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THE ROLE OF ENVIRONMENTAL COSTS IN IMPROVING THE QUALITY OF FINANCIAL STATEMENTS - A SURVEY STUDY OF THE OPINIONS OF A SAMPLE OF AUDITORS AND ACADEMICS IN THE FIELD OF ACCOUNTING IN THE CITY OF ERBIL

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Abstract: This research checks the role of environmental costs in improving the quality of financial statements by surveying the opinion of auditors and accounting academics in the Kurdistan region -Iraq. The study is inspired by global changes towards stability and environmental accountability, where the recognition and disclosure of environmental costs has become a necessary component in increasing transparency, loyal representation, perfection and verification of financial reporting. However, in many emerging economies, the disclosure of environmental cost is limited, causing incomplete or potentially misleading information that reduces the decision making of stakeholders.

The study employed a descriptive-analysis method using a structured questionnaire distributed to a sample of academics and practitioners in accounting and audit areas. Conclusions reveal a strong consent on the positive impact of incorporating environmental costs in financial statements, especially in strengthening transparency and stakeholders. Nevertheless, the results also highlight significant obstacles for effective implementation, including weak regulatory structures, limited awareness about environmental accounting and lack of technical expertise.

This research contributes to reducing a significant difference in local literature on environmental accounting and financial reporting quality in the Iraq and Kurdistan region. It provides a scientific foundation and practical recommendations for policy makers, regulators and educational institutions to encourage more transparent and durable accounting practices. The study concludes that integrating environmental costs in financial statements is an important step towards promoting sustainable growth. And strengthening the stakeholder trust.

Keywords: Environmental Cost, Financial statement quality, Environmental Accounting, sustainability.

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دور التكاليف البيئية في تحسين جودة التقارير المالية ـ دراسة استطلاعية لآراء عينة من المدققين والأكاديميين في تخصص المحاسبة في مدينة أربيل

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المستخلص: يبحث هذا الدراسة في دور التكاليف البيئية في تحسين جودة البيانات المالية من خلال استطلاع رأي المدققين والأكاديميين المحاسبين في إقليم كوردستان - العراق. تستلهم الدراسة من التغيرات العالمية نحو الاستقرار والمساءلة البيئية، حيث أصبح الاعتراف والإفصاح عن التكاليف البيئية مكوناً ضرورياً في زيادة الشفافية والتمثيل الموثوق والكمال والتحقق من التقارير المالية. ومع ذلك، في العديد من الاقتصادات الناشئة، يكون الإفصاح عن التكاليف البيئية محدوداً، مما يتسبب في معلومات غير كاملة أو مضللة محتملة تقلل من عملية اتخاذ القرار لأصحاب المصلحة.

استخدمت الدراسة المنهج الوصفي التحليلي باستخدام استبيان منظم، تم توزيعه على عينة من الأكاديميين والممارسين في مجالات المحاسبة والتدقيق. تكشف النتائج عن موافقة قوية على التأثير الإيجابي لدمج التكاليف البيئية في البيانات المالية، خاصة في تعزيز الشفافية وأصحاب المصلحة. ومع ذلك، تسلط النتائج الضوء أيضاً على عقبات كبيرة أمام التنفيذ الفعال، بما في ذلك ضعف الهياكل التنظيمية، والوعي المحدود بالمحاسبة البيئية، ونقص الخبرة الفنية.

يساهم هذا الدراسة في تقليل فجوة كبيرة في الأدبيات المحلية حول المحاسبة البيئية وجودة التقارير المالية في العراق وإقليم كوردستان. ويوفر أساساً علمياً وتوصيات عملية لصانعي السياسات والجهات التنظيمية والمؤسسات التعليمية لتشجيع ممارسات محاسبية أكثر شفافية واستدامة. وتخلص الدراسات إلى أن دمج التكاليف البيئية في البيانات المالية خطوة مهمة نحو تعزيز التنمية المستدامة وتعزيز ثقة أصحاب المصلحة.

الكلمات المفتاحية: التكاليف البيئية، جودة البيانات المالية، المحاسبة البيئية، الاستدامة.

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Introduction

Environmental cost has become an important field in accounting, as they represent financial sacrifice organizations due to their influence on the environment. This cost includes a wide range of activities such as pollution control, waste management, environmental treatment and compliance with environmental regulations. Integration of environmental costs in accounting systems is not only a matter of compliance, but also a strategic approach that improves transparency, enhances the quality of financial statements, and supports permanent growth. Many scholars have highlighted that these costs include both direct and indirect components and can be classified in different ways, such as prevention, detection, internal failure, external failure, or hidden and external costs. Proper recognition of these costs and disclosure provides relevant information to managers and stakeholders for decision making, long -term plan and risk management.

Globally, framework such as Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), and International Integrated Reporting Council (IRC) has emphasized environmental disclosure. However, many developing countries, including the Iraq and Kurdistan region, face significant challenges in implementing environmental cost accounting. Weak legislative structures, limited professional awareness, and lack of technical expertise obstruct effective disclosure and integration. In the Kurdistan region, where industries such as oil, gas and construction are prominent, the absence of clear environmental accounting practices reduces the lack of resources, environmental fall and the reliability of financial reporting.

This study tries to detect the role of environmental costs in improving the quality of financial statements in the city of Erbil city. Using a descriptive-analysis method, data will be collected through the questionnaire distributed to data auditors, academics and accountants, and analyzed using SPSS. The study envisages a positive relationship between environmental cost disclosure and qualitative characteristics of financial statements - reliability, reliability, equivalence and loyal

representation. Conclusions are expected to contribute to educational literature and provide practical guidance to align with global stability standards for policy makers, professional bodies and companies in the Kurdistan region, strengthen transparency and increase stakeholder trusts.

