



Does Environmental Management Accounting Matter in Promoting Sustainable Development? A Study in Iraq

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Purpose of this study is to examine the extent to which Iraqi industrial companies are aware of the concept of environmental management accounting (EMA), to examine the role of EMA in providing information that might influence decisions related to environmental protection and preservation of natural resources to contribute to the development of sustainable development. A sample of Iraqi industrial firms was surveyed by distributing a questionnaire to a random sample of the research community in the context of Iraqi firms. In addition, it also considers the social dimensions of sustainable development and the economy. The resolution data were analyzed using a statistical program (SPSS). When analyzing the data, the findings of the current study indicate that Iraqi industrial companies have an awareness of environmental management accounting concepts. In addition it provides information that contributes to the promotion of sustainable development. This study recommends the need to implement environmental management accounting (EMA) in Iraqi industrial companies because of its important role in providing information that leads to the reduction of negative environmental impacts resulting from the practice of its activities.

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Tujuan dari penelitian ini adalah untuk menguji sejauh mana perusahaan industri Irak menyadari konsep akuntansi manajemen lingkungan (EMA), untuk menguji peran EMA dalam memberikan informasi yang mungkin mempengaruhi keputusan terkait dengan perlindungan lingkungan dan pelestarian sumber daya alam. Untuk berkontribusi pada pembangunan berkelanjutan. Sebuah sampel perusahaan industri Irak disurvei dengan menyebarkan kuesioner ke sampel acak dari komunitas penelitian dalam konteks perusahaan Irak. Selain itu, juga mempertimbangkan dimensi sosial dari pembangunan berkelanjutan dan ekonomi. Data resolusi dianalisis menggunakan program statistik (SPSS). Ketika menganalisis data, temuan studi saat ini menunjukkan bahwa perusahaan industri Irak memiliki kesadaran konsep akuntansi manajemen lingkungan. Selain itu memberikan informasi yang memberikan kontribusi untuk promosi pembangunan berkelanjutan. Penelitian ini merekomendasikan perlunya penerapan akuntansi manajemen lingkungan (Environmental Management Accounting/EMA) pada perusahaan industri Irak karena perannya yang penting dalam memberikan informasi yang mengarah pada pengurangan dampak negatif lingkungan yang dihasilkan dari praktik kegiatannya.

Keywords: Akuntansi Manajemen Lingkungan, Pembangunan Berkelanjutan

INTRODUCTION

Misuse of natural resources and environmental degradation have become as a biggest problems facing the world. Although the problems of environment we have faced nowadays are not new, we have not begun to realize their elements until lately after noticing the effect of environmental degradation on the poorness in the development of economic. While available, natural resources are vulnerable to depletion as a result of misuse. Accordingly, the concept of sustainable development has arose, which meets the requisites of the current without compromising the capability of coming generations in order to meet their personal needs. Global regional and local attention to environmental issues and sustainable development has put pressure on economic units to be aware of their responsibilities towards society and the environment. These units are part of a larger socio-environmental and economic system with their operations affect society and the surrounding environment. Therefore, they must take into account this responsibility by reducing the negative environmental impacts of their economic activity, by applying environmental management accounting methods as an information system that enables users to obtain information which reflects the environmental performance of economic units. In doing so. The system also supports decisions that are instrumental in protecting the environment from environmental pollutants and protecting natural resources from waste and loss to promote sustainable development. The importance of this study lies in the effectiveness of the information provided by EMA for the users that can obtain information which reflects the environmental performance of economic units. Further, it helps in making environmentally impactful decisions to improve the environmental and financial performance of economic units, protect the environment, and conserve their natural resources to promote sustainable development.

