The role of green accounting in achieving sustainable development - a case study of Algerian cement enterprise-GICA-

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Abstract:

This study aims to clarify the role played by green accounting in achieving sustainable development. In order to reach the objectives of the study, a case study was carried out for the Algerian Cement Enterprise - GICA -, as it is among the industrial enterprises affecting the environment. The method of interviews and observations was used.

In the end, the following results were reached, including that the environmental dimension has become imposed on the enterprise, because it is one of the important indicators in determining its competitiveness and an important variable of sustainable development , so the enterprise had to change its management style, and accounting has an important role in Sustainability of development through the information provided by the accounting system, which has taken a new dimension is the environmental dimension.

Keywords: green accounting; environmental costs; financial disclosure; sustainable development; environmental management.

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1. INTRODUCTION

The problem of misuse of natural resources and environmental degradation has become one of the biggest problems facing developing countries as well as developed countries, which has led to the weakening of economic development, and because environmental degradation is the result of the activity of economic enterprises.

In the context of preserving the environment, enterprises of all kinds work to adopt or implement every system that would contribute to preserving the environment, and green accounting is one of the systems.

Giving the importance of development and the environment, the United Nations held its conference on development and the environment in 1992, and as a result of this conference, most countries adopted sustainable development as a national goal. The discussion revolves around how the economic or business sectors can contribute to achieving this goal, which resulted in a number of principles such as sustainable business or environmental corporate responsibility, and sustainable accounting.

And at the Rio +20 Conference in 2012 on sustainable development, major environmental polluters moved towards adopting environmental protection activities, as more than 300 partnership agreements were announced between public authorities and the private sector in order to reach the achievement of sustainable development goals. Major industrial enterprises publish information related to their environmental activities in their financial reports, which explains the increasing integration of the environmental dimension into the strategy of these enterprises.

The problem of the study**: What is the contribution of the Algerian Cement Enterprise through its application of green accounting to achieving sustainable development?**

Study Approach:

In order to achieve the objectives of the research, the researcher did the following in his research:

1. The descriptive approach: relying on accounting sources from Arab and foreign books, magazines and research, as well as using the Internet.

2. Case study approach: in which the case of the Algerian Cement Enterprise was studied, by knowing the extent of the enterprise's contribution to achieving sustainable development through its application of green accounting.

Objectives of the study:

The aim of the study is to show the role of green accounting in achieving sustainable development, through a theoretical aspect in which we dealt with green accounting and sustainable development and the link between them, and an applied aspect in which we dealt with studying and showing the role of green accounting in achieving sustainable development by studying the case of the Algerian Cement Enterprise.

The importance of studying: Represented in:

- The issue is of economic and environmental importance.
- Measuring the environmental costs helps the organization to adopt projects that are

less harmful to the environment.

- The topic shows the necessity of integrating the environmental dimension within the objectives and strategies of the industrial establishment in order to achieve sustainable development

2. What is green accounting?

2.1 Environmental Concept:

The environment is defined as the natural environment in which humans and other living creatures live and practice their various activities**.** (LAKHAL, 2011, p. 224)

The Algerian legislator defined it as: "The environment consists of abiotic and biotic natural resources such as air, air, water, land and subsoil, plants and animals, and the forms of interaction between these resources, places and landscapes." (Official, 2003, p. 10)

Through the previous definitions, it is clear to us that the concept of environment has two elements, the first is the natural element (the natural environment) and includes the elements of nature that man did not interfere in its existence, and the second human element (the human environment) means man and his effects on his natural environment. (مهاوات، 2015/2014، صفحة 05)

2.2 Green Accounting

Several names have appeared in the field of accounting referring to this aspect, including: green accounting, environmental accounting for sustainable development, environmental and economic accounting (بن فرج، 2011، صفحة 218) .

