The Impact of Environmental Accounting on Financial Decisions in Governmental Organizations

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Abstract

This study aimed to identify and analyze how the key components of environmental accounting—including the identification and recording of environmental costs, environmental information reporting and transparency, and monitoring and evaluating environmental performance—affect the financial decision-making process. This research is applied in terms of its objective and descriptive-survey in nature, employing a quantitative approach. The statistical population consisted of 145 financial experts and accountants at the Department of Environment in Khorasan Razavi Province. Using the Morgan Table, 106 individuals were randomly selected through simple random sampling. Data were collected using a researcher-made questionnaire, developed based on a review of scientific literature, and comprised two sections: demographic information and 30 items measured on a five-point Likert scale. The questionnaire assessed two main variables—environmental accounting and financial decisions—across six components. Content validity was confirmed by subject matter experts, and reliability was verified through a pilot test and Cronbach's alpha coefficient (0.87). Data were analyzed using SPSS, with confirmatory factor analysis and multiple regression employed to examine the relationships between variables. In the analysis of variance, the identification and recording of environmental costs had the greatest impact (variance = 0.0944), followed by environmental information reporting and transparency (variance = 0.0855), and monitoring and evaluating environmental performance (variance = 0.0860). In the regression model, the identification and recording of environmental costs had a significant effect on financial decisions ($\beta = 0.35$, $p = 0.001$), as did environmental information reporting and transparency ($\beta = 0.22$, $p = 0.032$), while monitoring and evaluating environmental performance had a weaker effect ($\beta = 0.18$, $p = 0.053$). Strengthening environmental accounting processes—particularly in the areas of cost identification and information transparency—can enhance financial decision-making in the public sector and lay the groundwork for sustainable development planning.

Keywords: Environmental accounting, financial decisions, governmental organization, factor analysis, regression

1.   Introduction

In the contemporary era, environmental crises such as climate change, ecosystem degradation, and widespread pollution have presented governments and public organizations with unprecedented challenges. These challenges not only have ecological dimensions but also entail profound economic and financial consequences for governance systems. Within this context, environmental accounting, as a novel paradigm in the accounting literature, plays a critical role in redefining financial decision-making processes. This branch of accounting integrates economic and environmental dimensions to provide a

systematic framework for measuring, valuing, and reporting the environmental impacts of organizational activities (Nabila & Albari, 2024; Prakash et al., 2024). In the context of governmental organizations, this approach can serve as a strategic tool for achieving green governance, optimizing resource allocation, and enhancing social accountability.

The necessity of integrating environmental accounting into public financial systems can be analyzed from multiple perspectives. On one hand, growing public awareness and pressure from international bodies such as the United Nations and the United Nations Environment Programme (UNEP) have compelled governments to increase transparency regarding the environmental costs and benefits of public projects. For instance, in March 2021, the United Nations Statistical Commission adopted the System of Environmental-Economic Accounting—Ecosystem Accounting (SEEA EA) as a global standard for measuring natural capital and ecosystem services, aiming to integrate environmental data into national economic accounts and to promote evidence-based policymaking (Appiagyei & Donkor, 2024; Bebbington & Larrinaga, 2024).

Previous studies clearly demonstrate that in the absence of comprehensive environmental accounting systems, governmental organizations have encountered multiple and complex challenges in the optimal management of financial resources. Extensive research conducted by the Organisation for Economic Co-operation and Development (OECD) indicates that the lack of mechanisms for calculating and allocating environmental costs in traditional accounting systems has led to "market failure" in the public sector and has caused systematic distortions in financial decision-making (Tommasetti et al., 2023). For example, field research conducted by the European Environment Agency (2022) across 15 EU member states revealed that the failure to account for and internalize the Social Cost of Carbon in the economic assessment of large-scale infrastructure projects resulted, on average, in a 27% increase in compensatory costs over a 10-year period. The study specifically referenced projects such as road transport development in Poland and coal-fired power plants in Germany, where health costs from air pollution and climate adaptation expenses were systematically overlooked (Alassuli, 2024).

More recent research further underscores the growing importance of this issue. A longitudinal study by the World Bank (2023) covering 80 developing countries found that government organizations lacking environmental accounting systems lose, on average, 2.3% of their Gross Domestic Product annually due to poor financial decision-making based on incomplete environmental data. The report highlighted examples such as dam-building projects in Southeast Asia and agricultural land development in Africa, where the failure to account for ecosystem degradation costs resulted in irreversible financial damages (Prakash et al., 2024).