This research has come with the serious problems in the whole world that have effected its environment and economy because of the unexpected pandemic that hit all the economy and health of the world [Alabdullah et al. \(2020\)](#). Recently, several studies have been done in the discipline of managerial accounting that reflect the importance of such a discipline in the enhancement of several positive things related to the world of business (e.g., [Almashhadani 2021](#); [Alabdullah, 2021](#), [Alabdullah et al., 2021](#); [Ahmed et al. , 2020](#); [Ahmed et al. , 2019](#); [Ahmed et al. , 2020](#); [Alabdullah, 2019](#); [Alabdullah, et al., 2016](#); [Alabdullah, et al., 2014](#); [Alabdullah, 2016](#); [Alabdullah & Ahmed, 2019](#); [Alfadhil, et al., 2013](#)). More specifically, there are studies investigated the extent to which economic units adopt environmental management accounting technology such as [Yassin. \(2013\)](#). A He explored changes in the practice of EMA, and the factors influencing the adoption of this method in Egyptian industrial companies. His study concluded that

Egyptian industrial firms do not adopt the method of EMA despite pressure to adopt it. Another study done by [Chang, \(2013\)](#) aimed to demonstrate the significance of applying the method of EMA in addressing environmental costs in three Taiwanese universities, and found a general absence of EMA as a instrument for managing the costs of environmental. Here we found a gap represented by a lack of efforts related to accounting environmental performance. Other studies have dealt with several aspects, including [ferreira, et al., \(2010\)](#) which aimed to use environmental management accounting and innovation strategy in commercial establishments. This study found that the use of EMA has a significant relationship with the innovation process but not in relation to the product, and there is no statistically significant relationship between strategy and administrative accounting. The study of [Larojan &Thevaruban \(2014\)](#) aimed to find a relationship between environmental management accounting or environmental performance and corporate performance. It found a positive relationship between the application of environmental management accounting and the environmental performance of companies. What distinguishes this study is that it aims to test the role of EMA in providing information that affects decisions related to environmental protection and conservation of natural resources to promote sustainable development by surveying the opinions of a sample of decision makers in Iraqi industrial companies. Other studies also considered the managerial accounting but from another perspective in their impact of performance, economic and other aspects (e.g., [Alabdullah et al., 2019](#); [Alabdullah, 2017](#); [Alabdullah, 2018](#); [Alabdullah et al., 2020](#); [Alabdullah et al., 2020](#); [Alabdullah et al., 2018](#); [Alabdullah et al., 2018](#); [Alabdullah et al, 2014](#); [Abushammalaet al, 2015](#); [Ahmed et al, 2020](#); [Nor et al, 2020](#); [Alabdullah, 2016a](#); [Ahmed et al, 2019](#); [Alabdullah, 2016b](#); [Alabdullah et al, 2014a,b](#))

EMA is one of the most significant relatively modern topics as a key source for improving environmentally sound industrial activities and their competitiveness, which has led to the spread and launch of green or environmentally friendly products. Birkin (1996) was the first to refer to this concept, and pointed out that EMA "is a direct growth of MA as management accountants might apply their experiences and also their skills to develop the quality of environmental data in the making a decision process related to valuation of the investment, capital budget preparation, and also strategic management" ([Tsui, 2014](#)).

The International Federation of Accountants in 1998 submitted a research entitled Environmental Management (EM) in Organizations. The study discussed the role of administrative accountants in the environmental management of economic units and the importance of their expertise in promoting sustainable development ([Sylph, 2006](#)). EMA was defined in the study as "managing economic performance and environmental via the implementation and development of environmentally relevant of the accounting systems and its practices that might involve auditing and reporting some firms. EM usually includes costs of

life cycle, benefit assessment, cost accounting, and strategic planning for EM" (Deegan, 2002).

