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# Green Accounting Practices and Environmental Performance

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**ABSTRACT:** The escalating environmental crisis compels businesses to move beyond traditional financial metrics and embrace sustainability practices. Green accounting emerges as a critical tool in this endeavour, aiming to integrate environmental costs and benefits into financial reporting. This research explores the intricate relationship between green accounting practices and a company's environmental performance. The study explores into various green accounting methodologies, encompassing environmental cost accounting, ecological accounting, and environmental management accounting. It examines how these practices identify and quantify environmental costs associated with resource depletion, pollution, and waste generation. By incorporating these costs into financial statements, green accounting offers a more holistic view of a company's impact and potential liabilities. Furthermore, the research investigates the potential of green accounting to enhance a company's environmental performance. By fostering transparency about environmental costs, green accounting can incentivize businesses to adopt sustainable practices. This might involve implementing cleaner production processes, investing in renewable energy sources, and minimizing waste generation. The analysis goes beyond mere correlation, exploring the potential mediating effects of factors like energy efficiency on the relationship between green accounting and environmental performance. By examining real-world examples of companies implementing green accounting practices, the research aims to provide concrete evidence of the positive impact on environmental performance. This research sheds light on the significance of green accounting as a tool for promoting environmental responsibility within businesses. By fostering transparency about environmental costs and incentivizing sustainable practices, green accounting has the potential to pave the way for a more eco-conscious business landscape, ultimately contributing to a healthier planet for all.

**KEYWORDS:** Green Accounting, Environmental Performance, Sustainability Practices, Environmental Costs, Environmental Management Accounting

## I. INTRODUCTION

In today's world, businesses face mounting pressure to balance economic success with environmental responsibility. While traditional accounting focuses on financial profit and loss, it often overlooks the environmental impact of a company's operations. This gap is where green accounting emerges as a powerful tool. Green accounting practices aim to integrate environmental costs and benefits into financial reporting, providing a more comprehensive picture of a company's performance. This introduction to green accounting practices and environmental performance delves into the intricate relationship between these two aspects. We will explore how green accounting methodologies can not only identify environmental costs associated with a company's activities but also incentivize the adoption of sustainable practices, ultimately leading to improved environmental performance. By analysing the financial implications of environmental impact, green accounting empowers businesses to make informed decisions that benefit both their bottom line and the planet. An overview of how green accounting practices can enhance environmental performance:

### 1.1 Environmental Cost Accounting (ECA)

Environmental cost accounting (ECA) is a specific green accounting practice that focuses on identifying, measuring, and recording the environmental costs associated with a company's activities. It aims to integrate these costs into traditional financial accounting, providing a more holistic view of a company's financial performance and environmental impact. The key aspects of ECA. The key aspects of ECA are

1. **Identifying Environmental Costs:** ECA goes beyond just production costs. It considers the environmental impact throughout a product's life cycle, including:
  - a. Resource depletion (raw materials, water, energy)
  - b. Pollution control and waste management
  - c. Environmental fines and liabilities



- d. Costs associated with environmental damage
2. **Measuring Environmental Costs:** Quantifying environmental costs can be challenging due to their intangible nature. However, ECA employs various techniques, such as:
  - a. Life cycle assessment (LCA) to trace environmental impacts throughout the product life cycle
  - b. Market-based valuation to assign monetary values to environmental resources and damages
  - c. Activity-based costing (ABC) to link environmental costs to specific activities within a company
3. **Recording Environmental Costs:** Once measured, these costs are incorporated into relevant financial statements. This could involve:
  - a. Creating separate environmental cost accounts
  - b. Integrating environmental costs into existing accounts (e.g., production costs)

