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QUALITY OF ENVIRONMENT ACCOUNTING INFORMATION IN ENHANCING SUSTAINABLE DEVELOPMENT THROUGH QUALITY OF FINANCIAL ACCOUNTING STATEMENT: EMPIRICAL EVIDENCE ON IRAQI INDUSTRIAL LISTED FIRMS

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ABSTRACT

There is a growing volume of literature on sustainable development. But, the association between the quality of environmental accounting information and sustainable development is devoted particular attention, especially in developing countries as Iraq. The purpose of this research is, therefore, to assess the mediating role of the quality of financial statements in the impact of the quality of environmental accounting information on improving sustainable development. Our empirical evidence is conducted on Iraqi industrial listed firms during the period 2013-2023. This research was conducted to several results. First, the quality of environmental accounting information has a positive effect on the quality of financial Statements, which has a positive effect on sustainable development. Second, there is a positive and significant relationship between the quality of environmental accounting information and sustainable development. Third, the mediating role of the quality of financial statements in sustainable development is partial. These findings emphasize the strong pressure from stakeholders to pay attention to the quality of financial statements and verify that the financial statements are devoid of earnings management in order to improve sustainable development.

KEYWORDS: Quality Of Financial Statements, Quality Of Environmental Accounting Information, Sustainable Development.

1. INTRODUCTION

Interest in sustainable development is one of the most important issues that developing countries like Iraq care about. This study highlights the growing global awareness of environmental issues and the corresponding demand for companies to adopt sustainable practices. It recognizes the critical role of accounting in measuring, reporting, and communicating environmental information to stakeholders. The relationship of the quality of environmental accounting information with the quality of financial statements contributes to increased accountability, transparency, and sustainability. By providing independent confirmation of the financial statements, auditors play a crucial role in verifying the accuracy, reliability, and completeness of the reported financial information. This transparency helps stakeholders, including investors, government agencies, and the public, to trust the financial performance and sustainability practices of industrial companies. Several studies have investigated these relations. For example, the empirical evidence by Abdeen and Rashwan (2017) focuses on the important role of environmental accounting in improving the quality of accounting information to achieve the sustainable development of industrial companies operating in the Gaza Strip. This study pays more attention to the application of environmental (green) accounting in Palestinian industrial companies to contribute clearly to the responsibilities that must be assumed in the field of environmental and social protection. Furthermore, Khudair (2019) examines the impact of sustainability accounting on the financial statements. He proves that there are many difficulties in applying sustainability reports as a lack of awareness of the administration of the importance of sustainability accounting and the consequent returns, not approved measurement in determining the items of sustainability accounting costs, not accredited standard for regulating sustainability and social responsibility. Nour *et al.* (2017) examine the effects of environmental detection on the financial performance in Malaysia. They find mixed results since environmental accounting is developing and expanding as the social focus on the environment is increasing. There are no such regulations and statutory requirements for firms in Malaysia to disclose on the environmental sustainability. The empirical evidence by Lakhderi *et al.* (2020), which was conducted on Algerian economic institutions, shows that environmental accounting has a significant impact on the removal of sustainable development. This study aims to clarify

environmental accounting and its impact on the dimensions of sustainable development in Algerian economic institutions and by touching on the general concepts of environmental accounting and sustainable development and the most prominent relationship between them and after analyzing data and testing their hypotheses and the study concluded that environmental accounting has a significant impact on the removal of sustainable development in institutions Algerian Economic. The choice of the Iraqi context is motivated by the lack of empirical evidence on environmental accounting and sustainable development. The desire to engage in environmental sustainability finance operations in Iraq has yet to be carried out in execution, indicating the need for the implementation of ecological reviewing to improve the legitimacy of the findings while maintaining adequate accountability and disclosure. Furthermore, the accounting information in the financial statements is considered insufficient for environmental purposes, which prompted those interested (senior management, accountants, auditors, the public among beneficiaries, capital owners, and government agencies) to focus on social, environmental, economic, and financial performance. Also, the Iraqi industrial private sector has undergone remarkable developments from Polyester gins, grain factories, textile studios, and other forms of artisanal production that dominated Iraq's industrial landscape in the 1920s to the petroleum product industry in 2021. The research problem in environmental accounting data lies in improving the quality of accounting information and what it reflects on the financial statements to help the beneficiaries of its adoption in achieving sustainable development in the industrial sector in Iraq. Our study is relevant in several respects. First, it contributes to providing good accounting information that contributes to serving the environment. Second, it permits to improvement of the quality of environmental accounting information and its impact on planning, implementation, control, and performance evaluation decisions. Third, it contributes to achieving the community's goals in sustainable development by activating the environmental and social dimensions and increasing the environmental awareness of the industrial sector. Fourth, our research determines the strengths and weaknesses of environmental accounting information in the financial statements. Lastly, it contributes to drawing up an appropriate audit program by the auditor to take note of all the auditing aspects of environmental accounting and issue the auditor's report accordingly. This research

aims to examine the role of the quality of environmental accounting information in enhancing sustainable development through the quality of financial accounting in the Iraqi private industrial sector. Our results highlight the importance of high-quality environmental accounting information in achieving sustainable development. It identifies several benefits, such as improved decision-making, enhanced stakeholder confidence, and reduced environmental risks. In addition, the study emphasizes the role of auditors in ensuring the accuracy and reliability of environmental disclosures, thus enhancing the credibility of financial statements. To encourage the adoption of sustainable practices and improve environmental accounting practices in Iraqi industries, many recommendations can be proposed. These include developing clear guidelines and regulations for environmental accounting and reporting, capacity-building programs to enhance the knowledge and skills of professionals in this field, and increasing collaboration between industry stakeholders, regulators, and auditors to promote the integration of environmental considerations into financial statements. The rest of the paper proceeds as follows. Section 2 provides a conceptual framework. Section 3 discusses the theoretical framework. Section 4 presents the literature review and develops the main hypotheses. Section 5 specifies the models used and provides a description of the data. Section 6 summarizes our main results. The last section focuses on the conclusion and recommendations for further research.

