting data, improve information quality, facilitate sustainability reporting, and support ESG performance evaluation. Digital accounting technologies therefore play an important role in strengthening organizational transparency and sustainability governance (Moll & Yigitbasioglu, 2019; Antonini, 2024; Gerged et al., 2024).

Nutsafir Cookies SME has demonstrated a commitment to sustainable business through the use of local agricultural resources, community empowerment, and export-oriented production. However, environmental cost information and ESG-related activities have not yet been systematically integrated into its accounting system, limiting the company's ability to evaluate sustainability performance and communicate ESG achievements. Therefore, this international community engagement program aims to implement an Environmental Management Accounting Information System (EMAIS) that integrates Environmental Management Accounting and ESG practices to strengthen business sustainability and provide a practical model that can be replicated by other export-oriented SMEs.

METHODS

This international community engagement program was conducted at Nutsafir Cookies SME, operating under CV. Safir Indo Raya in Mataram, West Nusa Tenggara, Indonesia. The program employed a participatory community engagement approach, actively involving the SME owner and employees throughout the planning, implementation, and evaluation stages. This approach ensured that the developed Environmental Management Accounting Information System (EMAIS) addressed the enterprise's operational needs while strengthening its Environmental, Social, and Governance (ESG) practices and sustainability management.

The program was implemented through four sequential stages. First, a preliminary assessment was conducted through observations, interviews, and document reviews to identify existing accounting practices, environmental management activities, and ESG-related challenges. The assessment revealed that environmental costs were not systematically recorded, ESG activities were documented only descriptively, and the existing accounting system focused primarily on financial transactions.

Second, capacity-building and technical training were organized to enhance participants' understanding of Environmental Management Accounting (EMA), ESG principles, sustainability indicators, and digital accounting systems. Interactive workshops and practical sessions introduced methods for identifying environmental costs, classifying ESG information, and integrating sustainability data into accounting processes.

Third, the Environmental Management Accounting Information System (EMAIS) was developed and implemented through a participatory process involving system design, customization, testing, and mentoring. The system was designed to integrate financial transactions with environmental and ESG information, enabling users to record environmental expenditures, monitor sustainability indicators, and generate management reports that support evidence-based decision-making.

Finally, monitoring and evaluation were conducted to assess system utilization, participants' competencies, and the effectiveness of the implemented program. Evaluation activities included direct observation, interviews, practical system assessments, and feedback discussions to identify improvements in accounting practices, ESG implementation, and sustainability management.

Based on the preliminary assessment, three major problems were identified and addressed through targeted interventions, as presented in Table 1.

Table 1. Problems Identified and Proposed Solutions

NO	Problems Identified	Proposed Solutions
1	Environmental costs and resource utilization were not systematically identified or integrated into the accounting system, limiting the availability of information for sustainability management	Develop and implement an Environmental Management Accounting Information System (EMAIS) that integrates financial and environmental information into a unified digital accounting platform.
2	ESG-related activities were implemented but not measured or documented systematically, making it difficult to evaluate sustainability performance and communicate ESG achievements to stakeholders.	Develop ESG indicators and integrate ESG-related information into the Environmental Management Accounting Information System to support sustainability monitoring and reporting.
3	Limited knowledge and digital competencies hindered the effective implementation of Environmental Management Accounting and the utilization of sustainability information for managerial decision-making	Conduct capacity-building workshops, technical training, and continuous mentoring to strengthen participants' competencies in Environmental Management Accounting, ESG practices, and digital accounting technologies.

The implementation of these interventions was expected to improve the SME's capability to manage environmental and ESG information systematically, strengthen sustainability governance, enhance accounting transparency, and support long-term business sustainability through the effective utilization of the Environmental Management Accounting Information System.

RESULTS AND DISCUSSION

The implementation of the international community engagement program resulted in significant improvements in the sustainability management practices of Nutsafir Cookies SME. Through the collaborative development of an Environmental Management Accounting Information

System (EMAIS), the enterprise strengthened its capability to integrate financial, environmental, and ESG-related information into a single management system. The participatory implementation process enabled the partner not only to adopt a new accounting application but also to improve organizational awareness regarding sustainability-oriented business management. The overall outcomes of the program are presented in Table 2.

Table 2. Outcomes of the Environmental Management Accounting Information System Implementation

Community Engagement Activities	Expected Outcomes	Achieved Results
Preliminary assessment and sustainability mapping	Identification of accounting and ESG-related needs	Baseline information was obtained regarding environmental cost management, ESG practices, and digital accounting readiness.
Development of Environmental Management Accounting Information System	Integration of financial, environmental, and ESG information	A digital accounting system capable of recording environmental expenditures and sustainability information was successfully implemented.
Capacity-building workshops and technical training	Improved understanding of Environmental Management Accounting and ESG concepts	Participants demonstrated improved competencies in identifying environmental costs, applying ESG indicators, and operating the developed system.
Technical mentoring and implementation assistance	Sustainable utilization of the accounting information system	Participants were able to utilize EMAIS independently to support sustainability monitoring and managerial decision-making.
Monitoring and evaluation	Assessment of implementation effectiveness	The enterprise showed improved accounting transparency, better environmental information management, and stronger sustainability governance.

CONCLUSION

This international community engagement program demonstrates that strengthening sustainability within SMEs requires more than the adoption of digital accounting tools; it requires the integration of environmental management accounting, ESG practices, and organizational learning into everyday business operations. The participatory development of the Environmental Management Accounting Information System (EMAIS) enabled Nutsafir Cookies SME to transform sustainability-related activities into measurable and manageable organizational information.

The integration of financial records with environmental and ESG information provided a stronger foundation for managerial planning, performance evaluation, and business transparency. Rather than functioning solely as an accounting application, the developed system became a decision-support tool that encourages resource efficiency, improves organizational accountability, and promotes sustainability-oriented governance. At the same time, the capacity-building activities

increased participants' confidence in utilizing sustainability information for continuous business improvement.

An important contribution of this community engagement program lies in its collaborative implementation model, where system development, knowledge transfer, and organizational mentoring were carried out simultaneously. This approach facilitated greater acceptance of the new system and encouraged the institutionalization of sustainability practices within the enterprise. The experience indicates that successful digital transformation in SMEs depends not only on technology adoption but also on the readiness of human resources and organizational commitment to sustainability.

The developed EMAIS model offers practical implications for other export-oriented SMEs seeking to improve ESG implementation and respond to increasing sustainability requirements in global markets. Future programs should focus on expanding the application of integrated sustainability accounting systems across different business sectors while evaluating their long-term contribution to organizational resilience, ESG performance, and sustainable value creation.

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