1st: Research Problem

In recent years, their impact on environmental issues and their influence on economic activities has increased. This trend has affected the requirements to prepare financial statements, which are no longer limited to presenting traditional financial information, but are now expected to include data with an environmental dimension. In this context, environmental costs have emerged as an important accounting element that can contribute to improve the quality of financial statements in terms of reliability, transparency and comparability.

However, the degree of disclosure regarding environmental costs in financial reports within the local context, including the city of Erbil, remains limited and insufficiently regulated. This raises questions about the extent to which practitioners and academics are aware of the importance of integrating these costs into the accounting system and their role in enhancing the quality of financial information. Accordingly, the research problem is represented in the following main question:

"What is the role of environmental costs in improving the quality of financial statements from the perspective of academics and professionals in the field of accounting in the city of Erbil?"

This main question is addressed through the following sub-questions:

1. To what extent are academics and professionals aware of the concept and components of environmental costs?
2. What is the impact of including environmental costs on the qualitative characteristics of financial statements (relevance, reliability, comparability, understandability)?
3. What is the current level of disclosure of environmental costs in the local environment?

2nd: Research objectives

1. Identify the concept of environmental costs and their importance in the accounting context.
2. Measure the awareness of academics and professionals regarding the impact of environmental costs on the quality of financial statements.
3. Analyze the level of disclosure of environmental costs in the local environment.
4. Provide practical recommendations to enhance environmental cost disclosure in a way that improves the quality of financial reporting.

3rd: Research Significance

1. Theoretical significance: the study fills a gap in the local accounting literature concerning environmental costs and the quality of financial statements. It provides a scientific framework that clarifies the relationship between environmental costs and the qualitative characteristics of financial information, thereby enhancing the comprehensive concept of environmental accounting.

2. Practical significance: It offers practitioners (auditors and accountants) a clear understanding of the benefits of including environmental costs in financial reports. It assists regulatory bodies and policymakers in developing accounting policies and standards that promote environmental disclosure and improve the quality of financial information in local economic entities.

4th: Research Hypotheses

Accordingly, the study tests the following main and sub-hypotheses:

Main Hypothesis (H_0): There is no statistically significant relationship or influence between the inclusion of environmental costs and the improvement of financial statement quality from the perspective of auditors and accounting academics in Erbil.

Alternative Hypothesis (H_1): There is a statistically significant relationship and influence between the inclusion of environmental costs and the improvement of financial statement quality from the perspective of auditors and accounting academics in Erbil.

H1-1: Environmental costs have a statistically significant relationship and influence on the Faithful Representation of financial statements.
H1-2: Environmental costs have a statistically significant relationship and influence on the Completeness of financial statements.
H1-3: Environmental costs have a statistically significant relationship and influence on the Timeliness of financial statements.
H1-4: Environmental costs have a statistically significant relationship and influence on the Verifiability of financial statements.
H1-5: There are statistically significant differences in perceptions of the impact of environmental costs on financial statement quality based on professional background (Professional vs. Academic).
H1-6: There are statistically significant differences in perceptions based on years of professional experience.

5th: Research Limitation

Subject matter limits: The study focuses on the role of environmental costs in improving the quality of financial statements without addressing other elements of environmental accounting.
Spatial limits: Companies, universities, and institutes in the city of Erbil.
Time limits: The data collected covers the year 2025.
Human limits: Professionals and academics in the field of accounting.

6th: Conceptual Model

Independent Variable: Environmental Costs (Awareness and Knowledge of Environmental Costs, Institutional and Economic Performance, Environmental Cost Disclosure).
Dependent Variable: Financial Statement Quality (assessed through dimensions: Faithful Representation, Completeness, Timeliness Verifiability).
This model helps to guide the empirical testing of the stated hypotheses and provides a structured lens through which the relationship between environmental costs and financial reporting quality can be examined.