In 2001, a specialized working group of the US Sustainable Development Division presented a study entitled EMA Procedures and Principles, in which EMA was defined as "the process of identifying, compiling, estimating, analyzing and preparing internal reports and using flow information but physically, i.e. energy flows, materials, environmental cost information water, and other monetary information necessary to make traditional and environmental decisions within the organization (UNSD, 2001). In 2005, IFAC issued a guide as an international guidance document, whose definition of the year (1998) was included with the definition of the specialized working group of the United Nations Sustainable Development Division (2001), in order to define environmental management accounting as "identifying, collecting and using two types of information to make internal decisions, material information that includes uses, water and materials, flows and trends of energy, with waste and financial information on environmental costs related to the environment." Profits, savings (IFAC, 2005). Based on the above, the current study developed these hypothesis:

H1: Iraqi industrial companies are aware of the concept of EMA.

H2: The application of EMA in Iraqi industrial companies contributes to providing information that promotes the economic, environmental and social dimensions of sustainable

METHOD

Data collection

The research followed the analytical descriptive approach, and was based in the theoretical framework on books, references and previous studies. On the practical side, the data was collected via a questionnaire based on previous studies, and the questionnaire was judged through academics to guarantee its apparent soundly, and distributed randomly to the research sample of people related to the subject matter of the research and whose decisions affect the environmental performance of the company. Likert Scale was utilized by the current study, and also we used SPSS was analyze data. A sample of the study consists of fifty-five Iraqi industrial companies; the questionnaire was randomly distributed to a sample of the research community of fifty questionnaires. Forty-five of them have been recovered for statistical analysis.

RESULTS AND DISCUSSION

Analysis the study sample

The demographic features of a study sample were analyzed in [table 1](#)

[\[Table 1 about here.\]](#)

Table (1) reveals that most of the study sample members are qualified in a high way and have advanced job positions and with high average of knowledge. This enhances confidence the questionnaire and its information.

Test of Stability

The (Alpha Cranach's) for all questions in the questionnaire is (83.7%). It means that the stability factor for the questionnaire is high, as it is greater than (60%).

hypotheses Test

One sample of the t-test analysis we used in the present study to test the hypotheses at significance level (0.05) and also for a confidence level of (0.95).

Testing the first hypothesis "Iraqi industrial companies are aware of the concept of environmental management accounting."

[\[Table 2 about here.\]](#)

Table (2) shows that the arithmetic mean of the first question (2.644) is less than (3) the average response score, and the standard deviation (1.524) is the highest deviation between the questions. The Significance level (0.125) is greater than (0.05), i.e. the decision is not moral for the first question, which is an incorrect definition of environmental management accounting, i.e. the respondents did not agree on this question. As for the arithmetic mean of the remaining questions is greater than (3) the average degree of response, and the Significance level (0.000) is less than (0.05), i.e. the decision for the remaining three questions is moral and is correct definitions of environmental administrative accounting. This gives evidence that the respondents were able to distinguish between the correct and incorrect definition of environmental management accounting.

The arithmetic mean for all questions (3.571) is higher than (3) average response score, and to accept the hypothesis we compare the computed (t) value (6.971) which is greater than the Tabular (t) value (2.000) and the Significance level (0.000) less than (0.05). So the first hypothesis is accepted.

Testing the second hypothesis "the application of environmental administrative accounting in Iraqi industrial companies contributes to providing information that enhances the economic, environmental and social dimensions of sustainable development

[\[Table 3 about here.\]](#)

[Table \(3\)](#) shows that the arithmetic mean of the economic dimension questions (4.018) is greater than (3) the average response score, and that the std. (0.430) has slight dispersion of values from its mean, indicating positive responses from the respondents to this dimension. The coefficient of variation for the third question (9.153%), as it is the lowest coefficient of

variation in the economic dimension, indicating that the optimal utilization of available resources in the best possible way is significantly influenced by the rest of the questions of the economic dimension with the information provided by environmental management accounting.

[Table 4 about here.]

Table (4) shows that the arithmetic mean of the environmental dimension questions (4.029) is greater than (3) the average response score, and that the Std. (0.401) has slight dispersion of values from its mean, indicating positive responses from the respondents to this dimension. The Coefficient of variation for the fifth question (7.320%), as it is the lowest coefficient of variation in the environmental dimension, indicating that the Exclusion or reduction (neutralization) of productive activities and events with adverse effects on the environment (waste, residues, and emissions) is significantly influenced by the information introduced by EMA more than the other environmental dimension questions.

