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ACHIEVING ENVIRONMENTAL PERFORMANCE THROUGH ENVIRONMENTAL MANAGEMENT ACCOUNTING AND INDIVIDUAL FACTORS: A LITERATURE BASED VIEW

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ABSTRACT
This study reviews the recent literature on the relationship between Environmental Management Accounting (EMA), Organizational Citizenship Behavior for the Environment (OCBE), and Environmental Performance (EP). Using the literature review approach, empirical peer-reviewed articles published between 2020 and 2025 were systematically identified, screened, and analyzed. A qualitative synthesis was conducted focusing on research objectives, methodologies, variables studied, contexts, and key findings. The review reveals that EMA functions not only as an accounting tool but also as a strategic enabler that, particularly when combined with human resource and managerial practices, stimulates OCBE and thereby improves EP. OCBE consistently emerges as a mediating mechanism that translates organizational systems into pro-environmental behaviors and performance outcomes, while EP contributes to corporate reputation, social legitimacy, and competitive advantage.

Keywords: Environmental Performance, Individual Factor, Accounting

INTRODUCTION

The utilization of green resources and investment in green accounting systems has become a growing concern among practitioners seeking to identify sources of competitive advantage for their companies, as the implementation of green accounting has significantly improved corporate sustainability (Dhar et al., 2022). Environmental accounting is defined as an instrument that aims to assist companies in managing environmental performance and reporting environmental information to internal and external stakeholders (Albelda, 2011). Green accounting integrates environmental costs into the traditional accounting framework, enabling companies to take into account their ecological impact and fulfill their social responsibility obligations (YELGEN, 2022). This implies the need for ongoing research into accounting methodologies and how to encourage employees to actively and voluntarily engage in helping organizations implement green accounting.

Environmental Management Accounting (EMA) is the practice of managing economic-environmental performance through the development and implementation of accounting systems that capture costs, benefits, material/energy flows, and non-financial information for internal decision-making. EMA also encourages better reporting to stakeholders. In other words, EMA complements financial accounting with an environmental cost-benefit lens so that investment, operational, and process design decisions are more “climate-friendly” as well as economical (Environmental Management Accounting: International Guidance Document, 2005). Recent reviews and studies show that EMA is positively associated with organizational/environmental performance, often mediated by green process innovation and influenced by institutional pressure.
The implementation of EMA will not be effective without the support of individual behavior within the organization. This emphasizes the importance of Organizational Citizenship Behavior for the Environment (OCBE), which is the voluntary behavior of employees in supporting sustainable environmental practices (Boiral & Paillé, 2012). This behavior plays an important role in strengthening a company's Environmental Performance (EP), which is a key indicator of success in managing environmental impacts. At the same time,

a meta-analysis of employee green behavior (EGB) confirms that individual factors such as personal values, personality, perceptions of organizational support, and leadership correlate with green behavior in the workplace, which in turn impacts environmental performance (Barani et al., 2025).

Many EMA studies emphasize pressure from institutions, systems, or process innovations, but few model micro-mechanisms (individual factors such as pro-environmental values, intrinsic or extrinsic motivation, perceptions of fairness, and task autonomy) as reinforcers of the relationship between EMA and environmental performance (EP). There are meta-analyses of Employee Green Behavior, but they are rarely integrated directly into accounting and operational EMA frameworks (Barani et al., 2025). Recent evidence suggests that external factors typically play an important role in shaping employees' environmental behavior, but there is still little research linking EMA-based incentive structures, such as profit sharing from ecological efficiency, to measurable behavioral changes and EP achievement (Liaquat et al., 2024).