### 1.2 Benefits of Environmental Cost Accounting

Environmental Cost Accounting (ECA) offers numerous benefits, fostering both sustainability and financial performance. Firstly, it helps organizations identify and quantify environmental costs, such as waste management, energy consumption, and pollution control. By making these costs visible, ECA encourages more sustainable practices and efficient resource use, leading to significant cost savings. Secondly, ECA enhances decision-making by providing a comprehensive view of the environmental impact of business activities. This holistic approach aids in developing strategies that align with sustainability goals, fostering innovation in green technologies and processes. Moreover, ECA ensures better regulatory compliance by tracking environmental expenditures and liabilities, helping organizations avoid fines and legal issues. Transparent reporting to stakeholders, including investors and customers, builds trust and enhances corporate reputation. ECA also aids in risk management by identifying potential environmental risks and liabilities, enabling proactive measures to mitigate them. This reduces the financial impact of environmental incidents and non-compliance. Finally, adopting ECA can provide a competitive advantage. It demonstrates a commitment to sustainability, attracting environmentally conscious investors and customers, and enhancing the company's market position. Overall, Environmental Cost Accounting is a vital tool for driving sustainable business practices and achieving long-term financial and environmental benefits.

- **Improved Decision-Making:** By revealing the true cost of environmental impacts, ECA can inform more sustainable business decisions. Companies can identify areas for cost reduction through pollution prevention or resource efficiency initiatives.
- **Enhanced Transparency:** ECA promotes transparency by providing stakeholders with a clearer picture of a company's environmental footprint. This can improve investor confidence and brand reputation.
- **Regulatory Compliance:** ECA helps companies identify and manage their environmental liabilities, ensuring better adherence to environmental regulations.

### 1.3 Challenges of Environmental Cost Accounting

Environmental Cost Accounting (ECA) presents several challenges that organizations must navigate to effectively integrate it into their operations. One primary challenge is the complexity of accurately identifying and quantifying environmental costs. Unlike traditional accounting, which deals with clear and direct financial transactions, ECA requires tracking indirect and sometimes intangible costs, such as the long-term impact of pollution or resource depletion. This often involves complex calculations and assumptions, leading to potential inaccuracies. Additionally, the lack of standardized methodologies and frameworks for ECA complicates the process further, as organizations must develop their own systems, which can vary widely in accuracy and comparability. Data collection poses another significant challenge, as it requires comprehensive and reliable environmental data, which may not always be available or easily accessible. Many organizations struggle with integrating this data into their existing accounting systems, especially if they lack the necessary technology or expertise. The implementation of ECA also demands significant initial investments in training, software, and possibly new personnel, which can be a deterrent, particularly for small and medium-sized enterprises (SMEs). Furthermore, there is often resistance to change within organizations, as stakeholders may be skeptical about the benefits of ECA or reluctant to adopt new practices that disrupt established workflows. Communicating the value and necessity of ECA to these stakeholders is essential but can be challenging. Additionally, the evolving nature of environmental regulations requires continuous adaptation of accounting practices, adding to the workload and complexity. The dynamic and often uncertain regulatory environment can make it difficult for organizations to stay compliant and up-to-date with the latest requirements. Moreover, the benefits of ECA, such as cost savings and improved sustainability performance, may not be immediately apparent, leading to short-termism where organizations prioritize immediate financial gains over long-term environmental benefits. This short-term focus can undermine the commitment to and investment in ECA. Lastly, there is the challenge of balancing transparency and





competitive advantage. While transparent environmental reporting can enhance reputation and stakeholder trust, it also exposes the organization to scrutiny and potential competitive disadvantages if proprietary information or perceived negative impacts are disclosed. Navigating these challenges requires a strategic approach, including investing in the right tools and expertise, fostering a culture of sustainability, and continuously adapting to regulatory and market changes. Despite these hurdles, the long-term benefits of ECA, such as enhanced risk management, regulatory compliance, and improved environmental performance, make it a worthwhile endeavor for organizations committed to sustainability.