Most of the studies define green accounting from the standpoint of environmental accounting and social responsibility accounting, and some of them focused on: "Identifying and measuring the costs of environmental activities and using that information in decision-making in departments with the aim of reducing and eliminating the negative environmental effects of environmental activities and systems in accordance with the principle of polluter pays." (tiqriti & All, 1998, p. 34)

Green accounting is the process of identifying and measuring monetary value of the environmental damage caused by a particular facility to the surrounding environment as a result of its operations and manufacturing processes or as a result of its production of goods that harm the environment when consumed, and identifying and measuring the environmental revenues that may result from the production of some industrial wastes. another product, and then carry out the accounting treatment for the value of those damages and revenues and report them in the financial statements (Salah, 2015, p. 11)

Green accounting is also defined as knowing the impact of the enterprise's products, services and economic activities on all concerned parties, and then measuring these effects in the form of costs and benefits to allow sound decisions to be taken.

2.3 The emergence and development of green accounting

From the foregoing, green accounting went through four stages, as indicated by Mathews, which are as follows: (Bargui & Gharbi, 2008, pp. 03-04)

- The first stage: the seventies, and it was descriptive studies using standard models;
- The second stage: the eighties, and it was discussions about the role of accounting in

disclosing information about environmental activities;

- The third stage: the 1990-1995 stage, which witnessed maturity in environmental accounting, environmental disclosure and the launch of the environmental audit process.
- The fourth stage: after the mid-nineties, in which environmental accounting was considered as a measure of environmental performance that exceeds regulatory standards;

2.4 The relationship between accounting and the environment

He may wonder about the relationship of accounting with environmental pollution, but when we look at the financial statements of establishments, which are one of the most important outcomes of accounting science, we see that they greatly affect the users of these lists, and therefore the content of these lists on information that shows the role of the facility in protecting the environment may have a significant impact It reflects positively on those establishments, and hence the interest in the concept of environmental accounting began.

After the development that societies witnessed economically and culturally, and because of globalization, the accounting profession has developed with it, and there are other branches of accounting, each of which specializes in a specific field, such as government accounting, bank accounting, and social accounting, from which environmental accounting is branched, and which is concerned with the environment in terms of preventing or reducing pollution, and that is from Through the measurement and interpretation of environmental costs and revenues in the facility. It should be noted the importance of the accounting role in addressing environmental issues, and the importance of the relationship between economic development and the environment, which led to the need for the emergence of a new branch of accounting, which is environmental accounting. (Salah, 2015, p. 215)

2.5 Environmental costs

Environmental costs are defined as "the value of the factors and efforts that need to be exhausted to restore the environment to what it was before, after harming it materially and humanly, as a result of the establishment, especially industrial ones, of its activities affecting the environment." (Letmathe & Doost, 2000, p. 226)

This definition shows us that environmental costs are all that the enterprise spends in relation to the environment, and this is in order to comply with the standards regulating the environment, whether it is the costs of reducing or preventing pollution.

2.6 Problems Facing Green Accounting

- Problems of current accounting information: Accounting specialists describe that current environmental accounting information does not reflect the long-term effects of environmental deterioration and pollution, as well as waste discharges and their impact on the national economy. Natural capital represented in the natural resources depleted in economic development, in addition to the environmental losses and damages, and it does not help to provide indicators to measure the ability of business organizations to achieve the objectives of sustainable development.
- Accounting measurement problems for natural resources and environmental impacts:

> The absence of accounting standards or laws binding on assuming and recognizing environmental responsibility, in addition to the problem of converting qualitative data for pollution into quantitative data measured in units of money to achieve the requirements of recognition, measurement, registration and accounting disclosure (Alhamdani, 2011, p. 08)

2.7 sustainable development

The concept of sustainable development

The Food and Agriculture Organization (FAO) believes that sustainable development is a process of managing the bases of natural resources and working to direct them towards technical and enterpriseal change in a way that ensures the achievement and continued satisfaction of human needs for current as well as future generations. Natural wealth, including land, water, plant and animal genetic resources, from any damages that may be inflicted on them and do not harm the environment, and that they are technically and technically appropriate, and economically, and are not rejected by society. (Dermagne, 2009)

