

The role of internal environmental audit in the evaluation of the environmental management system: The Case of Mitidja Cement Institution Blida, Algeria

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ABSTRACT

The study aims to highlight the importance of environmental internal audit in the organisation and its role in evaluating the environmental management system. In order to try to apply the theoretical study, we have taken the cement company Mitidja as a case study to understand the different aspects of the topic through field visits to the organisation. Regarding the tools of the field study, the interview, observation, questionnaires and analysis of various documents and data related to the studied organisation were used, using the descriptive and analytical approach.

The study concluded that environmental internal audit is an important tool to ensure the organisation's compliance with environmental laws and regulations and the validity of the procedures it has adopted to protect the environment. It aims to evaluate the environmental management system and identify the strengths and weaknesses of this system in order to assess its effectiveness, with the aim of protecting the organisation from legal penalties and fines resulting from the violation of environmental laws due to pollution from its activities.

Keywords: Environment, internal environmental audit, environmental management, environmental management system.

1. Introduction

The world has witnessed a significant increase in the number of industrial facilities that have worked to meet the growing demand for products. On the other hand, this great demand has exacerbated the irrational exploitation of natural resources and the increase in the volume of institutional waste (solid, liquid and gaseous production waste, etc.), which has exceeded the absorption capacity of the ecosystem, causing its imbalance and the aggravation of environmental problems that have become a threat to human safety and the entire universe. As a result of the serious damage to the environment, voices have been raised and pressure has been exerted on institutions and governments, calling for a concerted effort by all to find solutions to these environmental problems. Governmental and non-governmental organisations have accelerated the holding of many conferences and seminars, followed by a series of agreements, leading to the enactment of many environmental laws, regulations and by-laws.

These rapid successive changes have necessitated the emergence of administrative concepts for the management of economic resources. The concept of environmental management has emerged as one of the means by which institutions can protect the environment and make the best use of environmental resources. With the growing environmental awareness in society, there has been an increased interest in the existence of environmental systems that focus on guiding and controlling environmental management activities in institutions, known as environmental management systems. Institutions wishing to increase their competitiveness and maximise their profits have sought to establish an environmental management system that will provide them with environmental revenues in addition to commercial and economic revenues by achieving savings in environmental costs (energy costs, waste treatment costs).

The environmental audit has been activated in order to respond to further pressure from environmental stakeholders who want to know the extent to which institutions are fulfilling their environmental obligations. This audit includes, on the one hand, an examination of the environmental aspect of the institution to ensure its compliance with environmental laws and regulations and, on the other hand, the institution's desire to evaluate its environmental management system and its effectiveness. The environmental audit has attracted the attention of many, including external auditors, to produce a report expressing the institution's commitment to environmental protection. On the other hand, the interest of internal auditors in internal environmental audit is to evaluate the environmental management system and the environmental risks that institutions may face.

1.1 Research problem: From the above we can conclude that if the environmental management system implemented in the organisation is effective, it will lead to the activation of the internal environmental audit process. The problem of the topic can be formulated as follows

What is the role of the internal environmental audit in the evaluation of the environmental management system in Matiège Cement Company?

The following sub-questions can be used to answer this problem

-Does the evaluation of the environmental management system by the internal audit contribute to the commitment of the productive and industrial institutions to the environmental laws and regulations?

-Does Matiège Cement Company have an environmental management system and an internal environmental audit function? And to what extent is the latter effective in managing the activities and tasks related to the environmental aspect in the organisation under study?

1.2 Hypotheses: In order to answer the main problem and the sub-questions, the following two hypotheses were formulated:

-Internal environmental auditing is a management tool through which productive and industrial organisations periodically evaluate the set of consistent procedures and practices they adopt as a result of the pressures they face due to the environmental pollution they cause and to control their environmental management.

-The Matiège Cement Company adopts the function of internal environmental audit and environmental management system, and it enjoys a limited effectiveness in managing the activities and tasks related to the environmental aspect.

1.3 Research objectives:

This study aims to achieve the following objectives:

To try to demonstrate the importance of applying internal environmental auditing in the industrial organisation and its role in evaluating the environmental management system implemented by it.

The extent to which the environmental management system contributes to the success of the internal environmental auditing process in the cement company, because the more a sound system is in place, the more it contributes to the effectiveness and success of environmental auditing, whether it is internal or external.

1.4 Research limitations: In order to understand the various aspects of the problem, the limitations of the study were as follows:

- Spatial limitations: The geographical area selected for the field study was limited to Mitidja Cement Company in the State of Blida, Algeria.

- Temporal limitations: The time frame is limited by the use of a set of documents and records covering the period 2014-2023, provided by the management of the organisation under study.

1.5 Research Methodology: In order to answer the research problem, this study adopted a descriptive and analytical approach to conduct an in-depth and comprehensive analysis of the role of internal environmental auditing in evaluating the environmental management system in an industrial company. This is evident from the information and data obtained from various references and previous studies. A case study approach was also used to apply the theoretical aspects to the practical reality of the cement company in the Blida region of Algeria.