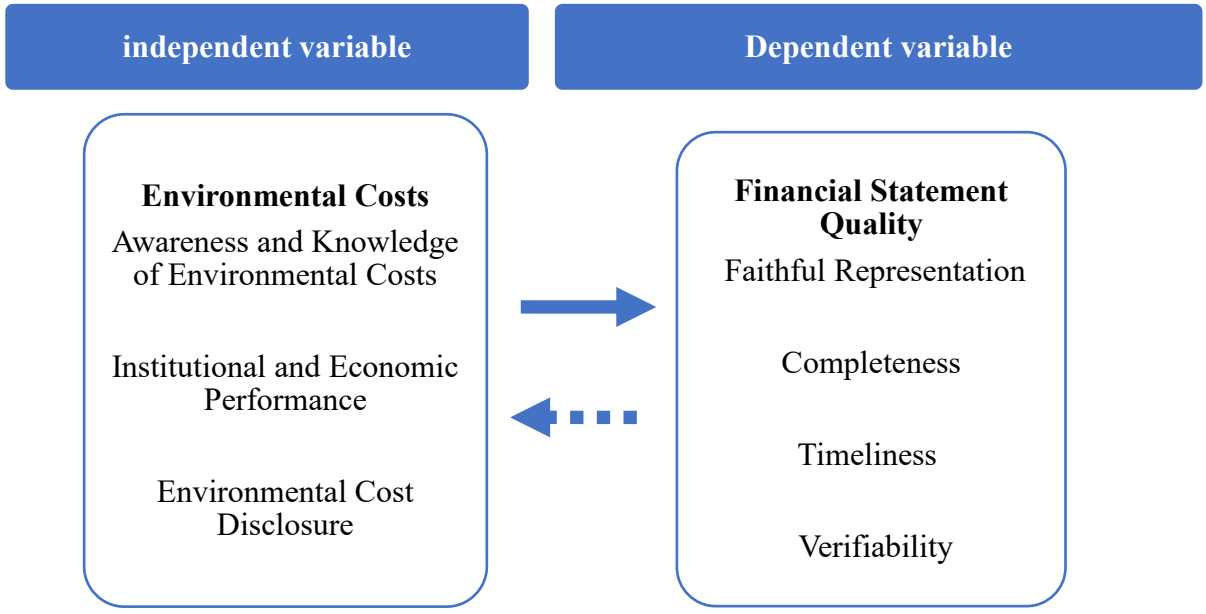

Diagram (1) *Conceptual Model*

Source: prepared by the researchers

Theoretical Framework

1st: Environmental cost

1- Definition and Concept of Environmental Costs

Environmental cost represents economic sacrifice organizations, resulting in their environmental impacts including pollution control, waste management, remedial activities, regulatory compliance and comprehensive stability projects. These costs are not only compliant, but also play a strategic role in increasing long-term trade stability and transparency Bucior and Szadziewska (2021) classify them in direct costs, such as waste disposal and pollution treatment, and indirect costs, such as stability reporting and environmental investment, which are rapidly relevant to small and medium -sized firms. Shiyghan, Mukah, and Vukenkeng (2024) face environmental costs as part of a strategic accounting structure, combining them with pollution prevention, community development, and activists' protection, while highlighting their role in improving returns on assets. From an area-specific point of view Collectively, these approaches confirm that environmental cost accounting is not limited to legal compliance, but serves as a managerial and strategic tool to improve decision making, corporate accountability and alignment with global stability objectives.

2- Historical Development of Environmental Cost Accounting

The historical development of environmental cost accounting (ECA) reflects its change with a narrow care on the repair of damage to a strategic equipment for stability and corporate accountability. Al Anssari (2023) prepares four chronological stages outline: initial attention on post -damage repair (1970s -1980s), expansion to preventive expenditure, introduction of active approaches in the mid -1990s such as material flow cost accounting (MFCA), and recent environmental costs, and the recent emphasis on external environmental costs, however, are difficult, however. Al-Mavli (2021) highlighted that traditional accounting often miscreited environmental costs as overheads, but empirical evidence from Jordan shows that ECA adoption improves efficiency, waste deficiency and financial performance by adding profitability to environmental results. From a global point of view, Iyanala et al. (2024) It was emphasized that ECA has shifted a marginal exercise to a main column of sustainable accounting, industries have seen rapid environmental costs as strategic investments that increase the alignment with competition, reputation and structures such as competition, reputation and GRI, SDG and IFRS. Complementing this.

The researcher argues that ECA has only progressed to become a strategic tool by repairing environmental damage that supports stability and financial performance. Despite the challenges in identifying external costs, its integration with MFCA and Global Framework such as GRI, SDG and IFRS highlights its growing role in corporate accountability and competition.

3- Advantages of Environmental Costs

Environmental Cost Accounts (ECA) provides significant managerial, financial and strategic benefits by translating environmental impacts into average financial terms that support sustainable decision making. Bucior (2021) has been highlighted that integrating environmental costs improves resource allocation, cost control, long -term strategy and compliance, while transparency also increases. Shiyghan, Mukah, & Vukenkeng (2023) emphasize their role in promoting corporate social responsibility, accountability and strong relations with communities and regulators through better waste and pollution management. Similarly, Yogiswari, Budiasih, & Purnamasari (2022) are stress that increases transparency, strengthens reputation, and attracts socially responsible investors. Agyemang et al. (2023) Provides evidence that ECA can improve both environment and financial performance by increasing operational efficiency and reducing regulatory risks. In high-effects industries.

The researchers believes that ECA strengthens organizational competition by aligning financial performance with environmental responsibility.

4- Types of Environmental Costs

A. **Prevention and minimalization costs:** These are active expenses before avoiding environmental damage, including environmentally friendly technologies, content replacement, training programs and emissions systems before it is. They help firms to reduce future liabilities and ensure long -term stability (Yogiswari et al., 2022).
B. **Detection and monitoring cost:** These include audit, inspection, emission tracking, and performance reporting that to verify compliance and generate reliable data to make decisions. Such costs strengthen accountability and transparency in environmental strategies (Bucior & Szadziewska, 2021).
C. **The cost of internal failure:** These arise when disabilities or environmental issues occur within organizational limitations, such as waste treatment, recycling and pollution control. They are often hidden in overheads, distorting true costs and reduce resource efficiency (Yogiswari et al., 2022).
D. **External failure costs:** These occur when environmental damage is spread beyond the firm, including legal fines, punishment, compensation, reputed damage and long-term ecological recovery. They represent significant financial risk and signal weaknesses in prevention and monitoring systems (Ratmono et al., 2024).
E. **Casual and therapeutic costs:** These are the possible future obligations arising from previous or current operations, including soil refinement, groundwater treatment, or facility demolition. Although uncertain, they are important for compliance with environmental risk management and global regime standards (Ndzebir et al., 2024).