LITERATURE REVIEW

Environmental Performance (EP)

Currently, many organizations in major industries are implementing strategic workforce development programs to improve competitiveness. The public at large believe that organizations that care about the environment are too expensive. However, other experts believe that consumers and markets place a higher value on organic organizations, leading to increased environmental productivity and business growth (Rodríguez-Antón et al., 2012) (Chaklader & Gulati, 2015). The successful implementation of policies and activities in preserving ecological sustainability and safeguarding human health is referred to as environmental performance. Environmental Performance is a company's ability to reduce negative environmental impacts, comply with regulations, and create sustainable improvements (Lisi, 2015; Roscoe et al., 2019).

It is a crucial metric for evaluating how effectively nations or businesses fulfill their environmental obligations. The integration of green accounting practices leads to better energy efficiency and overall environmental performance, which can enhance a company's reputation and competitive advantage. Green accounting significantly improves environmental performance by promoting sustainable practices within organization (Wu et al., 2025). (Roscoe et al., 2019) details EP indicators, including: 1). Significant reduction in environmental incidents; 2). Improvement of recycling programs; 3). Positive perception from the surrounding community; 4). Independent environmental audits; 5). Energy and resource consumption efficiency. Referring (Anwar et al., 2020) (Larrán Jorge et al., 2016) Environmental performance dimensions included environmental policy and management, reducing energy consumption, reducing water consumption, waste management, reducing pollution, compliance with normative, biodiversity, and, environmental awareness, and research

Environmental Management Accounting (EMA)

Recent studies show that consistent implementation of EMA can encourage sustainable practices in companies. They found that EMA positively affects waste reduction and resource efficiency in the manufacturing industry. Although the main purpose of EMA practices is to provide environmental information for business strategies also be used for other purposes, such as external reporting (Tien & Niap, 2006). It also (Bui & De Villiers, 2018) emphasizes that EMA plays an important role in strengthening corporate sustainability strategies through transparent environmental reporting.

Environmental management accounting and other organizational information systems are helpful for tracking financial and environmental performance and for providing information on environmental expenses. Research results in various research contexts and business sectors have established that EMA is related to environmental performance and financial

performance (Deb et al., 2023) EMA has an impact on financial efficiency and environmental efficiency (Le et al., 2019). EMA has a positive and significant impact on environmental performance (Zandi et al., 2019)

Organizational Citizenship Behavior for Environment (OCBE)
OCBE refers to voluntary employee behavior that supports environmental protection outside of formal job descriptions. OCBE is an essential factor for the successful implementation of environmental management systems and integrating environmental policies with workplace practices. OCBE has a positive influence on environmental performance (Anwar et al., 2020).

OCBE is defined as voluntary employee behavior that contributes to environmental sustainability even though it is not explicitly regulated in formal job descriptions (Saputro & Nawangsari, 2021). (Boiral & Paillé, 2012) Dividing OCBE into three dimensions: (1) Eco-initiative: employee initiatives in developing environmentally friendly solutions, (2) Eco-helping: willingness to assist colleagues in carrying out environmental tasks, (3) Eco-civic engagement: active participation in the organization's environmental activities.

METHODS

The method used in this study is a systematic literature review (SLR), which is a structured approach to identifying, evaluating, and analyzing the results of previous studies relevant to the topics of Environmental Management Accounting (EMA), Organizational Citizenship Behavior for the Environment (OCBE), and Environmental Performance (EP). The purpose of this method is to gain a comprehensive understanding of the interrelationships between variables and to identify research gaps. The article search process was conducted by accessing reputable international journal databases such as: Scopus, Web of Science, Science Direct, Emerald Insight, Wiley Online Library. Article Selection Criteria: 1) Empirical, peer-reviewed journal articles; 2) Published between 2020 and 2025; 3) Focus on the relationship between Environmental Management Accounting (EMA), Organizational Citizenship Behavior for the Environment (OCBE), and Environmental Performance (EP), either directly or indirectly. Tale 1 presents the studies that met the inclusion criteria and were included in the analysis stage.