1.6 Previous studies: Some of the main previous studies that formed the basis of this research are:

1.6.1 Study by Chtouah Walid (2014) entitled "The Place of the ISO 14000 Environmental Management System in the Management of Algerian Enterprises", published in the Oases Journal for Research and Studies, Volume 07, Issue 02, University of Ghardaia, Algeria. The researcher examined the reality of the environmental management system in Algerian companies and its contribution to company management. The study concluded that most Algerian companies do not focus on the environmental management system and do not fulfil their environmental obligations.

1.6.2 Study by Ahmed Mohammed Obaid Alabri (2014) entitled “Assessing the need for the adoption of operational and environmental performance systems in Omani shipyards”.

The PhD thesis in Philosophy, University of Portsmouth, England, aimed to evaluate environmental management systems as a tool capable of improving operational performance. The study concluded that environmental management is the foundation of any management and must be given the same level of planning, direction, organisation and follow-up as the rest of the management in institutions. The participation of employees in the planning and implementation of the stages of the environmental management system contributes to improving the useful outputs of this system, both environmentally and financially.

1.6.3 The study by Rashed Allam (2017) entitled “ISO14000 Environmental Management Systems”.

Reality and Obstacles to their Implementation in Algerian Economic Institutions”, a doctoral thesis, University of Mohamed Boudiaf-M'Sila-, Algeria, aimed to know the reality of the environmental situation of environmental management systems and the obstacles to their application in Algerian institutions. Through this study, the researcher found that environmental management is one of the most important mechanisms used by countries and institutions to improve their operations and control the negative practices of their activities that are harmful to the environment. It also opens up opportunities for institutions to enter global markets and improve their reputation in society. However, in Algeria there is still a significant delay in the adoption of ISO 14000 environmental management systems, while in more advanced countries they are widely used.

1.6.4 The study by Bouhafes Rouani (2017/2018), entitled: Environmental Auditing and Ways to Apply it in Algeria in Light of International Experiences, a Ph.D. thesis, University of Abou Bakr Belkaid -Tlemcen-, Algeria, aimed to determine the possibility of applying environmental auditing in Algeria in light of international experiences. The researcher in this study found that most Algerian institutions seek to adopt the environmental health and safety system and internal environmental auditing to avoid judicial and fiscal follow-ups and inspections by the environmental inspectorate, in addition to creating a good atmosphere for the institution with foreign institutions and a good reputation in society.

1.6.5 Study by Abdulhussain Tofeeq Shible and Jalil Ibrahim Salih (2020) entitled: “Extent of Employees’ Awareness of Environmental Audit Practices: A field study of industrial companies in Basra”.

International Journal of Innovation, Creativity and Change, Volume 14, Issue (07), United Kingdom. The purpose of this study was to determine the importance of environmental auditing in protecting the environment from pollutants and the level of employee awareness of environmental auditing and environmental protection. The results of the study showed that environmental auditing plays a role in protecting the environment from pollutants, as evidenced by the institutions’ adoption of necessary measures to preserve and protect the environment, and their commitment to their environmental responsibilities, as evidenced by their refusal to pay for any environmental damage they cause.

2. Theoretical aspect

Environmental management has received great attention from industrial institutions on the one hand and government agencies on the other, in various developed and developing countries, due to the competitive position it achieves and the protection of the environment by reducing and limiting pollution through the application of environmental laws and regulations.

2.1 Environmental management system

2.1.1 The concept of an environmental management system: There are many definitions of environmental management system, including:

- It is a “standard based on the preservation of the environment through pollution prevention, improvement of environmental performance and compliance with the application of environmental laws” (Al-Jabouri, 2016: 305).
- It was defined by the British Standards Institute in 1992 as “the organisational structure, responsibilities, practices, procedures and resources required to determine and implement environmental policy” (Behossi, Slimani, Nafaa, 2018: 112).

From the above definitions, we can say that the environmental management system is one of the subsystems of the overall system, which includes the organisational structure, procedures, and environmental policy followed by the institution, and supports the various other systems, such as production, to achieve the environmental goals set by the top management based on environmental management in the institution.

2.1.2 The concept of environmental management: Experts use several concepts of environmental management, where it is defined as:

-“The organised efforts made by institutions to approach the achievement of environmental objectives as an essential part of their policy” (Matanios, Adnan, 2009: 36).

Environmental management has been defined in the French standard 30200 as “a set of management activities that define environmental policy, objectives and responsibilities, implemented through means such as planning environmental objectives, measuring results and controlling environmental impacts” (Gendron, 2004: 60).

It is also defined as “the procedures and control measures, whether local, regional or global, put in place to protect the environment, as well as the rational use of available natural resources and the permanent use of these resources” (Kafi, 2013: 173).

From the above, environmental management is a set of organised activities and efforts by institutions to protect the environment through a set of policies and procedures that serve the environment and mitigate the environmental problems caused by their activities.

2.1.3 Objectives of environmental management: Environmental management aims to achieve the following objectives (Dargham, 2007):

- Improve the ability to solve environmental problems and develop working conditions.
- Adopt appropriate environmental policies by applying and implementing environmental laws, regulations and systems.
- To develop economic systems and methods to protect the environment and maximise economic returns.
- Achieve consumer protection by providing the necessary environmental requirements for the production of goods and services.
- Developing monitoring and surveillance systems to track pollution levels and support the competitive advantage of environmentally friendly products, which are constantly growing and expanding globally.
- Identify legal requirements and environmental aspects related to the organisation’s activities and products/services.
- Encourage management and staff commitment to environmental protection, defining specific responsibilities.
- Promote environmental planning to cover all project activities from material procurement to product distribution.
- Being able to compete.
- Effectively manage compliance obligations.
- Improve staff morale and the organisation’s image.