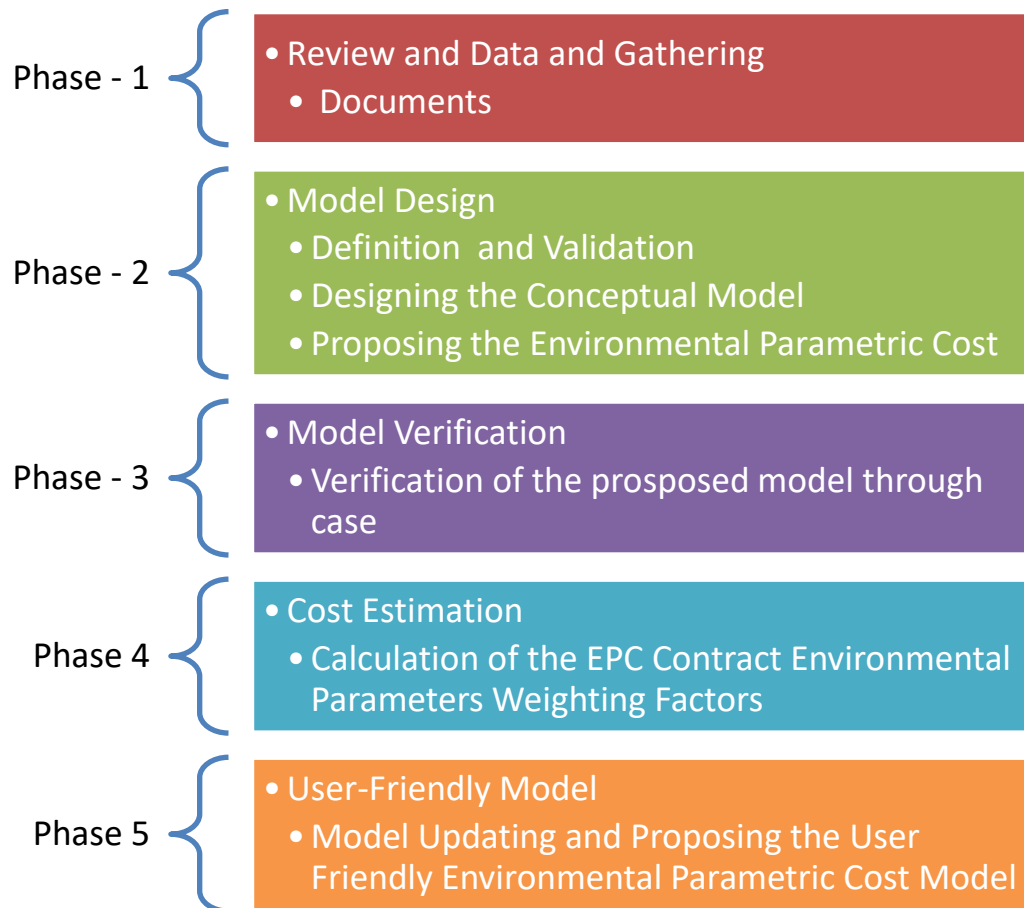


Figure. 1. Flow diagram for Proposed Architecture

- **Data Availability and Accuracy:** Quantifying environmental costs can be complex and require specialized knowledge. Data gathering and reliable valuation methods are crucial.
- **Integration with Traditional Accounting Systems:** Integrating environmental costs into existing financial systems can be challenging.
- **Standardization and Consistency:** The lack of universally accepted standards for ECA methodologies can lead to inconsistencies in reporting.

Overall, environmental cost accounting is a valuable tool for businesses seeking to operate more sustainably. By integrating environmental costs into financial considerations, companies can make informed decisions that benefit both their bottom line and the environment.

## II. FULL COST ACCOUNTING

Full Cost Accounting is a method used by businesses to evaluate the complete expenses associated with producing a product or delivering a service. Unlike traditional accounting approaches that primarily focus on direct costs like materials and labour, Full Cost Accounting incorporates both direct and indirect costs, providing a more comprehensive view of total expenses and profitability. In Full Cost Accounting, direct costs encompass expenses directly attributable



to the production of goods or services, such as raw materials, labour wages, and manufacturing overheads. Indirect costs, also known as overhead costs, include expenses not directly tied to specific products or services but essential for overall operations, such as rent, utilities, administrative salaries, and depreciation. By including all costs, Full Cost Accounting enables businesses to make more informed decisions regarding pricing, resource allocation, and profitability analysis. It ensures that all expenses, whether direct or indirect, are considered when calculating the true cost of production.

