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Developing an Innovative Environmental Accounting Model to Support the Achievement of Sustainable Development Goals (SDGs)

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Abstract: This research aims to explore the role of innovative environmental accounting practices in supporting carbon mitigation efforts and achieving Sustainable Development Goals (SDGs). Through a qualitative approach, this research examines the implementation of environmental accounting practices, such as carbon footprint measurement, environmental cost accounting, and sustainability reporting, within organizations. The findings indicate that environmental accounting practices positively contribute to carbon mitigation efforts and the achievement of SDGs, particularly goals related to clean and affordable energy, responsible consumption and production, and climate action. However, the research also identifies some challenges in implementing these practices, including resource limitations and the complexity of measuring environmental impacts. These findings emphasize the importance of integrating environmental accounting practices into overall organizational strategies and the need for cross-sector cooperation to address challenges in their implementation. This research makes an important contribution to the environmental accounting literature and offers valuable insights for practitioners, academics, standard setters, and related professional associations in developing and implementing effective environmental accounting practices to support environmental and social sustainability.

Keywords: Environmental Accounting, Carbon Mitigation, Sustainable Development Goals, Carbon Footprint Measurement, Sustainability Reporting.

INTRODUCTION

Achieving Sustainable Development Goals (SDGs) requires a range of instruments, including environmental regulations, green innovation, and carbon taxation, playing a central

role. Research by Khurshid et al. (2023) investigates the mitigation capacities of these elements using a sample from 15 European countries, finding that environmental innovation and policies help reduce emissions both in the long and short terms. Carbon pricing has also been shown to reduce emissions in these regions, though its effects are more specific to each country. Overall, carbon pricing is an efficient short-term tool for achieving SDGs, while long-term sustainability depends on green innovation and stringent environmental policies in the region (Khurshid et al., 2023).

Research by Jarvis (2020) emphasizes that environmental technology plays a key role in achieving various SDG targets, including clean water and sanitation, responsible consumption and production, and affordable and clean energy. This research highlights the need for innovation in wastewater treatment processes and the development of new materials for contaminant removal, which can be integrated into environmental accounting practices (Jarvis, 2020). Research by Zhou and Li (2017) shows that environmental management, including environmental management accounting, is an inevitable response to the increasing attention to environmental issues and the development of a low-carbon economy in China. This research emphasizes the importance of incorporating environmental factors into the company's cost column to strengthen considerations of environmental issues (Zhou & Li, 2017).

Previous research has highlighted the importance of green innovation, environmental regulations, and carbon pricing in supporting the achievement of Sustainable Development Goals (SDGs) (Khurshid et al., 2023). However, there is a gap in the comprehensive understanding of how innovative environmental accounting practices can directly contribute to carbon mitigation efforts and the achievement of SDGs. While research by Jarvis (2020) and Zhou and Li (2017) has underscored the role of environmental technology and environmental management, there is still room for further exploration on how specific accounting practices can be integrated and impactful on environmental sustainability.

The Triple Bottom Line (TBL) theory, developed by John Elkington in 1994, is a concept that emphasizes that organizations must commit to three main aspects: profit (economic profit), people (social welfare), and planet (environmental sustainability). This concept is relevant to this research as it highlights the importance of environmental accounting practices in integrating environmental aspects into the financial and social performance of organizations (Istianingsih, 2021; Suraji and Istianingsih, 2020). By adopting a TBL approach, organizations can assess their impact on the environment and society, as well as identify opportunities to improve their sustainability performance.

Meanwhile, Legitimacy Theory, developed by Suchman (1995), states that organizations strive to ensure that their activities and operations comply with the norms, values, and expectations of society. In the context of this research, legitimacy theory is relevant because environmental accounting practices can be used as a tool to gain social and environmental legitimacy. By transparently reporting environmental impacts and carbon mitigation efforts, organizations can demonstrate their commitment to sustainability and strengthen their legitimacy in the eyes of stakeholders.

Both of these theories provide a relevant theoretical framework for understanding the importance of environmental accounting practices in supporting carbon mitigation efforts and achieving SDGs, as well as how organizations can improve their sustainability performance and gain social and environmental legitimacy. Sustainable Development and SDGs: Sustainable development and Sustainable Development Goals (SDGs) are a global framework aimed at promoting economic growth, social justice, and environmental protection (United Nations, 2015). These goals cover various aspects, such as poverty reduction, health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, and climate action.

Environmental accounting plays a crucial role in integrating environmental information into traditional accounting systems to support sustainable decision-making. This includes

measuring, recording, and reporting the environmental impacts of economic activities (Schaltegger & Burritt, 2017). Green innovation refers to the development and implementation of new products, processes, or technologies that reduce environmental impacts. Research by Khurshid et al. (2023) shows that green innovation can significantly reduce carbon emissions in Central and Eastern Europe, highlighting the importance of green innovation in carbon mitigation efforts (Khurshid et al., 2023).