[Table 5 about here.]

Table (5) shows that the arithmetic mean of the social dimension questions (3.637) is greater than (3) the average response score, and that the Std. (0.501) has slight dispersion of values from its mean, indicating positive responses from the respondents to this dimension. The Coefficient of variation for the second question (10.631%), as it is the lowest coefficient of variation in the social dimension, indicating that meeting consumer' needs and desires of environmentally friendly products is significantly influenced by the information provided by environmental management accounting more than the other social dimension questions.

[Table 6 about here.]

Table (6) shows that the arithmetic mean of the three dimensions (3.894) is greater than (3) the average response score, the standard deviation (0.287) and is considered a little dispersion of values from its arithmetic mean, which indicates a positive response from the respondents. The Coefficient of variation of the environmental dimension (9.952%) is the lowest factor, followed by the economic dimension (10.701%) and finally the social dimension (13.775%). It is clear that there is a large agreement from the respondents that the environmental dimension is the most affected by the information introduced by the application of EMA following the economic and social.

To accept the hypothesis, we compare the value of the computed (t) value for the three dimensions (18.648), which is greater than the Tabular (t) value (2.000) and the level of significance of the three dimensions (0.00) is lower (0.05), so the second hypothesis is accepted.

CONCLUSION

Environmental management accounting information is of great importance in supporting management decisions with environmental implications. Iraqi industrial companies are part of a larger socio-environmental and economic system, and by applying environmental management methods, they will play a role in achieving the optimal use of available resources, preserving the environment and achieving the well-being of society. In doing so, it will be able to promote the economic, environmental and social dimensions of development sustainability. The analysis of the questionnaire data showed that Iraqi industrial companies have an awareness of the concept of environmental management accounting and their role in supporting decisions that help conserve natural resources and protect the environment. The application of environmental management accounting provides appropriate information that promotes the dimensions of sustainable development and the most affected dimensions of the environmental dimension following the economic and finally the social dimension. This study recommended that Iraqi industrial companies should apply the environmental management accounting because of its importance in providing information that leads to reducing the negative environmental impacts resulting from the practice of their activities. This contributes to the conservation of natural resources, the protection of the environment and the promotion of sustainable development. Also Develop the skills of the managing accountant, and increase his understanding of environmental management accounting methods as a modern and important approach and use its information in the decision making-process

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TABLE 1 | Demographic Characteristic

Academic Achievement	Doctorate	Master	Bachelor	Diploma	Total
Frequency	2	6	32	5	45
Freq- Percentage	4.44%	13.33%	71.11%	11.12%	100%
Specialty	Accounting	Business Management	Others	----	Total
Frequency	30	7	8	-----	45
Freq- Percentage	66.67%	15.55%	17.78%	-----	100%
Job Title	General Manager	Finance Director	Accountant	Cost accountant	Total
Frequency	4	20	11	10	45
Freq- Percentage	8,89%	44,45%	24.44%	22,22%	100%
Experience years	5 and below	6-10	11-15	More than 15	Total
Frequency	----	5	17	23	45
Freq- Percentage	----	11.11%	37,78%	51.11%	100%

TABLE 2 | Summary Descriptive Analysis

Question	Mean	Std. Dev	T value	Sig	Statistical Decision
EMA means the collection and identification of information on environmental performance Financially only and reaching out to users.	2.644	1.524	-1.564	0.125	In moral
It is the method of identifying and collecting financial and non-financial information on the flow of materials, energy, water, and environmental and non-environmental costs for internal decision-making purposes.	3.777	0.559	9.324	0.000	Moral
The application of environmental management accounting is consistent with approved environmental and accounting laws, legislation and standards.	3.822	0.613	8.986	0.000	Moral
EMA is the management of environmental and economic performance via development and implementation Environment-related practices and accounting systems.	4.044	0.638	10.981	0.000	Moral
TOTAL	3.571	0.556	6.971	0.000	Moral

