

The impact of the application of environmental management accounting on the strategic planning of budgets in the economic entity: Case Study in Wassit Co.in Iraq

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Abstract

The participation of managerial accountant in making strategic managerial decisions regarding the environment is insufficient, despite developments that managerial accounting had witnessed such as the emergence of many technologies that concerned in the environment, and the appearance of a new trend in the managerial accounting which known as (Environmental Management Accounting) which provides the required environmental information for making decisions. Therefore, the research problem stands on the assumption that industrial companies in Iraq are ignorant of the importance of using environmental managerial accounting information that is provided by technologies concerned with the environment for supporting programs and strategic decisions related to environment. The research aims to determine to what extent that Iraqi economic and industrial entities are applying Environmental Management Accounting methods and technologies, and are utilizing them in providing the adequate information for supporting the programs and strategic decisions that have effects on the environment. Wassit state Co. for textile industries was selected as a case study. An assessment to the extent of applying the Environmental Managerial Accounting in its both sides financial and physical was done, as well as to the evaluation of the followed environmental strategies and programs. A proposed model of Environmental Management Accounting to be applied in the factory is presented in this work. The foremost points are: Environmental Management Accounting considered important and necessary part of environmental management system as it provides physical and financial information that helps the managers in making decisions whether they are short-term operational programs or long-term environmental strategies linked to environmental activities. In addition, there is possibility of proposing a model of Environmental Management Accounting in its both financial and physical sides that commensurate with the nature of operations excited by Wassit state Co. for textile industries.

Keywords: environmental management accounting, environmental accounting, environmental management.

Introduction

Environmental management accounting emerged almost three decades ago and the United States Environmental Protection Agency (EPA) is the first national agency to develop a formal program to promote the application of environmental management accounting in the early 1990s. Since then, many organizations in many countries have begun to apply environmental management accounting. In 1999, the United Nations established a committee of experts to support the application of environmental management accounting worldwide. In 2005, the International Federation of Accountants issued an advisory document on environmental management accounting.

Consequently, Environmental accounting is a subset of accounting proper, its target being to incorporate both economic and environmental information. It can be conducted at the corporate level or at the level of a national economy through the System of Integrated Environmental and Economic Accounting, a satellite system to the National Accounts of Countries among other things, the National Accounts produce the estimates of Gross Domestic Product otherwise known as GDP

Environmental accounting is a field that identifies resource use, measures and communicates costs of a company's or national economic impact on the environment. Costs include costs to clean up or remediate contaminated sites, environmental fines, penalties and taxes, purchase of pollution prevention technologies and waste management costs.

There is still no accuracy in terms associated with the EMA. They considered the EMA as an application of traditional accounting that deals with the impact of environmental startups is measured in monetary units, and the impacts associated with the company on ecosystems, which are expressed in physical units. The EMA can be considered as part of an environmental accounting framework and is defined as the use of monetary and material information for the use of internal management. Developed a multidimensional framework of EMA. The Framework looks at the differences between five dimensions:

- Internal vs. External.
- Financial classifications.
- Past and future time frames.
- Short and long terms.

Collect custom versus routine information in the proposed EMA framework. In this framework, different techniques can be developed and customized from the EMA - such as costing the environmental life cycle or accounting for environmental costs. Gives the management of the company the choice of the best appropriate tools based on their information needs.

Research Methodology

Problem Statement

Many studies and researches have addressed the problems of environmental pollution and environmental conservation issues. These problems have also attracted the attention of many studies and accounting researches by intensifying efforts to measure and disclose the costs incurred by economic units to reduce the environmental damage resulting from the exercise of their economic activities or to address them. That the issue of involving the

accountant, especially the administrative accountant, in the process of strategic management decisions affecting the environment is still at the required level, despite the developments in the administrative calculator and the emergence of many technologies that are concerned with the environment. A modern approach has emerged in the management accounting which defines the environmental information which is suitable for making these decisions and which is in keeping with the latest developments and trends of environmental concern. Therefore, the problem of research is the omission of industrial economic units. The importance of using environmental management accounting information provided by environmental-oriented technologies in supporting programs and strategic decisions related to the environment (Schaltegger, & Burritt, 2017).

Research Objectives

In light of the problem of research and questions, the research aims mainly to determine the extent of application of the Iraqi industrial economic units to the methods and techniques of environmental management accounting and to use them in providing appropriate information necessary to support programs and strategic decisions with environmental impacts. As well as the pursuit of the following sub- objectives:

1. To Determine the extent of knowledge of the officials and workers of the Wassit plant for the concept of environmental management accounting.
2. To Determining the extent to which environmental management accounting is applied as an information system that contributes to the strategic planning of Wassit plant.
3. To identify the concerns and constraints that impede the application of environmental management accounting at the Wassit plant.

Research Questions

In light of the problem of research, there are questions that can be raised in this context in order to answer the researcher through this research, which is as follows:

1. What is the extent of knowledge of the officials and workers of the Wassit plant for the concept of environmental management accounting?
2. Does environmental management accounting is applied as an information system that contributes to the strategic planning of Wassit plant?
3. What are the concerns and constraints that impede the application of environmental management accounting at the Wassit plant?

Hypotheses

1. There is a relationship between the knowledge of the officials and workers and environmental management accounting in the Wassit plant.
2. There is a relationship between the environmental management accounting as an information system and strategic planning in Wassit plant.
3. There is a relationship between the concerns and constraints and environmental management accounting at the Wassit plant.

