

THE ROLE OF GREEN MANAGEMENT ACCOUNTING IN IMPROVING THE QUALITY OF ACCOUNTING INFORMATION AND IMPROVING THE QUALITY OF PRODUCTS IN INDUSTRIAL COMPANIES

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Abstract

The research aims mainly at scientific rooting by identifying the role of green management accounting in improving the quality of accounting information and improving the quality of products in industrial companies, and to answer questions and test hypotheses, the researcher used the descriptive approach, literature and previous studies to obtain theoretical information related to the research topic and in order to know the role of management accounting Green in improving the quality of information that affects the quality of products through the optimal utilization of resources, which will reduce environmental pollution and environmental risks that are generated as a result of producing industrial products, as well as adding information that helps reduce the cost of manufactured products through cost accounting information that helps reduce cost and resource utilization To optimize access to clean environmentally friendly products. The results showed that defining environmental activities in industrial companies contributes to improving the quality of accounting information, which reflected positively on financial reports, achieving product quality and achieving economic, social and environmental development. The research recommended a practical application and more attention to the application of environmental green management accounting in industrial companies to contribute in a manner. It is clear about the responsibilities to be assumed in the field of environmental protection and society.

Keywords: Green Managerial Accounting, Accounting Information, and Improving the Quality.

INTRODUCTION

Environmental pollution is one of the problems facing the world at the present time, due to its health impact on society, nature, and the performance of workers. Of its waste that is harmful to the environment and to humans by releasing it into the air or throwing it into the sea or burying it in the ground, which had a negative impact on environmental life. The application of cost accounting is sufficient to list and calculate the costs elements associated with the company without taking into account the costs of preserving the environment from pollution, which leads to the emergence of false profits, and this weakens confidence in the accounting information provided. Most companies face special problems in measuring and analyzing environmental costs and disclosing them in the financial statements, as the traditional accounting used to hide environmental costs within the indirect costs elements, resulting in inaccurate information and wrong decisions.

The challenge lies in the difficulty of measuring environmental costs and how to address them and explain their role in improving the quality of accounting information and thus in improving

the quality of products, which adds a new and advanced dimension to the accounting profession. Several names have appeared in the field of accounting referring to this aspect, including: green accounting, environmental accounting from for sustainable development, environmental and economic accounting.

Whatever the name, environmental accounting (green) means the inclusion and integration of the process of measurement and accounting and economic disclosure of activities and programs that affect the environment and practiced by companies to meet the needs of different parties in society. Environmental (green) accounting examines how the environment in terms of costs and benefits affects the financial and administrative accounting system, as many factories produce a large amount of pollution, whether it is air pollution or water pollution, as well as producing inferior and unfriendly products, which may cost the company or The state provides a lot of funds to protect the environment from the damages of these companies, with the aim of preserving the capabilities of future generations, which can achieve sustainable development and social welfare for all members of society, represented in meeting human needs and achieving social welfare in the long term, while preserving human and natural resources and trying to reduce Environmental degradation. To achieve this, a balance must be reached between economic and social development on the one hand, and resource management and environmental protection on the other. Where the research was divided into two sections:

The first: dealing with the concept of green accounting and environmental management systems.

The second: the emergence and importance of environmental accounting, environmental performance problems, and the role of green management accounting in improving the quality of accounting information, which in turn affects the quality of products and the concept of green management accounting. And then the conclusions and recommendations of the researcher were reached.

RESEARCH PROBLEM

The information provided by accounting in its annual financial statements is insufficient for environmental purposes, and requires accountants to focus on environmental, social and economic performance and the benefits that can be achieved from introducing green environmental accounting, through building a comprehensive framework for green management accounting (environmental) that stems from improving the quality of accounting information And improving the quality of products to rationalize decisions affecting the environment in order to seek to achieve the goal of producing green products that are environmentally friendly, which is the optimal use of resources. The research problem lies in clarifying the role of green management accounting in improving the quality of information and products in industrial companies to improve environmental performance. The research problem can be formulated in the following main question:

Is there a role for (green) environmental accounting in improving the quality of information and products in industrial companies? The following sub-questions are derived from the main question:

- 1- Is there a role for green management accounting in improving the quality of accounting information in industrial companies?
- 2- Does improving the quality of accounting information improve the quality of products in industrial companies.

RESEARCH AIMS:

The main objective of the research is to identify the role of green management accounting in improving the quality of accounting information, which in turn leads to improving the quality of manufactured products in industrial companies. This goal may be achieved from the following sub-objectives:

- 1- Accurate scientific rooting of the concept of green management accounting to clarify the extent of its effectiveness in improving the quality of the necessary and appropriate accounting information to rationalize financial decisions that help improve products.
- 2- Identifying the role of green management accounting in improving the quality of green products in industrial companies.

Importance of Research: The importance of the research lies in the following:

- 1- Helping industrial companies to activate the environmental and social dimension in a way that helps achieve their goals and the goals of society in producing green products that are environmentally friendly.
- 2- Identifying the role of industrial companies in protecting the environment through the good information provided by the system that reflects their performance.
- 3- Identifying the role of green management accounting in improving the quality of accounting information for industrial companies in order to help information users make planning, control and performance evaluation decisions.
- 4- Increasing the environmental awareness of industrial companies by recognizing the importance of environmental activities and linking them to manufactured products that help prevent pollution and waste of resources.

RESEARCH HYPOTHESES

The research is based on several hypotheses, which are as follows:

Main Hypothesis: There is a role for green management accounting in improving the quality of accounting information to achieve the quality of green products by helping decision makers in industrial companies to produce high-quality and environmentally friendly products based on accounting information related to environmental costs that achieve optimal use of resources.

The following sub-hypotheses are derived from the main hypothesis:

The first sub-hypothesis: There is a role for green management accounting in improving the quality of accounting information in industrial companies.

Second sub-hypothesis: Improving the quality of accounting information leads to the achievement of high quality and environmentally friendly products in industrial companies.

(The first topic)

Theoretical aspect of the research:

First: Concept of Green Accounting:

As a result of the efforts made by people engaged in this subject, green environmental cost accounting emerged around the start of the 1990s, following the appearance of negative features in its exploitation. Green accounting, environmental accounting for sustainable development, environmental accounting and economic are a few terms that have emerged in the accounting world to describe this element. Whatever the name, it refers to the inclusion and integration of the process of measurement, accounting, and economic disclosure of environmental activities and programs carried out by economic units, the identification and measurement of the costs of environmental activities, and the use of that information in environmental management decisions with a view to minimizing and eradicating the adverse environmental effects of environmental activities and systems (Al-Tikriti et al. 2000 p. 34).

Environmental accounting is defined as: “the method of measuring and communicating information related to the environmental activities of economic units with an environmental impact to the concerned parties and the community in a way that enables monitoring and evaluation of their environmental performance.” (Abdul Salam, 1999 pg. 5).