Edward barbier also defines it as that activity that leads to the promotion of social welfare as much as possible while taking care of the available natural resources, and with the least possible amount of environmental damage. (Barbier, 1987, p. 104)

It was formally embodied in the World Report on Human Development in 1991, which defines development as the process that allows people to develop their personality to gain confidence in themselves to lead a dignified life through freedom from fear of destitution, exploitation and forms of political, economic and social oppression. (Piré-Lechalard, 13-14 novembre 2008, p. 06)

Therefore, sustainable development is the development that transfers society to the era of clean industries and waste that uses the least amount of energy and resources, and produces the minimum amount of polluting, heat-trapping and ozone-damaging gases.

Dimensions of sustainable development

- **The Economic dimension**

It is based on the principle that maximizing the welfare of society and eradicating poverty through the optimal use of natural resources. Sustainable development in rich countries means reductions in the levels of consumption of energy and natural resources. In developing countries, sustainable development means using resources to improve living standards and reduce poverty, which is closely linked to environmental degradation and rapid population growth. Accordingly, in order to achieve sustainable development according to the economic dimension, it is necessary to stop wasting resources, reduce the dependency of developing countries and reduce income inequality, the responsibility of developed countries for pollution and how to treat it, reducing military spending.

- **Social dimension**

Sustainable development seeks to stabilize population growth and stop the flow of people to cities. And that is through developing the level of health and education services in rural areas. This dimension of development refers to the requirement for people to live securely in accordance with an acceptable level of well-being, and this is achieved through access to

appropriate health and educational services, striving to achieve respect for human rights, development of different cultures, diversity and pluralism, and effective participation of popular bases in decision-making to achieve acceptable social development. (قادري، 2013، صفحة 78)

- **Environmental dimension**

The environmental dimension of sustainable development is the preservation of physical and biological resources, such as the optimal use of agricultural land and water resources in the world, and they must be preserved by protecting natural resources, preserving the water ocean, protecting the climate from global warming, and reducing the refuges of biological species. (قاسم، 2010، صفحة 31)

Sustainable development indicators

Due to the multiplicity of dimensions and aspects of sustainable development, there are many indicators for measuring sustainable development. The concept of development indicators has evolved, such as the development of the concept of development. The indicators for measuring progress in achieving sustainable development differ according to the body prepared for them, and due to their multiplicity, we will focus on some sectoral indicators of sustainable development and the basic indicators bundled:

First: the sectoral indicators: they involve the preparation of an indicator of the environmental dimension of sustainable development, the most important of which are:

Ecological footprint: It measures the pressure exerted by man on nature, as it is based on the productive space necessary for a community to meet its requirements (consumption of resources, needs for waste disposal). It is also possible to obtain the ecological footprint of the average area per person = (land area)/) population number)

Environmental Accounting Index (Green Accounting): The national accounting aims to put on the horizon variables that express the state and development of the national economy, to give decision-makers a basis for action, and with the emergence of the concept of sustainable development led governments to want to integrate the macro-economic dimension of the environment into the field of political decision, Especially by a special environmental accounting called green accounting and can be defined as the systematic description within an accounting framework of the interrelationships between the environment and the economy.

Human development index: depends on a decent standard of living that can be achieved by increasing the average per capita income; An adequate level of education, health care and adequate nutrition, providing employment opportunities that guarantee adequate income; Giving all individuals a full opportunity to participate in the decisions taken by society; Individuals enjoy political and social freedom.

Second: The combined basic indicators: They can be divided into four main indicators:

- **Economic Indicators**

- Per capita gross domestic product (GDP).
- The share of gross fixed investment to GDP.

- Exports of goods and services / Imports of goods and services.
- Current account balance as a percentage of GDP.
- Total external debt as a percentage of GDP
- Net official development assistance received as a percentage of gross domestic product.

- **Social indicators**

- Unemployment rate.
- Combating human poverty (meaning a long and healthy life and the level of knowledge).
- Protection and promotion of human health.