2.2 Environmental Internal Auditing

2.2.1 The concept of environmental internal auditing: Environmental internal auditing has several definitions, including:

- It is defined as “a periodic, systematic, critical, and objective self-assessment process aimed at auditing environmental policies, programmes, activities, and operations to provide an objective judgment on whether the institution is fulfilling its responsibilities to the surrounding environment and communicating the results to the beneficiaries.” (Ahmed, 2013: 397)

The Institute of Internal Auditors defines environmental internal audit as “an integral part of the environmental management system to determine the adequacy of environmental control systems and the extent of compliance with legal requirements and internal policies.” (Amer, 2005: 04)

From the above, environmental internal auditing is a systematic and periodic review of environmental procedures and policies, and an evaluation of the existing environmental management system and its effectiveness, in order to avoid the costs resulting from the environmental impacts of the institution’s activities.

1.2.2 Objectives of environmental internal auditing: The objectives of environmental internal auditing can be identified as follows (Baejjaj, 2012):

- Designing a system that provides management with information on environmental performance in relation to pre-determined objectives to ensure that these objectives are achieved.
- Develop the institution’s environmental performance records.
- Helping management to anticipate environmental issues, rather than simply reacting to them, and focusing management’s attention on environmental requirements.
- Verify the institution’s compliance with environmental requirements.
- Assess the effectiveness of existing environmental management systems.
- Rationalise the environmental decisions of the institution and government agencies and departments.
- Improve the effectiveness of the monitoring of environmental performance by the institution’s management and government agencies and departments.
- Ensure management control over the institution’s environmental activities and the extent of implementation of programmes and policies related to environmental activities.

- Increase management interest and awareness of environmental performance.

2.3 Benefits of Internal Environmental Auditing for the Environmental Management System:

Conducting an audit of the environmental management system ensures that the institution achieves benefits, including (Al-Azzawi, 2002), (Bouhafs, 2007):

2.3.1 Benefits achieved at the production level: The environmental audit of the environmental management system contributes to increasing productivity by

- Rationalising the use of resources and reducing energy wastage.
- Reducing the percentage of faulty products.
- Improving the efficiency of employee performance through training programmes and the selection of competencies and skills.
- Increasing employee productivity by making the working environment more environmentally friendly.
- Improve environmental performance by reducing air emissions and reusing materials.

2.3.2 Financial benefits: These include:

- Reduced insurance costs due to a reduction in insurance liability and risk rates as a result of the institution's improved preparedness and response to emergencies.
- Benefit from tax exemptions as a result of reduced environmental risks.
- Helping to attract foreign capital to many countries where environmental risks have been a barrier to investment.
- Benefit from financial advantages that institutions may receive in return for their commitment to environmental regulations, such as preferential loans and credit facilities from banks or the receipt of government subsidies.

3- Realised legal benefits: Environmental auditing of environmental management systems helps to deal with environmental legal disputes, whether local or international, and also helps the institution to obtain incentives from the relevant authorities.

4- Realised administrative benefits: These have a positive impact on the improvement of the institution's administrative functions through

- Increased staff satisfaction.
- Integration of administrative systems.
- Reduction in administrative waste.

5- Realised social benefits: These can be summarised as

- Improvement of the general image of the institution in front of its community and its impact on consumer and environmental protection, which can enable the institution to gain the goodwill and support of these consumers.
- Preventing pollution and protecting the environment on the way to sustainable development.

6- Realised marketing advantages: Institutions that produce environmentally friendly products or services have a greater market share as they help customers achieve their environmental goals. Products that can be recycled after use or that are produced by following environmental practices are more desirable. (Abd El-Samad and Batayneh, 2005)

*** The applied aspect**

The Meftah Cement Company is in a situation similar to that of any industrial institution, whose primary objective is to maximise profits while ensuring its continuity. However, the cement sector is facing various challenges and pressures, whether from the legal aspect, such as the enactment of laws to protect the environment, or from the civil aspect, with the emergence of a heightened awareness and concern among members of society regarding the need to preserve the environment. All these changes have led Meftah Cement Company to focus on the environmental aspect.

1. Definition of the Cement Company of Meftah, located in the Wilaya (province) of Blida. The Cement Company of Meftah is an Algerian institution that owns the cement factory in Meftah, Blida, which occupies an area of 406,123 square meters, or approximately 40 hectares. It is a joint-stock company with a social capital of 1.4 billion Algerian dinars. The Meftah cement factory project was registered under the 1970/1973 development plan by Decision No. 70-20 of 10 March 1970. The project was completed at a cost of 680 million Algerian dinars. Construction of the plant began on 6 May 1975, while the kiln and production started on 1 September 1975. In 1998, the plant became a branch of the Regional Cement and Derivatives Group for the Centre. In 2008, a partnership agreement was signed with the French group "Lafarge Holcim" through a bidding process, with the foreign partner holding 35% of the shares and the Algerian Industrial Group for Cement holding 65% of the shares. In 2018, the GICA group regained the management of the institution after the expiry of the "Lafarge Holcim" contract.