Literature Review

The development of Environmental Management Accounting

Environmental issues (and related costs, revenues and benefits) are the focus of increasing concern and concern by many countries around the world (Weigand, & Elsas, 2012). These issues have gained importance as a result of a growing number of internal and external

stakeholders Environmental performance, and environmental pressures on the supply chain. Many economic units are asking their suppliers to comply with the (EMS) regulations set by the International Organization for Standards and Metrology (ISO), as well as pressures for disclosure by the economic units for their performance EMC in their accounts and annual reports (Song, Montabon, & Xu,2018).

There was no clear and effective role to play in accounting for these environmental issues in the 1970s, until the early 1980s when the environment or environmental management was linked to administrative accounting and the possibilities of management accounting emerged in the management of these issues. In the United States, Canada and Great Britain that have had a significant impact on environmental accounting and financial reporting (Chang, 2007).

As a result of this legislation, economic units have begun to develop environmental programs that help reduce environmental impacts, reduce costs and achieve sustainability. This requires assessing the administrative accounting of these programs by determining the costs and benefits associated with them. This is the starting point in the development and development of EMA (Al kisher, 2013) . In the 1990s, the most obvious stage in the application of management accounting in response to these issues and environmental performance management (Chang, 2007), however, the disadvantages of this application cannot be overlooked. The extent that administrative accounting is capable of distinguishing and recognizing the importance of these environmental issues for the following reasons (Epstein, 2018):

- Environmental costs are often not important for management accounting.
- Management accounting cannot identify and monitor certain types of environmental costs.
- In investment decisions, environmental costs are not always taken into account.

The following management accounting practices may be the cause of these inadequate considerations of environmental costs when making managerial decisions (Epstein, 2018):

- The unintended disappearance of many environmental costs in the additional cost calculations.
- The inaccurate allocation of environmental costs from incremental cost calculations to processes, products, and lines of operation.
- The inaccurate diagnosis of environmental costs as fixed costs when they are actually variable, and vice versa.
- Incorrect calculations of volumes and costs of raw materials lost.
- The actual lack of inclusion of significant and appropriate environmental costs in the accounting records.

As a result, there is a need to use environmental management accounting to address deficiencies in management accounting when dealing with activities and management decisions associated with environmental costs or that may have significant environmental consequences (Möhr-Swart, 2008). Decisions taking into account the financial and material environmental performance indicators, the financial indicator can be in the form of cash savings as a result of reduced waste costs, while the physical indicator can represent a drop in dropout rates (Niap, 2006). Administrative systems are inadequate to provide adequate information on the financial and physical environmental performance indicators (Ford, Hutson,

& Coventry, 2014), for failing to meet the environmental and environmental performance information requirements that require the collection, summarization and reporting of the environmental impacts of the unit. It focuses only on the financial performance indicators of the unit, based on the above, the differences between environmental management accounting (EMA) and administrative accounting can be identified (Nikolaev, 2003):

EMA focuses on environmental information, while management accounting focuses on financial information.

EMA integrates accounting for monetary and material units, while administrative accounting is linked to monetary units only. More specifically, environmental management accounting is included in the following accounts:

1. The environmental effects of financial causes. Information on these impacts aims at increasing the economic efficiency of activities related to the environment and is measured in monetary units that are part of the management accounting.
2. Environmental impacts measured in physical units, called "physical flow accounting", which are not part of administrative accounting but are intended to increase the environmental efficiency of the activities of the economic unit.

While many economic units recognize that many administrative decisions have potential environmental impacts and costs, the recognition and importance of environmental management accounting will increase in the future. However, the distinction between them and management accounting may become unclear if The combination of these two approaches in one approach to large-scale management accounting can better inform all types of decisions (Möhr-Swart, 2008). According to Niap, (2006) in which he stated that environmental management accounting in many ways could Be applied to concepts But with an environmental focus or environmental addition. Regardless of the above differences, it is clear that both environmental management accounting and management accounting share many characteristics (Nikolaev, 2003):

- Both are directed to use their information within the economic unit.
- Both are oriented towards the future. Management uses the information it provides to improve the future performance of the economic unit.
- They are not regulated by legislation.

In the 21st century, environmental management accounting has been gaining increasing attention by economic units as these units realize that poor environmental performance has significant financial consequences for them.(Chang & Deegan,2010) Some governments, international bodies and professional accounting bodies have devoted their efforts to developing and promoting the application of EMA, such as the United Nations Division for Sustainable Development (UNSD), the International Group of EMA Experts, and the International Federation of Accountants (IFAC) To guide their own studies and practices. This guide can be considered the most comprehensive guide to date (Chang, 2007). Organizations in more than 30 countries have already begun to strengthen environmental management accounting and implementation, In many industries, and many countries have adapted their objectives to their own concepts and practices (Uljas, 2017).

EMA has undergone rapid and convergent stages of development due to increased attention to environmental issues and the urgent need for effective environmental management. Although it is an emerging and relatively small field compared to management accounting, the

scope of information on the economic unit it covers is much broader than the information that are covered by administrative accounting, as they include both appropriate financial and material information, as well as information on environmental costs. Through this information, the environmental impacts Negative economic unity and reducing environmental risks, thereby improving the economic results of the unit (Lishan, Tao, Zhilong, & Jiangfu, 2018).

EMA is a new approach to accounting in general, and administrative accounting in particular, because it represents an important source of information for decision-making in general, and administrative decisions in particular, the importance of its information, the benefits of its use and its importance in the management decision-making process and the challenges it faces. The relationship with the environmental management system will be discuss (Babatunde, 2016).

Concept and Definition of EMA

EMA is a common approach used to transfer information from financial accounting, cost accounting, and material flow balances to increase the efficiency of materials use, reduce environmental impact and risk, reduce environmental protection costs, and can be implemented by special economic units or As well as a financial component as well as a physical element (Jasch, 2003).