Methods of achieving sustainable development in the enterprise

a. **Environmental management:** Thomas defined it as "the organization's structure, responsibilities, policies, practices, procedures, processes, and resources used to protect the environment and manage environmental matters The Environmental Management System defines the organization's philosophy towards environmental issues, sets the objectives of environmental programs, and develops environmental performance programs". (برني، 2007/2006)

The application of environmental management in all the establishment, especially the industrial establishment, has many benefits at various levels. It achieves economic benefits represented in the optimal use of resources, reduction in costs, and increased productivity, and it also achieves environmental benefits such as protecting the natural systems located near the establishment in addition to social benefits, These benefits can be used to improve the financial position of the enterprise and its ability to survive and continue. (Barbier, 1987, p. 116)

b. **Cleaner Production:** The cleaner production cleaner production was defined by the United Nations Environment Program on the basis that: the continuous application of an integrated environmental prevention strategy in processes, products and services with the aim of increasing their environmental efficiency and reducing their risks to humans and the environment. and apply cleaner production

On production processes: Conserving raw materials and energy, by avoiding toxic raw materials and reducing the quantity and toxicity of all emissions and waste.

• On products: by limiting the negative effects during the life cycle of a particular product, starting with the extraction of the raw material and ending with its final disposal.

• On services: by including concern for the environment in the design and delivery of services. The integration of cleaner production requires changes in attitudes that will ensure responsible environmental management and create prudent national policy, as well as an evaluation of technological options. (PUMA, 2001)

3. Case study of the Algerian Cement Enterprise

In the practical side of this study, we will discuss in it a case study in the Algerian Cement Enterprise, and it has been relied on in general as it is a public sector affiliated with

the state and therefore the same strategies, which included presenting and introducing the enterprise, its strategy in achieving sustainable development, and the extent of its response For environmental considerations, this is of course after determining the environmental costs borne by the enterprise and its environmental accounting measurement. The enterprise under study was selected based on the following two criteria:

that the selected enterprise belongs to a sector whose impact of operations has significant consequences on the economic and environmental resources of the community;

- That the scope of the processes related to environmental performance be expanded to include most of the environmental processes that fall within the types of environmental pollution that were dealt with in the theoretical study.

3.1 Methods of achieving sustainable development in the Algerian Cement Enterprise

- **Environmental Management**

Steps of implementing the ISO 14001 system in the enterprise: In 2004, the enterprise began preparing itself to obtain the ISO 14001 certificate by applying the principles and requirements of this system. The implementation of the environmental management system went through the following stages: (manager, 2020)

a. Conducting a preliminary environmental analysis: by analyzing the activity of the enterprise to find the strengths and weaknesses, as the environmental aspects of the activities of the enterprise that affect the environment, such as air, energy, water, have been identified.
b. The process of inventorying laws and decrees: in order to facilitate compliance with them, and among these laws, the establishment does not exceed the air pollution rate specified by: Nm/50mg
c. Assessment of the environmental aspects: so that the enterprise can determine the positive and negative effects of the environmental aspects of its activity on the environment, such as the environmental aspect, dust emissions resulting in a negative impact, which is air pollution, and the aspect of waste management that results in a positive effect, which is the reduction of soil pollution.
d. Arranging the environmental aspects in order of priority: After completing the environmental aspects assessment stage, this stage comes to arranging the environmental aspects according to the degree of harm and benefit they cause.
e. Studying the enterprise's policy for the protection of the environment: This policy is studied to determine the extent of interest in the previously arranged environmental aspects and to determine the necessary steps to address their negative effects and to set a framework for determining environmental goals and objectives.
f. Determining goals and objectives: Environmental goals and objectives are then defined for each job level in line with the enterprise’s environmental protection policy, legal requirements, other requirements, environmental aspects of the enterprise’s activities, and the company’s environmental obligations, such as reducing pollution and waste management.
g. Implementation of the program: To achieve the previous goals and objectives, a

program is developed for this and the time frame for its implementation is determined, such as a program to reduce pollution by maintaining refineries and machinery of the enterprise or installing new equipment to prevent pollution and waste management.