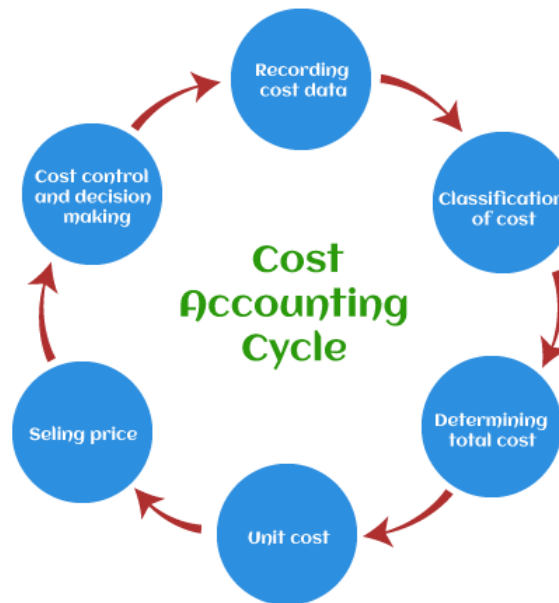


Figure. 2. Cost Accounting Cycle

This approach is particularly valuable in industries with significant overhead costs or where indirect expenses play a crucial role in determining profitability. Full Cost Accounting supports sustainable business practices by providing a clearer picture of the environmental and social costs associated with production. By understanding the full spectrum of costs involved, companies can identify areas for cost reduction, improve resource efficiency, and make strategic investments that align with long-term financial and environmental goals. Full Cost Accounting goes beyond traditional accounting methods by incorporating all expenses associated with production or service delivery. It offers a holistic view of costs, enhances decision-making processes, and promotes more sustainable business practices in today's complex economic environment.

### III. NATURAL RESOURCE ACCOUNTING

Natural Resource Accounting (NRA) is a framework used to measure and track the contribution of natural resources to economic activity, taking into account their use, depletion, and environmental impact. It seeks to integrate environmental considerations into economic decision-making by valuing natural resources beyond their market prices. Here's a detailed look at Natural Resource Accounting:

#### 3.1 Components of Natural Resource Accounting

**a. Physical Accounts:** Physical accounts quantify the stocks and flows of natural resources within an economy. This includes the measurement of resources such as forests, minerals, water, and fisheries. Physical accounts track changes in stocks over time due to extraction, regeneration, and other natural processes.

**b. Monetary Accounts:** Monetary accounts assign economic values to natural resources, incorporating both market and non-market values. Market values include prices of resources traded in markets (e.g., timber prices), while non-market values encompass environmental services (e.g., water purification by wetlands) and intrinsic values (e.g., biodiversity conservation).



- c. **Environmental Accounts:** Environmental accounts extend NRA to include the environmental impacts of resource use and degradation. This includes costs associated with pollution, depletion, and ecosystem damage. Environmental accounts help in assessing the true economic costs of resource extraction and use.