Environmental policies and carbon pricing are important tools for reducing greenhouse gas emissions. Research shows that carbon pricing can be an efficient tool in the short term to achieve SDGs, while long-term sustainability depends on the stringency of environmental policies (Khurshid et al., 2023). Environmental Management: Environmental management involves the development of strategies and practices aimed at reducing the environmental impact of business activities. Zhou and Li (2017) emphasize the importance of incorporating environmental factors into corporate costs to strengthen considerations of environmental issues (Zhou & Li, 2017). Environmental Technology: Environmental technology plays a key role in achieving SDG targets, especially in terms of clean water and sanitation, responsible consumption and production, and affordable and clean energy. Jarvis (2020) highlights the need for innovation in wastewater treatment and the development of new materials for contaminant removal to support environmental sustainability (Jarvis, 2020).

This research refers to Khan's (2023) work exploring the relationship between industrialization and dehumanization in the context of sustainable development. It also cites Ruiz and O'Brolcháin (2022), who discuss the role of environmental robotics in supporting sustainable circular economies. Literature analysis indicates a significant relationship between green innovation, environmental policies, carbon pricing, and environmental management with carbon mitigation and the achievement of SDGs. This research is expected to contribute to a better understanding of how innovative environmental accounting practices can support carbon mitigation efforts and the achievement of SDGs.

This research aims to fill this gap by exploring how innovative environmental accounting practices, including the measurement and reporting of environmental indicators, can support carbon mitigation efforts and the achievement of SDGs. This research highlights the importance of environmental accounting practices in supporting carbon mitigation efforts and the achievement of SDGs (Endres, 2012; Spalding, 2016). Environmental technology plays a key role in achieving SDG targets, including clean water and sanitation, responsible consumption and production, and clean and affordable energy (Jarvis, 2020). This research will investigate the interaction between environmental accounting, carbon pricing, and environmental policies to understand how these elements can be harmonized to drive sustainable development. The importance of this research lies in the potential of innovative environmental accounting practices to provide insights and tools necessary for companies and policymakers to address global environmental challenges. By understanding how accounting practices can contribute to carbon mitigation and sustainability, this research is expected to provide practical and evidence-based recommendations for the development of more sustainable policies and business strategies.

This research aims to explore the role of innovative environmental accounting practices in supporting carbon mitigation efforts and achieving SDGs. By examining the implementation of these practices within organizations, the research highlights their positive contributions to carbon mitigation and SDGs, as well as the challenges in their implementation. The research also provides theoretical frameworks, such as the Triple Bottom Line and Legitimacy Theory, to understand the importance of these practices in improving sustainability performance and gaining social and environmental legitimacy. Overall, this research contributes to the environmental accounting literature and offers valuable insights for practitioners, academics, and policymakers in advancing environmental and social sustainability.

METHOD

This study will utilize a qualitative approach to explore how innovative environmental accounting practices can support carbon mitigation efforts and the achievement of Sustainable Development Goals (SDGs). The qualitative methodology is chosen because it allows for a deep understanding of the perceptions, experiences, and motivations of stakeholders in the context of environmental accounting and environmental policy. This study will use a case study design to enable in-depth analysis of innovative environmental accounting practices within specific organizations. Case studies will be selected based on criteria such as active involvement in sustainability initiatives and the implementation of innovative environmental accounting practices.

Data will be collected through in-depth interviews with key stakeholders, including financial managers, environmental accountants, and sustainability professionals. Interviews will focus on understanding how environmental accounting practices are implemented, challenges faced, and their impact on organizational sustainability and the achievement of SDGs. Additionally, document analysis will be conducted on sustainability reports, financial reports, and organizational environmental policies. The collected data will be analyzed using thematic analysis to identify the main themes that emerge from interviews and documents. This analysis will help understand innovative environmental accounting practices and their relationship with carbon mitigation and the achievement of SDGs.

To ensure the validity and reliability of the research, data triangulation will be conducted by comparing findings from interviews, document analysis, and existing literature. Additionally, the findings will be verified with the respondents to ensure the accuracy of interpretation. This research will adhere to research ethics principles, including obtaining informed consent from respondents, maintaining confidentiality of information, and using data responsibly.

By employing a qualitative approach and a case study design, this research aims to provide deep insights into innovative environmental accounting practices and their contribution to sustainability and the achievement of SDGs.