5- Classification of Environmental Costs

According to Adegbie, Oluwadare, and Oyegoke (2023), the quality of financial statements directly affects the trust and decision making of stakeholders such as investors, creditors and employees, as reliable and timely reporting information reduces information disparity and supports confidence in corporate manifestations. In a similar view, Mesioye and Bakare (2024) emphasizes that high quality financial reporting, reinforced by audit assurance, is indispensable for regulators and analysts, as poor-quality reports may cause resources abuse, loss of investor trusts, and market volatility. Through a natural use in India, Bhambhwani (2019), shows that when the creditors are given strong rights, the firms responded by improving the quality of financial reporting and increasing the financial discipline, reducing the cost of lending. Kumar, Chandrarin, and Harmono (2023) further argued that transparent and accurate financial information improves investment efficiency by reducing over-and-investments problems through better resource allocation.
The researchers believes that the financial statement quality is not only a technical requirement, but a strategic tool that promotes stakeholders, ensures more efficient use of resources, and contributes to long -term economic growth and stability (Olalere et al., 2023; Mesioye & Bakare, 2024).

6- Models and Methods for Measuring Environmental Costs

Models and methods for measuring environmental costs have developed in essential tools of modern stability accounting, aimed at capturing visible and hidden environmental impacts and integrate them in corporate decision making and reporting. Sultan et al. (2024) A hybrid framework proposes in combination with financial accounting, environmental science and stability metrics, which improves organizational accountability, enhances environmental performance, and emphasizes global reporting standards such as GRI, CDP and SASB. Abubakar and Nasiru (2024) introduce an environmental management account (EMA) model that classifies costs into preventive, detection, internal failure and external failure categories by incorporating material flow cost accounting (MFCA) and input -output analysis to improve allocation accuracy and transparency. Completing these approaches, Munir and Ghazal (2023) advocate an integrated performance measurement system, which is inter-internal and non-transcendent environmental costs, supported by the life cycle cost (LCC) and full cost accounting (FCA), which are to hold long-term ecological and reputed effects. Despite the implementation challenges such as data reliability, institutional

support and managerial resistance, these models collectively highlight the strategic need to embed environmental costs in mainstream accounting systems. By moving beyond traditional methods, they promote transparency, regulatory compliance and investor trusts, promoting durable and socially responsible business practices.

7- International Standards Related to Environmental Cost Disclosure

The concept of environmental cost disclosure has become quite advanced, becoming an important mechanism to promote corporate transparency and stability, yet the absence of integrated international standards continues to limit its effectiveness. Jaber and Zerkot (2023) suggest that disclosure increases both environment and financial performance, but is forced by structural and regulatory obstacles, especially in contexts with IFRS or GRI-based framework deficiency. Similarly, la soa et al. (2024) This reflects that high levels of disclosure between Vietnamese firms reduce financial risk and improve market stability, although local weaknesses in guidance and institutional support obstruct complete implementation. Portela and Borba (2019) emphasizes that environmental disclosure should include both qualitative and quantitative indicators to meet stakeholders, but lack of harmonious standards create discrepancies in areas, which reduces comparison and reliability.

The researchers believes that environmental cost disclosure is important for accountability, risk reduction and sustainable development, but requires global standardization and strong institutional enforcement to achieve its full potential.

8- The Role of (IFRS) and (GRI) in Environmental Cost Reporting

Integration of environmental cost information in stability reporting has gained global prominence through the complementary roles of International Financial Reporting Standards (IFRS) and global reporting initiative (GRI). IFRS, especially through the installation of the International Stability Standards Board (ISSB), extends beyond traditional financial reporting to include environment, social and governance dimensions, encourages firms to encourage emissions, energy uses, and to disclose the costs related to waste management, which is a form of long -term risk management and behaviorally (blessing, 2024). Is. Meanwhile, GRI has pioneered stakeholder-oriented revelations by the need of organizations to report both direct and indirect environmental costs, resource consumption, and mitigation strategies, which is the status of environmental cost reporting as a tool for accountability and sustainable development (Roca and Sierssi, 2012). According to Osei-Tutu and Botng (2024), IFRS provides global comparability while GRI provides more detailed environmental matrix, and their coordination is required to align the reporting practices with Sustainable Development Goals, especially SDG 12 and SDG13. Despite these advances, challenges remain, including incompatible adoption, lack of sector-specific guidelines and fragmented reporting framework (Ashirvad, 2024). Collectively, IFRS and GRI are embedding environmental responsibility in financial revelations and investment practices, define the scope of accounting in the stability era.

2nd: Quality of Financial Statements:

1- Definition and concept of quality of financial statements

The quality of financial statements reflects the utility, reliability and relevance of financial information for stakeholders, ensuring transparency, comparison and accuracy in reporting. Apalowowa et al. (2025) It is tension that compliance with IFRS and GAAP reduces high quality reports that are complete, verified and free from material errors or bias, which maintains confidence and supported informed decisions. Raičević (2021) stated that selection and implementation of accounting policies defined by IAS 8 directly affects the reliability and equality of financial statements, making managerial options a decisive factor in determining quality. Osiga-Ibangbee et al. (2025) Further argues that quality reporting increases the trust of the investor, facilitates access to capital, and reduces the risks of manipulation, while poor reporting reduces governance and economic stability. From the perspective of a stability, Abangbi et al. (2025) Emphasizing that

integrating environmental costs and risks in financial statements correctness improves accuracy, ensures recognition of potential liabilities, and strengthens accountability. Collectively.

The researchers believes that the financial description quality is a multidimensional construction that is shaped by accounting standards, governance structures and managerial integrity, which plays a fundamental role in promoting transparency, market stability and sustainable growth.

2- Role of International Financial Reporting Standards (IFRS) in Enhancing the quality of financial information.

