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Analyzing the Potential Implementation of Environmental Accounting in the Preparation of Sustainable Natural Capital Accounts in Umbele Village

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Abstract

Nature inherently provides essential resources for human sustenance. Consequently, natural resources and environmental services are increasingly utilized. However, escalating population growth and rising income levels have led to a decline in the value and quality of these resources. Uncontrolled exploitation, environmental neglect, and inadequate structured recording pose significant threats to the sustainability of natural capital at the local community level. This study investigates the potential for implementing environmental accounting practices in Umbele Village to facilitate the preparation of sustainable natural capital accounts, utilizing primary data gathered through interviews and field observations. The findings reveal that the majority of Umbele's inhabitants heavily rely on natural resources, which are increasingly affected by environmental degradation and climate change. Current governmental interventions to address these challenges are perceived as insufficient, compounded by a lack of corporate responsibility.

Keywords *environmental accounting, natural capital accounts, sustainability.*

INTRODUCTION

Indonesia's economic development has progressed rapidly, achieving one of the highest growth rates globally, elevating the nation to a middle-income status and membership in the G20. However, this growth has placed significant pressure on the environment. Rapid population increase has led to greater consumption of natural resources, resulting in the depletion of critical resources such as forests and the contamination of water sources due to human and industrial waste (OECD, 2018). Environmental damage and climate change, driven by developmental activities, necessitate urgent attention from various stakeholders. While economic progress is vital, it is equally important to protect the environment to ensure the long-term survival and well-being of communities. Sustainable economic development requires a balance between economic advancement and environmental preservation (Daly & Farley, 2011).

Recognizing the importance of natural capital, the Indonesian government is proactively addressing challenges in its management. The National Medium-Term Development Plan (RPJMN) reflects a strong commitment to sustainable development, aligning with the Sustainable Development Goals (SDGs) and the Nationally Determined Contribution (NDC) to promote green growth. A crucial element in achieving these objectives is the establishment of reliable natural capital accounting (NCA) systems to assess the sustainability and resilience of the nation's economic growth model (World Bank, 2021).

Ecosystems possess inherent mechanisms to maintain equilibrium. However, extensive environmental damage has exceeded the natural regenerative capacity, leading to persistent pollution of soil, water, and air (Rockström et al., 2009). The perception of natural

resources as abundant and inexpensive has driven unsustainable practices. As populations grow and incomes rise, resource scarcity becomes apparent, necessitating the economic valuation of environmental assets (Costanza et al., 1997). Suparmoko (2011) emphasizes the critical role of the environment in supporting life by providing raw materials, assimilating waste, and offering amenity value. A balanced material flow between the economy and the environment is essential for a sustainable system (Ayres & Kneese, 1969).

Uncontrolled resource exploitation, coupled with environmental neglect and inadequate systematic recording, threatens the sustainability of natural capital at the village level. This leads to challenges such as declining land productivity, ecosystem degradation, and increased frequency of natural disasters. These issues highlight the urgent need for structured, data-driven, and sustainability-oriented approaches to managing natural capital. Environmental accounting is a tool for recording and evaluating environmental impacts resulting from human activities, providing information for informed decision-making (Gray, 2006). By implementing environmental accounting, local governments can understand the costs and benefits of resource use and the long-term implications of economic activities. This enhances transparency and accountability in resource management, providing a clearer picture of natural capital and its sustainable management in Umbele Village.

This study aims to analyze the potential for implementing environmental accounting in the preparation of sustainable natural capital accounts in Umbele Village. By identifying strategies and recommendations, this research seeks to assist the village in optimizing its natural resource management. The central research question is: How can environmental accounting be effectively implemented to prepare sustainable natural capital accounts in Umbele Village, Bumi Raya District, Morowali Regency? The objective is to determine the applicability of environmental accounting in this context.

LITERATURE REVIEW

Legitimacy Theory

Legitimacy theory is frequently employed in social and environmental accounting research (Deegan, 2002). It posits that organizations seek to align their actions with societal values and norms to maintain legitimacy and ensure their long-term survival. Companies perceive their existence as tied to the community and environment in which they operate. This theory suggests that companies must meet societal expectations to gain legitimacy, responding to stakeholder concerns and disclosing information about their environmental and social performance (Suchman, 1995). To maintain legitimacy, companies may enhance shareholder returns, improve debt repayment capabilities, and provide high-quality products and services. Compliance with government regulations and engagement in social responsibility activities are also crucial for gaining societal approval (Lindblom, 1994).