Environmental (green) accounting is defined as the accounting that examines how the environment, in terms of costs and benefits, affects the financial accounting system. (Jafar 2002 p. 11).

As for the environmental costs, they are the costs associated with the environment and the amount of pollution or damage from misuse of the available natural resources. (Al-Dosari 2011 pg. 19). Or are the costs incurred by the company in order to maintain the environment in which the company is located, taking into account the following: (Grace 2001 p. 155).

Elimination of environmental pollution resulting from the use of machines by using machines that pollute the environment. Disposing of industrial waste harmful to the environment by choosing appropriate methods that do not cause damage to the environment. Preserving the protection of natural resources and minimizing the depletion of their resources. Providing assistance to social organizations that preserve the environment.

Environmental Management System:

The environmental management system represents the backbone of the environmental performance in the business establishment and is one of the important concepts because green management accounting is one of the components of environmental management.

What is meant by the green management system : is a set of policies, concepts, procedures, commitments and action plans that will prevent the occurrence of environmental pollution elements of all kinds, and the employees of the facility understand that system, each in his competence, in addition to the application of these methods and procedures in practice and the preparation of periodic reports on the results of that application , where environmental management aims to develop, implement, manage, coordinate and control the activities of the facility in order to reduce the negative effects on the facility's products during their life cycle.

ISO 14000 standards are considered one of the most important attempts to set acceptable international environmental standards that provide flexibility for the facility to achieve its environmental goals efficiently and effectively.

These standards have been of interest to the International Organization for Standardization.

International Organization for standardization (ISO)

Where it issued quality standards No. (9001), which is related to quality and review of environmental management systems for business organizations (ISO 9001, 2002), and the organization also issued standards No. (14001) in 1996 and was developed in 2004 (ISO 14001, 2004), which is one of the most important Environmental protection programs due to the principles and standards it contains regarding environmental management systems, which must be adopted by business organizations to improve the level of their environmental performance and to obtain a certificate (ISO (Zieglerand Nogareda, 2004)).

The ability of management systems to: Work to prevent waste of energy, raw materials, and other resources; work to prevent diseases that pollute the environment; work to develop operating systems; and work to continuously improve product specifications through the creation of the product life cycle style are all reasons for the significance of management systems. The key components of green environmental policy are there.

- 1- Green internal environmental audit
- 2- Green Environmental Status Record
- 3- Training employees on green environmental concepts
- 4- Preparing the environmental performance report
- 5- Take corrective environmental measures

In light of this, the researcher believes that the green management accounting system enables industrial companies to apply the best environmental practices, which have direct repercussions on their environmental and economic performance. Good planning for environmental practices reduces negative environmental impacts on the facility and society through early detection and

treatment on the one hand, and enables understanding the sources and causes of environmental costs and then working to rationalize them, and this has an impact on the profitability and growth of the facility on the other hand. The application of green management accounting within the environmental management system includes several terms, the most important of which are:

- 1- Environmental performance
- 2- Environmental control
- 3- Environmental Efficiency.

Despite the increased attention to environmental issues in accounting thought in recent times, there are some terms that overlap among themselves, such as the terms environmental impacts and environmental performance. Businesses for their activities such as recycling of waste, toxic releases, non-compliance with environmental statutes and other environmental influences. (AL-Tuwaijri, et.al., 2004, Mobus, 2005), while the concept of Environmental Performance is more general and comprehensive than that It is limited to environmental impacts only because the use of environmental impacts as a proxy for environmental performance restricts consideration of that multi-dimensional concept in only one dimension, but it expands other dimensions such as customer satisfaction, productivity, motivation) and therefore different efficiency models must be used to define environmental performance. System and model strategic-constituencies and value model Competitiveness In light of these models, environmental performance includes several dimensions, which are results versus internal versus external processes (Henri, 2004 internal versus external).

In order to include these dimensions in the environmental performance, it was suggested (Ilinitch, et. al., 1998) that they be represented in two axes: a vertical axis indicating the internal / external dimension, and a horizontal axis indicating the results / processes dimension so that the points of convergence of these two axes highlight the structure of a different organization dimensions of environmental performance. The researcher summarizes these dimensions in the following table:

	The results	The process
Internal	financial impact	Product and process improvement
External	Environmental impact and company reputation	Relationships with other stakeholders

It should also be noted here that environmental performance measures must be characterized by several characteristics - such as the characteristics of management accounting information - such as appropriateness, appropriate timing and homogeneity. In his study of linking performance measurement systems to strategy with the application to the environmental strategy, (Perego and Hartmann, 2009) dealt with a test of the characteristics that must be available in the environmental performance measurement indicators through the field study.

Environmental Control:

Environmental control is the stages or processes by which managers ensure that environmental and economic resources are obtained and used efficiently and effectively to achieve the organization's goals. The main uses of environmental control are to review compliance with environmental policies and laws, stimulate the continuous development of environmental performance, provide the necessary data for internal decision makers, and provide the data necessary for the preparation of external reports. Quantitative and organizational estimates of environmental releases improve the link between business strategy, environmental strategy and value drivers. (Value driver Henri, 2006).

Environmental monitoring enables managers to provide feedback information by comparing results and targets.

Environmental Costs:

Studying and analyzing the behavior of environmental performance costs components in a proper manner enables increasing the efficiency of using the elements of operating inputs and improving the level of environmental performance. (Tariq Fathi Abdel Khaleq, 2004, Khaled Abdel Aziz Attia, 2007, Suleiman Sanad Al-Sbo`, 2009).

Where this report classified environmental costs into four groups as follows:

1- Waste and radiation treatment:

It includes several main elements, namely the cost of depreciating machines, the costs of inspection and maintenance to maintain materials and services, the salaries of related employees, fees, taxes and environmental license expenses, insurance against exposure to environmental hazards, and provisions for cleaning and treatment.

2- Environmental prevention and management:

They are the costs associated with preventing or avoiding environmental impacts and the costs of managing environmental programs in the facility. They include several elements: the costs of external services for environmental management such as training and consulting, the salaries of employees working in environmental management activities, research and development costs related to environmental projects, additional expenses in modern technology for environmental protection, and the costs of other environmental management such as printers, communications and others.

3- The value of purchasing materials that do not have a product output:

Or the cost of materials not related to products, which is the value of materials that are lost to the facility - during the stage of purchase, operation or disposal - and in light of this, it becomes clear to the researcher how important environmental control is in supporting and activating environmental performance through the information provided by the feedback, directing consideration Management towards critical areas (strengths and weaknesses in environmental performance), and other information needed to make decisions related to environmental performance, in a way that helps establishments avoid damage to the environment as an

alternative to the reaction method that depends on how to deal with environmental damage and accidents.

