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The role of environmental audit in Algerian economic enterprises in realizing the requirements of sustainable development – A study on a sample of Algerian economic companies -

دور التدقيق البيئي بالمؤسسات الاقتصادية الجزائرية في تحقيق متطلبات التنمية المستدامة –
دراسة على عينة من المؤسسات الاقتصادية الجزائرية-

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Abstract:

This study aims to identify the role of environmental auditing in realizing the requirements of sustainable development in Algerian economic companies. The study reached a set of results, the most important of which are environmental auditing is one of the most important mechanisms for preserving the environment and achieving the requirements of sustainable development.

Keywords: environmental auditing, sustainable development, environment

الملخص باللغة العربية:

تهدف هذه الدراسة للتعرف على الدور الذي يلعبه التدقيق البيئي في تحقيق متطلبات التنمية المستدامة بالمؤسسات الاقتصادية الجزائرية. حيث توصلت الدراسة لمجموعة من النتائج من أهمها تولي المؤسسات الاقتصادية الجزائرية أهمية للتدقيق البيئي، كما يعد التدقيق البيئي أحد أهم الآليات للمحافظة على البيئة وتحقيق متطلبات التنمية المستدامة حيث أن التدقيق البيئي وسيلة للتأكد من الالتزام بالقوانين والسياسات والبرامج البيئية.

الكلمات المفتاحية: التدقيق البيئي، التنمية المستدامة، البيئة

1. INTRODUCTION

The environment has become one of the most important and salient topics, and this is not new today, because one of the most important demands presented is the achievement of sustainable development, which aims to ensure the well-being of the society without compromising the environment. and its resources, considering that the environment is a common good between current and future generations, which has made economic institutions aware of the need to integrate the environmental dimension into their activities, the disclosure of environmental information has become necessary for these institutions, and to ensure the validity of this information, the latter is subject to the control of an auditor within the framework of the so-called environmental audit, which is considered one of the most important which confirm or refute the respect by institutions of environmental laws.

This brings us to pose the following problematic:

Does environmental auditing at the level of Algerian economic companies contribute to realizing the requirements of sustainable development?

The following questions arise from this problematic:

- Are the companies interested in environmental audit?
- Are companies interested in realizing the requirements of sustainable development?

Hypotheses of the study:

- The companies interested in environmental audit;
- The companies interested in realizing the requirements of sustainable development.

The objectives of the studies: This study aims to identify to what extent environmental audit contributes to the achievement of sustainable development at the level of Algerian economic companies by conducting a study on a sample of these companies

2. The concept of environmental audit and Sustainable development

The environmental audit is described as a management system consisting of “the systematic, documented, periodic and objective evaluation of the environmental performance of an organization, the management system and the processes intended to ensure environmental protection.”¹

The environmental audit is a business management tool that has several advantages, including:²

- Help develop environmental protection measures, but also contribute, while providing evidence, to compliance with laws, regulations, as well as society's standards and rules
- Function as a management tool providing information on the positioning of the company in relation to the environment;
- Provide a medium and long-term vision which makes it possible to monitor the evolution of a factory in terms of environmental protection, in particular by regularly updating the information contained in the audit;
- Evaluate the company's compliance with established standards and with its own environmental policy;
- Improve management policy and give credibility to its efforts in environmental protection;

- Facilitate operational control of practices likely to have an impact on the environment;
- Reconcile economic objectives and environmental protection.

The Sustainable development is defined as that meets the needs of the current generation without compromising the ability of future generations to meet their own needs.³