2. CONCEPTUAL FRAMEWORK

2.1. *Quality of Environmental Accounting Information*

Okoye and Asika (2019) define Environmental Accounting as the verification, gathering, calculation, analysis, disclosure, and implementation of knowledge on supplies and power flows, ecological expenses, and different costs for mainstream integrated environmental deciding inside of a company. Financial data on costs, incomes, and expenditures concerning environmental issues are also included. There are four forms of environmental accounting, Environmental Financial Accounting (EFA), Environmental Cost Accounting (ECA), Environmental Management Accounting (EMA), and Environmental Nation Accounting (ENA). EFA, ECA, and EMA are related to corporate (business) accounting. The growth of sustainability problems, along with financial, political, and intellectual innovation, has increased the relevance of

environmental accounting. Rahma (2016) suggest that many goals can be attained through the use of environmental accounting. Environmentally friendly accounting is the practice of systematically collecting, analyzing, and applying such data in a financial context in order to better the fiscal and ecological sustainability of the company, and to assess ecological expenses and earnings. Environmental accounting information disclosure is an important part of the entire accounting. In order to better integrate revenue growth and preservation of nature, a new field known as environmental accounting information quality has emerged, which integrates ecology at principles. It can be used to illustrate how a business interacts with its surroundings and even encourage more efficient operations. When business decisions are monitored and assessed, they can be adjusted for the better, helping the company progress normally. Overexploitation of natural assets has hampered economic growth around the world. Environmental concerns have become increasingly closely aligned with the priorities of both the public and companies as the quantity of polluting businesses and the associated consumer demand have grown. Therefore, ecological assets and conventional accounting procedures must be fused to foster sustainable corporate growth. Beck et al. (2018) argue in response to a growing concern for protecting ecosystems and a continuing reduction in the overall state of the outside world. Gray et al. (2014) justify the quality of environmental accounting information by its relevance, reliability, comparability, and understandability. First, relevance implies that the information is capable of influencing the decisions of users by providing meaningful insights into an organization's environmental performance and impacts. Second, reliability ensures that the information is free from bias, is based on accurate data and sound measurement methods, and can be independently verified. Comparability allows users to make meaningful comparisons between different organizations or over time. Last, understandability refers to the clarity and accessibility of the information for users who may not have a technical background in environmental accounting. The importance of high-quality environmental accounting information cannot be overstated. It enables organizations to identify and evaluate their environmental costs, risks, and opportunities, which can lead to more effective environmental management strategies. Additionally, it allows stakeholders to assess an organization's environmental performance, identify potential

environmental liabilities, and make informed decisions about their engagement with the organization. Several factors influence the quality of environmental accounting information. These include the availability and reliability of data, the adequacy of measurement methods, the level of disclosure and transparency, and the competency and independence of the accountants and auditors involved.

2.2. Sustainable Development

Defining the concept of sustainable development is not an easy task, although it is probably a complex and systematically cooperative term. This concept has emerged since 1980 as a reference to "preserving the world's goods" in the global conservation approach, an alliance between the three main environmental non-governmental organizations, IUCN, WWF, and UNEP. Van et al. (2018) argue that the main objective of the International Strategy for Conservation is to unite countries in their efforts to end environmental damage caused by the overexploitation of renewable resources. The concept of sustainable development has only been understood at a very superficial level.

The expression did not begin to integrate more than one field of study until a century later. The World Commission on Environment and Development (WCED) published its white paper in 1987. Sustainable development is a civilization that meets the requirements of the present without compromising the possibilities of future centuries to satisfy their desires. This document laid the primitive foundations for the concept of long-term growth (UN, 2020). The Commission defined sustainable development as an area encompassing economics, sociology, and the environment. It is a set of rules that all sovereign states must respect. The UN Commission has a mandate to review progress in implementing the 2030 Agenda for Change and the Constitution on Atmosphere and Development and to provide recommendations on how to comply with the implementation strategies of the JPOI (Joint Action Plan) at local, national, regional and global levels. In 2015, the UN endorsed the SDGs as a rallying cry for people around the world to take action in five key areas by 2030: society, environment, happiness, security, and connectivity. The UN's 193 member states unanimously approved the 2030 Sustainable Development Strategy in 2015. Green growth is the ultimate goal of the UN's global agenda, and many countries have committed to working towards it. The goal of sustainable development is to leave future generations with at

least the same kind of environment and community that we have today, only better. This is why sustainable development focuses on improving three interconnected systems: human civilization, the global economy, and the health of our environment. The revolutionary framework sets out 17 Sustainable Development Goals (SDGs) and targets to be achieved by 2030 in order to ensure equality for all, global peace, and financial stability. According to Golusin and Ivanovi (2019), if a community wants to grow in a way that benefits future generations, it must exhibit these qualities. Sustainable development is also defined as aiming to provide economic well-being for present and future generations, preserve the environment and its principles, and preserve life support systems. The sustainability includes the environment and the finances of civilization; there are human, social, economic, and environmental sustainability.

2.3. Quality of Financial Statements

A financial statement is a comprehensive and orderly presentation of financial information. Both the former and current financial state of the company are reflected in these declarations. In order to create reliable and consistent accounts payable, accountants must adhere to a collection of fiscal rules, beliefs, and methods. White et al. (2022) and Atukalp (2023) suggest that there are three primary accounts that are typically included under the umbrella phrase "financial statements": The Balance Sheet (position statement), The Profit and Loss Account (income statement), and the statement of cash flows. A company's financial statements are documents detailing the operations and results of a business financially. For correctness and for revenue taxes, financing, or investment objectives, accounting records are frequently checked by government companies, auditors, companies, etc.

The main financial statements of a non-profit company are the synergy sheet, the revenue statement, the financial statements, and the announcement of equity amendments. Nonprofits use similar but distinct financial statements. Financial statements are used by analysts and financiers to evaluate the success of a company and a project where its share price will go in the future. The financial statements listed on the annual document are one of the most reliable and organized forms of financial statements available about the company. Economic researchers and financial analysts all use accounting records to assess a company's financial stability and future profitability. Conduct financial statement analysis to conduct a comprehensive

assessment of the industrial sector. A financial audit that includes verifying investment research information, data, and ratios, and then formulating these results by creating an analytical report. This report will then be examined by the Financial Auditor to draw conclusions regarding the progress of the study, which can be determined from the data infrastructure, ratios, and statistics cited in the analysis documents.