4- Operating costs that have no product output:

Or the operating cost that is not related to the products, and it means the costs of labor, wasted capital and any materials that were not classified within the cost of the materials purchased in the previous group, and other costs resulting from inefficiency in production. It should be noted here that the report presented these groups of costs (as well as environmental revenues) in a table. These groups and their various elements represent the rows in this table and express the tabulation of environmental costs from the point of view of the financial manager, while the columns include the rating from the point of view of the environmental manager. Where costs are classified according to their environmental nature to Air/Climate, Wastewater, Waste, Soil/Groundwater, Noise/Vibration, Biodiversity/Landscape, Radiation, and various others.

Environmental Efficiency:

Efficiency generally means the relationship between outputs and inputs. In general, two types of environmental efficiency can be distinguished: Environmental product efficiency, which expresses a measure of the ratio between the processing of a product unit and the resulting environmental impact at the level of the product life cycle or part of it. Environmental functional efficiency, which means measuring the amount of environmental impact associated with providing a specific job or the ratio between providing a job and the environmental impact associated with it (Burritt and Saka, 2006).

Environmental efficiency is defined as the facility's ability to produce goods and services of high quality, and at the same time, it is able to reduce the environmental impacts associated with the production process.

That is, environmental efficiency means that cost reductions can be achieved by increasing environmental performance.

Environmental efficiency in all its forms (optional and indicative) is one of the important applications of environmental management accounting, environmental reports, and environmental accounting in general. In order to support the environmental efficiency model, it is necessary to have the financial and environmental management accounting information available. It is represented in the burdens borne by society as a result of their exposure to various elements of environmental pollution resulting from the practice of the facility's activities or the irrational depletion of non-renewable natural resources.

This type of external costs is usually taken into account mainly when evaluating investment projects, and these costs are taken into account in the comprehensive environmental cost accounting approach, which includes all elements of internal and external environmental costs in addition to external savings as well, such as the use and production of environmentally friendly products (UNSD, 2001).

Also, the environmental costs mentioned in the UNSD classification express the internal environmental costs or internalized costs borne by the establishment, whether compulsorily or

optional, as a result of its setting up programs to protect the environment from the environmental impacts resulting from its activities (and this may be due from the researcher's point of view that the system The management accounting that this report aims to develop tends to address real raw material loss and environmental efficiency for the purposes of internal decision-making rather than focusing on external influences. However, the report indicated that there is a second type of costs (not included in the previous environmental costs tab), which is the external environmental costs. In the mind of the reader, when it appears in the rest of the research, the researcher presents in the next point of the research the accounting approach to the study of the environmental dimension in general.

(The second topic)

Origin and Importance of Environmental Accounting:

Professional organizations and consumer groups have become more strict and interested in examining the extent of business organizations' commitment to environmental laws and regulations, and in this context, the (IFAC, 2005) study examined the reasons for organizations' interest (or accountants) in environmental issues, as the study indicated the exercise of multiple pressures on many organizations. To improve its environmental performance, the most prominent examples of these pressures at the international level are the following:

- Value chain pressures: the pressures that large-sized companies exert on their suppliers to urge them to comply with the environmental management systems issued by the Organization for Standardization (ISO) for products.
- Disclosure pressures: the pressures exerted by stakeholders on the business establishment for the necessity of disclosing the environmental performance in the annual financial reports or voluntary disclosure in the company's environmental performance reports, according to what is known as the global disclosure initiatives (the guidelines of the Reporting Initiatives).
- Financial pressures: These are pressures generated by the growth of global awareness of the social responsibility of investments and investment classification systems in this case, such as the Dow Jones Sustainability Index .
- Legal and regulatory pressures: These are the pressures exerted by the regulatory and legal authorities in different countries to reduce the rates of production of business establishments of hazardous, toxic or polluting materials to the environment, as well as reducing the rates of toxic gas emissions.
- Tax pressures: the value of taxes imposed by governments on the use of materials harmful to the environment, such as carbon tax and other similar taxes aimed at limiting damage to the environment.
- Trade pressures and international agreements to reduce environmental pollution such as the Kyoto Protocol.

Many writings have addressed the importance of environmental accounting since its inception, the researcher mentions, for example, what was stated in the report issued by (USEPA, 1995) entitled Environmental accounting as an administrative tool, that environmental costs are one of the costs that occur for the production of products and services and that environmental performance is one of the most important measures of business success, and therefore environmental costs and environmental performance deserve management attention for the following reasons:

- 1- Many of the environmental costs can be reduced or reduced as a result of management decisions (ranging from operations management to asset management) such as investing in green technology operations and redesigning processes/products. At many environmental costs may not add value to systems, processes and products.
- 2- The current environmental costs (and those potentially saved) may be hidden in the overhead accounts or in other accounts that may be overlooked.
- 3- Many companies have discovered that environmental costs can be offset by generating benefits from selling of waste by/products or licensing of clean technologies.
- 4- Good management of environmental costs can produce an improvement in environmental performance and tangible benefits in the health of individuals and thus business success.
- 5- An understanding of environmental costs and the performance of operations and products increases the accuracy of product costs and prices, which helps management in designing a better environment for operations, products and services in the future.
- 6- Improving environmental performance enables obtaining competitive advantages from customers for products and services that participate in obtaining a better environment .
- 7- Accounting for environmental costs and environmental performance supports the application of environmental management systems and is the system that companies must apply to enter into international trade .

The report (USEPA, 1995) presented three branches of environmental accounting: national income accounting, which is prepared at the state level and reports to external parties, financial accounting is prepared at the enterprise level and reports to external parties, managerial or management accounting is prepared at the level of The facility, department, production line, center or system and submits its reports to the internal parties.

(Bartolomeo, et.al., 2000) examined the relationship between environmental management and accounting functions in companies and businesses, and identified four broad but distinct approaches to environmental accounting writings: external financial reports, social accounting reports, raw materials and energy accounting, and environmental management accounting. . This study has linked these approaches according to internal and external points of view on the one hand, and financial and non-financial points of view on the other. Environmental management accounting from the point of view of this relationship provides a common approach that enables the transfer of data from financial accounting, cost accounting, and raw

material and energy flow budgets towards increasing the efficiency of materials and energy, reducing environmental impacts and risks, and reducing environmental protection costs.

Accounting for raw materials and energy means defining products or services (the final product), defining production inputs, which consist of raw materials and energy, and then preparing a raw materials and energy budget to verify that the amount of input is equivalent to the amount of output, after running a quantity of those raw materials and energy (meaning that The amount of inputs from the raw material = the amount of output from the raw material = the amount spent from stores from the raw material to the production line = the amount of production + the amount of wasted raw material). The waste of raw materials is analyzed according to responsibility (natural loss and abnormal loss) on the one hand, and according to its nature.

- Problems when carrying out the environmental performance measurement process:
 - A. The problem of defining and limiting the environmental activities to be measured.
 - B. The problem of determining the measurement range.
 - C. Determining objective criteria for the accounting measurement of environmental activities.
 - D. Finally, the problem of the difficulty of linking environmental costs with environmental benefits.