RESULTS

Overarching pattern
Across the reviewed empirical studies, a clear pathway emerges: Environmental Management Accounting (EMA) supports organizational processes and capabilities that stimulate Organizational Citizenship Behavior for the Environment (OCBE), which in turn drives improvements in Environmental Performance (EP). Several studies also show that EMA contributes directly to transparency and strategy (reporting, green innovation) and that EP yields reputational and competitive benefits.

Key themes
EMA as an enabler of environmental behavior and outcomes: 1) Evidence: Zandi et al. (2019), Yusliza et al. (2020), Zhang et al. (2023), Bui & Villiers (2022); 2) Interpretation: EMA does more than produce numbers — it restructures information flows, clarifies environmental costs and benefits, and supports managerial decision-making. These informational and managerial functions create the conditions (awareness, resources, managerial signals) that encourage employees to enact pro-environmental discretionary behaviors (OCBE) and stimulate green innovation that improves EP.

OCBE as a mediator between organizational systems and EP. Evidence: Zhang et al. (2023), Anwar et al. (2020) (Green HRM → OCBE → EP), Paillé et al. (2022). Interpretation: Multiple studies identify OCBE as a behavioral mechanism that translates

systems and practices (EMA, Green HRM, managerial signals) into on-the-ground environmental outcomes. OCBE appears to operate as both a direct contributor to performance and a mediator amplifying the impact of structural interventions.

Complementary roles of HRM and organizational practices Evidence: Anwar et al. (2020) demonstrates Green HRM's role; other studies implicitly show managerial and reporting systems' effects (Bui & Villiers, Zandi et al.). Interpretation: EMA and Green HRM are complementary: EMA supplies environmental information and measurement systems, while HRM shapes employee capabilities, motivation, and opportunities to act. Interventions that combine information systems with HR practices are therefore more likely to produce sustained OCBE and better EP.

Organizational outcomes and external legitimacy. Evidence: Akhtar et al. (2021), Nguyen et al. (2023), Bui & Villiers (2022). Interpretation: Improved EP yields reputational gains, market trust, and competitive advantage. EMA and OCBE thus have downstream strategic consequences beyond operational or compliance benefits — they contribute to external legitimacy and firm value.

Sectoral and regional variation. Evidence: Studies span SMEs in Indonesia (Zandi), manufacturing in Malaysia/China (Yusliza, Zhang), higher education in Malaysia (Anwar), service firms in France (Paillé), and public firms in Vietnam (Nguyen). Interpretation: While the general EMA→OCBE→EP pathway is consistent, the relative strength and manifestation of these relationships depend on sectoral features (e.g., operational complexity in manufacturing, stakeholder pressure in public firms) and regional regulatory and cultural contexts.

Table 1. Literature Review

Author(s) & Year	Main Variables	Research Context	Key Findings
Zandi et al. (2019)	EMA, Knowledge Transfer (KTR), Green Innovation (GIN), Environmental Performance (EPR)	SMEs in Indonesia	EMA has a positive and significant effect on KTR, GIN, and EPR.
(Yusliza et al., 2020)	EMA → OCBE	Manufacturing firms, Malaysia	EMA enhances environmental awareness among employees and strengthens OCBE.
Anwar et al. (2020)	Green HRM Practices → OCBE → Environmental Performance	University campus, Malaysia (higher education context)	Green HRM practices (grounded in the AMO framework) positively affect OCBE among academic staff, which in turn significantly improves environmental performance.
(Akhtar et al., 2021)	Environmental Performance (EP)	Multinational companies, South Asia	Higher EP elevates corporate reputation and enhances social legitimacy.
Paillé et al. (2022)	OCBE → EP	Service firms, France	OCBE plays a vital role in the effectiveness of environmental strategies.
Bui & Villiers (2022)	EMA	Global sustainability reporting	EMA enhances transparency in sustainability reporting and strengthens sustainability strategies.
Zhang et al. (2023)	EMA → OCBE → EP	Manufacturing firms, China	OCBE significantly mediates the relationship between EMA and EP.
Nguyen et al. (2023)	Environmental Performance (EP)	Public companies, Vietnam	EP contributes to market trust and competitive advantage.