Adopting the International Financial Reporting Standards (IFRS) is widely recognized as a driver of high-quality financial information, which is from increasing transparency, credibility and comparison in courts. Saddam Kateya (2024) suggests that IFRS implementation in Iraqi banks greatly improved the disclosure practices, cash flow presentation and investor decision making, leading to an increase in economic efficiency. Similarly, Auvalu Musa (2019) stated that IFRS reduces income management and increases price relevance, although its effectiveness depends on strong enforcement and managerial incentives. Evidence of Taiwanese firms indicates that IFRS curb adopted eclipse income management and improve income accuracy, although loyal advice and Abdullah Abdel-Salam (2020) pay attention to limited effects on relevance and time loss recognition due to weak governance structures. Indonesia, Food, Juliyarto and Harto (2019) report mixed results, emphasizing that convergence without strong institutional support cannot fully improve accounting quality. Collectively, these studies confirm that IFRS improves the quality of disclosure and in investors' confidence, its effectiveness depends a lot on the power of regime, regulatory enforcement, and organizational readiness, especially in emerging economies.

3- Importance of Financial Statement Quality for Stakeholders

The quality of financial statements plays an important role in meeting the needs of stakeholders such as investors, creditors, employees and regulators, which supports making sound economic decisions by providing transparent, reliable and relevant information. High quality reporting information reduces inequality, stake strengthening confidence, and encourages the flow of capital. Enteritic evidence confirms that reliable corporate reporting stakeholders positively affect the trusts and decisions (Adegbie et al., 2023), while audit assurance and transparency are required to reduce misunderstandings and market volatility (Mesioye & Bakare, 2024). Similarly, creditor empowerment encourages firms to increase reporting practices and financial discipline, which reduces the cost of lending (Bhambwani, 2019). High quality disclosure also improves investment efficiency by reducing over- and under-investments through better resource allocation (Kumar et al., 2023). In addition, quality reporting reduces the agency conflict between managers and shareholders, promotes efficient investment behavior, and enhances firm valuation (Biddle et al., 2009). Collectively, these findings suggest that the financial statement quality is not only a technical requirement, but also a strategic tool that promotes stakeholders, supports efficient resource allocation, and contributes to long -term economic stability (Olalere et al., 2023; Mesioye & Bakare, 2024).

4- Impact of Accounting Policies on Financial Information Quality

Accounting policies play a decisive role in shaping the reliability, transparency and comparability of financial information, which directly affect the managerial decision making and stakeholder trusts. Cernius & birškytė (2020) can display via differential methods that reflect different depreciation methods, especially tax-operated quick depreciation vs. IFRS-compliance direct reference methods, can distort profit and return indicators by reducing profitable representation. Similarly, Stojanovic and Genjic (2022) emphasizes that accounting options in evaluation, inventory pricing, and depreciation reflect managerial intentions, which can either strengthen or weaken reporting quality, but increase the alignment and accountability with IFRS. Domil, Bogdan, and Kariman (N.D.) provide evidence from Romanian firms that well -dominated accounting policy improves manual reporting accuracy, internal control and overall effectiveness of accounting

information systems. Applying this, Beretta and Bazol (2022) suggest that the inconsistent application of recognition and measurement principles leads to financial ratio and variability in the KPI, which reduces the beliefs of the investor and equivalence in firms. Collectively, these studies confirm that cohesion and transparent accounting policies, especially when combined with IFRs, are essential to ensure high quality financial reporting, reduce the wrong buzz and strengthen governance.

5- Qualitative Characteristics of Financial Information

Qualitative features of accounting information make up the cornerstone of financial reporting quality by ensuring that financial statements are useful, reliable and relevant to various stakeholders. According to Grigoraș-Ichim & Moroşan-Danilă (2016), these features are classified as fundamental characteristics under IASB and FASB Framework-with their interpretation by cultural and authoritarian references, with their interpretation, verification, humility, and timeliness, and extending characteristics such as timeliness. The empirical evidence of Morocco suggests that relevance and loyal representation, supported by other enhancing characteristics, positively affect firm performance indicators such as ROE and ROA, which strengthens transparency, comparability and stakeholder (Khaddouj & Ait Bahabbaz, 2023). Nobes & Stadler (2015) further demonstrated that managers actively refer to these characteristics when adopting or replacing accounting policies, providing direct evidence of their practical importance in the quality of decision making and disclosure. Technological innovations like XBRL have also increased these qualitative characteristics by improving comparison, timeliness and understanding through standardized, machine-elective data, thus to increase future accuracy and reduce information disparity (Burt et al., 2017). Collectively, these studies confirm that qualitative characteristics are not only theoretical guidelines, but are decisive factors in ensuring high quality reporting, improving corporate accountability and providing companies with competitive advantages.

Statistical Analysis of the Questionnaire Results

The following chapter conducts a statistical analysis of the data obtained through the questionnaire, which investigated the environmental costs as a way of enhancing the quality of financial statements. The questionnaire had its target sample of accounting professionals and academics in the city of Erbil. Out of 120 distributed questionnaires, 114 valid questionnaires were gathered and considered statistically analysis eligible. The response rate of 95% reflects an important commitment from those they targeted, which strengthens the findings.

The analyses presented in this chapter are organized systematically according to the demographic characteristics of respondents and their opinions on the variables of interest. It starts with a section describing the participants' background to assist in contextualizing the substantive findings. Next, the core constructions of the study are described, including the independent variable (environmental costs) and the dependent variable (quality of financial statements).

Item development was based on literature, theory, and groupings consistent with each of the two variables' dimensionality. Responses were coded and subjected to analysis using simple descriptive statistical methods, such as frequencies and percentages, as well as bar charts and tables. Each table and figure are analyzed to extract meaning relevant to the research questions and hypotheses of the study.

The combination of academic and practitioner respondents' aids in capturing a holistic view of theoretical knowledge and applied knowledge of environmental accounting concepts. This chapter's data analysis sets the path for reliable conclusions in the following chapters and evidence-based recommendations.