And the environment: in its broad sense, it does not only include natural elements such as water, air, minerals, energy sources, plants and animals, and the person who invests and exploits natural resources to satisfy his needs and satisfy his desires, but the environment means monitoring the material and social resources available at a given time to satisfy human needs and aspirations. (Al-Marayati, 2001, p. 15).

The recent interest in the environment is due to several reasons, including: (Mahmoud, 2001, pg. 4).

1. The emergence of pollution and its significant increase and the depletion of natural resources
2. The limited ability of the evidence to absorb and absorb the elements of pollution.
3. Increasing environmental crises resulting from the rapid growth of production and the consequent population growth and increasing expenditure on goods and services.
4. Exacerbated environmental problems as a result of littering.
5. The pressures of individuals and organizations with an environmental concern
6. The increasing interest in environmental problems in the media and the increasing number of environmental supporters day after day.

Manifestations of environmental pollution: Environmental pollution has many manifestations that can be listed as follows:

- 1- Air pollution.
- 2- Water pollution.
- 3- Soil pollution.
- 4- Noise pollution.
- 5- Solid waste pollution.

Types of Environmental Costs:

Environmental costs are divided into two types of costs:

1 - Environmental pollution prevention costs, and this type of costs starts from the beginning of the first source of pollution, and it can be avoided or reduced by improving raw materials and improving production requirements. Among this type of costs are those related to pollution control, such as planning and control costs, pollution prevention measurement costs, and costs to reduce or treat it.

2 - The costs of removing the environmental effects caused by these factories, such as the costs of removing solid or liquid waste), and the fumes emitted from the factory. The previous division was based on the activity to which the environmental cost was directed.

Environmental Activities to be measured:

It is common knowledge, before the accounting measurement of the costs of environmental pollution, that the environmental activities to be measured must be determined, which are:

1- Determining the environmental effects of the production processes this stage includes the qualitative and quantitative determination of the environmental effects of the production processes, and the classification and evaluation of the environmental impact of industrial treatments in the production cycle.

2- Inventory and determination of environmental costs and revenues.

Most industrial companies have activities that have harmful effects on the environment. They are obligated to disclose environmental performance information in separate reports or attached to the financial statements of the facility.

(Al-Shirazi 1990, p. 16) believes that the areas of corporate social responsibility are determined by the following:

- Preserving the quality of the environment
- Achieving product safety.
- Preserving natural resources and using them in an optimal manner, in order to confront each of:

A- Negative results of the company's activities, which are represented in damages to others without the company paying compensation for it.

B - Inadequate government resources in the provision of public goods and services in line with society's expectations.

Methods of accounting measurement for environmental activities:

It is measured at three levels:

1. The first level: enumerate the environmental activities to measure the inter- and social processes whose effects can be measured with a monetary scale.
2. The second level: quantitative information to measure environmental and social processes whose effects cannot be measured with a monetary scale, and non-monetary quantitative measures must be available to measure them.
3. The third level: descriptive information and it is expressed in a structural way about its effects on environmental and social processes whose effects cannot be measured with a quantitative scale. (Badawi 2012 p. 158).

Linking Environmental Costs to Environmental Benefits:

(Ali 2003, p. 46) indicates that environmental costs arise from companies engaging in an activity that produces waste that can be recycled or disposed of in a way that does not harm the environment. To achieve this goal, the company bears the so-called environmental costs. These costs include the following:

A- Prevention costs: They are the costs of the activities carried out by the company to prevent the production of pollutants or waste that cause environmental quality deterioration. These costs include environmental studies, evaluation and selection of suppliers, and evaluation and selection of machines to prevent pollution or reuse and manage waste. .

B- Discovery costs: They are the costs of activities carried out by companies to determine whether products, processes and systems within companies are in compliance with appropriate environmental standards, such as product inspection costs, environmental audit costs, control of pollution rates, and development of environmental performance measures.

C- Interfacial failure costs: They are divided into:

- Internal failure costs: They are the environmental costs that occur within the company in the event of failure to avoid and prevent them, and thus cause the production of pollutants and waste and their release into the environment, and from the activities of environmental failure are the fines and penalties imposed on the company as a result of non-compliance with environmental legislation and environmental damage that You speak it.
- External failure costs: They are the environmental costs resulting from the activities performed by the company due to the production of pollutants or waste and the release of these pollutants and waste into the environment. Or environmental waste such as the

costs of cleaning up contaminated soil), the costs of unconscious failure (the costs of activities carried out outside the company and borne by parties outside the facility, such as the costs borne by society for the company's failure to realize the true cause of pollution and environmental damage).

Environmental Pollution Costs:

The direct and indirect costs include the following: (Al-Dosari 2011 pg. 20)

1- Measuring the direct burdens of environmental damage, including counting the cases of diseases resulting from pollution, the costs of their treatment, and the expenses and compensations for health and death cases. It includes the following:

- a) Expenses incurred directly by the company in the field of pollution reduction. This type is determined by the hypothesis of the relationship between these expenses and the activity for which these expenses are allocated. On this basis, the direct share of each period of the beneficiary part of the resources of the economic unit is to reduce environmental pollution, and it is considered all expenses incurred in the removal of waste harmful to the environment in a particular accounting period from the expenses and revenues that are charged to the profit and loss account.
- b) Expenses paid by the economic unit to the competent official authorities in the field of pollution abatement.
- c) Annual depreciation premiums for pollution control equipment that are considered fixed assets in addition to pollution control expenses that are considered revenue expenses. As for the total costs of the establishment, it includes all direct costs that represent the cost of production.

2- Measuring the indirect burdens of environmental damage, including the following:

A- Measuring the cost of decreasing the production and human capacity of the work element, i.e. the value of lost productivity, and dividing it into three types

Return of the worker without affecting his productivity.

Return of the worker with reduced productivity.

Referring the worker to retirement as a result of total disability.

B- In addition to the indirect costs that are charged to the profit and loss account.

The role of green management accounting in improving the quality of accounting information:

Environmental accounting and accounting disclosure about environmental performance have a role in rationalizing and improving the quality of financial reports. There are some motives that may push some companies to disclose environmental information, including:

1. Giving the facility an opportunity to improve its image within the community in which it operates.
2. Providing the opportunity to build better relationships between the facility and the different groups of society such as government agencies, shareholders, employees of the facility, customers, suppliers, financiers and pressure groups, which are considered to have a strong influence, especially in the countries of Western Europe and the United States.
3. Willingness to apply environmental laws and regulations that will require disclosure of environmental information and are expected to be binding on all companies.
4. Use disclosure as a means of informing society as a whole that the facility voluntarily discloses environmental information.
5. Using disclosure as a means to reach an advanced competitive position in the establishment's field of activity.
6. Disclosure of environmental activities helps information users to take planning, control and performance evaluation decisions, as well as to develop research and studies in the field of environmental safety.
7. Gaining consumers' satisfaction and conviction with the goods and services offered by the organization in the market will help it fulfill its responsibilities towards society and future generations (because the use of resources and pollution of the environment may affect future generations).