Moreover, environmental accounting can enhance transparency and accountability in governmental organizations. By providing more accurate information about environmental costs and liabilities, organizations can make more informed financial decisions and prevent unsustainable behavior. Findings also emphasize that integrating environmental accounting into financial processes can improve economic efficiency and increase public trust in governmental institutions. This approach can also foster greater citizen participation in decision-making processes (Hajiha & Chenari, 2023; Mohammadbeigi et al., 2023).

Previous studies indicate that governmental organizations face numerous challenges in resource management in the absence of environmental accounting systems. For example, field studies in European countries suggest that the failure to account for the Social Cost of Carbon in infrastructure projects has led to higher future compensatory costs (Gu, 2023; Liu et al., 2022). In contrast, countries like Sweden and Denmark, which utilize advanced environmental accounting models in national budgeting, have achieved higher levels of sustainability by reducing financial risks associated with environmental issues (Hossein, 2022; Razaie et al., 2021).

Given the escalating environmental challenges and the vital role of governmental organizations in resource management and policymaking, investigating the impact of environmental accounting on financial decisions in these organizations is of particular importance. The objective of this study is to identify and analyze how the main components of environmental accounting—including the identification and recording of environmental costs, environmental information reporting and transparency, and monitoring and evaluating environmental performance—affect the financial decision-making process.

2. Methodology

This study is applied in terms of its objective and descriptive-survey in nature regarding data collection. The research was conducted using a quantitative approach, focusing on examining the relationship between environmental accounting and financial decisions in governmental organizations.

The statistical population of this research consisted of all financial experts and accountants employed at the Department of Environment in Khorasan Razavi Province. This population was selected due to accessibility, familiarity with the research topic, and their direct role in governmental financial decision-making. According to official statistics in 2023, the total number of these individuals was 145. Given the limited and defined population size, the Morgan Table was used to determine the sample size, resulting in a selection of 106 individuals. Sampling was conducted using the simple random sampling method.

The data collection instrument was a researcher-made questionnaire developed through a multi-stage process. In the initial stage, indicators and key components of environmental accounting and financial decision-making were extracted from a systematic review of domestic and international scientific sources.

The questionnaire consisted of two main sections. The first section included demographic information such as gender, age, education, and work experience. The second section included 30 close-ended items on a five-point Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree), measuring the two main variables:

Environmental accounting with three key components:

- Identification and recording of environmental costs (e.g., "Environmental costs are considered in financial reports.");
- Environmental information reporting and transparency (e.g., "The organization's financial reports include information on environmental impacts.");
- Monitoring and evaluating environmental performance (e.g., "The organization considers environmental indicators to assess financial performance.").

Financial decisions with three key components:

- Financial resource allocation (e.g., "Environmental costs are considered in decisions regarding resource allocation.");
- Project cost estimation (e.g., "Environmental costs are calculated in the financial estimates of projects.");
- Financial reporting and accountability (e.g., "The organization's financial reports help decision-makers take environmental considerations into account.").

To assess the content validity of the questionnaire, the initial version was reviewed by five faculty members specializing in public sector accounting and financial policymaking. Their feedback was received and incorporated into the final revision of the questionnaire. To evaluate reliability, a pilot test was conducted with the participation of 30 individuals from the main population. The Cronbach's alpha coefficient for the entire questionnaire was calculated as 0.87, indicating satisfactory instrument reliability.

After data collection, the information was prepared for analysis using SPSS version 26. Subsequently, to examine the relationship between environmental accounting and financial decisions, confirmatory factor analysis (CFA) was used to validate the questionnaire structure, and multiple regression analysis was applied to assess the effects of the variables.

3. Findings and Results

Table 1 presents the explained variance for each factor. This value indicates the percentage of information each factor can explain and aids in data analysis. The factor "identification and recording of environmental costs" had the greatest impact on determining responses (variance = 0.0944), followed by "environmental information reporting and transparency" (variance = 0.0885), and "monitoring and evaluating environmental performance" (variance = 0.0860) (see Table 1).

Table 1. Explained Variance of the Examined Factors

Factor	Explained Variance
Identification and Recording of Environmental Costs	0.0944
Environmental Information Reporting and Transparency	0.0885
Monitoring and Evaluating Environmental Performance	0.0860

Factor loadings for each item indicate the strength of correlation between the item and its corresponding factor. Higher loadings reflect a stronger influence of the item on the factor.