h. Reviewing the program implementation process: After implementing the program, it is reviewed to discover the strengths and weaknesses in order to address the weaknesses (the percentage of air pollution and waste is reduced by a small percentage than it was programmed for). In order to implement the environmental management system, the enterprise focuses more on training and sensitizing its members about the environment, as it considers the environment one of the first elements within its obligations, as we have previously noted in the quality and environment policy announced by the enterprise within the framework of developing an integrated system for quality management and environment SMQE, and the most important The guidelines followed by the Foundation in the process of protecting the environment are as follows:

- Sensitizing and training the employees of the organization about the environmental dimension in order to reduce the negative impacts of their activities on the environment;
- Encouraging the concerned parties to adopt the environmental dimension (suppliers);
- Continuous and orderly maintenance of environmental protection devices (refineries and pollution prevention devices);
- Waste management from the cement factory, especially kiln packing bricks, rubber materials, used batteries and oils;
- Adopting an investment policy of an environmental nature (such as purchasing refineries and emissions control and combustion regeneration equipment).

- **Achievements resulting from the application of the environmental management system in the enterprise**: It includes two aspects:

Organizational achievements: An environmental committee has been appointed to study the effects of the enterprise's activities on the environment inside and outside the factory, and to develop special procedures to address these environmental effects; Forming a documentary system to document the steps and procedures followed in protecting the environment; Defining the legislative requirements and the rest of the requirements, in order to know the laws and other requirements related to the environmental aspects of the activities of the enterprise in order to comply with them and prepare its requirements; Carrying out the study on the impact on the environment in accordance with the laws in force; Managing the environmental performance contract between the enterprise and the Ministry of Environment and Territory Preparation, in order to develop appropriate rehabilitation programs for the enterprise with its obtaining technical and financial assistance from the Ministry to implement these programs to reduce environmental pollution; Disinfection of the plant and equipment for environmental protection and waste management control.

First Special Objective: It is the initial environmental analysis, which includes the study

of the environmental impact according to the environmental aspects assessment index by defining the environmental objectives, as their percentage during the first and second trimesters is 20% and during the third and fourth trimesters is 50%. carrying out .

The second special objective: It is the establishment and gradual application of the elements of the environmental management system, which includes the development and application of the documentary system of the environmental management system. 50, as for the general procedures, there were 13, where the percentages of completion during the three years of the year are, respectively: 10%, 25%, 45%, 45%.

As for the year 2005, the results were as follows: Completion of the rest of the stages of implementing the environmental management system, which was audited during the month of September 2005. The embodiment of investment operations related to environmental protection. Follow-up and implementation of the terms of the contract related to environmental performance concluded between SCIMAT and MATE, and based on these achievements of the Enterprise through its implementation of the ISO 14001 system, the Enterprise obtained the ISO 14001 certificate on October 10, 2005.

- **Cleaner product**

Waste management in the enterprise: This waste is represented in: (manager, 2020)

a. Managed waste: It represents kitchen waste and office cleaning waste, as it is stored in a container at the restaurant level and then transported by the cleaning establishment to be dumped in the public dump in accordance with the applicable law. In addition to waste tires, wood and plastic that are stored in their own containers.
b. Special (hazardous) waste: it is represented in used oils and greases, batteries, printer cartridges, treatment clinic waste, waste lamps that operate with fluorinated gases, contaminated pieces of cloth or paper, which are stored in containers in the enterprise and then disposed of as waste from the treatment clinic. To be burned, the used oils are sold by public auction to an environmentally certified person (Naftal) and this results in economic effects for the establishment represented in reducing its cost through savings from the sale of waste and reducing the cost of waste disposal.
c. Special hazardous waste (resulting from cement production): These wastes are related to raw or complete unrecovered materials. These wastes are produced at the level of the raw area, the cooking area, and the cement area, and these wastes are considered special waste according to Executive Decree No. 06-104 that specified A blog for special hazardous waste

From the previous data, it is clear that the raw furnace waste is re-entered into the production process, which leads to achieving an environmental impact by reducing waste polluting the environment and economic effects represented in reducing the cost by reducing the cost of waste disposal, and increasing productivity. The flour mixed with water or other residues is stored near the lime-cement quarry. The defective bags of transmission (the finished product) were stored at the level of the quarry, but at present they are re-entered with the undercooked clinker in a small quantity (in a very small proportion) in the quarry. Good

clinker. Carrying this waste is essential, because the latter of the clay mixed with the crushed bodies is transformed when the flour is consumed during the milling process.