The first reference to this concept by (Birkin) in 1996 has been that EMA is a "direct development of management accounting" as managerial accountants can apply their expertise and skills to improve the quality of environmental information in the decision-making process of assessment (Tsui, & Bian, 2014). Pointed out that it is concerned with collecting data on the environment (from the lowest levels) that are transferred through techniques and processes (intermediate level) to useful information for managers (top levels) (Sendroui et al., 2006).

Brown, & Ulgiati, (2018) showed that EMA is the way in which economic units calculate the materials used and the environmental costs of their work. Material accounting is a means of tracking the flow of materials at work in order to distinguish inputs and outputs for the purpose of assessing resource efficiency And environmental improvement opportunities. Environmental cost accounting concerns the identification and allocation of environmental costs to material flows or financial aspects of the operations of the economic unit.

Also in 1998, the IFAC presented a study entitled Environmental management in organizations - the role of management accounting in which the role of managerial accountants in the environmental management of economic units and the importance of their expertise in promoting sustainable development (Loft, Humphrey, & Turley, 2006) , The study also presented the first definition of EMA as environmental and economic performance management through the development and implementation of appropriate environmental practices and accounting systems, which may include reporting and auditing in some companies. Environmental management typically includes life cycle costs, Benefits Assessment, Strategic Planning for Environmental Management (Johnstone, 2018).

Subsequently, a specialized team of the UNDSO in 2001 presented a study entitled "Environmental Management Accounting: Policies and Links" in which EMA was defined as "identifying, collecting, assessing, analyzing and preparing internal reports, (Material, water, energy), environmental cost information and other financial information for traditional and environmental decision-making within the organization "(UN, 2001).

The IFAC subsequently presented a guide on EMA in 2005 as an international guidance document aimed at reducing some international confusion by providing a general framework and set of definitions that are fairly comprehensive and consistent with existing and widely used environmental accounting frameworks, EMA adapts to it (Epstein, 2018)

The same definition, which was included in a 1998 study, was added with the addition of the definition published by the UNDSO of the Specialized Working Group (2001) in the study entitled EMA: procedures and principles" Identify, collect, analyze and use two types of information for internal decision-making:

- Material information on the uses, flows and trends of energy, water, and materials (including waste).
- Financial information on costs associated with the environment, profits and savings (IFAC, 2005).

Chang, (2007) was defined as a tool that helps companies manage environmental performance and report environmental information to stakeholders, whether internal or external. Reed, (2008) defines it as a system of methods and methods that can be used together to provide management information that can be useful when making environmentally sensitive internal decisions, It was defined by as environmental performance management through the use of environmental information to increase the efficiency of the use of materials and to reduce environmental impacts and costs (Song, et al., 2018).

The study of previous definitions shows that the IFAC in 1998 did not distinguish between the financial and material aspects of EMA. Although it was mentioned again in the General Guide (2005), it included a definition of UNDSO (2001), which highlighted the financial and material aspects of the importance of this distinction. It is also possible to observe the consensus of most definitions on the importance of using EMA in the process of making internal decisions. The following definition can be formulated as identifying, collecting, analyzing and using And reporting The economic unit of financial and material when he died taking the environmental impacts of internal decisions in order to increase the environmental and economic efficiency of the unit and to achieve sustainable development (Singla, & Ahuja, 2018).

As a result of the problems of pollution and environmental degradation such as acid rain, drought, desertification, pollution of groundwater and the depletion of natural resources as well as environmental disasters and their devastating effects, these environmental problems have been aggravated by neglect of the environmental dimension of programs and administrative decisions. In particular when the economic units develop the plans and policies necessary to carry out their economic activities. Environmental pollution - whether internally or externally Economic has had a negative impact on the limited economic resources and exhausted, and its social dimensions is the negative impact on human society as well as the negative effects on other organisms in the universe (Amiruddin, 2016).

EMA is widely defined to be the classification, collection, estimation, analysis, internal reporting, and use of physical flow data (i.e, materials, water , and energy flows) ,environmental cost information, and other monetary data for both conventional and environmental decision-making within an organization. This definition of EMA is similar to the definition of conventional management accounting, but has a variety of key differences:

- EMA places particular emphasis on accounting for environmental costs.

- EMA encompasses not only environmental and other cost information, but also information on physical flows and fates of materials, water, and energy.
- EMA information can be used for any type of management activity or decision making.

Within an organization, but is particularly useful for activities and decisions with significant environmental components and/or consequences. Therefore EMA incorporates and integrates two out of the three foundation blocks of sustainable development – environment and economics – as they can relate to an organization's decision-making internally (Mokhtar, Jusoh, & Zulkifli, 2016).

Types of Information Included Under EMA

EMA includes two kinds of financial and material information, recognizing both the environmental impacts associated with the economic position of the economic unit (through monetary units) as well as the economic impacts of economic units (through physical units), thus integrating all material issues And financial issues of stakeholders in order to be aware of the environmental impacts of the unit (Liu, et al., 2018) , From the above, the EMA can be divided into two types:

Physical Environmental Management Accounting (PEMA)

The physical environmental information (PEMA) can be defined as energy, water, materials and waste information, in other words, the environmental impacts of the economic unit (in physical units) such as total amount of fresh water consumed, volume of waste generated, amount of materials used (Mokhtar, Jusoh, & Zulkifli, 2016), These environmental effects are expressed in physical units such as kilograms, cubic meters or joules, for example, kilograms of materials per customer served or rounds of energy consumed per unit produced (Miyata, Shibusawa, Permana, & Wahyuni, 2018).