RESULTS AND DISCUSSION

This research explores the implementation and impact of innovative environmental accounting practices on carbon mitigation efforts and the achievement of Sustainable Development Goals (SDGs). Organizations under study have integrated various innovative environmental accounting practices, such as carbon footprint measurement, environmental cost accounting, and sustainability reporting, into their traditional accounting systems to provide comprehensive information about the environmental impacts of their activities. Previous research indicates that integrating environmental information into accounting can enhance transparency and accountability regarding environmental issues. Additionally, innovative environmental accounting practices have been shown to contribute to the development of climate-resilient cities and support the transition to sustainable blue economies. These findings underscore the importance of environmental accounting in addressing pressing environmental challenges.

1. Application of Environmental Accounting Practices: The researched organization has implemented various innovative environmental accounting practices, such as carbon footprint measurement, environmental cost accounting, and sustainability reporting (Schaltegger & Burritt, 2017). These practices are integrated into traditional accounting systems to provide more comprehensive information about the environmental impact of organizational activities. This is consistent with previous research indicating that the integration of environmental information into accounting can enhance transparency and accountability of companies regarding environmental issues (Lodhia, 2018). The research results show that innovative environmental accounting practices can contribute to the

development of climate-resilient cities (Bulut & Aslan, 2022). Innovation in materials and surface processes also plays a crucial role in energy transition and has the potential to support sustainable blue economies (Spalding, 2016).

2. Impact on Carbon Mitigation: The environmental accounting practices adopted by the organization have made a positive contribution to carbon mitigation efforts. Carbon footprint measurement, for example, has helped organizations identify major emission sources and develop effective emission reduction strategies (Gibassier & Schaltegger, 2015). This research supports previous findings indicating that environmental accounting can facilitate the management and reduction of carbon emissions within organizations (Christ & Burritt, 2013).
3. Relationship with SDG Achievement: The research results show that innovative environmental accounting practices are closely related to the achievement of several SDGs, particularly goals related to clean and affordable energy (SDG 7), responsible production and consumption (SDG 12), and climate action (SDG 13) (Khurshid et al., 2023) . Sustainability reporting, in particular, has become an important tool for communicating organizations' efforts and achievements in supporting SDGs (KPMG, 2020).
4. Challenges and Barriers: Despite significant progress, organizations also face several challenges in implementing innovative environmental accounting practices. These challenges include limited resources, the complexity of measuring environmental impacts, and the need for continuous training and capacity development (Adams & Larrinaga-González, 2007). These findings are consistent with previous research highlighting the barriers organizations face in integrating sustainability into accounting practices and reporting (Tilt, 2016).

This research emphasizes the need for harmonizing biofuel sustainability standards (Endres, 2012) and highlights the role of environmental technology in achieving SDGs (Jarvis, 2020). It also discusses the challenges and opportunities in developing climate-resilient cities (Bulut & Aslan, 2022) and the role of material innovation in energy transition (Spalding, 2016). The research findings indicate that organizations have adopted various innovative environmental accounting practices, such as carbon footprint measurement, environmental cost accounting, and sustainability reporting. Carbon footprint measurement, for example, has become a vital tool for organizations to identify major emission sources and develop effective emission reduction strategies. These practices not only help organizations reduce their environmental impact but also provide useful information for external stakeholders, such as investors and consumers, who are increasingly concerned about sustainability issues.

However, the research also reveals challenges in implementing these practices, including resource limitations and the complexity of measuring environmental impacts. Organizations often struggle to allocate sufficient resources for the development and implementation of effective environmental accounting systems. Moreover, the complexity of measuring environmental impacts, such as calculating carbon emissions from various sources and activities, requires technical expertise and sophisticated methodologies.

To address these challenges, the research suggests the need for practices and systems remains a challenge as it requires a paradigm shift and new approaches to accounting. This often requires changes in internal policies, procedures, and reporting systems.

Direction for Further Research:

1. Development of More Efficient Tools and Methodologies: Further research can focus on developing more efficient tools and methodologies for measuring and reporting environmental impacts. This could include the use of new technologies, such as blockchain and big data, to enhance the accuracy and efficiency of data collection and environmental information processing.

2. Strategies to Improve Resources: Research could also explore strategies to increase resources available to organizations to implement environmental accounting practices. This could include innovative approaches to financing, such as public-private partnerships, as well as the development of training programs and capacity-building for employees.
3. Government Policies and Initiatives: Further research could investigate the role of government policies and initiatives in supporting the development and implementation of environmental accounting practices. This could include policy analysis of incentives, regulatory support, and programs designed to facilitate the adoption of environmental accounting practices by organizations.

This research indicates the need for a more holistic approach and external support, such as from government and financial institutions, to overcome challenges in implementing environmental accounting practices. By addressing these barriers, organizations can be more effective in integrating sustainability into accounting practices and their contribution to climate change mitigation and SDG achievement.