1st: Analysis of Respondents' Demographic Characteristics Professional Affiliation

Table (1): Distribution of Respondents by Demographic Characteristics Professional Affiliation

Academic Title	Frequency	Percent
Assistant Lecturer	31	27.19%

Lecturer	28	24.56%
Assistant Professor	16	14.04%
Professor	3	2.63%
None	36	31.58%
Total	**114**	**100.0%**
Professional Affiliation	**Frequency**	**Percent**
Professional	36	31.58%
Academic	78	68.42
Total	**114**	**100.0%**
Educational and Professional Qualifications	**Frequency**	**Percent**
Ph.D.	30	26.32%
Master's Degree	48	42.11%
Chartered Accountant	36	31.58%
Total	**114**	**100.0%**
Length of Professional Experience	**Frequency**	**Percent**
Less than 5 years	25	21.93%
5 to 10 years	27	23.68%
11 to 15 years	43	37.72%
More than 15 years	19	16.67%
Total	**114**	**100.0%**
Participation in Training	**Frequency**	**Percent**
Yes	42	36.84%
No	72	63.16%
Total	**114**	**100.0%**

Source: prepared by the researchers

2nd: Normality Test Using Kolmogorov–Smirnov (K–S) Test

Before proceeding to more advanced statistical analyses, it is essential to verify whether the data for each variable and its sub-dimensions follow a normal distribution. The Kolmogorov–Smirnov (K–S) test is a widely used method for assessing the goodness-of-fit between an observed data distribution and the normal distribution. This test helps determine the appropriateness of applying parametric tests, which assume normality, or whether non-parametric alternatives should be considered.

Table (2): Kolmogorov–Smirnov Test Results for Normal Distribution

Variable or Dimension	Statistic	p-value	Critical Value
Environmental Costs	0.099	0.196	0.127
Awareness and Knowledge of Environmental Costs	0.175	0.002	0.127
Institutional and Economic Performance	0.175	0.002	0.127
Environmental Cost Disclosure	0.142	0.019	0.127
Quality of Financial Statements	0.106	0.145	0.127
Faithful Representation	0.121	0.064	0.127
Completeness	0.147	0.013	0.127
Timeliness	0.216	0.000	0.127
Verifiability	0.143	0.016	0.127

Source: prepared by the researchers

The results in Table 2 indicate that the overall variable of Environmental Costs yielded a K–S statistic of 0.099 with a p-value of 0.196, which is higher than the critical value of 0.127. Similarly, the total score for Quality of Financial Statements produced a K–S value of 0.106 and a p-value of 0.145, also exceeding the critical threshold. These results imply that both composite variables are approximately normally distributed and suitable for parametric analysis.

On the other hand, several dimensions under each variable exhibited significant deviations from normality. For instance:

Awareness and Knowledge of Environmental Costs recorded a K–S value of 0.175 and a p-value of 0.002, indicating a significant departure from normality.

Institutional and Economic Performance mirrored this result, with the same K–S value and p-value.

Environmental Cost Disclosure had a K–S statistic of 0.142 and a p-value of 0.019, also suggesting non-normality.
Similarly, among the dimensions of the dependent variable:
Completeness (K–S = 0.147, p = 0.013),
Timeliness (K–S = 0.216, p = 0.000),
Verifiability (K–S = 0.143, p = 0.016)
All displayed statistically significant p-values below the accepted threshold, indicating that their distributions deviate from normal.
In contrast, Faithful Representation approached normality, with a p-value of 0.064 and a K–S value of 0.121, which is slightly below the critical value. Although marginal, it does not present strong evidence against the assumption of normality.
These findings suggest a mixed pattern: while the overall constructs exhibit normal distribution, several sub-dimensions violate the assumption of normality. Consequently, the choice of statistical techniques in subsequent analyses should be made with caution, potentially integrating both parametric and non-parametric approaches to ensure the validity and robustness of the results.

3rd: Study Hypothesis Test

In alignment with the research objectives and grounded in the theoretical foundations established through the literature review, a set of hypotheses has been developed to guide empirical investigation into the role of environmental costs in enhancing the quality of financial statements. The purpose of these hypotheses is to examine both the relationship and the influence that environmental cost practices may exert on the perceived quality of financial reporting among auditors and accounting academics in Erbil. Accordingly, the study tests the following main and sub-hypotheses:
Main Hypothesis (H_0): There is no statistically significant relationship or influence between the inclusion of environmental costs and the improvement of financial statement quality from the perspective of auditors and accounting academics in Erbil.
Alternative Hypothesis (H_1): There is a statistically significant relationship and influence between the inclusion of environmental costs and the improvement of financial statement quality from the perspective of auditors and accounting academics in Erbil.
To evaluate the overall relationship and influence of environmental costs on the quality of financial statements, a simple linear regression analysis was conducted. The analysis aimed to determine the extent to which the inclusion of environmental cost considerations predicts improvements in financial reporting quality as perceived by professionals in the accounting field.

Table (3): Simple Linear Regression for the Main Hypothesis

Quality of Financial Statements	Constant	Slope	t-value	p-value	F	p-value	R	R^2
Environmental costs	1.027	1.205	22.524	< 0.001	507.344	< 0.001	90.5%	81.9%

Source: prepared by the researchers

The results presented in Table 3 reveal a statistically significant and strong positive relationship between environmental costs and the quality of financial statements. The slope coefficient of 1.205 indicates that for each unit increase in the environmental cost variable, the perceived quality of financial reporting increases by approximately 1.205 units. This suggests that greater emphasis on environmental cost considerations is associated with notable improvements in reporting quality. The t-value of 22.524 and its corresponding p-value (< 0.001) confirm the statistical significance of the slope coefficient, providing strong evidence that the predictor variable (environmental costs) has a meaningful influence on the dependent variable. In addition, the F-value of 507.344, also significant at $p < 0.001$, indicates that the overall regression model is highly significant and explains a considerable proportion of the variation in the quality of financial statements. The coefficient of determination (R^2) is 0.819, meaning that approximately 81.9% of the variance in the

quality of financial statements can be explained by the environmental cost variable. This is supported by a high correlation coefficient (R) of 0.905, indicating a strong and direct linear relationship between the two variables.