Finally, it says that the disclosure of various environmental information is useful in the following (Badawi, 2012: (150).

1. Improving production processes.
2. 2 - Negotiation and conflict resolution with institutions.
3. Influencing decision makers.
4. Re-evaluating the accounting strategy and management practices.

Here, the role of green management accounting emerges in the exploitation of accounting information for the purpose of making good decisions in improving the quality of manufactured products so that they meet the needs of society and are less harmful and at a lower cost. For the resources of the institution to present its products to the market and society and to preserve the environment from pollution and damage that will be generated due to poor products and non-

clean or non-green production produced by some companies. Society and at the lowest cost, taking into consideration the calculation of the necessary environmental costs for valuable environmental activities and the exclusion of unnecessary activities that do not add value to the company and cause environmental damage that affects society with the optimal use of available resources, which is certified to the saying (do the right thing from the first time).

Concept of Green Management Accounting:

Definition of Environmental Management Accounting (Green):

First: The use of raw materials, energy, water, and other wastes and emissions are linked to many of the effects that business organizations have on the environment.

Second: The costs of purchased raw materials represent one of the main cost causes in business organizations (IFAC, 2005).

The definitions of environmental management accounting included both the financial and quantitative aspects as follows:

Definition of organizations and scientific bodies, including: The definition of the United Nations Sustainable Development Department (UNSD) of environmental management accounting (which is the definition that was reached by international agreement for members of the group representing (30 countries) as identifying, compiling, analyzing and using two types of information for internal administrative decisions: Information In kind (physical or material) the flows and use of raw materials, water, energy and waste. and financial (monetary) information related to savings, profits and environmental costs.

And the definition of the International Institute of Accountants (IFAC, 2005) for environmental management accounting: as a tool for managing the environmental and economic performance of business organizations through the development and application of current accounting systems that are related to environmental practice and environmental management accounting includes mainly: product life cycle costs, comprehensive costs, expected benefits and strategic planning for environmental management. Some definitions of environmental accounting: It is the identification and reporting of costs related to the environment, such as the costs of waste disposal, and in other cases it is defined as more than just accounting for environmental costs and benefits, it represents accounting for any costs and benefits arising from changes in products or processes The economic unit, where the change also includes a change in the environmental effects. It is a branch of accounting that focuses on the cost structure and environmental performance of the economic unit, and the preparation, presentation and communication of information related to the interaction of the economic unit with the environment. Sometimes called green accounting, resource accounting, or integrated economic and environmental accounting, this term refers to the amendment of the system of national accounts to include the use or depletion of natural resources. It is a broad term related to the provision of information related to the environmental performance of stakeholders within and outside the economic unit. Environmental accounting is a broad term used in a number of various contexts, including the assessment and reporting of financial information related to the

environment in the context of financial accounting and reporting, and the evaluation and use of physical and monetary information related to the environment in the context of environmental management accounting. Environmental accounting (or green accounting) is an environmental analysis tool (measuring and communicating the costs and benefits of comprehensive economic impacts, and it includes collecting information about the volume of materials and cost to determine the costs incurred by economic units, as a result of pollution emissions, waste treatment and environmental protection).

Environmental Management Accounting Definitions:

Environmental management accounting has become an important part of environmental accounting, but it is very important not only for environmental management decisions, but for all types of management activities, as the scope of decisions that are affected by the environment is increasing, and environmental pollution has become a global problem, and the activities of Businesses that have negative impacts on the environment are receiving increasing attention, and this leads to a significant increase in environmental costs, due to environmental regulations and social needs for sustainable development. Researchers have presented different definitions of environmental management accounting, some definitions of environmental management accounting. The United Nations working group of experts defined environmental management accounting as the process of identifying, collecting and using information to make internal decisions. A tool for measuring environmental costs, by measuring information. It is a common approach that provides for the transfer of data from financial accounting and cost accounting to increasing the efficiency of the use of materials, reducing environmental impacts and risks, and reducing environmental protection costs. It is also the management of environmental and economic performance through the development and implementation of accounting systems and practices appropriate to the environment. Environmental management accounting is one of the environmental management tools, as it provides a wide range of principles and approaches required for the success of many other environmental management functions, and since the set of decisions affected by environmental issues is gradually increasing, EMA has become more important not only for management decisions | environmental, but rather for all types of managerial functions with a particular focus on environmental efficiency. It is the process of collecting and analyzing information on environmental costs to make internal decisions, and examples of those decisions are product design, process design, product pricing, environmental efficiency, environmental quality, and improving environmental performance.

Benefits and uses of Environmental Management Accounting:

Environmental management accounting helps economic units to monitor and manage their monetary and material resources, and the resources associated with them more effectively. It also allows the economic unit to identify opportunities to achieve cost savings and improve efficiency, and to make better decisions based on reliable information, thus giving the economic unit strategic advantages, and among the benefits Environmental management accounting as follows: 1. Providing appropriate information to support the establishment of cost-effective programs to improve the environmental performance of the economic unit. 2.

The ability to monitor and manage the consumption and flow of energy and materials more accurately. 3. Providing appropriate information for measuring and reporting environmental performance, thus improving the image of the economic unit with stakeholders. 4. The ability to more accurately identify, estimates, allocates, and manages the types of environmental costs. 5. Implementation of the EMA by industry enhances the effectiveness of existing government policies/regulations, by revealing the real environmental costs and benefits to the economic units resulting from those policies/regulations. 6. Industry EMA data can be used to inform the government of program design/ Policies 7. The government can use industry-specific EMA data to develop matrices for reporting the financial and environmental benefits of voluntary partnership programs with industry, innovative approaches to environmental protection, and other government policies and programs. Among the non-accounting reasons that called for the emergence of environmental management accounting are:

First: Increasing pressure from stakeholders interested in environmental issues

Second: The growing demand for an integrated view of the financial and material aspects of environmental management

Third: The concepts of sustainable development and social responsibility of economic units require joint consideration of the financial, environmental and social aspects

Fourth: Increasing the importance of costs associated with the environment. Restrictions in management accounting methods lead to the loss of many opportunities in reducing environmental costs and improving the environmental process. The Sustainable Development Division at the United Nations also refers to the role of environmental management accounting by changing the interest of traditional management accounting from providing financial information to Hajj reduces the consumption of resources and increases the efficiency of resource use. While it is mentioned that traditional management accounting does not give separate recognition to the effects related to the environment or environmental costs, but rather focuses on the economic or financial performance of the economic unit.

The shortcomings of traditional management accounting practices with regard to environmental costs during the internal decision-making process are as follows:

1. Many environmental costs are hidden indirect industrial costs
2. The process of allocating environmental costs from indirect industrial cost accounts to processes and products has been incorrectly done
3. Some environmental costs have been classified into fixed costs rather than variable costs
4. Incorrectly calculating the volume and cost of damaged raw materials
5. Some important and appropriate environmental costs were excluded from the accounting records, which led to their underestimation during the investment evaluation process.