In most companies, the management team is tasked with creating annual funding and quarterly reports. The auditor's task is to provide an opinion indicating that sufficient confidence has been gained that the financial statements as a whole are not affected by significant errors, and that their quality is due to intentional or unintentional misconduct, and have been reported accurately in accordance with applicable accounting standards. The instructions on how to conduct an audit and the amount of comfort gained are set out in detail by independent audit firms in accordance with the accompanying guidelines. The purpose of financial statements is to disclose the financial condition and results of a firm. Many stakeholders rely on this data when making financial decisions. Shareholders who own a company are not necessarily the same people who run it. Financial statement audits provide verification that companies' financial records fairly show a company's financial condition and accomplishments in all material aspects, which is important for shareholders who own the firms as well as other interested parties, including banks, manufacturers, and consumers.

3. THEORETICAL FRAMEWORK

3.1. Agency Theory

Agency theory (Jensen and Meckling, 1976) suggests that the principal delegates decision-making authority to the agent, expecting actions in their best interest. However, trust may erode due to information gaps, conflicting goals, and differing risk perceptions, necessitating a mechanism to sustain mutual confidence between owners and managers. The theory also highlights that asymmetric information and misaligned interests can lead managers to withhold or manipulate environmental disclosures, risking stakeholder trust and reputation. External auditors help mitigate this by offering independent evaluations of financial reports. While Big Four firms are valued for quality, their services are often seen as costly. Therefore, some companies may opt for Non-Big-4 auditors to reduce expenses without sacrificing credibility.

3.2. Stakeholder Theory

Stakeholder theory suggests that a firm's success depends on effectively managing its relationships with various stakeholders, a concept first introduced by the Stanford Research Institute (SRI). In environmental accounting, the theory focuses on including environmental costs in financial statements to enhance the quality of environmental disclosure (Johnson and Olanrewaju, 2016). Companies are more likely to disclose high-quality environmental information when they recognize the power and influence of their stakeholders. According to the theory, providing accurate, detailed, and timely information about environmental practices and impacts builds greater stakeholder trust and improves corporate reputation. Freeman et al. (2018) developed this theory further, viewing firms as part of an ecological framework where multiple stakeholders from different segments of society form the core. Research has confirmed the importance of this community concept in understanding relationships among workers, consumers, investors, residents, legislators, advocacy groups, and organizations. Firms that actively involve stakeholders in sustainability discussions are better equipped to identify key environmental issues and address them transparently in their reports. This proactive approach not only meets stakeholder expectations but also supports more effective environmental management.

3.3. Legitimacy Theory

Legitimacy theory explains that an organization's legitimacy is based on the perception that its actions align with socially accepted standards and values. Deegan (2019) highlights that this theory helps us understand voluntary corporate social and environmental disclosures and promotes public dialogue. Organizations seek to maintain legitimacy by demonstrating their commitment to environmental responsibility, which in turn affects the transparency and quality of their environmental reporting. Companies first establish legitimacy by showing competence and adhering to accepted social standards, then maintain it by continuously performing stable roles and addressing challenges, all while adapting to changing societal expectations (Soewarno et al., 2019; Deegan, 2019). When expanding into new markets or changing relationships with existing ones, firms must actively work to earn trust from skeptical stakeholders (Robert et al., 2021). Additionally, organizations need to defend their legitimacy by responding to threats or incidents that challenge their standing. In capitalist

systems, this often requires balancing operational efficiency with societal concerns, which can sometimes create conflicts between stakeholder interests and the broader community's welfare (Deegan, 2019).

Accounting researchers have mostly focused on the legitimacy defense phase, which provides a clearer opportunity to examine the critical link between legitimacy and resources (Kuruppu et al., 2019). This phase includes addressing threats to legitimacy and aligning regulatory actions with stakeholder expectations. It is important to realize that satisfying the interests of stakeholders may come at the expense of the interests of society, while fulfilling responsibilities towards the larger society may sometimes conflict with the interests of shareholders. Organizations may adopt various strategies to manage and defend legitimacy, such as proactive, remedial, and symbolic disclosures. These strategies can influence the quality and credibility of environmental accounting information, depending on the organization's commitment to genuine environmental performance improvements.

3.4. Positive Accounting Theory (PAT)

Positive Accounting Theory seeks to explain and predict the accounting choices made by companies and their economic consequences. Given the state for ecological accounting research, it is crucial to encourage the development of better environmental accounting theory, speed up the building of a solid environmental accounting. PAT provides insights into why firms disclose environmental information. Companies may enhance environmental disclosures to mitigate, for example, political costs, appeal to environmentally conscious investors, or comply with regulatory requirements. Zyznarska (2020) provides evidence for political expenditure speculation as an illustration of corporate social discoveries.

Buachoom (2022) supports positive accounting theory by emphasizing its focus on explaining actual disclosure practices rather than prescribing what should be disclosed socially. These explanations, however, are not easily justified from a social perspective. The quality of environmental accounting information plays a crucial role in enabling stakeholders to assess a company's environmental impact and sustainability efforts. High-quality disclosures, marked by accuracy, completeness, and relevance, facilitate informed decision-making. Moreover, improved accounting quality, such as greater earnings persistence, has encouraged the adoption of sustainability reporting, suggesting that integrating environmental factors

enhances the reliability and usefulness of financial reporting.

4. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

4.1. *The Impact of Environmental Accounting Information Quality on Quality of Financial Statements*

The growing recognition of environmental issues in the context of sustainable development raises the important role of environmental auditing in assessing the quality of environmental accounting information and, hence the quality of financial statements. Pramanik et al. (2018) argue that environmental preservation and modernization of financial statements are both favored by the presence of an efficient environmental assessment system. The compliance with applicable environmental laws, rules, and standards helps the organization avoid or mitigate the severity of any potential financial penalties, thereby reducing operating expenses and increasing profitability and maintaining investment in the future. The Organization's financial performance relies on its ability to maximize profitability and to provide an immaculate free of contaminants atmosphere.