Under the physical aspect of environmental management accounting, the economic unit must attempt to track all inputs and outputs to ensure that large quantities of energy, water and other materials are accounted for, based on the basic assumption that all material inputs must eventually become outputs either on Form of physical products, waste or emissions (Smit, & Kotzee, 2016). Outputs that are not in the form of physical products are called "Non-Product Output"(NPO) and in units that use materials and energy but do not manufacture any physical products such as service units. All outputs in this case will be non-material products (NPO) Non-physical products in tandem with "residues and emissions" (Jasch & Savage, 2008).

There are several terms that also refer to EMA and the accounting process for energy, water, materials and waste flowing within and outside the economic unit, such as (Jasch 2009),

- Materials Balance
- Input-output Balance
- Material Flow Balance
- Eco-balance

According to Schaltegger, and Burritt, (2018), EMA as an approach to internal environmental accounting works as follows:

- An analytical tool aimed at detecting environmental strengths and weaknesses.
- A technique to support decision making that highlights environmental quality.

- A tool for measurement that is an integral part of other environmental measures, such as environmental efficiency.
- A tool for direct and indirect control over environmental consequences.
- An accountability tool that works to provide a neutral and transparent base for internal and external communication indirectly.
- A tool that fits closely and fully with the toolkit being developed to help promote sustainable environmental development.

Jasch & Savage (2008), argues that many of the required material accounting information is not readily available to accountants, as it is not regularly recorded in accounting records or is not recorded in a way that reflects the real flow of material within the economic unit. Other places such as production and workplaces are more detailed estimates and measurements of material flows, and this information is not readily verified by accountants, so accountants need to work more closely with staff from other departments for the exact performance of the material side of EMA.

Monetary Environmental Management Accounting (MEMA)

Is a subsystem of environmental accounting that deals only with the financial impacts of environmental performance, as it allows management to better evaluate the financial aspects of products and projects when making business decisions (Ambe, 2011). MEMA assists in strategic and operational planning, serves as the regulatory body and provides a regular source and head of information for decision-making on the objectives that economic integration wishes to achieve (Abiola & Ashamu, 2012). Environmental information relates to environmental costs and revenues, Waste and emissions, environmental research and development costs, sales of scrap and waste, and support for recycling and tax incentives on green equipment (Mokhtar, 2015). The way environmental costs are presented varies from one economic unit to another, their views on environmental issues and their economic and environmental objectives (Smit, & Kotzee, 2016).

IFAC noted that in terms of accounting for environmental costs related to EMA, economic units tend to use the four types of costs to analyze their costs (IFAC, 2005):

- Categories that reflect the type of environmental activity (eg, control and prevention of waste).
- More representative categories of traditional accounting (eg, materials and wages).
- Categories representing the environmental domain (eg, water, air and land).
- Categories that reflect the clarity of data in accounting records (eg, clear costs and hidden costs).

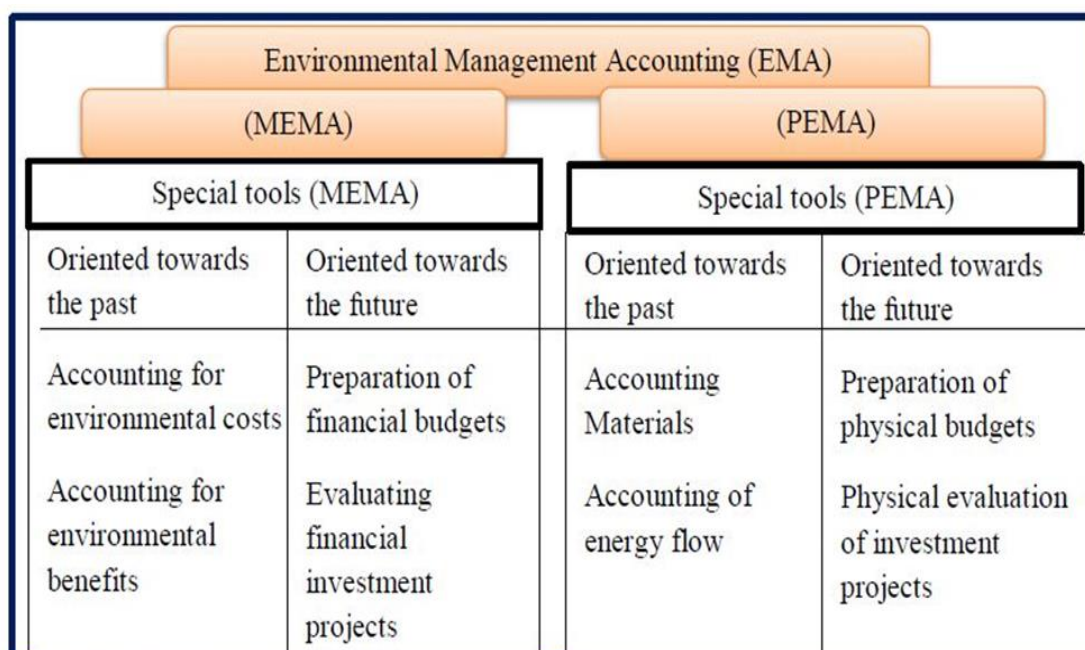
Importance of EMA in Managerial Decision Making Process

EMA is an environmental management approach in the economic unit that involves the use of accounting practices and codes to help managers make decisions about environmental and economic performance. Their use in strategic development processes to create a balance between the economy, society and technical factors Necessary to ensure a sustainable environment (Doorasamy, & Garbharran, 2015).

It is therefore a tool for decision-making within the economic unit, as it leads to economic and environmental benefits at the level of economic unity. The practical results also

confirm that they help to provide profitable solutions from both financial and environmental aspects by improving the economy and impact of economic units on the environment as well as the promotion of social profitability (Hájek et al, 2012).