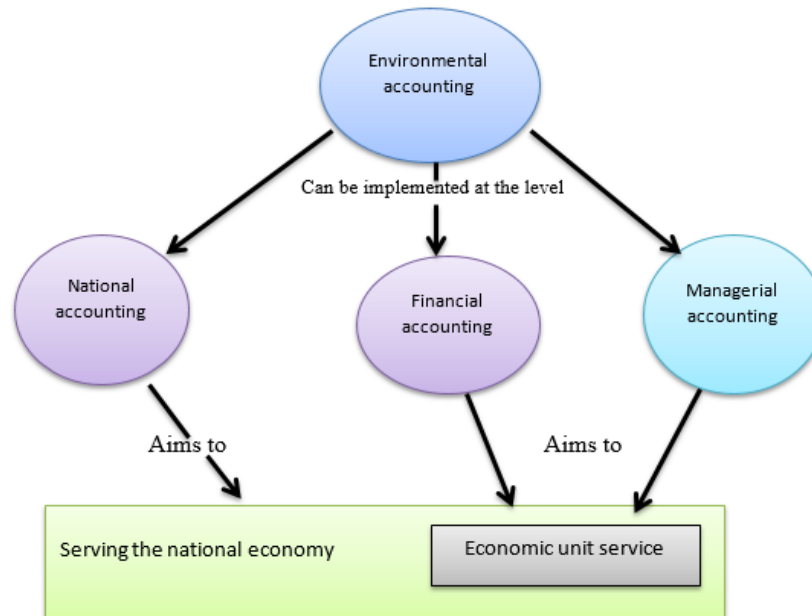
Fifth: He tried to clarify several shortcomings in management accounting practices, including the lack of attention given to environmental costs due to the misconception that environmental costs are somewhat unimportant as a result of the bias or tendency of traditional management accounting to neglect the importance of material information in managing environmental impacts as well as About the difficulty of effectively collecting and evaluating environmental costs, which leads to underestimating them, because part of this reason is the weak communication between managers with accounting departments and environmental management functions. As a result, environmental management accounting appeared to fill the gap of lack of information about the environmental performance of economic units.

Sixth: From the above, it is clear that there are several justifications for the emergence of environmental management accounting, some of which have a direct impact on its appearance as a failure in the management accounting systems to include the environmental aspects of the activity of economic units within the environmental management accounting reports, while others have an indirect effect such as the interest of all members of society in the environment and the consequences It has a responsibility on the shoulders of economic units in measuring and improving environmental performance, as well as directing the whole world towards achieving sustainable development and providing its requirements, so it is necessary to know its historical development and this is what will be addressed in the next paragraph.

As for James & Tonye, they divided environmental accounting into (110: 2014; James & Tonye):

1. Environmental financial accounting (EFA): It is the financial accounting that focuses externally and specifically on reporting the costs of environmental responsibility and other environmental costs.
2. Environmental management accounting (EMA): It is management accounting, which focuses internally and specifically on the flow of materials and energy to generate information on environmental costs.
3. Environmental national/green accounting (ENA) focuses on natural resources to serve the national economy. The figure shows what was mentioned above

Environmental Accounting Branches and Objectives



Source: Al-Waeli, Fatima Hamed Ghanem, 2018, pg. 19

In conclusion, it turns out that environmental management accounting has emerged as a new tool for environmental management and is valuable in creating a culture of pollution prevention and waste reduction in an attempt to shed light on the resources used and the costs imposed on the ecosystem through the activities of the economic unit, and it can also be considered a comprehensive way to integrate environmental considerations with Financial in the decision-making process, as it has become increasingly important to provide material and monetary information on the performance of the unit through several techniques, the most important of which are life cycle assessment (LCA), material flow cost accounting (MFCA), multi-criteria assessment (MCA), assessment of environmental risk and uncertainty, and the sustainable balanced scorecard.

Green Management Accounting Techniques:

Strategic cost management techniques have responded to the changes taking place in the environment, such as the high rates of environmental pollution, the exacerbation of global warming, and the spread of incurable and malignant diseases. These techniques include:

1. Total Environmental Quality Management:

This technology aims to achieve environmental sustainability and improve product quality and focus on long-term objectives and to maintain the achievements and product manufacturing defects zero, taking into account environmental specifications and requirements, integration is between the overall quality of environmental management and environmental management systems concept based technology ((TQEM In addition to the above objectives The use of this

technology leads to achieving many benefits such as reducing waste, preventing pollution, increasing productivity, reducing costs and developing traditional working methods with customers and suppliers.

2. Green Product Life Cycle:

The product life cycle green one of the strategic tools used by the economic unit to improve production and enhance market share and achieve competitive advantage, and are similar to the stages of cycle green product with traditional products except for the first stage of life (submission stage) being characterized by radical changes and great efforts in R & D activity, as well as Promotional expenditures to introduce the product and its characteristics, and the remaining stages of the life cycle of the green product are growth, maturity and decline.

3. Manage environmental costs based on activities:

This technique aims to measure and determine the environmental indirect costs using cost-based activities ((ABC, the focus is on the environment as a guide head of the cost, and the general environmental costs allocated to products and services by identifying resources and activities used and quantities in the production, and lead the use of technology to reducing the environmental such as pollution control and energy costs of raw as well as materials for hidden costs and intangible costs such as monitoring gas emissions and equipment. other benefits of this technology equitable distribution of environmental costs and reducing the number of activities that do not add value by canceled and provide accurate information about the cost of the product.

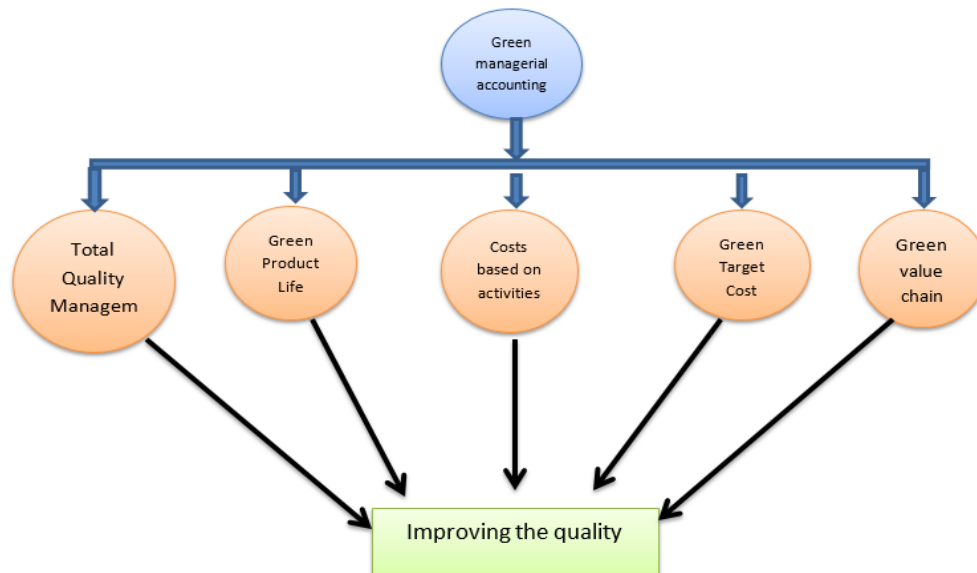
4. Green Target Cost:

Green target cost technology was defined as the integration of traditional work cost mechanisms targeted with the environmental requirements of the process based on this technology to six steps which is to identify and evaluate product specifications green and functions, evaluating both the selling price target as well as the green price, determine the profit margin of green product, distribution costs on routers Cost Implementation of cost management metrics Carrying out continuous improvement of the green product.