The Sustainable Development Goals are a set of 17 interconnected goals:⁴

- No Poverty: in all its forms and all over the world;
- Zero Hunger: eliminate hunger and famine, ensure food security, improve nutrition and promote agriculture sustainable;
- Good Health and Well-being : giving individuals the ways to lead a healthy life and help well-being of all at all ages;
- Quality Education: ensuring that all have access to education and promote learning opportunities quality under fair conditions throughout life;
- Gender Equality: achieving equality of the sexes by making women and girls more autonomous;
- Clean Water and Sanitation: guarantee access to water and sanitation for all and manage water resources in a manner sustainable;
- Affordable and Clean Energy: guarantee access for all to energy services reliable, durable and renewable at a cost affordable;
- Decent Work and Economic Growth: promote sustained, shared economic growth and sustainable, full and productive employment and decent work for all;
- Industry, Innovation, and Infrastructure: Supporting small businesses so that they can develop, promote the development of companies that respect the environment and manufacture healthy products (which do not harm not to our planet or to the populations) and allow everyone access to news technologies;
- Reducing Inequality: reducing inequalities between countries and within each country
- Sustainable Cities and Communities: creating cities, housing, open transport to everyone, safe, resistant and durable;
- Responsible Consumption and Production: establish consumption and production patterns sustainable: avoiding waste, reducing waste and consumer goods (books, clothing...) by reducing, reusing and recycling;
- Climate Action : Fight against climate change: take emergency measures to combat against climate change and its consequences;
- Life Below Water: Protection of aquatic fauna and flora : conserve and exploit in a manner sustainable oceans, seas and resources marines;
- Life On Land : preserve and restore ecosystems terrestrial, ensuring that they are exploited sustainably, manage forests sustainably, fight against deforestation, desertification, stop and reverse the process of land degradation and ending impoverishment of biodiversity;
- Peace, Justice, and Strong Institutions: Justice and peace:

- promoting peace, ensuring access to justice for all and put in place, at all levels, effective institutions, responsible and open;
- Partnerships for the Goals: revitalize the global partnership in service sustainable development and strengthen means of this partnership.

The role of environmental auditing in realizing sustainable development is highlighted as a fundamental and extremely important axis for the implementation of sustainable development programs through:⁵

- Check the effectiveness of environmental management systems, because the application of an effective environmental management system helps to reduce environmental pollution in factories and production units, and also helps to increase the volume of production thanks to the reduction in the volume of atmospheric, solid and liquid waste. , and recycle the part that is not disposed of by methods of reducing various elements of environmental pollution;
- Environmental auditing can help to strengthen environmental responsibility, which helps to achieve sustainable development and thus actually contributes to making the necessary improvements.
- Allow weak points to be identified early and modifications to be made at any stage of the implementation of development activities. Thus, the environmental audit process will make it possible to take early preventive measures to ensure the preservation of the environment;

- Auditors play an effective role in the field of environmental risk management to which economic institutions are exposed, as the auditor identifies activities and areas that result in exposure to environmental risks, proposes corrective procedures and solutions and follows up the implementation of these procedures; .
- Environmental audit helps reduce the risks of non-compliance or violation of environmental laws and regulations due to non-compliance and non-compliance with these laws.
- Environmental audit helps to identify relevant environmental issues and emergencies that affect the organization.
- Evaluate the adequacy of control procedures to identify and assess environmental risks.

3. Methods and Materials

A sample of 60 Algerian economic companies was selected. The following table shows the response rate of the study sample.

Table 1. Sample Response to Study

Number of questionnaires distributed	Number of questionnaires retrieved	Response rate
60	54	90%

Source: Prepared by researchers

The previous table shows that the response rate of the sample under study is 90%, which is very good.

3.1 Study Material

The study was based on a questionnaire prepared according to the scientific research methodology, which was

distributed to a sample of Algerian economic companies.

The questionnaire was divided into two main parts: the first part deals with the general information such as the qualification, the professional experience and Function, the second part is devoted to the axes of study divided into two axes, the first axis is related to the environmental auditing, and the second axis is related to the requirements of sustainable development.

3.2 Statistical treatments

SPSS 20 was used in this study using: Alpha Cronbach, arithmetic mean, standard deviation, T-test for a sample.

The questions will be analyzed and judged on the meaning of the answer using the weighted mean and the Fifth Likert Scale.

The following table shows the values of the alpha Cronbach obtained.