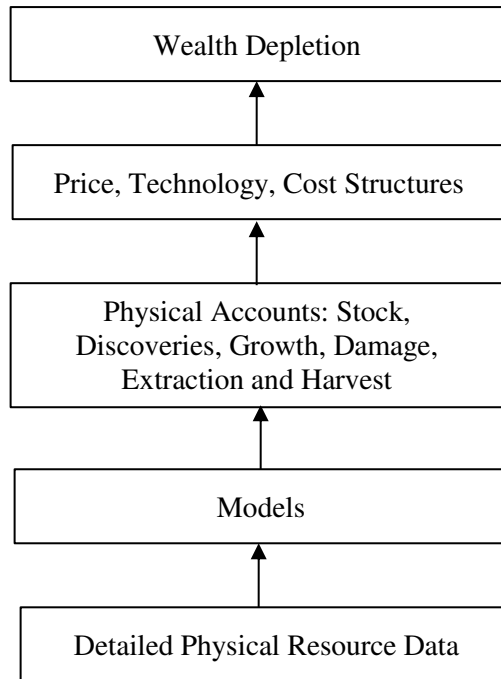


Figure.3. Process of Natural Resource Accounting

#### d. LIFE CYCLE ASSESSMENT (LCA)

Life Cycle Assessment (LCA) is a systematic methodology used to evaluate the environmental impacts of a product, process, or service throughout its entire life cycle—from extraction of raw materials, through production and use, to disposal or recycling. It aims to quantify potential environmental burdens associated with all stages of a product's life, providing insights into where improvements can be made to reduce environmental impacts.

The process of LCA involves four main phases:

1. **Goal and Scope Definition:** Clearly define the objectives of the study and the boundaries of the life cycle stages to be included. This phase determines the scope of analysis and establishes the functional unit for comparison.
2. **Life Cycle Inventory (LCI):** Compile comprehensive data on inputs (e.g., materials, energy) and outputs (e.g., emissions, waste) at each stage of the life cycle. This inventory forms the foundation for subsequent impact assessments.
3. **Life Cycle Impact Assessment (LCIA):** Evaluate the potential environmental impacts associated with the collected inventory data. Common impact categories include global warming, resource depletion, acidification, and eutrophication.
4. **Interpretation:** Analyze and interpret the results of the impact assessment, considering uncertainties and limitations. This phase provides insights into the environmental hotspots of the product or process and identifies opportunities for environmental improvement.

LCA helps businesses, policymakers, and consumers make informed decisions by providing a holistic view of environmental impacts. It supports sustainable development by promoting resource efficiency, reducing emissions, and guiding the development of eco-friendly products and processes.

### IV. CARBON ACCOUNTING

Carbon accounting, also known as carbon foot printing or carbon accounting, is the process of measuring and tracking the amount of greenhouse gas (GHG) emissions associated with an organization, product, service, or event. The primary goal of carbon accounting is to quantify the carbon dioxide (CO<sub>2</sub>) and other GHG emissions released into the atmosphere as a result of human activities. This information is crucial for understanding and managing the



environmental impact of these activities, particularly in relation to climate change mitigation efforts. The key components of carbon accounting include:

- **Scope Definition:** Carbon accounting typically categorizes emissions into three scopes:
- Direct emissions from owned or controlled sources, such as emissions from fuel combustion in company-owned vehicles and facilities.
- Indirect emissions from the generation of purchased electricity consumed by the organization.
- Indirect emissions from activities outside the organization's direct control, such as emissions from the supply chain, business travel, and employee commuting.
- **Measurement and Calculation:** Organizations gather data on energy consumption, fuel use, and other relevant activities to calculate their GHG emissions. Emission factors and conversion coefficients are used to convert activity data into CO<sub>2</sub> equivalents.
- **Reporting and Verification:** Carbon accounting results are often reported in sustainability reports, annual disclosures, or to regulatory bodies. Verification by independent third parties enhances credibility and transparency of reported emissions data.
- **Reduction Strategies:** Armed with carbon accounting data, organizations can identify emission hotspots and implement strategies to reduce their carbon footprint. This may include energy efficiency improvements, adoption of renewable energy sources, and changes in procurement and transportation practices.

Carbon accounting plays a vital role in corporate sustainability strategies, regulatory compliance, and environmental stewardship efforts. It supports informed decision-making by providing a quantitative basis for setting emission reduction targets, tracking progress over time, and demonstrating commitment to climate action. As global awareness of climate change grows, carbon accounting continues to evolve, with increasing emphasis on accuracy, consistency, and comparability of emissions data across organizations and sectors.