Source: primary data processed (2025)

Methodological observations and limitations. Dominance of quantitative survey designs with SEM/PLS-SEM: Most empirical evidence relies on cross-sectional surveys and structural equation modeling (Zandi, Yusliza, Zhang, Anwar). This provides consistent tests of mediation but limits causal inference. Limited longitudinal or experimental evidence: Few studies track temporal changes after interventions, reducing ability to claim causality or long-term effectiveness. Heterogeneous operationalization of EMA and OCBE: Measurement items and constructions vary across studies, complicating direct comparison and meta-analytic synthesis. Context concentration in Asia: A notable number of empirical studies come from Southeast and East Asia, which suggests cultural/regulatory clustering and the need for broader geographic validation.

CONCLUSION

The reviewed literature consistently demonstrates that Environmental Management Accounting (EMA) extends beyond its traditional role as an accounting tool to function as a strategic enabler that, when integrated with human resource and managerial practices, fosters Organizational Citizenship Behavior for the Environment (OCBE) and, in turn, enhances Environmental Performance (EP). This relationship is best understood as a multi-level and dynamic process in which accounting practices provide the informational and managerial foundation that empowers pro-environmental behaviors, and these behaviors subsequently generate outcomes with both ecological and strategic value, such as improved sustainability, organizational legitimacy, and competitive advantage.

REFERENCES

Akhtar, R., Sultana, S., Masud, M. M., Jafrin, N., & Al-Mamun, A. (2021). Consumers' environmental ethics, willingness, and green consumerism between lower and higher income groups. *Resources, Conservation and Recycling*, *168*, 105274. https://doi.org/10.1016/J.RESCONREC.2020.105274.

Yusliza, M. Y., Yong, J. Y., Tanveer, M. I., Ramayah, T., Noor Faezah, J., & Muhammad, Z. (2020). A structural model of the impact of green intellectual capital on sustainable performance. *Journal of Cleaner Production*, *249*, 119334. https://doi.org/10.1016/J.JCLEPRO.2019.119334.

Albelda, E. (2011). The role of management accounting practices as facilitators of the environmental management: Evidence from EMAS organisations. *Sustainability Accounting, Management and Policy Journal*, *2*(1), 76–100. https://doi.org/10.1108/20408021111162137

Anwar, N., Nik Mahmood, N. H., Yusliza, M. Y., Ramayah, T., Noor Faezah, J., & Khalid, W. (2020). Green Human Resource Management for organisational citizenship behaviour towards the environment and environmental performance on a university campus. *Journal of Cleaner Production*, *256*. https://doi.org/10.1016/j.jclepro.2020.120401

Barani, O., Ahmed, A. D., Joshi, M., & Asiaei, K. (2025). How environmental management accounting drives performance: a meta-analysis considering national EMA maturity. *Journal of Accounting Literature*, *47*(5), 416–443. https://doi.org/10.1108/JAL-01-2025-0033

Boiral, O., & Paillé, P. (2012). Organizational Citizenship Behaviour for the Environment: Measurement and Validation. *Journal of Business Ethics*, *109*(4), 431–445. https://doi.org/10.1007/s10551-011-1138-9

Bui, B., & De Villiers, C. (2018). Management control systems to support sustainability and integrated reporting. In *Sustainability Accounting and Integrated Reporting*. https://doi.org/10.4324/9781315108032-11

Chaklader, B., & Gulati, P. A. (2015). A Study of Corporate Environmental Disclosure Practices of Companies Doing Business in India. *Global Business Review*, *16*(2), 321–335. https://doi.org/10.1177/0972150914564430