Table 2. Alpha Cronbach values

The axes	Alpha Cronbach
Axis 1	0.887
Axis 2	0.772
All axes	0.905

Source: Prepared by researchers based on SPSS 20 results

The previous table shows that the Cronbach alpha value for the first axis is 0.887, which is very good value. For the second axis the value of alpha Cronbach is 0.772, which is a good value. The value of alpha Cronbach for all the axes of the questionnaire is 0.905 which is very good value statistically, indicating that the terms of the questionnaire have internal consistency and stability.

4. RESULTS AND DISCUSSION

4.1 Statistical description of the study

sample according to general information

Table 3. Distribution of the study sample according to general characteristics

Characteristics		Repetition	Percentage
Qualification	License	31	57.41%
	Magister / Master	14	25.93%
	Professional certificate	09	%16.66
	Total	54	% 100
Professional experience	Less than 5 years	06	11.11%
	From 5 to 9 years	11	20.37%
	From 10 to 19 years	32	59.26%
	More than 20 years	05	9.26%
	Total	54	% 100
Function	Auditor	38	70.37%
	Responsible for Prevention and Safety	10	18.52%
	Financial manager	6	11.11%
	Total	54	% 100

Source: Prepared by researchers based on sample study responses

The above table shows that most of the study sample has a license and that most of their practical experience is from 10 to 19 years.

4.2 Statistical description of the study sample according to Statistical description of the study sample according to the weighted mean and standard deviation

Table 4. The weighted mean and standard deviation of the first axis

The phrase	Weighted mean	Standard deviation	The direction of the answer
You have sufficient knowledge of environmental auditing	4.5556	0.50157	always
Environmental audits are carried out periodically and continuously.	4.4630	0.50331	always
The environmental auditor is independent and carries out his functions without any pressure.	4.3333	0.47583	always
The employees responsible for the environmental audit have appropriate academic and practical appropriate qualifications.	4.3704	0.48744	always
There are systematic procedures and steps that the auditor follows in environmental auditing.	4.3889	0.50469	always
It is ensured that the company complies with the environmental laws and instructions to which he is submissive.	4.3519	0.61430	always

The auditor takes the necessary procedures during his mission to preserve and protect the environment.	4.3889	0.49208	always
All recommendations made by the auditor are taken into consideration.	4.1296	0.44234	often

Source: Prepared by researchers based on SPSS 20 results

Table (4) shows all sentences in the axis in which the response direction of the sample was “always”, with the exception of one sentence in which the response direction was “often”. This indicates that the companies interested in environmental audit.

Table 5. The weighted mean and standard deviation of the second axis

The phrase	Weighted mean	Standard deviation	The direction of the answer
The nature of the company's environmental activity is disclosed periodically.	4.1667	0.46091	often
The company respects laws related to environmental protection.	4.2963	0.46091	always
It exists an environmental policy declared by the company to preserve the environment.	4.2778	0.45211	always

The company is always up to date with the latest developments related to environmental protection.	4.3704	0.48744	always
The company respects laws relating to protection against professional risks, illnesses and accidents at work.	4.5556	0.50157	always
The company works to reduce waste, energy and water consumption.	4.4259	0.49913	always
The company leads the technology used to obtain environmentally friendly products.	4.4259	0.49913	always
Company management provides sufficient human and financial resources to preserve the environment.	4.2407	0.58067	always
The company looks for adapt production methods and means to preserve the environment	4.4074	0.49597	always
The company tries to establish an environmental culture.	4.3704	0.48744	always
The company tries to find possible solutions to citizens' complaints about the environment	4.3889	0.59611	always

Source: Prepared by researchers based on SPSS 20 results

Table (5) shows all sentences in the

axis in which the response direction of the sample was “always”, with the exception of one sentence in which the response direction was “often”. This indicates that the companies interested in realizing the requirements of sustainable development.

4.3 Distribution normality test

To determine whether the data followed a normal distribution, the one-sample K-S test was performed.