Based on the statistical evidence, the null hypothesis (H_0) is rejected in favor of the alternative hypothesis (H_1), confirming that environmental costs have a significant and positive impact on the quality of financial statements. This finding aligns with the theoretical expectations and emphasizes the strategic importance of integrating environmental considerations into financial reporting frameworks.

To further explore the dimensions of this relationship, the following sub-hypotheses are formulated:

H_1-1: Environmental costs have a statistically significant relationship and influence on the Faithful Representation of financial statements.

To test this hypothesis, a simple linear regression analysis was conducted with Faithful Representation as the dependent variable and Environmental Costs as the independent variable. This test aims to determine whether perceptions of environmental cost integration significantly affect the reliability, accuracy, and neutrality of financial reporting.

Table (4): Simple Linear Regression for the H_1-1 Hypothesis

Faithful Representation	Constant	Slope	t-value	p-value	F	p-value	R	R^2
Environmental costs	-1.460	1.258	13.807	< 0.001	190.622	< 0.001	79.4%	63%

Source: prepared by the researchers

As indicated in Table 4, the regression analysis produced a statistically significant model, with both the t-value for the slope (13.807) and the F-value (190.622) achieving significance at the $p < 0.001$ level. This confirms the presence of a strong and meaningful influence of environmental costs on the faithful representation of financial statements. The slope coefficient of 1.258 suggests that an increase in the level of environmental cost consideration leads to a proportional increase in the perceived reliability and accuracy of financial reporting. In other words, the more organizations emphasize environmental cost disclosure, the more respondents perceive their financial statements as truthfully representing economic reality. The R-squared (R^2) value of 0.630 indicates that 63% of the variance in Faithful Representation can be explained by Environmental Costs. The correlation coefficient (R) of 0.794 also reflects a strong positive relationship between the two variables. The findings strongly support the alternative hypothesis (H_1-1), indicating that environmental costs exert a statistically significant and positive influence on the Faithful Representation dimension of financial reporting. This supports the view that incorporating environmental considerations enhances the transparency, neutrality, and completeness of financial disclosures.

H_1-2: Environmental costs have a statistically significant relationship and influence on the Completeness of financial statements.

This hypothesis was tested using simple linear regression, with Completeness as the dependent variable and Environmental Costs as the predictor. The goal was to determine whether incorporating environmental cost elements contributes to more comprehensive financial disclosures, including information that stakeholders need for informed decision-making.

Table (5): Simple Linear Regression for the H_1-2 Hypothesis

Completeness	Constant	Slope	t-value	p-value	F	p-value	R	R^2
Environmental costs	-0.324	1.035	15.427	< 0.001	238.005	< 0.001	82.5%	68%

Source: prepared by the researchers

As seen in Table 5, the slope coefficient is 1.035, indicating that increased attention to environmental costs corresponds with a proportional rise in the perceived completeness of financial statements. This implies that as environmental data is integrated into financial reporting, disclosures

become more comprehensive and inclusive of critical non-financial factors. The t-value of 15.427 for the slope is highly significant, with a p-value < 0.001, confirming the strong predictive power of environmental costs on the completeness of disclosures. Likewise, the F-statistic of 238.005 with the same level of significance indicates that the regression model itself is robust and reliable. Furthermore, the coefficient of determination (R^2) is 0.680, meaning that changes in environmental cost practices explain 68% of the variance in the Completeness variable. The correlation coefficient (R) of 0.825 supports the presence of a strong, positive linear relationship. Based on these results, the alternative hypothesis (H_1-2) is accepted. The findings demonstrate that environmental costs have a statistically significant and positive influence on the completeness of financial statements. This supports the view that integrating ecological concerns leads to more transparent, inclusive, and decision-useful financial reporting.

H_1-3: Environmental costs have a statistically significant relationship and influence on the Timeliness of financial statements.

To investigate this hypothesis, a simple linear regression was conducted using Timeliness as the dependent variable and Environmental Costs as the independent variable. This test aims to assess whether incorporating environmental cost factors influences the timely preparation and disclosure of financial reports.

Table (6): Simple Linear Regression for the H_1-3 Hypothesis

Timeliness	Constant	Slope	t-value	p-value	F	p-value	R	R^2
Environmental costs	-1.524	1.335	18.102	< 0.001	327.676	< 0.001	86.3%	74.5%

Source: prepared by the researchers

The results in Table 6 show that the slope coefficient is 1.335, indicating a substantial positive impact of environmental cost consideration on the timeliness of financial reporting. This means that as organizations place greater emphasis on environmental costs, the timeliness of financial disclosure tends to improve, possibly due to better planning, monitoring, and responsiveness. The t-value of 18.102, with a p-value less than 0.001, confirms the statistical significance of the slope. This strongly suggests that environmental costs significantly contribute to explaining changes in the timeliness dimension. Furthermore, the F-statistic of 327.676, also significant at $p < 0.001$, reinforces the robustness of the overall regression model. The R-squared (R^2) value of 0.745 indicates that 74.5% of the variance in the timeliness of financial statements can be explained by the inclusion of environmental costs. The correlation coefficient (R) of 0.863 reflects a very strong positive linear relationship between the two variables. The empirical evidence supports the alternative hypothesis (H_1-3), indicating that environmental costs have a statistically significant and positive influence on the timeliness of financial statements. This highlights the role of environmental accountability not only in enhancing content quality but also in improving the punctuality of financial disclosures.