In general, researchers believes that the development of EMA has been made for the internal decisions of the economic unit, as it focuses on tracking all expenditures generated by losses resulting from inefficient materials and environmental management, and improving the unit information systems and decision bases (Jasch, 2009). The EMA is used to make internal decisions to report on the past, such as the determination of annual environmental expenditures or costs, the costs and uses of the inflows, as well as a future-oriented tool for budgeting, investment assessment, performance targets (Sulanjaku, 2013) .Figure (1) The following illustrates the difference between management accounting tools relating to the past and the future.



Source: Schaltegger et al., (2018).

Figure (1) Environmental Management Accounting Tools (EMA)

Vinayagamoorthi, et al., (2012), as identified two types of internal decisions that take into account environmental activities are as follows:

Phase Decisions Product

Determining the correct cost and accurate product pricing is a precondition for sound strategic decisions. EMA converts many of the additional environmental costs (Overhead) into direct costs allocated to the products responsible for the costs incurred. Cost by EMA includes:

- Different pricing of products as a result of recosting.
- Revaluation of product margins.
- Redesigning stages or products to reduce environmental costs.
- Gradually withdraw some products if their costs become large.

Investment Projects and Decision Making

Decision making on investment projects requires the calculation of a number of different profit indicators such as net present value, recovery period and internal rate of return.

Without measuring and recognizing environmental costs and benefits when calculating these indicators, management can reach wrong conclusions and harm the environment. Many environmental costs that may arise from long-term processes or projects should be included in the assessment of these projects. These environmental costs can be grouped into five clusters (DePalma, & Csutora, 2003):

Costs of raw materials, services, labor and capital

Are the traditional costs that are always taken into account when evaluating projects, but the environmental part of these costs (such as unprocessed raw material costs) is not isolated and identified as environmental costs.

Administrative costs incurred and hidden in overhead costs

(Eg control costs, financial reporting and training costs).

Conditional costs

Which may or may not be incurred in the future (such as potential cleaning costs from an accident or compensation of fines) and the difficulty in predicting the likelihood, magnitude and timing of such costs often result in their omission or omission when determining costs, Which posed a great danger to the workers of the economic unit.

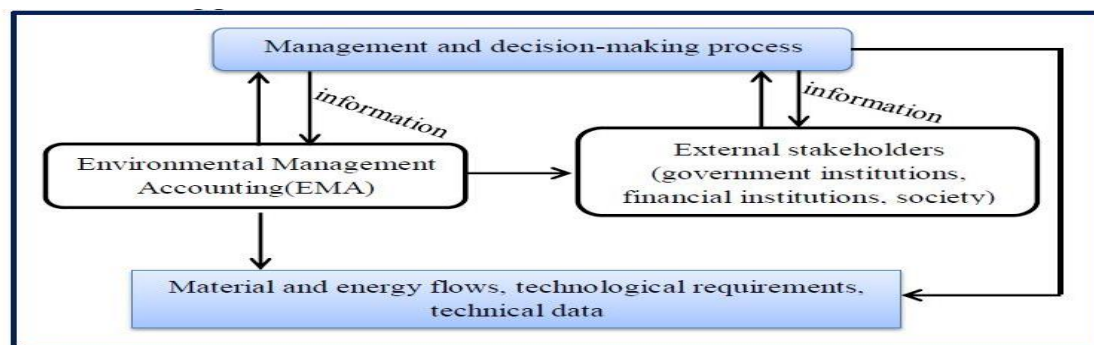
Costs and benefits of intangible assets

(such as goodwill) Which arise from a good or weak vision of interests, whether environmental, legislators, customers or others.

External costs that are provided to external interests

(Community, clients, etc.). Most accountants agree that these costs should not be taken directly into account when making decisions on investment projects. However, the economic unit should be aware that high levels of external costs may be converted to costs through environmental systems, taxes or fees (such as environmental degradation costs).

EMA is primarily designed for internal decision making, but can be used when making external management decisions, which can be said to provide basic information to guide management behavior in relation to the environmental efficiency of management decisions (Christ, & Burritt, 2013) . According to Gibassier, (2017), whether the use of EMA as a tool for managerial decision making is an effective choice, or as a result of pressure from other powers, the impact on economic unity of both cases will be strong and strengthened, which should be included at all practical levels, not only for a short period of time or Because others do so. Figure (1.2) illustrates the importance of EMA in the decision making process.



Source: Staniskis & Stasiskiene, (2006).

Figure (1.2) the importance of environmental management accounting (EMA) in the decision making process

This explains the importance of EMA, which has prompted many economic units to adopt it. Burritt argues that there are various reasons for the increasing interest of many managers in the information provided by environmental management accounting, as follows (Burritt, & Saka, 2006): Environmental legislation requires conditions and requirements to be implemented by economic units. If these conditions and requirements are met, they will lead to environmental costs. When these environmental costs are important, they will require management control and control. Increasing the voluntary acceptance by managers of the importance of managing the environmental impacts of the business of economic units. Managers have begun to recognize the increasing importance of the financial consequences of these impacts on the prosperity of their economic units. If managers want to reduce costs (to improve income or profitability) To reduce the penalties that may be imposed on them such as suspension of work or the anger of different stakeholders), the EMA information will be necessary in this case. Voluntary acceptance leads to commitment, assessment, monitoring and elimination of the causes of such As well as negative impacts. On the preservation of the legitimacy of economic unity in the eyes of customers and society and the interests. EMA has been promoted by international, international and local bodies and some educational institutions. It has been adopted by UNSDD, the United Nations Environment Program (UNEP) and many academic researchers, because of the potential social and environmental benefits of Extensive environmental management tools related to the need of economic units that include all environmental costs in operational decisions and analysis of investment projects. Increasingly available EMA tools to assist in the management process With a number of ways to successfully implement each tool, a number of tools were identified by the Ministry of Economy, Trade and Agriculture in 2002 through a project The methods of using different tools were discussed.