2. The cement plant and the environmental management system: In 2018, the Cement Factory obtained the ISO9001:2015 quality management system certification, which is an international quality

standard that encourages the improvement of the effectiveness of the quality management system to increase customer satisfaction by meeting their requirements. As part of the plant's efforts to achieve the best possible product in terms of quality, it has a 300 million Swiss franc raw materials analysis laboratory equipped with advanced technology. In this laboratory, the materials are processed using physical and chemical methods in order to obtain a product that complies with the standards. If there are any complaints from customers about the quality of the product, it undergoes further analysis to ensure greater effectiveness.

Once the plant was confident in its quality performance, it worked to comply with and implement environmental regulations. As a result of this compliance, it obtained the ISO45001:2018 Occupational Health and Safety Management System certification, which consists of a set of requirements that help provide healthy and safe workplaces. The plant also started to implement the ISO14001:2015 environmental management system, an international standard that sets out the basic requirements for establishing an environmental management system, enabling organisations to formulate policies and objectives and to comply with legal requirements relating to environmental aspects.

Within this framework, the organisation has

- Established a special system that allows the blasting of large boulders without disturbing local residents.
- Processed 800,000 tonnes of waste.
- Constructed a wastewater treatment and purification plant in 2021.

The management systems adopted by the facility under study constitute an integrated management system that includes quality, health and the environment.

3. Environmental Management System Requirements for Mitidja Cement Company:

3.1 Environmental Policy: The environmental policy of the company under study is based on the "KAIZEN" principle, meaning "continuous improvement", which is a modern approach to reducing production costs. It focuses on

- Meeting the needs of customers and stakeholders: This is achieved by managing and improving business performance, monitoring product quality, marketing cement and managing the integrated management system for quality, environment, health and safety.
- Compliance with system and regulatory requirements: Through legal and systems management for all operations.
- Employee skills development: Through human resources management.
- Developing new products and packaging methods: Through maintenance and development of equipment and infrastructure, cement marketing and quality control of cement production.
- Enhancing the company's brand image: Through performance management and improvement and management of information and communication systems.
- Contributing to environmental protection, including pollution prevention: Through equipment and infrastructure maintenance and development, raw material preparation and product quality control, and management of the integrated management system for quality, environment, health and safety.
- Provide safe and healthy working conditions to prevent work-related injuries and illnesses: Through business performance management and improvement, human resource management and management of the integrated management system for quality, environment, health and safety.
- Ensure an appropriate social climate and promote a culture of consultation and participation of workers' representatives: Through business performance management and improvement, and human resources management.

3.2 Planning: Planning is carried out by:

- **Identification of environmental aspects:** Société des Ciments de Mitidja has identified the main environmental aspects, such as
- **Extraction and crushing of raw materials:** This generates noise (explosives) and dust emissions, and the resulting effects are cracks in neighbouring residential buildings and soil contamination.
- **Cooking process:** This produces gas emissions, dust and high temperatures, resulting in contamination of the working environment.
- **Loading and distribution process:** This generates noise and dust, resulting in worker fatigue and pollution of the area surrounding the loading zone.
- **Compliance with environmental laws and regulations:** The laws and regulations relating to the company's activities are identified and complied with. For example, the company is not allowed to exceed the dust emission rate specified in Decree No. 06-138 of 15 April 2006, which regulates the emission of gas, smoke, vapour and liquid or solid particles into the atmosphere and the conditions under which they are monitored, which was 50 mg/Nm³ in 2006.
- **Definition of objectives, targets and programmes:** The company's objectives, targets and programmes to achieve them are defined for all departments and directorates. For example, one of the objectives set for the environmental management of Société des Ciments de Mitidja is to recover 98% of the dust during the installation of the arm filter, in accordance with the waste management and recycling or sale programme.

3.3 Implementation and operation: This will be achieved by adhering to the following:

- Providing resources, tools and responsibilities: The Matiège Cement Company has mobilised a group of financial and human resources and has allocated specific sums for investment in environmental protection. In 1999, an electric filter worth DZD 300,000,000 was installed. On 01/09/2010, an arm-type filter worth DZD 380,000,000 was installed. On 24/03/2011 arm-type filter accessories worth 600,000 DZD were installed. On 02/04/2011 maintenance work was carried out on the arm-type filter to the value of DZD 760,000. On 31/12/2011 a fan bridge for the arm-type filter worth DZD 414,960 was installed. In 2017 a new arm-type filter was purchased for DZD 610,000,000. In 2021, a large filter for the workshops worth DZD 800,000,000 will be installed.
- Employee training and awareness: The company works to raise environmental awareness among employees to enable them to take environmental responsibility.
- Documentation of the environmental management system: The company maintains and documents all information, records and documents related to its environmental management system, including system requirements and implementation procedures.

4. Use of internal environmental audit in the evaluation of the environmental management system of Cement Company Mitidja :As part of the internal environmental audit process carried out by the audit team, the aim is to evaluate the company's environmental management system by examining quality, environmental and health aspects, taking into account the company's integrated management system. The evaluation of this system is done by examining the differences in the company's performance before and after the implementation of the environmental management system.

4.1 Analysis of productivity trends:

The company's efforts to obtain a high-quality product affect its productivity. The following table shows:

Table 1: the development of the company's productivity over the period from 2014 to 2023.