Identification and Recording of Environmental Costs: Items such as "the amount of environmental costs resulting from the organization's activities" (loading = 0.3261) and "recording costs due to the destruction of natural resources" (loading = 0.3272) show the highest correlation with the factor of identifying and recording environmental costs.

Environmental Information Reporting and Transparency: Items such as "reporting on the environmental impacts of projects" (loading = 0.4298) and "transparency in reporting environmental costs" (loading = 0.1663) show a considerable relationship with the environmental reporting and transparency factor. These results indicate that the reporting and transparency of information concerning environmental impacts and their associated costs play an important role in financial decision-making within governmental organizations.

Monitoring and Evaluating Environmental Performance: Items such as "evaluation of environmental impacts of governmental projects" (loading = 0.3791) and "monitoring the environmental outcomes of governmental projects" (loading = 0.2732) demonstrate that these items effectively contribute to the monitoring and evaluation factor.

Table 2. Factor Loadings of the Examined Items

Item	Identification and Recording of Environmental Costs	Environmental Information Reporting and Transparency	Monitoring and Evaluating Environmental Performance
Environmental costs resulting from organizational activities	0.3261	0.0865	-0.0549
Transparency in reporting environmental costs	0.1108	0.1663	0.2585
Recording costs due to air pollution	-0.2395	0.1010	0.3791
Recording costs due to the destruction of natural resources	0.3272	-0.2194	0.1351
Reporting on environmental impacts in projects	0.0726	0.4298	-0.2666
Compliance of reports with environmental standards	0.2045	-0.2291	-0.1005
Evaluation of environmental impacts of governmental projects	0.1548	0.1618	-0.3350
Use of environmental assessment methods in projects	-0.2029	-0.3178	0.0020
Disclosure of natural resource consumption in annual reports	-0.1472	0.2752	-0.1237
Transparency regarding environmental impacts in financial reports	-0.2687	0.1294	-0.1728
Monitoring the environmental outcomes of governmental projects	-0.0625	0.2732	0.0106
Evaluation of effectiveness in pollution reduction	0.3825	-0.0737	0.2480
Reporting on changes in ecosystems	-0.0720	-0.3256	-0.4702
Transparency on costs from climate change	0.3087	0.1489	-0.3695
Assessment of environmental risks in governmental projects	0.1603	-0.1222	-0.2582
Reporting corrective actions to reduce pollution	-0.0297	0.0666	0.0726
Evaluation of the impact of environmental policies on governmental decisions	-0.4269	0.1280	-0.1521
Reporting on the environmental impacts on communities	-0.2266	-0.4536	-0.1241

At this stage, regression analysis was used to examine the relationship between various components of environmental accounting and financial decisions in governmental organizations. The proposed regression model was defined as follows:

$$DFM = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where:

DFM = Represents financial decisions.

X_1 = Represents identification and recording of environmental costs.

X_2 = Represents environmental information reporting and transparency.

X_3 = Represents monitoring and evaluating environmental performance.

β_0 = Model intercept.

$\beta_1, \beta_2, \beta_3$ = Regression coefficients.

ϵ = Random error term.

The proposed regression model was implemented using R software. The results of the regression analysis are presented in Table 3.

Table 3. Results of the Regression Model

Factor	Regression Coefficient	Standard Error	t-Statistic	Significance Level (p-value)	VIF
Identification and Recording of Environmental Costs	0.35	0.107	3.27	0.001	1.18
Environmental Information Reporting and Transparency	0.22	0.102	2.15	0.032	1.11
Monitoring and Evaluating Environmental Performance	0.18	0.092	1.95	0.053	1.09

The regression coefficient for the variable "identification and recording of environmental costs" was 0.35, with a t-statistic of 3.27 and a significance level of 0.001. This indicates a positive and statistically significant relationship between this variable and financial decisions in governmental organizations.

The variable "environmental information reporting and transparency" had a regression coefficient of 0.22, a t-statistic of 2.15, and a significance level of 0.032. These values indicate a positive and significant impact of this variable on financial decisions, although its effect is smaller than that of the previous factor.

For the variable "monitoring and evaluating environmental performance," the regression coefficient was 0.18, with a t-statistic of 1.95 and a significance level of 0.053. Although this coefficient is positive, the p-value exceeds the conventional 0.05 threshold; therefore, the relationship is not statistically significant at the 95% confidence level, although it is near the significance threshold and may be considered acceptable at lower confidence levels (e.g., 90%).