Methodology

Research Design

To achieve the research objectives, the following methods will be adopted:

- I. The inductive approach in reviewing the theoretical side of the research by extrapolating sources and literature related to the subject in order to reach theoretical conclusions that support the research ideas.
- II. Analytical descriptive approach to describe and process the data that will be obtained from the field study on the economic unit - the subject of research - The study community consisted of all officials and employees of the General Department of Financial Affairs Wassit factory, (30) questionnaires were distributed, (25) questionnaires were retrieved valid for statistical analysis, and the analysis of the collected data was carried out using the Statistical Package for Social Sciences (SPSS) Statistical analysis of ratios, frequencies, arithmetic mean and standard deviation, as well as the calculation of Cronbach's alpha , Kolmogorov-Smirnov test and T-test for a single sample.

The Study Population and Sample

The industrial sector of Iraq has been targeted, represented by the Iraqi industrial economic units as a research society, because of the importance of this sector in the economic development of the country, as well as its great effects on the environment through the various industrial waste that affect the environment in all its forms and components. In this research, a textile and weaving plant was selected as the locator for the application of the research because of its environmental impact at the internal and external levels. The environmental trends of the

plant are represented by strategic environmental investment through the development of a unit Complete for environmental treatment in the factory. As the reports of the Department of Environment in Wassit province that this plant is the largest pollutant among the total industrial economic units in the province.

Methods of statistical analysis

To achieve the objective of the study, the SPSS program was used for statistical analysis, and the statistical methods used were:

4. Percentages and frequencies.
5. The arithmetic mean and the standard deviation of the sample to see the direction of the answer.
6. Cronbach's alpha test is used to determine the stability of the vertebrae and to measure self-honesty.
7. Kolmajarov-Smirnov test (1-Sample K-S).
8. T-test for one sample to test the ferrite.

Findings

Case Study in the Wassit Plant

This is one of the most important companies of the Iraqi Ministry of Industry and Minerals specialized in the textile industry, is located in Wassit / Kut city on the left bank of the Tigris River, with a total area of (500000) square meters, of which about(155633) square meters are buildings occupied by the halls. The company was founded in the sixties of the last century under the Iraqi-Soviet agreement and began actual production on 1/6/1969 and included only the knitting factory. In 1969 the General Company for Spinning and Weaving was established and continued as two independent companies until 1971 when it was merged Which is affiliated to the General Company for Cotton Industries in Baghdad because of the large number of common services (such as water, electricity and sewage) between the two companies which were affiliated to the cotton spinning factory, in order to ensure the safety of the work and identify Responsibilities, raising the level of workers and reducing the total expenses as well as the adoption of the knitting factory in part of its production on the cotton yarn produced by the textile factory had to be subject to these facilities to a unified management.

The design capacity of the textile factory amounted to 30 million square meters of cotton fabrics, and the design capacity of the knitting factory was 6 million pieces of woven outer garments and 3 million pieces of cotton and silk underwear annually. To the textile factory at the end of the seventies for the purpose of the production of fabric Albaza and added yarn to the knitting factory, and both manufacturers were also updated in 1989, replacing all the machines of the textile department and a large part of the spinning machine machines were added knitting machines Sophisticated machines and surface area and other textile sewing to knitting factory .

Another change that the company underwent was in 1987 when cotton facilities were merged into a single facility called the General Establishment for Cotton Textiles and Tailoring. It was based in Baghdad and in 1988 it was merged with the General Company for Spinning and Weaving in Mosul and the General Company for Spinning and Weaving In the Diwaniyah and named (the General Establishment for Cotton Industries), and continued to work in this manner until 2001/7/1. The spinning and weaving factory and the knitting factory

were separated by a decision of the Council of Ministers at that time about the company above. Recently changed its name in 2016 to (weaving factory Wasit weaving).

In 2009, a cotton mill was launched. The factory started with a design card of 8 million tons of cotton woven annually. It is an integrated production line set up and operated by a specialized team sent to the country of establishment. Is a textile factory which produces various kinds of woven cotton fabrics as final production as well as yarns of different measurements, knitting factory which is specialized in producing different kinds of woven garments (outer and internal), polyester fabrics, birlon, Which is the primary material of the workshop. It produces three products: cotton, which is used by factory factories, and cotton seeds, which are used in the manufacture of oils. Animal feed, as well as falling cotton that are sold to scabs for use in their work.

Analysis of sample characteristics

The table (1) shows that the bachelor's degree represents (64%) of the sample, which is a large percentage and constitute (76%) with the master's degree. This category is usually the most concerned with the implementation of the various activities of the organizations, Assess cities awareness and awareness of business requirements.

Table (1) *Distribution of the sample members in terms of qualification*

Qualification	Repetition	The ratio
Diploma	6	24%
BA	16	64%
M.A.	3	12%
Ph.D.	0	0%
Total 25 100%	25	100%

Experience in table (2) shows that more than half of the sample has more than 15 years of experience, and that the sample members with 11 years or more experience represent (68%). This percentage gives some assurance that most of the sample have experience and adequate knowledge of labor affairs.

Table (2) *Sample distribution in terms of experience*

Experience	Repetition	The ratio
Five years or less	5	20%
From 6-10 years	3	12%
From 11 to 15 years	4	16%
More than 15 years	15	52%
Total 25 100%	25	100%

In terms of functional division, it is noted from table (3) that all the sample are either accountants, auditors or head of department who are all concerned with the subject of the study.