5. Green value chain:

It is a broader extension of traditional value chain technology aimed at creating safer and cleaner activities in the various stages of product manufacturing or service provision that reduce the use of hazardous materials and increase the potential of economic units in the field of recycling products and recovering production waste to achieve a competitive advantage.

The shape of the five techniques that improve the quality of the green product can be designed:



Source: Researchers preparation

In conclusion: Green accounting is one of the contemporary branches of accounting, and as mentioned in this topic, directing various accounting disciplines towards environmental problems to enhance the role of this science in combating the phenomenon of environmental pollution, which has increased in recent years, and among these disciplines is cost and management accounting through correcting strategic cost management techniques Towards enhancing environmental protection.

Practical Side

The study aims to demonstrate the role of green management accounting in improving the quality of accounting information and thus improving the quality of products. To achieve this goal, a questionnaire was conducted that included two axes, where the first axis focused on the role of green management accounting in improving the quality of information in industrial companies, and the second axis focused on that improving the quality of accounting information leads to improving the quality of products in industrial companies. Where the researchers distributed paper and electronic questionnaires with a number of (100) questionnaires that were distributed to different segments, from which (70) questionnaires were retrieved. The results were analyzed within the five-year Likert scale using statistical methods through the spss program to choose the hypothesis of the study and as in the table listed below:

Table No. (1) General information:

Qualification			Specialization			Years of Experience		
Details	Num.	Ratio	Details	Num	Ratio	Details	Num	Ratio
PHD	10	13	Accounting	42	60	Less than 5 years old	25	36
Master	25	36	Finance and Banking	22	32	6 to 10 years old	17	24
BA	27	39	Business Admin.	3	4	11 to 15 years old	8	11
Others	8	12	Others	3	4	More than 15 years	20	28
Total	70	100%	Total	70	100%	Total	70	100%

Which represents general information about the sample of the study, and through the analysis of the results it was found that the academic qualification was 27 individuals for the bachelor's degree by 39%, and 25 individuals for the master's degree by 36%, for the doctorate degree 10 individuals by 13%, and for the other 8 individuals by 12%. In terms of specialization, the number of individuals in the accounting major reached 42, at 60%, in the finance and banking majors, 22, at 32%, and in the business administration major, 3 individuals, at 4%, and the other 3 individuals, at 4%. It is clear from the information in Table No. (1) That the study has good qualities that can be relied upon in building targeted results from this study.

Table No. (2)

Seq.	Questions	means	Std. deviation	percentage	T value	Sig.
1	Companies apply environmental guidelines and regulations to preserve the environment and its resources.	3.50	1.199	74	21.438	.000
2	The environmental activities tab helps improve the quality of accounting information.	4.04	0.523	85	56.679	.000
3	Available information about environmental activities meets the needs of information users when making their decisions.	3.71	0.887	84	30.319	.000
4	There is a role for the information system used in companies in making decisions about social, economic and environmental activities.	3.71	0.98	84	27.438	.000
5	Determining environmental activities helps in improving the quality of accounting information, and then it is reflected in the company's financial reports.	4.16	0.845	62	36.209	.000
6	Environmental impacts are taken into account when making important corporate decisions.	3.81	1.133	71	24.473	.000
7	Green (environmental) management accounting helps in rationalizing decisions and ensuring the accuracy of accounting information.	3.97	0.701	81	41.410	.000
8	The company is developing accounting information systems to suit environmental developments.	3.57	1.220	82	28.344	.000
Total		3.85	0.895	77.875	33.288	.000

1) The first hypothesis: There is a role for green management accounting in improving the quality of information in industrial companies.

Table No. (2) Concerning the hypothesis of the role of green management accounting in improving the quality of accounting information shows that the general arithmetic mean of the axis is 3.85 and the standard deviation is 0.895, with a relative weight of 77.85. This indicates a positive degree of approval that there is a role for green management accounting in improving the quality of accounting information. As the highest arithmetic average was obtained by paragraph (5), which is represented in "**Determining environmental activities helps in improving the quality of accounting information, and then it is reflected in the company's financial reports**". (4.16) with standard deviation (0.845) and percentage (%62). While paragraph (1) obtained the lowest mean (3.50), standard deviation (1.199), and a percentage (74%), which is represented in "**Companies apply environmental guidelines and regulations to preserve the environment and its resources**".

2) The second hypothesis: Improving the quality of accounting information leads to an improvement in the quality of products in industrial companies.

Table No. (3)

Seq.	Questions	means	Std. deviation	percentage	T value	Sig.
1	The company is working to find appropriate solutions to reduce the problem of environmental pollution to contribute to the production of green products.	3.8	1.016	77	27.180	.000
2	Containing the accounting information on the predictive ability helps in preparing a plan how to manufacture green products.	3.96	0.999	70	28.952	.000
3	There is a role for accounting information in making decisions related to the environmental dimension of the company.	3.86	1.026	72	27.388	.000
4	Green products are considered a goal and a goal that the company seeks to achieve by making environmental decisions.	3.89	0.843	80	33.585	.000
5	The company prepares reports on information related to the environment.	3.76	0.999	78	27.277	.000
6	The company uses the accounting information system to measure the environmental performance to contribute to the process of manufacturing green products.	3.9	0.98	68	29.020	.000
7	The disclosure of environmental information is an expression of the company's commitment to environmental legislation and laws.	4.06	0.976	62	30.483	.000
8	The company's commitment to improving the quality of accounting information leads to the assurance of high quality reports that improve the quality of products.	4.19	0.666	71	46.317	.000
Total		3.92	0.938	72.25	31.275	.000

Table No. (3) concerning the hypothesis of the quality of accounting information leading to improving the quality of products shows that the general arithmetic mean of the axis (3.92) and the standard deviation (0.938) and relative weight (%72) and this indicates a positive degree of approval that there is an effect of improving the quality of accounting information on the quality of products in industrial companies. As the highest arithmetic average was obtained by paragraph (8), which is represented in **“The company’s commitment to improving the quality of accounting information leads to the assurance of high quality reports that improve the quality of products.”** (4.19), with a standard deviation of (0.666) and a percentage (71%). While paragraph (1) obtained the lowest arithmetic mean (3.8), standard deviation (1.016), and a percentage (77%), represented by **“The Company is working to find appropriate solutions to reduce the problem of environmental pollution to contribute to the production of green products.”**