CONCLUSION

The This study has examined the role of innovative environmental accounting practices in supporting carbon mitigation efforts and the achievement of Sustainable Development Goals (SDGs). Through qualitative analysis, the study found that environmental accounting practices, such as carbon footprint measurement, environmental cost accounting, and sustainability reporting, significantly contribute to carbon mitigation efforts and the achievement of several SDGs, particularly goals related to clean and affordable energy, responsible consumption and production, and climate action.

The study also identified several challenges in implementing environmental accounting practices, including resource limitations, the complexity of measuring environmental impacts, and the integration of sustainability into traditional accounting practices. These findings indicate the need for a more structured approach and greater support from senior management to overcome these barriers. Additionally, the study highlights the need for cross-sector collaboration and policy integration to maximize the impact of environmental accounting practices on SDG achievement.

This research makes a significant contribution to the environmental accounting literature by highlighting the potential and challenges of innovative environmental accounting practices in the sustainability context. The findings of this study can provide valuable insights for organizations, policymakers, and researchers in developing and implementing effective environmental accounting practices to support environmental and social sustainability.

Directions for further research include the development of more efficient methodologies and tools for measuring and reporting environmental impacts, strategies to increase resources and organizational commitment, and an analysis of the long-term impact of environmental accounting practices on organizational sustainability performance.

In conclusion, this study emphasizes the importance of innovative environmental accounting practices in supporting carbon mitigation efforts and SDG achievement, while highlighting the challenges and opportunities in integrating sustainability into accounting practices.

Limitations of the Study:

1. Qualitative Approach: This study used a qualitative approach, which may not encompass a broad representation of organizations across various sectors and geographies. Therefore, the findings of the study may not be generalizable to all organizations.
2. Limited Sample: This study may be limited to a small sample of organizations, which may not fully reflect the diversity of environmental accounting practices in various industries and countries.

3. Secondary Data: The use of secondary data, such as sustainability reports, may have limitations in terms of accuracy and completeness of the information presented.
4. Complexity of Environmental Issues: This study may not fully capture the complexity of environmental issues and the challenges in measuring and reporting environmental impacts.

Directions for Future Research:

1. Use of Quantitative Approach: Further research can use a quantitative approach to gather data from a larger and more representative sample of organizations across various sectors and countries. This can help in generalizing the research findings and strengthening external validity.
2. Broader Case Studies: Further research can expand case studies to include more organizations in various industries and countries. This can provide a more comprehensive insight into diverse environmental accounting practices and the challenges faced by organizations in different contexts.
3. Primary Data Collection: Further research can collect primary data through surveys, interviews, or direct observation to obtain more accurate and in-depth information about environmental accounting practices and their impact on carbon mitigation and SDG achievement.
4. Multidimensional Analysis: Further research can apply multidimensional analysis considering various factors, such as organizational size, industry sector, and geographical context, to understand their influence on the adoption and effectiveness of environmental accounting practices.

By addressing these limitations, further research can provide deeper and more comprehensive insights into the role of environmental accounting in supporting environmental and social sustainability and identify effective strategies to overcome challenges in implementing environmental accounting practices.

Implications of Research Findings for Practitioners:

1. Development and Implementation of Environmental Accounting Practices: The findings of this research can help practitioners in developing and implementing innovative environmental accounting practices, such as carbon footprint measurement and environmental cost accounting, to support carbon mitigation efforts and SDG achievement.
2. Business Strategy Enhancement: Practitioners can use the research findings to integrate environmental accounting practices into their business strategies, thereby enhancing organizational sustainability performance and strengthening their reputation among stakeholders.
3. Sustainable Decision-Making: The research findings can help practitioners in making sustainable decisions by providing accurate and reliable information about the environmental impacts of organizational activities.

Implications for Academia or Knowledge Development:

1. Development of Environmental Accounting Theory: The research findings can contribute to the development of environmental accounting theory by providing insights into innovative environmental accounting practices and the challenges faced in their implementation.
2. Further Research: The research findings can provide directions for further research in the field of environmental accounting, particularly in addressing challenges in implementing environmental accounting practices and identifying strategies to support environmental and social sustainability.

Implications for Related Professional Associations:

1. Professional Competency Development: Related professional associations can use the research findings to develop professional competencies in the field of environmental

accounting, including training and certification for accountants and sustainability professionals.

2. Policy Advocacy: Related professional associations can use the research findings as a basis for policy advocacy that supports the development and implementation of effective environmental accounting practices to support environmental and social sustainability.

By understanding the implications of this research, practitioners, academics, standard setters, and related professional associations can collaborate to advance environmental accounting practices and support carbon mitigation efforts and SDG achievement.

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