Table (3) *Distribution of the sample in terms of functional division*

Functional	Repetition	The ratio
Accountant	18	72%
Head of department	3	12%
Auditor	4	16%
Manager	0	0%
Total 25 100%	25	100%

Test honesty and consistency using Cronbach's alpha

This test is intended to measure the degree of consistency and internal consistency of the questions. If Cronbach's alpha = 60% or more, the value is statistically acceptable, and SPSS shows that Cronbach's alpha (74.9%) is a good result. The self-honesty factor is the square root of alpha, and the self-honesty coefficient (86.5%) is a good indicator of the validity of the questionnaire.

Natural distribution test results (K-S)

The normal distribution test is used because the T-test is required to use data to be naturally distributed when the sample size is less than 30. When the data are not distributed naturally, other tests based on the percentage such as the Chi-square Test should be used. When the test (K-S) is applied, if the value of sig < 5%, it means that the data are distributed naturally and the study data are found to be naturally distributed in all the questionnaires, as shown in Table (4)

Table (4) *Test the normal distribution of the study data*

Axis	Sig	distribution
The first	0.057	Normal
The second	0.7006	Normal
The third	0.9834	Normal

Testing Hypotheses

To test the hypotheses, the T test was used for a single sample because the number of questionnaires valid for statistical processing is less than 30 years. A level of significance (5%) was used at a 95% confidence level, which is an acceptable level in the social sciences study. The statistical decision (non-significant) will be accepted. In this case, the null hypothesis will be accepted. If Sig is > 5%, the statistical decision is significant. The null hypothesis will be rejected and the alternative hypothesis accepted, which is in this case the hypothesis of the study.

Test the First Hypothesis

Measure the test for the perception of the employees and employees of the Wassit plant for the concept of environmental management accounting.

The above table (5) shows the following: The first paragraph, which is an incorrect definition of environmental management accounting, obtained the lowest average of (2.83). It is located within the neutral zone. The standard deviation of the paragraph is the highest of 1.09. Type of confusion in the sample (persons). With respect to this paragraph.

It is noted that the value of the moral level in this paragraph is (0.148), which is greater than (5%) and the rest of the poverty has reached a significant level less than (5%), and note that the fourth paragraph ranked first with an average of (3.84). This gives an indication that the sample (people) is a measure of perception in the concept of environmental management accounting, as this paragraph is the most comprehensive definition of environmental management accounting.

It is also noted that the average of all the paragraphs is equal to (3.468) in the sense that it is slightly above the average limits, where the approval area according to the mean, the moral level of all paragraphs is (0.037), less than (5%) the first hypothesis of the study is accepted.

Table (5) *T-test results for the first hypothesis test*

NO	Paragraph	SMA	Standard deviation	T	Ranking	Sig p. value	Statistical Resolution
1	Environmental management accounting means collecting and identifying information about environmental performance in financial terms only and communicating it to the beneficiaries.	2.83	1.09	1.5	4	0.148	Not significant
2	Environmental management accounting means collecting and identifying information on environmental performance (in quantities and dinars) and communicating them to the beneficiaries.	3.76	0.77	8.1	2	0.000	Significant
	Is the management of environmental performance through the development and implementation of accounting systems and practices related to the environment?	3.44	0.197	5.1	3	0.000	Significant
4	Is the process of identifying and compiling financial and non-financial information on the flow of materials, energy, water, environmental and non-environmental costs for internal decision-making	3.84	0.898	7.5	1	0.000	Significant
	All paragraphs	3.468				0.037	

Test the Second Hypothesis

Is that the application of environmental management accounting may contribute to the provision of crisis information for strategic planning at the Wasit plant. Less cost advantage, process efficiency, product quality and marketing will be discussed, as shown in the table (6).

Table (6) shows the following: The significance of the fourth paragraph in the category of efficiency of operations where the value of Sig (0.65) is greater than (5%) with an average of (4.08), which means that the members of the sample agree to this paragraph which states

that the application of environmental management accounting will contribute to reducing waste. By tracking the flow of materials, energy and water.

It is noted that at the lowest cost level, the second paragraph ranked first with an average of 4.08 and stated that the application of environmental management accounting would help the product price reflect the real value of its cost by identifying and loading environmental costs for each product. In the second dimension of the efficiency of operations, the sixth paragraph was ranked first in terms of approval with an average of (4.04) and a standard deviation (0.538). It states that the application of environmental management accounting will contribute to raising the efficiency of the company in optimizing the exploitation of its environmental assets. The fourth paragraph ranked first in terms of approval with an average of 4.28 points, which is the highest for all paragraphs of the second axis. It states that the application of environmental management accounting will contribute to improving the company's reputation with the parties concerned with the environment.

Table (6) *T- test results for the second hypothesis*

First: The Lowest Cost Advantage							
No	Paragraph	SMA	Standard deviation	T	Ranking	Sig p. value	Statistical Resolution
1	The application of environmental management accounting will lead to control and control of the environmental costs of the operations and products of the company.	3.92	0.702	6.549	2	0.000	significant
2	Application of environmental management accounting will help the product price reflect the real value of its cost by identifying and loading environmental costs for each product.	4.08	0.64	8.433	1	0.000	significant
3	The application of environmental management accounting will contribute to increasing the efficiency of planning, thus reducing the cost of the unit produced in the long run.	3.56	0.712	3.934	4	0.000	significant
4	The application of environmental management accounting will contribute to reducing the costs of waste treatment leading to financial savings.	3.84	0.800	5.25	3	0.00	Significant
Second: Efficiency of operations							
1	Application of environmental management accounting will contribute to the provision of data for the effective management of all possible environmental impacts of waste and emissions.	4.04	0.539	9.656	2	0.00	Significant
2	The application of environmental management accounting will contribute to concealing the use of resources by tracking the flow of materials, energy and water.	3.88	0.440	10.007	4	0.00	Significant
3	The application of environmental management accounting will contribute to improving the decision-making process by providing environmental performance indicators.	3.76	0.723	5.253	6	0.00	Significant