Environmental Accounting

Environmental accounting involves identifying, measuring, and allocating environmental costs, integrating these costs into business decisions, and communicating this information to stakeholders (IFAC, 2005). Green accounting identifies, measures, presents,

and discloses costs related to company activities affecting the environment (Hamid & Garusu, 2024). It incorporates environmental variables into cost accounting, reflecting a commitment to environmental protection (Soesanto, 2022). Green accounting encompasses identifying, recognizing, measuring, presenting, and disclosing all costs incurred to improve environmental quality by preventing, reducing, or avoiding negative environmental impacts (Kurniawan & Mustofa, 2022).

Importance of Environmental Accounting

Environmental accounting is increasingly important due to stringent regulations, corporate social responsibility (CSR) demands, sustainability concerns, and the need for enhanced reputation and competitiveness.

Classification of Environmental Costs

Environmental costs include social and environmental costs associated with providing goods and services (Balley in Mustamin, 2024). Management considers environmental costs and performance to reduce or eliminate business decisions that negatively impact the environment (Bringer in Mustamin, 2024). Companies can offset losses by generating revenue through the sale of residual materials and improve environmental performance, benefiting public health (Bringer in Mustamin).

Natural Capital Accounting (NCA):

The UK Natural Capital Committee defines natural capital as elements of nature that directly or indirectly produce value for humans, including ecosystems, species, fresh water, soil, minerals, air, and oceans (Natural Capital Committee, 2013). NCA provides critical information on economic dependencies and impacts on nature, integrating economic valuation into decision-making (Agarwala et al., 2014). It is essential for addressing biodiversity loss, climate change, and global pressures on resources. NCA is increasingly recognized as a systematic approach to valuing natural resources such as land, plants, animals, water, and biodiversity (Fleming et al., 2022). It involves measuring and valuing renewable and non-renewable resources to generate societal benefits (Rainsford et al., 2024).

METHOD

This research employs a qualitative approach to analyze the potential implementation of environmental accounting in preparing sustainable natural capital accounts in Umbele Village, Morowali Regency. Qualitative research involves intensive fieldwork, careful observation, reflective analysis of documents, and detailed report writing (Sugiyono, 2016). The study focuses on understanding personal experiences and exploring individual involvement with the phenomenon.

The research was conducted in Umbele Village, Bumi Raya District, Morowali Regency, over one month in January. Informants were selected based on their knowledge and roles within the community. Jonathan Smith et al. (2009) suggest that 3-6 participants are sufficient for in-depth analysis.

Data collection methods included:

1) Observation: Direct observation of environmental conditions and resource management practices in Umbele Village (Nasution, 2013).
2) In-depth Interviews: Semi-structured interviews with key informants to gather detailed insights and perspectives (Esterberg, 2009).
3) Documentation: Collection of relevant documents, photographs, and videos to support findings (Djama'an Satori, 2014).

Data analysis followed the Miles and Huberman model, involving data reduction, data display, and conclusion drawing (Sugiyono, 2022).

RESULT AND DISCUSSION

Natural Resource Management by the Umbele Village Community

Interviews with various informants revealed that the primary natural resources utilized by the Umbele Village community are land and water. A significant majority of residents, approximately 60%-70%, depend on agricultural land as their primary source of livelihood. The land is primarily used for cultivating plantations, particularly for farming. Concurrently, some community members utilize the aquatic ecosystem by constructing fishponds (empang) and working as fishermen. This diverse utilization of natural resources indicates that the village possesses an economy rooted in both agriculture and fisheries. However, this heavy reliance on natural resources also presents unique challenges, particularly in the face of environmental changes and ecosystem degradation.

The dependence on natural resources for economic activities is a common characteristic of rural communities in Indonesia. However, this reliance makes these communities particularly vulnerable to environmental degradation and climate change (McCarthy et al., 2018). Sustainable management of these resources is, therefore, crucial for ensuring the long-term well-being and economic stability of the community.

Environmental Damage Occurring in Umbele Village

Environmental damage in Umbele Village is primarily associated with coastal reclamation, abrasion, air pollution, and marine pollution. Informants from various backgrounds highlighted that marine and air pollution are caused by the activities of companies operating in the vicinity of the village.

1) Coastal Reclamation and Abrasion: Coastal reclamation and abrasion have led to changes in the coastal ecosystem, impacting fishponds managed by the community.
2) Marine Pollution: Marine pollution disrupts the activities of fishermen and the sustainability of the aquatic ecosystem.
3) Air Pollution: Air pollution affects the quality of life of the community, particularly in terms of health and environmental cleanliness.