Clarkson et al. (2008) show that firms with better environmental performance tend to disclose higher-quality environmental information, which correlates with better financial reporting practices. The transparent environmental disclosure reduces information asymmetry and improves the credibility of financial statements. Furthermore, Sharif (2018) affirms that the objective of the environmental audit is to reduce the impact of human activities on the environment, in particular on financial statements, which is above all a monetary phenomenon whose after-effects have a deleterious influence on societal and individual wealth. The goal of an environmental audit is to assess whether or not a company's goals involve sustainable resource extraction (such as renewing the planet's resources and respecting responsible property rights). The requirement is that the audited entity engage in a variety of environmental actions in order to achieve its goals for environmentally friendly initiatives. A quality development accounting system that can track and share information with neighbors is needed. The availability of enforceable laws and the need for standardized measures to evaluate the success of equitable growth initiatives. Malone et al. (2019) prove that examining environmentally sustainable growth efforts requires knowledgeable experts. The

quality of environmental accounting data can affect the auditor's report, which is a fundamental part of financial reporting. The auditor's report provides an independent and professional assessment of the fairness and reliability of the financial statements. Sharawi and Shahawi (2024) investigate how Environmental, Social, and Governance (ESG) disclosures affect the quality of financial reporting (FRQ) among nonfinancial firms listed on the Saudi Stock Exchange over the period 2019–2023. The empirical findings reveal that ESG disclosures have a statistically significant and positive impact on FRQ, indicating that greater ESG transparency leads to improved financial reporting quality. Similarly, Qirem et al. (2023) examine the impact of sustainability accounting, particularly environmental accounting, on the quality of financial reporting in pharmaceutical and chemical companies listed on the Amman Stock Exchange (ASE), using data from 27 firms covering the period 2016–2021. The results indicate that a higher quality of environmental accounting significantly improves the quality of financial reporting. Although the importance of environmental auditing in enhancing the quality of environmental accounting information is increasingly recognized, there is still limited research directly examining the link between the quality of this information and the quality of financial statements, particularly across diverse economic contexts. Prior studies (e.g., Sharawi and Shahawi, 2024; Qirem et al., 2023) have focused on the broader effects of ESG disclosures or sustainability accounting on financial reporting quality, without sufficiently isolating the specific role of environmental accounting information quality. This highlights the need to explicitly investigate this relationship.

We put our first hypothesis H1.

Hypothesis 1: Quality of environmental accounting information has a positive effect on quality of financial statements.

4.2. The Impact of Financial Statements' Quality on Sustainable Development

The quality of financial statements plays a crucial role in achieving and promoting sustainable development. High-quality financial reporting provides accurate, transparent, and timely information that enables stakeholders and policymakers to make informed decisions. Financial transparency supports economic, environmental, and social progress. Al-Hiyari et al. (2025) highlight the vital role that disclosing information related to the Sustainable Development Goals (SDGs) plays in

strengthening the overall quality of financial statements. Companies that engage in more extensive SDG disclosures tend to exhibit greater transparency and accountability. This improvement in reporting practices contributes directly to higher earnings quality. Dungtripop et al. (2025) investigate the relationship between the quality of integrated corporate reporting and sustainable growth among companies listed on the Stock Exchange of Thailand. Focusing on 59 SET50 firms over the period 2019–2022, the authors found that while overall reporting quality components did not show a significant impact on sustainable growth, specific sub-elements, such as information connectivity, conciseness, and business model disclosure, were positively associated with sustainable growth. Kadhim and Kaneem (2020) show that by providing independent assurance on the financial statements, auditors play a crucial role in verifying the accuracy, reliability, and completeness of the reported financial information. This transparency helps stakeholders, including investors, government authorities, and the public, to have confidence in the financial performance and sustainability practices of industrial firms. Amagtome and Alnajjar (2020) show that an auditor's report has a direct impact on investor confidence in the private industrial sector in Iraq. Investors rely on audited financial statements to make informed investment decisions. The independent opinion provided by the auditor's report adds credibility to the financial statements, giving investors a higher level of trust in the reported financial information. This, in turn, promotes investment flows and supports the growth and development of the private industrial sector. Yane and Dita (2021) examine the effect of financial statement quality and value relevance on sustainability reporting among Indonesian companies. The results indicate that accounting conservatism positively impacts sustainability reporting in social and environmental aspects, while the economic aspect shows no significant effect. The auditor's report helps to identify risks and opportunities for sustainable development in the private industrial sector. The auditors identify areas where firms may face risks, such as non-compliance with environmental regulations or inefficient resource management. They enable firms to take corrective actions and adopt sustainable practices that mitigate these risks and identify opportunities for improving environmental performance. Mostafa and Al-Taie (2021) show that where sustainable development is a growing priority, the auditor's report helps private industrial companies to ensure

compliance with environmental regulations.

Auditors assess the company's environmental accounting practices and verify the accuracy and completeness of environmental disclosures. By providing assurance on the company's compliance with environmental reporting requirements, auditors support firms in meeting their obligations, promoting environmental stewardship, and achieving sustainable development goals. While the importance of financial transparency for sustainable development is widely acknowledged, there is still limited research directly examining the impact of financial statement quality on achieving sustainability goals, particularly within the private industrial sector. This gap highlights the need to explore how high-quality financial reporting contributes to sustainable development.

We put the following Hypothesis:

Hypothesis 2: The quality of financial statements has a positive effect on sustainable development.

4.3. The Effect of Quality of Environmental Accounting Information on Sustainable Development

Hao (2019) argues that the sharing of environmental accounting data is necessary for sustainable development. The principle of sustainable development serves as the foundation for the open presentation of environmental accounting data. The fundamental content of environmental accounting is the development of the natural assets used by the economy. Therefore, the publication of this information encourages firms to focus more on ecological advantages.