Year	Institution Productivity (tons)	Change in Productivity Development (Productivity of year N – Productivity of base year)	Percentage Change in Productivity (Change in productivity development of year N ÷ Productivity of base year)
2014 (Base Year)	926598	-	-
2015	1032757	106159	11.45%
2016	1035807	109209	11.78%
2017	1063313	136715	14.75%
2018	1183550	256952	27.73%
2019	1220692	294094	31.74%
2020	1253776	327178	35.31%
2021	1289719	363121	39.18%
2022	1290446	363848	39.27%
2023	1297812	371214	40.06%

Source: Prepared by the researchers on the basis of information provided by the institution.

From Table 1, we can see that there has been an evolution and an increase in the productivity of the institution. The institution achieved significant rates between 2014 and 2017, and this increase continued until 2023, when it reached its highest level. The justification for this is the attention paid by the institution to the quality of its product, as the institution implemented the Quality Management System (ISO 9001) in 2015, which contributed to an increase of 27.73% in the productivity of the institution. In addition, the institution implemented the Environmental Management System (ISO 14001) and the Occupational Health and Safety Management System (ISO 45001), which were all driving factors in increasing the institution's productivity, as the institution achieved an increase in productivity of 39.18% in the year 2019. Meanwhile, the year 2023 saw the highest increase in the quantity produced, estimated at 40.06% compared to 2014, when the institution had not yet implemented the aforementioned systems. This is due, on the one hand, to the expansion of the cement market and the institution's orientation towards exports and, on the other, to the development of the construction and public works sector.

4.2 Analysis of the sales development of the Mitidja Cement Institution: Every institution aims to maximise its sales and this is the case with Mitidja Cement Institution in order to achieve its economic objectives. We present below the statistical evolution of its sales:

Table 2: Statistics of Mitidja Cement Institution's sales development for the period (2014 - 2023).

Year	Sales Quantity (tons)	Change in Institution's Sales Development (Sales of year N – Productivity of base year)	Percentage Change in Sales Development (Change in sales development of year N ÷ Sales of base year)
2014 (Base Year)	930508	-	-
2015	1028424	97916	10.52%
2016	1032807	102299	10.99%
2017	1066868	136360	14.65%
2018	1195022	264514	28.42%
2019	1201366	270858	29.10%
2020	1231195	300687	32.31%
2021	1270285	339777	36.51%
2022	1298183	367675	39.51%
2023	1298798	368290	39.57%

Source: Prepared by the researchers based on the information provided by the institution.

From Table 2, we can see that between 2014 and 2017, the company's sales experienced fluctuating and low growth, with the cement sales ratio during this period ranging from 10.52% to 14.65%. However, the company's sales increased significantly in 2018, reaching 28.42%, which is a positive indicator of the initial implementation of the quality management system. The remarkable increase in the company's sales continued after the implementation of both the environmental management system and the occupational health and safety management system, with a record increase in the company's sales estimated at 39.57% in 2023. This is due to the increase in the number of customers dealing with the company and the increase in their needs for this vital product for the construction, building and urban expansion process.

4.3 Gas and electricity consumption analysis: The cement industry is one of the most energy intensive industries in terms of gas and electricity consumption. The evolution of the use of various consumptions is shown below:

Table 3: Statistics on the development of gas and electricity consumption for Mitidja Cement Company for the period (2014 - 2023).

Year	Gas Consumption (MJ/ton of clinker)	Electricity Consumption (kWh/ton of cement)
2014	4389	120
2015	4274	117
2016	3886	113
2017	3648	111
2018	3612	110
2019	3346	105
2020	3333	103
2021	3128	85
2022	2664	78
2023	2380	65

Source: Prepared by the researchers, based on information provided by the institution.

Table 3 shows a decrease in consumption of both gas and electricity over the period 2014-2023. This continuous decrease is the result of the institution's efforts to rationalise energy consumption. In 2022, gas consumption will be approximately 2,664 megajoules per tonne, compared to 4,389 megajoules per tonne in 2014, representing a significant decrease. Similarly, electricity consumption was estimated at 78 kilowatt-hours per tonne in 2022 and 65 kilowatt-hours per tonne in 2023, also a record low compared to 2011 when electricity consumption was estimated at 120 kilowatt-hours per tonne.

4.4 Occupational accident analysis: The following table shows the cases of occupational accidents for the period from 2014 to 2023:

Table 4: Development of occupational accidents at Mitidja Cement Company for the period (2014 - 2023).

Year	Work Accidents for Factory Workers	Work Accidents for Contractors	Total Work Accidents
2014	6	8	14
2015	3	8	11
2016	3	3	6
2017	0	3	3
2018	2	0	2
2019	0	1	1
2020	1	1	2
2021	1	0	1
2022	0	0	0
2023	0	0	0

Source: Prepared by the researchers, based on information provided by the institution.

From Table 4, we can see that the institution was able to reduce the number of work accidents during the period 2014-2021, where the number of accidents involving factory workers ranged from 6 to 1 incident, and the number of accidents involving contractor workers ranged from 8 to 1 incident, while the institution recorded zero work accidents after the implementation of both the environmental management system and the occupational health and safety management system.