## V. IMPACT ON ENVIRONMENTAL PERFORMANCE

Green accounting, also known as environmental accounting or sustainability accounting, refers to practices that integrate environmental factors into financial reporting and decision-making processes. It aims to assess and disclose the environmental performance of organizations, thereby promoting sustainable development and responsible environmental stewardship. Here's an exploration of how green accounting practices impact environmental performance:

### a) Measurement and Monitoring

Green accounting involves measuring and monitoring environmental impacts alongside financial performance metrics. This includes quantifying resource use, emissions, waste generation, and other environmental indicators throughout the organization's operations. By systematically tracking these metrics, organizations gain insights into their environmental footprint and can identify areas for improvement.

### b) Transparency and Disclosure

One of the key benefits of green accounting is enhanced transparency and disclosure of environmental impacts. Organizations report their environmental performance through sustainability reports, integrated reports, or disclosures in financial statements. This transparency fosters accountability to stakeholders, including investors, regulators, customers, and communities affected by the organization's activities.

### c) Cost Savings and Efficiency

Implementing green accounting practices often leads to cost savings and improved operational efficiency. By analysing resource consumption and waste generation, organizations can identify opportunities for waste reduction, energy efficiency improvements, and conservation measures. This not only reduces environmental impact but also lowers operational costs through reduced resource use and waste disposal expenses.

### d) Risk Management

Green accounting helps organizations manage environmental risks effectively. By identifying potential environmental liabilities and regulatory compliance issues early on, organizations can mitigate risks associated with fines, penalties, and reputational damage. Understanding the full extent of environmental impacts also allows for proactive risk management strategies.

### e) Strategic Decision-Making

Integrating environmental considerations into decision-making processes enables organizations to make informed strategic choices. Green accounting data informs decisions regarding product design, supply chain management, investment in clean technologies, and adoption of sustainable practices. This strategic alignment with environmental goals supports long-term business sustainability and resilience.



**f) Regulatory Compliance**

Green accounting practices help organizations comply with environmental regulations and standards. By accurately measuring and reporting environmental impacts, organizations demonstrate compliance with legal requirements and reduce the risk of non-compliance penalties. Compliance with environmental laws also enhances relationships with regulatory authorities and minimizes legal uncertainties.

**g) Stakeholder Engagement and Reputation**

Engaging with stakeholders on environmental performance enhances organizational reputation and stakeholder trust. Investors increasingly consider environmental performance as a criterion for investment decisions, while customers prefer products and services from environmentally responsible companies. By demonstrating commitment to sustainability through green accounting, organizations build stronger relationships with stakeholders and enhance brand reputation.

**h) Challenges and Considerations**

While green accounting offers numerous benefits, challenges include the complexity of measuring environmental impacts, variability in data quality and availability, and the need for standardized reporting frameworks. Overcoming these challenges requires investment in robust data management systems, training for personnel, and collaboration across departments to integrate environmental considerations into overall business strategy effectively. Green accounting practices significantly impact environmental performance by promoting transparency, efficiency, risk management, and strategic decision-making aligned with sustainability goals. By quantifying and disclosing environmental impacts, organizations contribute to sustainable development while enhancing operational resilience and stakeholder trust in an increasingly environmentally conscious global economy.