4	The application of environmental management accounting will contribute to the concealment of waste by tracking the flow of materials, energy and water.	4.08	0.862	1.74	3	0.065	Not Significant
5	The application of environmental management accounting will contribute to the evaluation and implementation of environmental programs to ensure the company's long-term competitiveness.	3.84	0.553	7.584	5	0.00	Significant
6	The application of environmental management accounting will contribute to raising the efficiency of the company in the optimum utilization of its environmental assets.	4.04	0.536	9.656	1	0.00	Significant
Third: product quality and marketing							
1	The application of environmental management accounting will contribute to meet the needs of consumers with environmentally friendly products and environmental quality standards.	3.76	0.83	4.575	3	0.000	Significant
2	Application of environmental management accounting will contribute to improving product quality through mitigation of environmental impacts.	3.68	0.900	3.778	4	0.001	Not Significant
3	The application of environmental management accounting will contribute to maximizing the company's ability to market its products.	3.56	0.821	3.412	5	0.000	Significant
4	The application of environmental management accounting will contribute to improving the company's reputation with environmental stakeholders.	4.28	0.614	10.428	1	0.000	Significant
5	The application of environmental management accounting will help to design and implement EMS which is a requirement of ISO 14000	3.96	0.789	6.08	2	0.000	Significant
For all paragraphs		3.885				0.004	Significant

The general average of all the paragraphs = 3.885 and therefore is in the approval grade area through the mean (3.40 less than - 4.20).

It is also known that the standard deviation measures the dispersion of the mean of the arithmetic mean and therefore the lower its value, the more homogeneous and convergent the data. The second paragraph in the efficiency category is the least standard deviation of 0.440.

The value of Sig for all the paragraphs = 0.004 is the lowest (0.05). Therefore, based on statistical analysis, the study rejects the null hypothesis and accepts the alternative hypothesis which is: The application of environmental management accounting can contribute to the provision of information for strategic planning.

Test the third hypothesis

The assumption was that there are concerns and constraints that limit the application of environmental management accounting at Wassit plant, as shown in table (7)

Table (7) T-test results for the third hypothesis

No	Paragraph	SMA	standard deviation	T	Ranking	Sig. p. value	Statistical Resolution
1	Difficulty measuring environmental costs.	4.08	0.759	10.40	1	0.00	Significant
2	Absence of environmental policies and programs.	3.72	0.891	6.846	2	0.00	Significant
3	Application of environmental management accounting may lead to an increased proportion of costs.	3.600	0.764	7.201	5	0.00	Significant
4	There is no community interest in environmental issues.	3.72	1.02	5.972	3	0.00	Significant
5	It is difficult to collect and evaluate environmental data under the current accounting system	3.64	0.952	5.986	4	0.00	Significant
6	Lack of coordination and close cooperation between accounting departments and other departments.	3.08	0.996	2.910	6	0.00	Significant
7	Lack of qualified cadres	2.96	1.135	2.025	7	0.054	Not Significant
	All paragraphs	3.543				0.007	Significant

Table (7) shows the following:

The significance of the seventh paragraph where the value of the Sig is greater than (5%), and this means that the approval of the sample on them and it states that there is no qualified cadres.

The rest of the paragraphs at a high level of significance as the value of Sig for each of them = 0.000.

The general average of all paragraphs (3.543) is located in the approval area, and the value of Sig for all the paragraphs together = 0.007, which is less than (5%), so the study is going to accept.

The third hypothesis is: There are concerns and constraints that limit the application of environmental management accounting at the Wassit plant.

Results

During the review of scientific literature related to environmental management, it is discovered that it is a modern technology aimed at reducing waste and emissions and protecting the environment through exploitation Optimization of resources.

Wassit plant has outstanding environmental performance, and is making great efforts to preserve the environment and reduce waste, but this has not been accompanied by the development of accounting practices within it, as it does not apply environmental management accounting,

Environmental costs of various types are still hidden within additional costs. Officials at Wassit plant understand the concept of environmental management accounting.

The application of environmental management accounting may contribute to the provision of information to the strategic planning of the Wasit plant through (costs, product quality, efficiency of operations, excellence in marketing).

There are concerns and impediments to the application of environmental management accounting, including the difficulty of measuring environmental costs as well as the collection and assessment of environmental data under the current accounting system. There are also concerns that the application of environmental management accounting may lead to an increase in costs. Close between the accounting departments and other departments, and also lack of interest by the community environmental issues.

Conclusion

1. Wassit Textile and Textile Factory applies the unified accounting system to the calculation of its account, which is largely lacking in environmental information, and does not meet the requirements of the environmental management accounting financial information.
2. The adoption of Waseet factory and fabric for the procedures and divisions brought by the unified accounting system and not to adopt its own sophisticated method of recording and controlling costs.
3. The financial statements of the Wasit plant do not disclose any environmental information, such as environmental assets, liabilities or environmental related expenses and revenues.
4. The possibility of proposing an environmental management accounting model with its physical and financial aspects commensurate with the nature of the operations carried out by the Wasit plant in supporting the environmental programs and strategies of the Wasit plant for providing material and financial information that will effectively assist in the selection of programs and strategies for preserving the environment.

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