5. Some of the solutions and suggestions provided by the Audit and Control Directorate to increase the growth of the audited institution: After the internal audit team carried out the audit process by reviewing what the institution had achieved, it provided some suggestions and solutions, which are:

5.1 Suggestions and solutions to develop and increase the productivity of the institution:

- Increasing the recovery rate of rising dust in the production process by using additional filters.
- Improving working conditions and the cleanliness of the environment, which creates a sense of comfort in the psyche of the workers and thus motivates them to work harder.
- The provision of more pollution control equipment, which helps to increase worker productivity and reduce the number of sick days taken as a result of illness or industrial injury, thus allowing workers to spend more time on production.

5.2 Suggestions and solutions for increasing the institution's sales volume: These can be summarised as follows:

- The institution conducts a survey among its customers to determine their preferences regarding the quality of the institution's product in order to meet their demands, which contributes to increasing sales in line with the evolving tastes and needs of consumers.
- Compliance with environmental regulations and the organisation of conferences on environmental protection, as well as participation in large-scale reforestation campaigns, all of which create customer satisfaction with the institution's activities and increase their economic transactions with the institution as an environmentally friendly entity, leading to an increase in demand for the institution's product.

5.3 Solutions and proposals to reduce the institution's energy consumption: These include

- The need to implement policies aimed at rationalising the consumption of gas and electricity and seeking alternative sources of energy.
- The reliance on manual operation of some machines instead of automated operation, which consumes additional electrical energy.

5.4 Solutions and proposals to maintain the stability of the institution and the absence of occupational accidents:

We summarise them as follows:

- Address the gaps in both the environmental management system and the occupational health and safety management system and develop what needs to be developed.
- Raise awareness of environmental and health and safety issues among workers.
- Provide more means of protection and prevention of occupational accidents.

6. Evaluation of the Environmental Management System of Mitidja Cement Company

In order to evaluate the environmental management system and to identify the strengths and weaknesses of this system, the internal audit team uses the questionnaire tool, and the description of the reality of the environmental management system in the institution under study has already been mentioned. For a clearer understanding, a questionnaire has been prepared as an example for the evaluation of the institution's environmental management system, where this questionnaire contains closed questions with "yes" or "no" answers, and this evaluation is related to the requirements of the institution's environmental management system. We have prepared a table with a series of questions, and the following tools have been used to answer this questionnaire

- Interview and discussion with the person responsible for the environmental management system
- The documents of the institution.

Table 5: Environmental management system requirements questionnaire for cement company of Mitidja.

N°	Questions	Yes	No	Comments
01	Does the organisation have an environmental policy for its activities and products?	×		
02	Has top management approved the environmental policy?	×		
03	Has a responsible person been appointed and given authority to oversee and implement the policy?	×		
04	Is the organisation's environmental policy documented?	×		
05	Is the environmental policy clearly communicated to all staff?		×	
06	Is the institution's environmental policy appropriate to the nature and scale of the	×		

	environmental impacts of its activities?			
07	Does the institution's environmental policy include procedures for afforestation and maintenance of green spaces?		×	
08	Does the institution do what is necessary to protect the environment and is there no need to review its environmental policy periodically?	×		
09	Does the institution's environmental policy include a framework for reviewing environmental objectives and targets?	×		
10	Does the institution's environmental policy include a commitment to continual improvement and pollution prevention?	×		
11	Does the institution prepare and identify the environmental aspects of the institution's activities, products and services?	×		
12	Does the organisation create activities and products with environmental impacts?	×		
13	Does the institution have a procedure to assess the environmental impact of its new projects?	×		
14	Does the location of the institution require special environmental considerations, such as environmentally sensitive areas?	×		
15	Does the institution's activity have an impact on the environment?	×		The effects of pollution are local.
16	Does the institution identify products and activities that have an environmental impact?	×		
17	Does the institution budget for the environmental impacts of its activities?	×		
18	Does the institution track changes in environmental legislation?	×		
19	Does the institution communicate information on laws and requirements to employees?		×	

Source: Prepared by the researchers on the basis of the information provided by the institution under study.

Table 6: Continuation of the survey questionnaire on the environmental management system requirements for the Cement Company of Mitidja.

N°	Questions	Yes	No	Comments
01	Are procedures in place to identify the applicable requirements for the environmental aspects of the organisation's activities and products?	×		
02	Have environmental objectives and targets been established?	×		
03	Does the organisation document its environmental objectives?	×		
04	Are the environmental objectives distributed throughout the organisation?	×		
05	Does the environmental management planning process involve all relevant stakeholders?	×		
06	Are the programmes implemented consistent with the organisation's environmental policy?	×		
07	Are the roles, authorities and responsibilities of each individual in the organisation defined and communicated?	×		
08	Does the organisation provide environmental training and awareness to its employees?	×		
09	Does management provide the resources necessary to implement the environmental management system?	×		
10	Are employee training programmes modified and developed based on the organisation's environmental needs?	×		
11	Does the organisation have a procedure for maintaining and documenting the environmental management system in place?	×		
12	Is the system implemented and operated on the basis of documented procedures and records?	×		
13	Do employees have access to the system documentation in order to perform their tasks?	×		
14	Does the organisation have procedures for dealing with emergency situations that may affect the environment?	×		
15	Has the organisation established procedures for internal and external communication on environmental matters?	×		
16	Are environmental activities monitored?	×		
17	Does the organisation document its procedures for monitoring and measuring its activities?	×		
18	Does the organisation ensure the alignment of objectives and targets in the monitoring process?	×		
19	Does the organisation conduct regular compliance evaluations?	×		

Source: Prepared by the researchers on the basis of the information provided by the company under study.