Table 6. Distribution normality test

The axes	z value	sig
Axis 1	0.812	0.525
Axis 2	0.849	0.467

Source: Prepared by researchers based on SPSS 20 results

From the previous table, it is clear that the value of the sig is greater than 0.05, and therefore all axes of the questionnaire follow a normal distribution.

4.4 Test of the hypotheses of the study

The study hypothesis was tested using One-SampleT-test, at a level of 5%, where the T tabular is the value of 1.676.

For the hypotheses of the first axis

H0: The companies are not interested in environmental audit

H1: The companies interested in environmental audit

Table 7. Results of the One-SampleT-test for the First Axis

Axis	T calculated	Sig
The First Axis	37.528	0.000

Source: Prepared by researchers based on SPSS 20 results

The T calculated value of is greater than T tabular and Sig less than 0.05. we

reject the null hypothesis H0 and accept the alternative hypothesis H1, which means that the companies interested in environmental audit.

For the hypotheses of the second axis

H0: The companies are not interested in realizing the requirements of sustainable development

H1: The companies interested in realizing the requirements of sustainable development.

Table 8. Results of the One-Sample T-test for the second Axis

Axis	T calculated	Sig
The second Axis	42.724	0.000

Source: Prepared by researchers based on SPSS 20 results

The T calculated value of is greater than T tabular and Sig less than 0.05 we reject the null hypothesis H0 and accept the alternative hypothesis H1, which means that the companies interested in realizing the requirements of sustainable development

4.5 Analyze the relationship between environmental audit and meeting sustainable development requirements using a simple regression model

To analyze the relationship between environmental audit and sustainable development requirements using a simple regression model, the following hypotheses were developed:

H0: There is no statistically significant relationship between environmental audit and sustainable development requirements.

H1: There is a statistically significant relationship between environmental audit and sustainable development requirements.

A simple regression analysis was used to test this hypothesis, according to the following model:

$$Y = a + bx$$

In which:

Y: Sustainable development requirements

x: Environmental audit

a: Fixed limit

b: inclination

Table 9. Correlation coefficients between environmental auditing and sustainable development requirements

Correlation coefficient	sig
0.925	0.000

Source: Prepared by researchers based on SPSS 20 results

Table 10. Testing the relationship between environmental audit and sustainable development requirements

Model variables	b	Standard error	Beta	sig
Fixed	0.306	0.077		0.000
x	0.830	0.047	0.925	0.000

Source: Prepared by researchers based on SPSS 20 results

From the previous table, we notice that the Sig value is 0.000, and since the Sig level is less than 0.05, we reject the null hypothesis and accept the alternative hypothesis, that is, it There is a statistically significant relationship between environmental audit and sustainability requirements, and the value of the correlation coefficient is positive, and therefore the relationship between environmental audit and sustainable development. It's a direct relationship.

We can therefore formulate a model that shows this relationship as follows:

$$Y = 0.306 + 0.830X$$

5. CONCLUSION

This study reached a set of results that can be summarized as follows:

- Algerian economic companies interested in environmental audit;
- Environmental auditing is one of the most important mechanisms for preserving the environment and realizing the requirements of sustainable development, as environmental audit is a means to ensure compliance with environmental laws and policies;
- Algerian economic companies are trying to achieve the requirements of sustainable development by respecting laws related to protection from risks, reducing waste, and working to conserve water and energy. Companies also seek to adapt methods and means of production in a way that preserves the environment;
- The field study on a sample of Algerian economic companies demonstrated the existence of a direct relationship between environmental audit and realizing sustainable development requirements.

⁴Thematic sheet, UNICEF France, www.unicef.fr, consulted on 03/01/2024 at 4 o'clock.

⁵ **Cherigui omar, brahimi loubna**, The role of environmental auditing in achieving sustainable development goals, Journal of Research and Development Studies, Volume 4, (Issue 1), 2017, p 117-119

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² Imed Eddine Brachene, Yasser Abderrahmane, the practice of environmental auditing in Algerian companies: processes and contributions, review of economic papers, n° 2, june 2018, P35-36.

³ Justice mensah, Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review, cogent social sciences, 5, 2019, p 6.