H_1-4: Environmental costs have a statistically significant relationship and influence on the Verifiability of financial statements.

This hypothesis seeks to determine whether integrating environmental cost information contributes to enhancing the verifiability of financial statements, i.e., the extent to which the reported information can be corroborated through audit procedures, documentation, and objective evidence. A simple linear regression model was used to assess this relationship.

Table 7. Simple Linear Regression for the H_1-4 Hypothesis

Verifiability	Constant	Slope	t-value	p-value	F	p-value	R	R^2
Environmental costs	-0.800	1.193	21.538	< 0.001	463.877	< 0.001	89.8%	80.6%

Source: prepared by the researchers

As presented in Table 7, the slope coefficient is 1.193, which indicates a strong positive influence of environmental costs on the verifiability of financial reporting. This implies that organizations that emphasize environmental cost disclosure are more likely to produce financial information that can be independently verified and supported by objective documentation. The model demonstrates strong statistical significance. The t-value of 21.538 and the F-value of 463.877 are both highly significant, with p-values less than 0.001, confirming that the relationship is not due to random chance and that environmental costs serve as a powerful predictor of verifiability. The coefficient of determination (R^2) is 0.806, meaning that 80.6% of the variance in the verifiability of financial statements can be attributed to the integration of environmental costs. Additionally, the correlation coefficient (R) is 0.898, indicating an extremely strong and direct linear association between the two variables. The findings confirm the acceptance of the alternative hypothesis (H_1-4), supporting that environmental costs have a statistically significant and positive influence on the verifiability of financial statements.

Conclusion and recommendations

1st: Conclusion

This study has examined the role of environmental costs in improving the quality of financial statements, focusing on the perspectives of auditors and academics in the city of Erbil. The findings highlight that integrating environmental costs into financial reporting is not merely a regulatory obligation but a strategic necessity for enhancing transparency, credibility, and decision-usefulness of accounting information. Drawing on both theoretical frameworks and empirical evidence, the research confirms that comprehensive identification, measurement, and disclosure of environmental costs significantly contribute to strengthening the qualitative characteristics of financial statements—particularly faithful representation, completeness, timeliness, and verifiability.

The literature review demonstrated that global accounting standards and sustainability frameworks, such as IFRS, GRI, and ISO guidelines, increasingly recognize environmental costs as critical components of corporate reporting. International studies consistently reveal a positive relationship between environmental cost disclosure and improved financial information quality, while also identifying challenges in measurement, standardization, and implementation—especially in developing economies. The Kurdistan Region shares these challenges, with current disclosure practices often lacking in scope and detail due to limited regulatory enforcement, insufficient technical expertise, and weak environmental accounting culture.

The empirical component of this study confirms that stakeholders in Erbil acknowledge the importance of integrating environmental costs into financial statements. Respondents emphasized that environmental cost disclosure enhances stakeholder trust, reduces information asymmetry, and supports sustainable development objectives. Furthermore, statistical analysis supports the hypothesis that higher levels of environmental cost disclosure are associated with improvements in financial reporting quality. These findings align with international evidence, reinforcing the argument that environmental accounting serves as both an ethical obligation and a competitive advantage in today's business environment.

In conclusion, the study underscores the need for a systematic approach to environmental cost accounting in the Kurdistan Region. This includes the development of standardized measurement frameworks, alignment with international reporting practices, capacity building among accounting professionals, and stronger regulatory oversight. By institutionalizing environmental cost disclosure, economic entities in the region can enhance the quality of their financial statements, meet the expectations of diverse stakeholders, and contribute to broader environmental sustainability goals. The implications extend beyond compliance—offering a pathway toward improved corporate reputation, long-term financial performance, and alignment with global sustainability standards.

2nd: recommendations

In light of the above findings, the study presents the following nine recommendations:

1. Establish Mandatory Environmental Disclosure Standards

Regulatory authorities in Iraq and the Kurdistan Region should develop and enforce mandatory disclosure frameworks for environmental costs. These frameworks must be aligned with international reporting standards such as IFRS, GRI, and ISSB sustainability guidelines. Mandatory disclosure will reduce inconsistencies in reporting practices, enhance comparability across companies, and ensure that stakeholders receive reliable information about environmental liabilities and investments.

2. Adopt Advanced Environmental Accounting Tools

Companies should embrace modern environmental accounting methodologies such as Material Flow Cost Accounting (MFCA) and Environmental Management Accounting (EMA). These tools enable organizations to identify hidden costs, trace resource inefficiencies, and link environmental performance with financial outcomes. By applying such methods, firms can achieve both cost efficiency and environmental sustainability while providing accurate data for disclosure in financial statements.

3. Enhance Professional Training and Capacity Building

Continuous professional education should be provided for accountants, auditors, and financial managers in the field of environmental accounting. Training programs, workshops, and certifications will build technical expertise in identifying, measuring, and disclosing environmental costs. This capacity building is essential to ensure that local practitioners can apply international standards effectively and contribute to high-quality financial reporting.

4. Integrate Environmental Accounting into Higher Education

Universities and professional institutes should embed environmental accounting modules within accounting and finance curricula. Teaching students about environmental cost accounting at an early stage will raise awareness, foster technical competence, and prepare future professionals to implement sustainability practices. This academic integration will help build a new generation of accountants who are both financially and environmentally literate.

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