The knowledge of environmental accounting information helps people to understand the real state of the surrounding area, which in turn raises consciousness about environmental issues and encourages more efficient use of natural resources. The process of publishing environmental accounting information is beneficial for the government on two levels: the implementation of efficient environmental management and a better understanding of environmental economics. Alhelou et al. (2018) prove that firms practicing sustainable achievement demonstrate a high level of ecological consciousness, a willingness to take on the duty of enforcing relevant laws, and a commitment to long-term growth. Conservation of natural resources, governance of existing ecosystems, and continuous improvement are all essential components of any sustainable development strategy. Nguyen et al. (2020) investigate the adoption of environmental accounting for sustainable development (EASD) in

Vietnamese manufacturing companies. Applying a quantitative method, the authors conducted a structured questionnaire survey among general managers and accountants and received 250 usable responses, which were tested using descriptive statistics, reliability tests, exploratory factor analysis, and multivariate regression.

The findings show that senior managers' awareness of the benefits and costs of EASD, business scale, environmental dynamics, and disclosure pressures significantly influence EASD adoption. In addition, Jankalova and Jankal (2024) explore how quality of environmental accounting information contributes to sustainable development. The authors conducted a comprehensive bibliometric analysis using data from the Web of Science and Scopus databases. They conclude that the accounting profession and the quality of environmental accounting information are crucial in promoting sustainability development and addressing global challenges through transparent and responsible practices. The term sustainability refers to the process of coordinating various functions throughout an organization to ensure that manufacturing is carried out in a sustainable and economically viable manner. Putting ecological consciousness at the forefront of the company's initiatives is crucial.

The influence on the surroundings should be considered by the leadership before decisions are made concerning choosing and carrying out of sustainability policies. According to Hilali (2019), it is important to include a number of cross-functional activities, such as expenditure planning and estimating, non-financial and financial measuring, fiscal oversight, and product cost finance, when incorporating ecological oversight into company operations and incorporating ecological procedures as a fundamental component of business achievement.

While existing literature recognizes the role of environmental accounting in supporting sustainable development (Hao, 2019; Alhelou et al., 2018), limited empirical research directly examines how the quality of environmental accounting information contributes to sustainability outcomes. Although studies such as Jankalova and Jankal (2024) emphasize its importance, there remains a need for deeper analysis of how high-quality, transparent, and reliable environmental data influence sustainable decision-making at the organizational level.

We put the hypothesis H3:

Hypothesis 3: Quality of environmental

accounting information has a positive effect on Sustainable Development.

4.4. The Mediating Effect of Quality of Financial Statements on Sustainable Development

The quality of environmental accounting information and its impact on sustainable development is a topic of increasing importance in today's world. "As organizations recognize the significance of sustainable practices, the role of financial statements and the auditor's report becomes crucial in mediating the relationship between environmental accounting information and sustainable development. Financial statements, including balance sheets, income statements, and cash flow statements, provide a comprehensive view of an organization's financial performance.

These statements contain various variables that can influence the assessment of sustainable development. For instance, revenue figures can reflect the success of sustainable products or services, while expenses may indicate investments in environmentally friendly technologies or practices. Moreover, assets and liabilities on the balance sheet can disclose the extent of an organization's commitment to sustainable initiatives. The auditor's report, prepared by an independent auditor, provides an evaluation of the financial statements' accuracy and compliance with accounting standards. The report offers an assessment of the reliability and credibility of the financial information disclosed.

In the context of environmental accounting, the auditor's report can play a mediating role by providing assurance on the accuracy and completeness of the environmental accounting information in financial statements. This assurance is crucial in building trust among stakeholders and validating the organization's commitment to sustainable development (Pham and Vu, 2022). The empirical evidence by Jaff et al (2021) shows a positive relationship between the comprehensive disclosure of the dimensions of sustainable development and the quality of financial reporting in commercial banks operating in Iraq. The findings by Al-Wattar et al. (2019) show a positive correlation between the integration of hotel sustainability reporting practices into the accounting information system and the hotel's financial performance. The

study reveals that hotels that effectively implement sustainable practices and report them within their accounting systems are seeing improvements in financial performance indicators. Recent empirical literature consistently finds that the quality of financial statements plays a significant mediating role in achieving sustainable development. A study of 262 Vietnamese listed firms by Nguyen Thi Thu (2022) empirically examined how financial reporting quality affects the extent of sustainable development information disclosed in annual and sustainability reports.

The results show that higher financial reporting quality is positively associated with more extensive disclosure of sustainable development information. This suggests that firms with higher-quality financial statements are more transparent and proactive in reporting on social and environmental responsibilities, supporting sustainable development initiatives. In addition, Adjobi et al. (2025) highlight that quality sustainability-related disclosures in financial statements enhance company value and stakeholder confidence, directly supporting sustainable development objectives. While prior research confirms that both environmental accounting information and financial statement quality contribute to sustainable development, the mediating role of financial statements in this relationship remains underexplored. Studies such as Pham and Vu (2022), Jaff et al. (2021), and Nguyen Thi Thu (2022) indicate that higher-quality financial reporting enhances transparency and strengthens sustainability disclosures. However, there is a lack of empirical investigation into how financial statement quality acts as a bridge between environmental accounting practices and sustainable outcomes. This highlights the need to test the mediating effect of financial reporting in linking environmental accounting information to sustainable development.

We put the hypothesis H4:

Hypothesis 4: Quality of Financial Statements mediates the relationship between Quality of environmental accounting information and Sustainable Development.

Figure 1 presents the interactions between Quality of Financial Statements, Quality of Environmental Accounting Information and Sustainable Development.

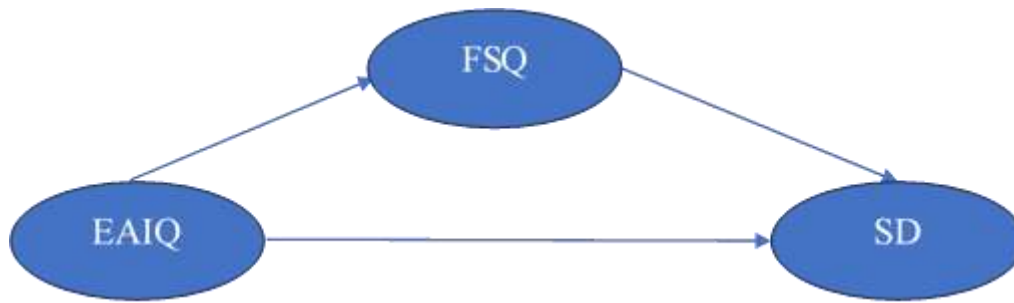


Figure 1: Interactions between Variables.