Table 7: Continuation of the questionnaire on the requirements of the environmental management system for the cement company of Mitidja.

N°	Questions	Yes	No	Comments
01	Does the institution comply with current legislation?	×		
02	Are the environmental impacts of the activities identified?	×		
03	Are the environmental impacts addressed and corrected as they occur?	×		
04	Does the organisation keep records to monitor activities and operations that have an impact on the environment?	×		
05	Does the internal audit function ensure that the institution's environmental management system complies with the environmental requirements to which it is subject?	×		

06	Does the internal audit department establish a periodic audit programme for the environmental management system?	×		
07	Are there strict penalties for any employee who causes an environmental incident?		×	
08	Does the organisation participate in conferences, forums and study days related to environmental protection and make proposals to reduce pollution?	×		
09	Does the organisation provide a clean and pollution free working environment?	×		
10	Are employees aware of pollution risks in the organisation and do they report them to management in a timely manner?	×		
11	Does the organisation ensure that its waste is treated to reduce pollution?	×		

Source: Prepared by the researchers on the basis of information provided by the institution under study

Through the survey questionnaire in Tables 5, 6 and 7, prepared on the requirements of the environmental management system applied in the organisation under study, the strengths and weaknesses of the system were identified as follows:

6.1 Strengths:

These are as follows:

- The environmental management system includes an environmental policy prepared by the top management of the institution so that this policy is in line with the nature and scale of the environmental impacts resulting from its activities.
- The institution's environmental policy shall include a commitment to continual improvement and pollution prevention, as well as a framework for environmental auditing that contributes to the ease of carrying out internal environmental audits.
- The institution's environmental policy is documented in documents that are relied upon in the operation of the system and that can be referred to in order to evaluate the environmental management system and verify its conformity with reality.
- The environmental management system is based on the planning process as one of the requirements of this system, through the prior identification of the environmental aspects of the institution's activities and the identification of relevant environmental laws and regulations.
- During the planning process, estimated budgets are established to address the institution's environmental impacts through the preparation of a well-defined treatment methodology.
- There is a separation of duties and responsibilities specific to each individual in the organisation, which are announced and documented to avoid conflicting duties.
- The environmental management system operates in the cement company according to documents and records to ensure the safety and reliability of the existing system.
- The Environmental Management System is audited by the Internal Auditor to ensure that it is implemented as planned.

6.2 Weaknesses:

The weaknesses are as follows:

- Insufficient mastery of the requirements contained in ISO14001, which was adopted as the applied model in the institution under study, such as the lack of review of the environmental management system by top management.
- The environmental policy was not declared and communicated to all employees, resulting in a lack of environmental awareness among employees.
- The evaluation of the environmental management system in the cement company Mitidja is limited to verifying the compliance with the requirements adopted by the institution according to its activity and their conformity with what has actually been achieved.
- The implementation stages of the environmental management system in the cement company lack a clear design.
- The environmental management system does not include strict procedures against any employee who violates the progress of the system and causes environmental problems, which creates more indifference among employees, resulting in the failure of the system to achieve its goals.
- The absence of a very important requirement procedure, i.e. the review of the internal auditor's report on the efficiency and integrity of the prevailing system by top management, as the report is reviewed by the director of the integrated management system, and this procedure is contrary to the separation of duties, considering that the director is the implementer of the environmental management system.

6.3 Suggestions made by the internal audit team regarding the organisation's environmental management system:

After the internal audit team carried out its mission to review and assess the environmental management system of the cement company, the following recommendations and suggestions were made to address the problems and deviations in this system:

- It is recommended that the organisation designate an employee responsible for reviewing the internal auditor's report and separate the implementation of the environmental management system from the evaluation of the internal auditor's report on the environmental management system.
- Support the training and development of the integrated management system manager because of the limited information gained in the environmental management system requirements.
- It is necessary to re-evaluate the scope of the environmental management system assessment, such as examining the stages of implementation to ensure the proper introduction of this system, instead of only auditing the specific requirements of the environmental management system.
- It is necessary to activate the role of top management in monitoring the organisation's environmental management system for its continuous improvement.
- It is necessary to activate the role of the workers in the organisation by involving them in the implementation of the environmental management system and preparing plans to increase environmental awareness.
- Clarifying, announcing and disseminating the organisation's environmental policy to all workers and employees is a necessary condition for the success of the environmental management system.
- Restructure the environmental management system in terms of design rather than relying on the availability of requirements in its operation.
- Work on the communication and dissemination of the environmental policy to the organisation's external stakeholders.

7. Conclusion:

Environmental protection has become one of the important criteria for measuring economic growth, and since the industrial institutions, especially the industrial ones, have a reciprocal relationship with the environment, they affect it and are affected by it. Among the tools that contribute to the control of the impact of the institution on the environment is the implementation of an environmental management system, and the verification of the effectiveness of the latter in managing the environmental issues of the institution necessitated carrying out an environmental audit of the environmental activities of the institutions.