Deb, B. C., Rahman, M. M., & Rahman, M. S. (2023). The impact of environmental management accounting on environmental and financial performance: empirical evidence from Bangladesh. *Journal of Accounting and Organizational Change*, *19*(3), 420–446. https://doi.org/10.1108/JAOC-11-2021-0157

Dhar, B. K., Sarkar, S. M., & Ayittey, F. K. (2022). Impact of social responsibility disclosure between implementation of green accounting and sustainable development: A study on heavily polluting companies in Bangladesh. *Corporate Social Responsibility and Environmental Management*, *29*(1), 71–78. https://doi.org/10.1002/csr.2174

Environmental management accounting : international guidance document. (2005). International Federation of Accountants.

Larrán Jorge, M., Herrera Madueño, J., Calzado, Y., & Andrades, J. (2016). A proposal for measuring sustainability in universities: a case study of Spain. *International Journal of Sustainability in Higher Education*, *17*(5). https://doi.org/10.1108/IJSHE-03-2015-0055

Le, T. T., Nguyen, T. M. A., & Phan, T. T. H. (2019). Environmental management accounting and performance efficiency in the Vietnamese construction material industry-a managerial implication for sustainable development. *Sustainability (Switzerland)*, *11*(19). https://doi.org/10.3390/su11195152

Liaquat, M., Ahmed, G., Ismail, H., Ul Ain, Q., Irshad, S., Sadaf Izhar, S., & Tariq Mughal, M. (2024). Impact of motivational factors and green behaviors on employee environmental performance. *Research in Globalization*, *8*. https://doi.org/10.1016/j.resglo.2023.100180

Rodríguez-Antón, J. M., Del Mar Alonso-Almeida, M., Celemín, M. S., & Rubio, L. (2012). Use of different sustainability management systems in the hospitality industry. The case of Spanish hotels. *Journal of Cleaner Production*, *22*(1), 76–84. https://doi.org/10.1016/J.JCLEPRO.2011.09.024

Roscoe, S., Subramanian, N., Jabbour, C. J. C., & Chong, T. (2019). Green human resource management and the enablers of green organisational culture: Enhancing a firm's environmental performance for sustainable development. *Business Strategy and the Environment*, *28*(5), 737–749. https://doi.org/10.1002/bse.2277

Saputro, A., & Nawangsari, L. C. (2021). The Effect of Green Human Resource Management on Organization Citizenship Behaviour for Environment (OCBE) and Its Implications on Employee Performance at Pt Andalan Bakti Niaga. *European Journal of Business and Management Research*, *6*(1), 174–181. https://doi.org/10.24018/ejbmr.2021.6.1.716

Tien, D., & Niap, F. (2006). *ENVIRONMENTAL MANAGEMENT ACCOUNTING FOR AN AUSTRALIAN COGENERATION COMPANY*.

Wu, Y., Awang, S. R., & Ahmad, T. (2025). Leadership styles, employee green behavior, and organizational citizenship behavior for the environment: a systematic literature review. *Environment, Development and Sustainability*. https://doi.org/10.1007/s10668-025-06573-x

YELGEN, E. (2022). YEŞİL Muhasebe Ve UygulamaÖrnekleriÜzerineBir Çalişma. *Yönetim Bilimleri Dergisi*, *Özel Sayı*, 100–126. https://doi.org/10.35408/comuybd.1150938

Yusliza, M. Y., Yong, J. Y., Tanveer, M. I., Ramayah, T., Noor Faezah, J., & Muhammad, Z. (2020). A structural model of the impact of green intellectual capital on sustainable performance. *Journal of Cleaner Production*, *249*, 119334. https://doi.org/10.1016/J.JCLEPRO.2019.119334

Zandi, G. R., Khalid, N., & Islam, D. M. Z. (2019). Nexus of knowledge transfer, green innovation and environmental performance: impact of environmental management accounting. *International Journal of Energy Economics and Policy*, *9*(5), 387–393. https://doi.org/10.32479/ijeep.8285