With
 FSQ: Quality of Financial Statements
 EAIQ: Environmental Accounting Information Quality
 SD: Sustainable Development

5. RESEARCH DESIGN

5.1. Sample and Data

Our sample consists of 22 Industrial Companies Listed on the Iraq Stock Exchange during the period 2013- 2022. We collect data from many sources, especially annual reports and financial statements of firms obtained from the Iraqi stock market website and the contents of corporate websites.

5.2. Variable Measures

This study aims to test the mediating role of financial statement quality in the effect of disclosure

quality of environmental accounting information on sustainable development. Our dependent variable is Sustainable Development (SD). This variable is assessed by a score which taking account the items advanced in Table 1. The approach to scoring items is essentially dichotomous in that score 1 is assigned if a firm disclosed the information in question, and 0 if not. (3) Groups of sustainable development disclosure are analyzed: Environment, Social, and Economy. The calculation of indexes taking account these items for Sustainable Development (SD) and Quality of Environmental Accounting Information (QEAI) were developed through adaptation from prior empirical studies as Nguyen et al (2022), Golusin and Ivanović (2019); Gray et al (2014), Sharawi and Shahawi (2024). Each item was selected based on its alignment with established standards in the literature and its relevance to the Iraqi context.

Table 1: Sustainable Development Items.

The Environmental Dimension	
	<i>Waste Management</i>
Reduce energy and water consumption, environmental damage, reuse and recycling	
Transition of renewable energy sources	
	<i>Resources Management</i>
Energy, water and electricity management especially to improve the use of non-renewable energy	
	<i>Chemical Elements Management</i>
Reducing emissions of gases and carbon	
	<i>Stakeholder Management Activities</i>
Adoption of supplier codes of conduct	
Develop the awareness of stakeholders in sustainable activities and reduce its negative impacts on societies	
	<i>Supply Chain Management Activities</i>
Implement sustainability initiatives through a wide network of stakeholders	
The use of resources common to the various linkages in the production chain	
Social Dimension	
Provide services that meet the needs of users without the need to own physical products	<i>Handing over jobs instead of ownership</i>
To achieve the welfare of employees, living wages and community development in terms of education and health and means of livelihood	<i>Adopt a supervisory role to ensure the long-term health and well-being of stakeholders long</i>
Reduce consumption and production	<i>Encouragement of sufficiency</i>
Economic Dimension	
Not seeking to maximize profit, focusing on provide social and environmental benefits through develop close integration between companies and stakeholders	<i>Reworking business to benefit Society/Environment</i>
Develop franchising, licensing, and collaboration models such as outsourcing, open innovation platforms, incubators, and slow capital	<i>Development of Large-Scale Solutions</i>

The independent variables are the Quality of Environmental Accounting Information (QEAI) and the Quality of Financial Statements (QFS). QEAI is also measured by a score which taking account the items identified in Table 2. The approach to scoring

items is also dichotomous. The item takes a score of 1 if a firm disclosed the information in question, and 0 if not. Three dimensions of Quality of Environmental Accounting Information disclosure are examined: Relevance, Reliability and Compliance.

Table 2: Quality of Environmental Accounting Information.

Relevance Dimension	
Item Disclosure	Financial Position
Total Investment in Environmental Protection	
Environmental protection facilities and technologies	
Obligations arising from environmental problems	
	Results of operational work
Environmental protection expenditures in facilities	
Environmental lawsuits and fines costs	
Environmental government support	
Environmental Protection Income	
Environmental other expenses	
	Environmental Policy Information
Establishing attributes of the environmental management system	
Ecosystem certification and clean production	
	Control of pollution
Identification of the sources of discharged pollutants	
Recycling exhaust emissions of internal combustion	
Resource consumption and reduction measures	
Reliability	
The degree of accuracy of the company's management structure	Firm Structure
	Organizational Situation
Inspection and enforcement of tax laws, including for industry, commerce, and taxation	
Regulation on Information Disclosure	
	External documentation
Annual reports of the firm and audit opinions on environmental information	
The internal control system of a firm and its implementation	
Compliance Dimension	
	The Right time
Timely disclosure of financial and related reports	
Timely disclosure of key reports	
	Integrity
Integrity of the contents and scope of disclosure in accordance with laws and regulations	
Integrity of accounting processes and the contents of financial information in accordance with laws and regulations	

However, the Quality of Financial Statements (QFS) is assessed by a dummy variable that takes the value 1 if the absolute value of abnormal accruals is less than the sample average of the absolute abnormal accruals and 0 otherwise. This classification assumes that lower absolute abnormal accruals indicate higher financial reporting quality (Kothari et al., 2005).

5.3. Empirical Model

A logistic model is used in this study in order to assess the effect of Quality of Environmental Accounting Information (QEAI) on Quality of Financial Statements (QFS) (Model 1). We employed this regression as our dependent variable Quality of Financial Statements (QFS) is dummy. Logistic regression is the suitable estimation method when

the dependent variable is binary, as it allows modeling the probability of occurrence of a given event.

The model (1) is presented as follows:

$$QFS = \alpha + \beta_1 QEAI + \epsilon \quad (1)$$

The models that assessed the effect of the Quality of Environmental Accounting Information (QEAI) on sustainable development (SD) are advanced as follows:

$$SD_{it} = \alpha + \beta_1 QFS_{it} + \epsilon_{it} \quad (2)$$

$$SD_{it} = \alpha + \beta_1 QEAI_{it} + \epsilon_{it} \quad (3)$$

$$SD_{it} = \alpha + \beta_1 QEAI_t + \beta_2 QFS_{it} + \epsilon_{it} \quad (4)$$

With:

i: Firm and t: 2013-2022

SD: Sustainable Development

QEAI: Quality of Environmental Accounting Information

QFS: Quality of Financial Statements

These all Models (2, 3 and 4) are linear regression as their dependent variable Sustainable Development (SD) is a continuous score, constructed as a sum of multiple disclosure indicators across environmental, social, and economic dimensions. These are suitable for assessing both direct and

mediating effects of studied variables.