These damages underscore the need for greater attention to the sustainable management of natural resources to prevent more significant negative impacts in the future. The environmental degradation in Umbele Village is consistent with broader trends of

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environmental damage in coastal areas of Indonesia, often driven by industrial activities and unsustainable resource extraction (Walpole, 2014).

Impact of High Rainfall on Agriculture

The Umbele Village community, predominantly farmers, is significantly affected by high rainfall, particularly on oil palm plantations. Excessive rainfall causes flooding on agricultural land, leading to various problems:

1) Disrupted Plant Growth: Plant growth is disrupted, often causing oil palm leaves to turn yellow and reducing fruit productivity.
2) Increased Crop Failure Risk: The risk of crop failure increases, especially as plants become submerged due to prolonged waterlogging.
3) Unstable Harvests: Unstable harvests directly impact the economic welfare of farmers in the village.

These conditions indicate that weather factors are a major challenge in the agricultural sector in Umbele Village. Adaptation to climate change and improved drainage systems can provide solutions to mitigate the negative impacts of high rainfall. Climate change is increasingly affecting agricultural communities worldwide, with changing rainfall patterns and extreme weather events posing significant challenges to food security and livelihoods (IPCC, 2021).

Government Efforts to Address Environmental Damage and High Rainfall (Climate Change)

In addressing various forms of environmental damage, the village government has taken several steps, including:

1. Correspondence with the DPRD and Mediation with Companies
   a. The village government attempts to convey community concerns through official letters to the DPRD.
   b. Mediation with companies has been conducted but has not yielded sustainable results due to a lack of concrete follow-up.
2. Construction of Embankments to Overcome Abrasion
   a. A proposal for embankment construction has been submitted to the Public Works Department (PU) and approved.
   b. However, the length of the embankment constructed is still insufficient to fully protect the village from ongoing abrasion.

Despite these initiatives, limitations in policy implementation remain a major obstacle. The involvement of regional governments and other stakeholders is essential to ensure the sustainability of environmental mitigation efforts. As a mitigation measure against flooding and its impact on agriculture, the village government has constructed drainage channels in several flood-prone areas. However, informants from various community groups believe that this construction is still uneven and less than optimal. Some parts of the village still experience severe flooding due to the lack of adequate drainage channels.

These efforts indicate that while initial steps have been taken to address flooding, more comprehensive drainage infrastructure improvements are needed to provide a broader and more effective impact. Community participation and collaboration with external agencies are crucial for the success of these initiatives (Ostrom, 1990).

Evaluation of Natural Resources

Interviews revealed that annual evaluations of the degradation of managed natural resources in Umbele Village, both in terms of plantation land reduction and in aquatic and marine ecosystems, have not been conducted to date. The village government stated that one of the main obstacles in conducting evaluations is the lack of data or materials that can be used as a basis for analysis. All informants agreed that an evaluation of plantation land reduction is necessary, given that the majority of the village community depends on the agricultural sector, particularly oil palm plantations. This evaluation is expected to:

1) Serve as a basis for more sustainable land planning and management.
2) Identify factors causing land reduction and seek appropriate solutions.
3) Support policies that are more favorable to farmers, especially in the face of environmental changes and economic conditions.

However, to realize this evaluation, policies from the regional or district government are needed to ensure that the process can run systematically and based on accurate data. Regular monitoring and evaluation of natural resources are essential for adaptive management and ensuring the long-term sustainability of resource use (Holling, 2001).

Integrating Environmental Accounting for Sustainable Natural Capital Management

The findings from this study highlight the critical need for integrating environmental accounting practices into the management of natural resources in Umbele Village. The current lack of systematic recording and reporting of environmental impacts from corporate activities hinders transparency and accountability. Companies operating in the area should be held responsible for the marine and air pollution they cause by including environmental costs in their financial statements. This aligns with the principles of corporate environmental responsibility and the "polluter pays" principle (Tietenberg & Lewis, 2009).

The implementation of environmental accounting can provide several benefits for Umbele Village:

1) Improved Decision-Making: By quantifying the environmental costs and benefits of different activities, environmental accounting can inform better decision-making regarding resource allocation and development planning.
2) Enhanced Transparency and Accountability: Environmental accounting promotes transparency by making environmental information publicly available, increasing accountability for environmental performance.
3) Sustainable Resource Management: By integrating environmental considerations into economic planning, environmental accounting can support the sustainable management of natural resources and promote long-term ecological and economic health.