## VI. DISCUSSION

Environmental Management Accounting (EMA) plays a crucial role in promoting sustainable development, especially in industries like construction materials in Vietnam, known for significant environmental impacts. Understanding and implementing EMA is thus imperative. This study aimed to achieve several research objectives: identifying factors influencing EMA adoption, examining its impact on enterprise performance (financial and environmental), and analysing how environmental outcomes affect financial outcomes. The research findings highlight six factors positively correlated with EMA adoption: government enforcement, stakeholder interests, positive environmental strategy, community expectations, professional education and association networks, and financial condition, confirming hypotheses H1, H3, H4, H5, H8, and H9. Government enforcement emerged as the most influential factor, consistent with prior research, reflecting its role in regulatory compliance. Stakeholder interests and community expectations also significantly drive EMA adoption, aligning with studies emphasizing societal monitoring and organizational legitimacy. Positive environmental strategies, according to enhance EMA adoption by integrating environmental goals into waste management practices. Similarly, professional education and association networks positively influence EMA implementation, underscoring the importance of knowledge and industry collaboration. Financial condition also supports EMA adoption, noted in studies indicating financial constraints hinder environmental information management. However, factors like environmental uncertainty and mimicking pressure did not significantly impact EMA adoption, consistent with conversely, environmental changes drive gradual EMA adoption by responding to market shifts and landfill reduction. This fills a gap in existing literature by demonstrating that enterprises focusing on environmental efficiency also achieve notable financial gains. For instance, proactive environmental management not only mitigates risks like fines and reputational damage but also enhances long-term cost savings and stakeholder reputation. Integrating EMA practices into business operations not only supports sustainable development but also enhances financial and environmental performance. This underscores the importance of aligning environmental goals with operational strategies to achieve long-term business success in Vietnam's construction materials industry.



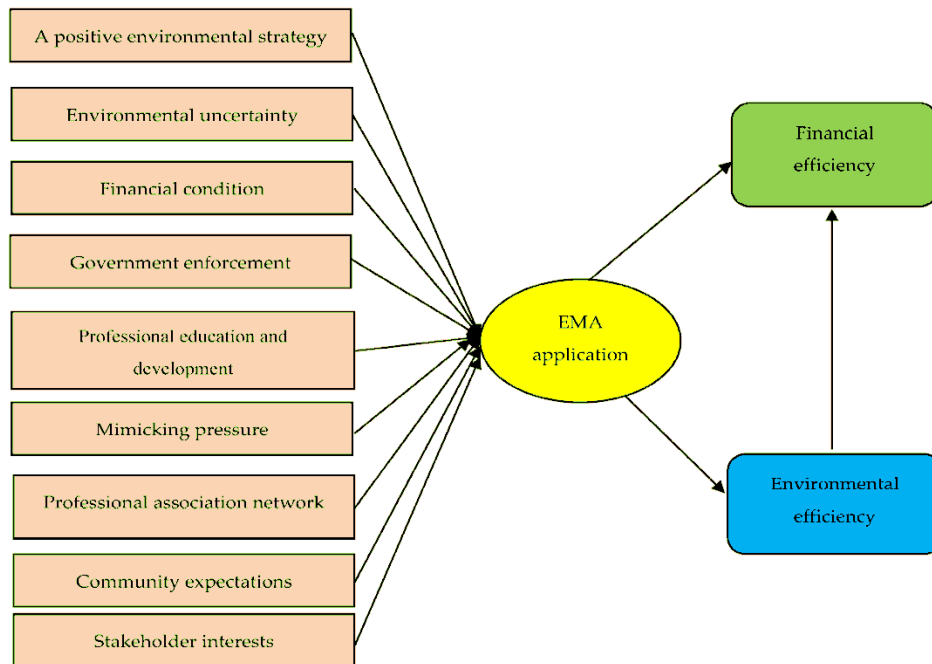


Figure. 4. Research Model for Environmental Efficiency

## VII. CONCLUSIONS

The research findings underscore the critical role of Environmental Management Accounting (EMA) in driving sustainable development within Vietnam's construction material production industry. Recommendations include enhancing government enforcement, improving professional education and industry networks for EMA practices, adopting a positive environmental strategy, achieving sound financial conditions, and increasing community and stakeholder expectations. These measures aim to integrate environmental considerations into accounting systems, enhance operational efficiency, and bolster enterprise reputation. Moreover, the study highlights the correlation between improved environmental and financial performance, emphasizing the benefits of proactive environmental management in enhancing profitability and competitiveness.

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