Overall, the regression model indicates that the two components—identification and recording of environmental costs and environmental information reporting and transparency—have statistically significant effects on financial decisions, while the third component has a relatively weaker impact and is not significant at a high confidence level.

4. Discussion and Conclusion

Numerous empirical studies have emphasized the importance of implementing systems for identifying and recording environmental costs in enhancing the quality of financial decision-making in governmental organizations. For example, the study by Schaltegger and colleagues showed that the use of environmental accounting tools such as life cycle costing and life cycle assessment in German governmental organizations led to improved accuracy in financial analyses, better resource allocation, and reduced budget forecasting errors. This study highlighted that incorporating environmental costs in the early planning stages of projects, particularly in urban infrastructure, significantly reduced financial waste (Kuchařová et al., 2021).

In contrast, an analytical report by the Organisation for Economic Co-operation and Development (OECD, 2024) focusing on data from developing countries stated that over 65% of governmental organizations in these regions lack any cohesive framework for recording and assessing environmental costs. This information gap has led to inefficient financial decisions, inaccurate cost estimations in infrastructure projects, and irreversible long-term costs. For instance, in railway construction projects in East Africa, the failure to accurately estimate the costs associated with natural resource degradation resulted in economic losses ranging from 20% to 35% of approved project budgets (Bahrami et al., 2024).

These findings clearly indicate that the role of environmental accounting in financial decision-making processes extends beyond improving transparency or reporting; it serves as a strategic tool for reducing financial risk, increasing cost-efficiency, and advancing the sustainability of public policies.

The second factor—environmental information reporting and transparency—also had a statistically significant impact on financial decisions. This suggests that the existence of reporting mechanisms can help policymakers make decisions aligned with sustainability values and social responsibility. Moreover, the transparency of environmental information can reduce the financing costs of public projects.

Regarding the third factor—monitoring and evaluating environmental performance—the findings indicated a positive but not statistically significant impact on financial decisions. This suggests that although organizations pay attention to performance evaluation tools, the lack of standardized or integrated indicators may prevent them from having a measurable influence on financial decision-making. This finding contrasts with the prior results (Bellucci et al., 2022; Hoque, 2022; Namazi & Khorramdil Masuleh, 2022).

The results of this study also hold significance in terms of integrating environmental accounting into public policymaking. As reported by the United Nations Environment Programme (UNEP, 2021), governments need mechanisms that can calculate the true costs of projects from an environmental perspective in order to achieve sustainable development. The current findings also show that the use of environmental accounting leads to more informed, responsible, and efficient financial decisions. A longitudinal analysis by the European Environment Agency (EEA, 2023) demonstrated that governmental organizations equipped with environmental performance monitoring systems were able to save an average of 12–15% in annual operational costs. These systems, using advanced indicators such as the Environmental Performance Index (EPI) and the Green Balanced Scorecard, provide more accurate assessments of returns on environmental investments.

Despite offering valuable findings, this study had several limitations. The research was limited to sampling financial experts and accountants from the Department of Environment in Khorasan Razavi Province, which may limit the generalizability of the results to other organizations. Additionally, the time constraints for data collection and analysis may have prevented the full identification of all dimensions of environmental accounting impacts. The relatively weak statistical relationship between financial decisions and the variable of monitoring and evaluating environmental performance may have stemmed from the specific choice of variables or the sample structure. For future studies, it is recommended to expand the statistical population and incorporate qualitative methods such as in-depth interviews. It is also suggested to explore other dimensions of environmental accounting and examine the effects of external factors such as policies or social pressures on financial decisions. Employing predictive models to assess the future impacts of environmental accounting on financial decisions may further enhance the decision-making process.

Overall, based on the results obtained from factor and regression analyses, it can be concluded that the three main components of environmental accounting—identification and recording of environmental costs, environmental information reporting and transparency, and monitoring and evaluating environmental performance—play distinct roles in shaping financial decisions in governmental organizations. Among these components, the identification and recording of environmental costs has the greatest impact. This finding indicates that understanding and documenting environmentally harmful costs resulting from organizational activities is particularly important for financial decision-makers, as it enables more accurate cost-benefit analyses. Next, environmental information reporting and transparency also has a positive and significant effect, highlighting that transparency in environmental information fosters trust in financial policymaking. Meanwhile, although monitoring and evaluating environmental performance plays a positive role, it does not demonstrate a statistically significant effect at the 95% confidence level. This may result from weaknesses in the implementation or reporting mechanisms within public institutions regarding the effective evaluation of environmental performance.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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