CONCLUSIONS

The researchers concluded from this study the following results:

- 1- It was concluded that there is a significant role for green management accounting in improving both the quality of information and the quality of products, since green management accounting is linked to economic, social and environmental concepts.
- 2- The increasing environmental awareness and the efforts of international environmental agencies and organizations in many countries of the world have had the effect of increasing the accounting interest in the environment and its issues, and with the high environmental sensitivity of many establishments at the present time (as a result of industrial progress), the importance and need for the application of environmental management accounting emerged.
- 3- The management's commitment to environmental issues enables these issues to be supported by taking the environmental dimension into consideration within the facility's strategy
- 4- The green management accounting system works to build bridges of cooperation between environmental management (environmental management system) and financial management (other accounting systems) in the facility, in order to achieve the objectives of economic, social and environmental management accounting, including separating environmental costs from other production costs, and achieving compatibility between the activities of the facility. And the environment, and its positive repercussions on the environmental and economic performance of business establishments.

Green management accounting is a fusion between financial accounting systems, traditional management accounting and environmental information systems, as it depends mainly on the information of the financial accounting system in general and environmental financial accounting in particular, and uses the tools, methods and rules of traditional management accounting, but from an environmental perspective and represents one of the basic pillars of the management system Environmental accounting, where green management accounting is a broader concept than environmental accounting.

RECOMMENDATIONS

In light of the above, the researchers recommend the following:

- 1- The need for industrial companies to pay more attention to the application of green management accounting (environmental) to clearly contribute to the responsibilities that they must use in the field of environmental protection and society.
- 2- The need for industrial companies to disclose more and increase the quantity and quality of their environmental activities in order to develop appropriate solutions to the environmental problems that may be exposed to them.
- 3- The necessity for the report preparers in the industrial companies to abide by the qualitative characteristics of the accounting information as it provides information on the environment.
- 4- Work on setting legislations, regulations and laws that all industrial companies are obligated to take the necessary measures to reduce the pollution phenomenon resulting from the practice of their production activities.
- 5- The necessity of holding many courses, workshops and seminars for workers in industrial companies for the purpose of improving the quality of accounting information because of its importance in achieving the quality of products.
- 6- Researchers should conduct many researches related to the quality of environmental financial information and reports because of their impact on the quality of products.

References

1. Al-Baqmi, Mutaib Ayesh, and Al-Bashtawi, Suleiman Hussein, (2014), the reality of accounting for sustainable development in industrial companies, an applied study in Jordanian industrial companies, Journal of Baghdad College of Economics, special issue of the joint scientific conference, Iraq.
2. The United Nations Environment Report, (1993), the Rio Declaration - February 14-2, 1992.
3. Al-Tikriti, Ismail Yahya, the narrator, Sate' Muhammad, Al-Shaabani, Saleh Ibrahim, (2000), criteria for determining environmental costs by applying to the General Company for Northern Cement, Journal of Economic and Administrative Sciences, University of Baghdad, Volume 6.
4. Jeries, Ibrahim Shukry, (2001), Accounting for Environmental Costs and Their Impact on Decision-Making, Field Study, The Scientific Journal of Economics and Commerce, Faculty of Commerce, Ain Shams, Cairo.
5. Jaafar, Abd al-Ilah Nehme, (2002), "The Impact of Accounting on the Social Costs of Environmental Pollution on the Economics of the Industrial Project, Amman - Jordan.
6. Al-Dosari, Abdel-Hadi, (2011), The Importance of Environmental Cost Accounting in Improving the Quality of Accounting Information, Unpublished Master's Thesis, College of Business, Middle East University.
7. Zahraa, Bou Maaraf Fatima, (2014), the contribution of inter-accounting to achieving sustainable development, a case study of the Amouri Al-Ajer Brothers Complex - Biskra, an unpublished master's thesis, Faculty of Economics, Commercial and Management Sciences, Mohamed Khider University of Biskra, Algeria.
8. Al-Marayati, Kamil Jassem, and others, (2001), the concept of the environment from the perspective of sociology, House of Wisdom Publications, Baghdad.

9. 20- Hussain, Mohammad, Wahidah, Sitinur, Bakar, Rosni and Bhuiyan, Abul Bashar (2013).Conference: International Conference on Business Innovation, Entrepreneurship and Engineering , At Penang, Malaysia, , Penang Island, Malaysia.
10. 21- Ionescu, Cicilia, Ramona, Maria and Chivu, Marin. (2014). Management Strategies and Environmental Accounting in Economic Entities. A Contribution to Sustainable Development, Journal of Economic Development, Environment and People, Vol. 3, No. 1, Bucharest, PP.12- 18.
11. 22- Jankovic , Sandra and Krivacic, Dubravka. (2013). Environmental Accounting as Perspective for Hotel Sustainability: Literature Review, Tourism and Hospitality Management, Vol. 20, No. 1, pp. 103-120.
12. 23- Senol, Hasan and Ozçelik, Hakan.(2012). The Importance of Environmental Accounting in the Context of Sustainable Development and Within IFRS Evaluation, International Symposium on Sustainable Development, May 31 - June 01 2012, Sarajevo
13. Dumitrana, M., Jianu, I., Laptas, R. and Popa, A. F.(2009). Sustainable Development and Environmental Accounting: Concepts, Trends and Quality of Accounting Information, Accounting and Management Information Systems, Vol. 8, No. 1, pp. 27-39.
14. Al-Rikabi, Ali Khalaf Salman, (2014), Accounting Response to Preserving the Environment and Supporting Sustainable, Journal of Baghdad College of Economic Sciences University, Special Issue of the Scientific Conference, Iraq.
15. Badawy, Muhammad Abbas, (2012), Environmental Accounting, Edition 1, Modern University Office, Alexandria.
16. Al-Sheikh, Muhammad Salih, (2002), the economic and financial effects of the pollution of the environment and the means of protection from it, edition 1, Al-Radia Technical Library and Press, Alexandria.
17. Al-Shirazi, Abbas Mahdi (1990), Accounting Theory, Edition 1, Dar Al-Salasil, Kuwait.
18. Abdel Salam, Kamal, (1999), Environmental accounting is one of the basic requirements for auditing, Journal of Financial Supervision, Arab Group for Supreme Audit Institutions, No. 35, Tunisia.
19. Al-Waeli, Fatima Hamed Ghanem, “Using Environmental Management Accounting Techniques in Rationalizing Investment Decisions and Achieving Sustainable Development,” a master’s thesis in Accounting Sciences submitted to the College of Administration and Economics, Wasit University, 2018.