5.4. Empirical Results

5.4.1. Data Description

Table 3 provides the descriptive statistics of our variables.

Table 3: Descriptive Statistics.

Variable	N	Mean	Median	Std. Dev.	Min	Max
Sustainable Development	220	11.645	12.000	1.012	10	13
Quality of Environmental Accounting Information	220	19.095	19.000	2.077	16	22
Quality of Financial Statement	220	0.718	1.000	0.451	0	1

5.5. Validity of the Regression Assumptions

Before testing our hypotheses, it is very important to examine the validity of regression assumptions

through many tests as normal distribution, multicollinearity, stationarity, autocorrelation, and homoscedasticity. Table 4 resumes all the results of these tests.

Table 4: Validity Tests of the Regression's Assumptions.

Normality Test		
Variable	skewness	kurtosis
SD	-0.281	1.998
QEAI	-0.161	1.796
QFS	-0.97	1.941
Multicollinearity Test		
	VIF	1/VIF
QEAI	1.164	0.859
QFS	1.164	0.859
Mean VIF	1.164	.
Time Series Test		
	LLC Test	HT Test
	With (Without) Trend	With (Without) Trend
SD	-8.325*** (-7.081) ***	-5.586*** (-10.296) ***
QEAI	-11.459*** (-8.671) ***	-6.905*** (-9.272) ***
QFS	-10.845*** (-6.666) ***	-8.332*** (-12.063) ***
Autocorrelation & Homoscedasticity Test		
Wooldridge Test for Autocorrelation in Panel Data		
Model	F (1, 21)	Prob > F
1	2.794	0.109
2	2.697	0.115
Modified Wald Test for Groupwise Heteroskedasticity		
Model	chi ² (22)	Prob>chi ²
1	141.6	0.000
2	161.84	0.000
***. shows they are stationary		

According to these results, Table 4 confirms according to Gujarati (2003) the normality of distribution, the absence of multicollinearity (VIF less than 5), Stationarity of series (t value for Levin-Lin-Chu test (LLC) and Harris-Tzavalis test (HT) tests are less than sig ($\alpha < 5\%$)), absence of autocorrelation and the heteroskedasticity.

5.6. Selection Model of Panel Data Regression

The results of Table 5 show that the Fixed Effect Model is appropriate since the test values are below the threshold level of 5%.

Table 5: Validity Tests of the Regression's Assumptions.

Husman Test		
Model	chi2	P-value
1	7.165	0.007
2	11.098	0.004

Breusch and Pagan Lagrangian multiplier test for random effects

5.7. Estimation Results

(4) Models are used in our study in order to examine the mediating role of the quality of the financial statements in the effect of the quality of

environmental accounting information on sustainable development: simple and multiple linear and logistic regressions. Table 6 provides all the results of the estimated models.

Table 6: Results of Estimated Models.

Model 1							
Variable	Coef.	St.Err.	t-value	p-value	Wald chi ² test	H1	
QEAI	0.476	0.114	4.18	0.000	17.44***	Confirmed	
Intercept	-7.652	2.137	-3.58	0.000			
Model 2							
Variable	Coef.	St.Err.	t-value	p-value	F test	R ²	H2
FSQ	0.812	0.193	4.2	0.000	17.67***	0.175	Confirmed
Intercept	11.062	0.139	79.74	0.000			
Model 3							
Variable	Coef.	St.Err.	t-value	p-value	F test	R ²	H3
QEAI	0.196	0.036	5.38	0.000	28.92***	0.225	Confirmed
Intercept	7.908	0.695	11.38	0.000			
Model 4							
Variable	Coef.	St.Err.	t-value	p-value	F test	R ²	H4
QEAI	0.160	0.038	4.27	0.000	29.129***	0.314	Confirmed
FSQ	0.605	0.176	3.44	0.002			
Intercept	8.148	0.664	12.26	0.000			

*** p<.01, ** p<.05, * p<.1

Table 6 shows that the results of model 1 prove the positive and significant relationship between quality of environmental accounting information (QEAI) and quality of financial statement (QFS) by logistic regression. This result confirms our hypothesis H1. Quality of environmental accounting information path coefficient for quality of financial statement is 0.476, indicating that quality of environmental accounting information has a positive effect on the quality of financial statement. This means that the higher the quality of environmental accounting information, can increase the quality of financial statements. The results of this study provide empirical evidence that companies which meet the quality standards of environmental accounting information and disclose more tend to have higher financial statement quality. At the meaning, the quality of environmental accounting information that involves environmental elements in its

statements leads to the quality of the financial statements, which results in confidence in the company, which is reflected in its value. The results of this study are consistent with previous studies as Khaghaany et al (2019), Sharawi and Shahawi (2024), and Qirem et al. (2023). We find that the coefficients on QFS is significantly positive at less than 5% significance level, implying that firms which have better quality of financial statements are more likely to improve sustainable development. H2 is confirmed. The quality of financial statements plays a crucial role in achieving and promoting sustainable development. The results of this study provide applied keep up that companies that have achieved of the quality in its financial statement that led to it was strengthened sustainable development. When financial statements are devoid of earnings management, this is reflected in improving sustainable development management, which is the

demand of stakeholders. We corroborate many empirical evidences as Pizzi et al. (2020), AL-Hiyari et al. (2025), and Dungtripop et al. (2025). The results of Table 6 also show that the quality of environmental accounting information (QEAI) positively and significantly impacts sustainable development (SD). Our hypothesis H3 is also confirmed. The higher quality of environmental accounting information can increase sustainable development. The knowledge of environmental accounting information helps people to understand the real state of the surrounding area, which in turn raises consciousness about environmental issues and encourages more efficient use of natural resources. When managers avoid disclosing any accounting information about environmental that reduce of improving sustainable development it hurts of stakeholders. This finding is supported by empirical evidence presented in the studies of Hao (2019), Jankalova and Jankal (2024), and Nguyen et al. (2020). Our empirical evidence finds that the coefficient on QEAI has a positive and significant effect on SD through QFS. Our hypothesis H4 is confirmed. As organizations recognize the significance of sustainable practices, the role of financial statements and the auditor's report becomes crucial in mediating the relationship between environmental accounting information and sustainable development. This finding is backed by empirical evidence from the studies conducted by Adjobi et al. (2025) and Nguyen Thi (2022). We apply the Sobel test to support the mediating role of quality financial statements in explaining the impact of the quality of environmental accounting information on sustainable development (Table 7).