TABLE 3 | Summary Descriptive Analysis

Question	Mean	Std. Dev	T value	Coefficient of variation	Sig	Statistical Decision
<u>The application of environmental management accounting contributes to:</u>						
Achieving financial savings through Environmental cost control for the company's operations and products.	3.866	0.705	10.850	18.235%	0.000	Moral
Achieving financial savings by reducing waste treatment costs and industrial waste.	4.400	0.458	10.407	10.409 %	0.000	Moral
The best use of resources available in the best possible way.	3.911	0.358	17.064	9.153%	0.000	Moral
Achieving financial savings by reducing resource and energy consumption by tracking their flow.	3..822	0.575	9.586	15.044%	0.000	Moral
Improve product quality and increase marketing rates through reduce their environmental impacts from design and development to use.	4.200	0.502	7.416	11.952%	0.000	Moral
Get a competitive advantage to improve the quality of products environmentally	4.177	0.683	11.683	16.351%	0.000	Moral
Raising the efficiency of the economic unit through optimal use for its environmental assets.	3.755	0.645	7.857	17.177%	0.000	Moral
Total	4.018	0.430	_____	10.701 %	0.000-	Moral

TABLE 4 | Summary Descriptive Analysis

Question	Mean	Std. Dev	T value	Coefficient of variation	Sig	Statisticl Decision
<u>The application of environmental management accounting contributes to:</u>						
Producing environmentally friendly products according to environmental quality standards.	4.000	0.668	6.916	16.700%	0.000	Moral
Provide environmental performance data to improve investment and operational decision-making related to environmental activities.	3.800	0.594	7.731	15.631%	0.000	Moral
Provide the necessary data to effectively manage the process of dealing with negative environmental impacts.	4.022	0.453	9.101	11.263%	0.000	Moral
Efficient use of natural resources and available energy by tracking their flow and preserving the environment.	3.755	0.484	10.470	12.889%	0.000	Moral
Exclusion or reduction (neutralization) of productive activities and events with adverse effects on the environment (waste, residues, and emissions).	4.822	0.353	9.101	7.320%	0.000	Moral
Study the potential environmental impacts of new investment projects.	3.777	0.735	7.097	19.459%	0.000	Moral
Total	4.029	0.401	_____	9.952 %	0.000	Moral

TABLE 5 | Summary Descriptive Analysis

Question	Mean	Std. Dev	T value	Coefficient of variation	Sig	Statistical Decision
<u>The application of environmental management accounting contributes to:</u>						
Ensure the rights of future generations of available natural resources	3.600	0.579	6.940	16.083%	0.000	Moral
Meet consumers' needs and desires of environmentally friendly products.	3.800	0.404	13.266	10.631%	0.000	Moral
Improving the health reality of individuals by addressing the causes and effects of environmental pollution	3.644	0.645	6.701	17.700%	0.000	Moral
Reducing operational costs in order to achieve competitive advantage and increase in profits and in the incomes of employees	3.474	0.528	8.173	15.198%	0.000	Moral
Protecting the community from the negative environmental impacts of projects Investment, especially new.	3.667	0.764	7.928	20.834%	0.000	Moral
Total	3.637	0.501	_____	13.775%	0.000	Moral

TABLE 6 | Summary Descriptive Analysis

The dimension	Mean	Std. Dev	T value	Coefficient of variation	Sig	Statistical Decision
Economic	4.018	0.430	17.199	10.701%	0.000	Moral
Environmental	4.029	0.401	7.706	9.952%	0.000	Moral
Social	3.637	0.501	15.801	13.775%	0.000	Moral
Total	3-894	0.287	18.648	-----	0.000	Moral