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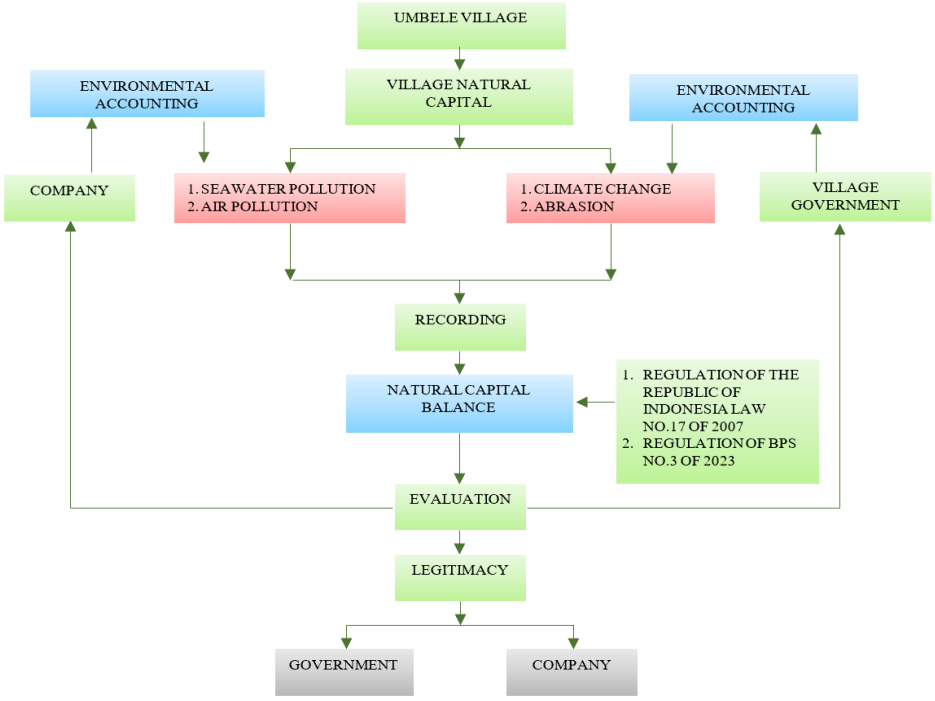

Figure 1. environmental accounting application model in the preparation of natural capital balances

To effectively implement environmental accounting, Umbele Village needs to:

1) Develop a Natural Capital Accounting System: Establish a system for measuring and valuing the village's natural capital assets, including land, water, and ecosystems.
2) Incorporate Environmental Costs into Financial Accounting: Require companies operating in the area to disclose their environmental costs in their financial statements.
3) Conduct Regular Environmental Audits: Conduct regular audits to assess the environmental performance of companies and identify areas for improvement.
4) Engage the Community: Involve the community in the environmental accounting process to ensure that their concerns and perspectives are considered.

By taking these steps, Umbele Village can move towards a more sustainable and resilient future, where economic development is balanced with environmental protection. The integration of environmental accounting is not only a matter of compliance but a strategic imperative for ensuring the long-term well-being of the community and the preservation of its natural heritage.

CONCLUSION

This study has examined the potential for implementing environmental accounting in the preparation of sustainable natural capital accounts in Umbele Village. The findings reveal that the village's natural resources are under threat from environmental degradation and climate change, highlighting the urgent need for sustainable resource management practices. The lack of systematic recording and reporting of environmental impacts, particularly from corporate activities, hinders transparency and accountability.

Environmental accounting and natural capital accounting are integral and inseparable components. Information derived from recording in natural capital accounts will become evaluation material related to environmental damage. Umbele Village has natural resource assets, or what is called natural capital, where the natural capital is influenced by environmental damage such as sea water pollution and air pollution due to company activities, and there is also climate change that affects Umbele Village, such as high rainfall. Thus, Umbele Village has the potential to implement environmental accounting in the preparation of natural capital accounts in order to measure, assess and evaluate natural capital affected by environmental damage and climate change.

The implementation of environmental accounting can provide numerous benefits for Umbele Village, including improved decision-making, enhanced transparency and accountability, and sustainable resource management. To effectively implement environmental accounting, the village needs to develop a natural capital accounting system, incorporate environmental costs into financial accounting, conduct regular environmental audits, and engage the community in the process.

The integration of environmental accounting is not merely a matter of compliance but a strategic imperative for ensuring the long-term well-being of the community and the preservation of its natural heritage. By embracing environmental accounting, Umbele Village can move towards a more sustainable and resilient future, where economic development is balanced with environmental protection.

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