7.1 Results of hypothesis testing

-The first hypothesis states: "Environmental internal audit is a management tool through which productive and industrial institutions periodically evaluate the set of consistent procedures and practices they adopt as a result of the pressures they face due to the environmental pollution they cause and to control their environmental management".

It was found that the internal environmental audit is a systematic critical review by the internal auditor for the continuous improvement of the environmental management system, which is part of the organisational structure of institutions, and the effectiveness of this system is mainly based on a good mastery of its requirements, the efficiency of the environmental management system contributes to the efficiency and effectiveness of the internal environmental audit, which proves the validity of the hypothesis.

-The second hypothesis states: "The Cement Institution of Mila adopts the function of environmental internal audit and environmental management system, and it has limited effectiveness in managing activities and tasks related to the environmental aspect". It was found that the Cement Institution of Mila adopts the Environmental Management System because it relies on it to obtain accurate information about the institution's compliance with environmental laws and regulations, as it helps it to achieve its objectives related to its environmental performance, and the Cement Institution was convinced of the need to use the Environmental Internal Audit to monitor, evaluate and correct deviations in the implementation of the Environmental Management System, and the latter is characterised by limited effectiveness due to insufficient mastery of its requirements, which proves the validity of the hypothesis.

7.2 Results of the study:

Based on the information presented in this study, the following results were obtained:

7.2.1 Theoretical findings:

From the theoretical aspect, the following findings have been extracted:

- Environmental management and its systems are successful methods to reduce environmental problems by creating a balance between the environment and the activities of the organisation.
- The ISO 14001 environmental management system is a strategic management model suitable for all organisations. It consists of a set of requirements that enable industrial organisations to continuously plan, implement and monitor the improvement of their environmental performance.
- The environmental management system is influenced by factors related to legal and regulatory controls. The compatibility of this type of system with these variables is considered an essential requirement that must be considered and taken into account when setting up an environmental management system in order to ensure the achievement of its objectives with high efficiency.

- The environmental internal audit process is carried out in a series of interrelated steps, culminating in an opinion on the environmental situation of the organisation, the soundness and effectiveness of its environmental management system, the organisation's compliance with environmental laws and regulations, and the validity of the measures it has taken to protect the environment. It is therefore a tool for identifying and correcting deviations in the environmental management system and for continuous improvement.

7.2.2 Practical results:

After conducting the field study at the cement manufacturing plant, the following results were obtained:

- The studied organisation implements the ISO9001 quality management system to improve the quality of its product according to customer requirements, which has led to an increase in sales volume.
- The organisation works to provide a safe working environment for its employees by implementing the ISO45001 Occupational Health and Safety Management System.
- The cement company adopts the ISO14001 environmental management system to ensure compliance with environmental regulations and to protect the environment to avoid pressure from the local community and environmental legislation.
- The organisation's possession of an integrated management system covering quality, health and environment has contributed to various developments, including an increase in the organisation's productivity, accompanied by higher sales volumes, as well as the creation of an accident free and safe working environment for employees.
- The cement company is considered to be the main party responsible for the degradation of the environment through pollution and depletion of resources in the region, and it is working to reduce the resulting risks by implementing a series of measures.
- Implementing an environmental management system is an upfront cost, but over time the organisation gains returns and profits by avoiding environmental fines and penalties.
- Projects to reduce pollution and dust have a positive impact on the organisation's performance by contributing to increased resource productivity.
- The absence of financial statements containing information about the organisation's environmental performance is due to the lack of strict laws and penalties.
- The lack of environmental awareness among managers and workers is one of the factors hindering the proper implementation of the environmental management system.
- The organisation's interest in environmental auditing stems from several reasons, the most important of which is the risk of exposure to penalties and fines due to non-compliance with environmental regulations.
- By evaluating the environmental management system, internal audit aims to identify the strengths and weaknesses of the system in order to assess its effectiveness and make improvements.

7.3 Recommendations:

Based on the results obtained, a number of suggestions can be made that may help to increase the effectiveness of environmental auditing in improving the environmental management system and the environmental performance of the institution:

- The need to balance economic, social and environmental objectives, as environmental degradation can hinder economic growth.
- The institution must strive to complete, properly establish and perfect the requirements of the environmental management system in order to comply with the international standard ISO 14001.
- Greater attention should be paid to the staff involved in environmental management by improving their necessary academic and practical qualifications through training courses that contribute to updating their knowledge in the field of environmental management systems.
- The need to have qualified auditors with scientific expertise in the field of pollution and environmental problems, in addition to raising their awareness of environmental auditing procedures.
- The need for the organisation's top management to consider the recommendations and suggestions contained in the internal auditor's report on the organisation's environmental performance and the state of the existing environmental management system.
- The need for the cement company to pay more attention to the content of the financial statements by including the environmental costs and revenues related to the institution, so that these statements reflect the true picture of the financial position of the institution.
- The need to focus on teaching the principles and specifics of environmental auditing in Algerian universities.
- The need to develop environmental accounting in industrial institutions.
- The need to focus on environmental accounting within the institution as one of the requirements of environmental auditing.
- Attention should be paid to unifying a national framework for environmental auditing that auditors can rely on in carrying out their duties.
- The need to provide all instructions and regulations relating to the environment at the level of all Algerian economic institutions, especially those that are harmful to the environment.

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