3.2 The company's contribution to achieving sustainable development through its application of green accounting

- **The costs incurred by the organization to preserve the environment**

In this regard, the enterprise incurred a number of costs, which were divided into two types: capital (investment) costs and current costs. (accountant, 2020)

1- <u>Capital Costs</u>:

- Raw crusher: change of electrostatic precipitators (bk + oven) by bag filters with analyzer gas opcimetry: 616186.35 DA.
- Cooking: installation of a new bag filters with redecam cooler outlet with opacimetry: 2302020 DA.
- crushing: renovation of the bag filter in the raw material crushing workshop and installation of a new bag filter at the level of the jetty of transporters 11 p006 and 11 p 007: 789390.20 DA.
- Expedition: renovation of the four filter heads bagging machines - three cement silos filters: 7517.80 DA.
- Clinker storage and extraction: renovation of new bag filters for clinker storage and extraction: 78930.34 DA.
- All the filters from the production workshops: presentation of the technical, diagnostic and maintenance assistance for all the filters installed: 6000 DA.
- Industrial Security Equipment: 674635 DA.
- Medical Clinic Equipment: 158000 DA.

2- <u>Current Costs</u>:

- Effluent treatment costs:127239 DA.
- Quality control costs: 91829.8 DA.
- The costs of training workers in the field of environmental protection: 30120.69 DA.
- Health service costs for workers: 71271 DA.
- Staff transportation costs: 214880 DA.
- Fee costs for pollution: 530664.27 DA.
- Incentive tax costs for industrial waste disposal for hazardous waste: 552007.02 DA.
- Air pollution tax costs: 549200.65 DA.
- Tax costs on industrial wastewater: 400000 DA.

4. CONCLUSION

In the end, it can be said that the main objective of our study is to know the main impact and role Green accounting plays in achieving sustainable development. Where the study concluded a set of results are as follows:

Accounting has a role in achieving this economic development through the necessary accounting information provided by the accounting system, which has taken a new path and a new dimension, which is the environmental dimension.

- The environmental dimension has become imposed on the enterprise, and it has become an important indicator in its competitiveness and an important variable of sustainable development. Therefore, the enterprise must change its management style, by applying the methods of the environmental management system and the cleaner production program that enables it to achieve sustainable development.

The Algerian Cement Enterprise follows a set of measures to limit or reduce as much as possible the environmental pollution.

The Algerian Cement Enterprise follows a preventive policy in order to address the negative effects resulting from its activity, which are the prevention of soil and air pollution, and the recycling of waste. It also works to rationalize its expenditure of natural resources and rational use of them.

- Finally, it can be said that the Algerian Cement Enterprise is trying hard to achieve sustainable development through its application of green accounting.

- The application of green accounting in the Algerian Cement Enterprise is considered a gradual application, due to the presence of a number of difficulties, including the inefficiency of the Algerian financial accounting system in terms of environmental standards.

Recommendations:

Through the theoretical study and based on the results of the field study, we offer a set of suggestions:

It is necessary to include all environmental costs that can be measured in the financial reports of the facility so that the users of these reports are familiar with the reality of green accounting in the facility.

- Integrating the environmental dimension into the various development plans;

- Reducing the production of waste so that it does not exceed the ability of the environment to absorb it, increasing the efficiency of resource use and increasing renewable resources to compensate for the spring resources;

Work on the multiplicity of types of reports issued by the facility to include reports prepared for environmental purposes that highlight the most important contributions of the facility in the environmental field.

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