Table 7: Sobel Test Result.

Input		Output			
Coef.	St.Err.	z-value	St.Err.	p-value	H4
0.476	0.114	2.964***	0.130	0.003	<i>Confirmed</i>
0.812	0.193				
*** p<.01, ** p<.05, * p<.1					

Table 7 shows that the Z value is equal to 2.964 with a probability less than 0.05 (p-value 0.003). We confirm the assumption that states that the quality of environmental accounting information affects sustainable development through the quality of financial statements. Financial statements problems that occur can encourage companies' management to keep up with preparing and auditing financial statements according to standards, meaning that the financial statements are free of any manipulation in their elements, and thus the quality of those financial statements. Therefore, by disclosing the quality of

environmental accounting information, they can also increase the quality of the financial statements, because it can reduce issues and manipulation that lead to increased quality in it. So, this will be able to improve sustainable development. This finding corroborates the study of Pham and Vu (2022). The findings from this study have direct implications for business strategy in Iraqi companies. The documented positive relation among the quality of environmental accounting information (QEAI), financial statement quality (QFS), and sustainable development (SD) suggests that the inclusion of environmental disclosures in financial reports enhances transparency, stakeholder confidence, and value in the long term. To operationalize these findings, Iraqi industrial firms can take several practical steps: Firms should embed environmental accounting practices into their regular financial reporting cycles. This means systematically collecting, verifying, and reporting environmental data, such as resource usage, emissions, waste management, and compliance with environmental regulations, in a standardized format that aligns with international frameworks like the Global Reporting Initiative (GRI) or the Sustainability Accounting Standards Board (SASB). Companies need to invest in training accounting and audit staff on environmental reporting standards and techniques. This includes workshops, certifications, and partnerships with environmental experts to ensure the accuracy and credibility of reported information. Firms should strengthen their internal audit functions to include environmental data verification. Engaging external auditors with expertise in environmental accounting can provide independent assurance, improving the trustworthiness of sustainability-related disclosures. Industrial companies can define measurable sustainability targets (e.g., reducing carbon emissions by a certain percentage) and regularly disclose progress. This links environmental performance with financial outcomes, making sustainability a part of corporate strategy. Transparent and high-quality environmental reporting can differentiate Iraqi firms in the marketplace, attracting investment from socially responsible investors and improving access to global supply chains with strict environmental requirements. At the policy level, regulators should establish clear mandates for environmental disclosure, develop guidelines tailored to Iraqi industries, and enforce compliance through audits and penalties. Government programs can support this transition by offering incentives for firms that adopt sustainable practices and invest in reporting

infrastructure. By operationalizing these steps, Iraqi industrial firms can not only improve their financial and environmental performance but also contribute meaningfully to national sustainable development goals, positioning themselves competitively in an increasingly sustainability-driven global economy.

6. CONCLUSION

This study aims to reveal the influence of the quality of environmental accounting information on sustainable development by the mediating effect of the quality of financial statements. To achieve this objective, we propose a new framework model and examine it by regression analysis. This study indicates that disclosure of the quality of environmental accounting information has a significant effect on sustainable development. This study confirms the relationship between the qualities of environmental accounting information on sustainable development by the mediating effect of quality of financial statements. Therefore, it can be concluded that more disclosure of the quality of environmental accounting information influences the quality of financial statements, leading to improved sustainable development in a better way. Recently, industrial companies in Iraq have been paying attention not only to the quality of financial statements but also to the quality of environmental accounting information, in additional interest to economic, environmental, and social sustainability at alike. Therefore, the study findings can confidently contribute value to the literature and may influence managers, stakeholders, regulators, and, more importantly, Industrial Companies Listed on the Iraq Stock Exchange. These empirical results carry significant practical implications for the Iraqi corporate environment, where the push for sustainability is still emerging and often constrained by regulatory, institutional, and economic challenges. The demonstrated positive relationship between the quality of environmental accounting information (QEAI) and both financial statement

quality (QFS) and sustainable development (SD) suggests that Iraqi firms can enhance their financial credibility and long-term sustainability performance through improved environmental disclosure practices. In a context where stakeholder trust in corporate reporting is relatively low, especially post-conflict and amid rebuilding efforts, companies that integrate transparent and high-quality environmental information into their financial reports can signal accountability and build reputational capital. This is particularly relevant for sectors heavily scrutinized for environmental impact, such as oil, cement, and industrial manufacturing. Moreover, the mediating role of financial reporting quality emphasizes that improvements in environmental accounting alone are insufficient unless matched by strong financial reporting frameworks, which can attract foreign investors and foster regulatory compliance. As Iraq moves toward aligning with international sustainability standards, the study's results highlight the need for policy makers, auditors, and corporate leaders to prioritize the development of integrated reporting practices that not only meet statistical benchmarks but also respond to the practical demands of transparency, environmental responsibility, and sustainable economic development. The current study has certain limitations. First, the sample is limited to Iraqi industrial companies, and this may affect the comparability of results across industries or even geographic areas. Second, even if efforts are made to standardize measures, variables such as environmental accounting quality remain, to some degree, subjective in measurement. Future research could address these limitations by expanding the sample to other sectors or undertaking cross-country comparisons to enhance external validity. Moreover, longitudinal studies could also help to understand how the interplay between environmental accounting and sustainable development evolves over time.

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