

**RESEARCH TITLE**

**THE IMPLEMENTATION OF EFFECTIVE EMS IN THE LIBYAN  
PETROLEUM INDUSTRY**

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HNSJ, 2022, 3(9); <https://doi.org/10.53796/hnsj3914>

**Published at 01/09/2022**

**Accepted at 13/08/2022**

**Abstract**

In order to evaluate the implementation of EMSs in the petroleum industry in Libya, a field visit was conducted to number of petroleum fields. Field visit data along with information from a literature review are analyzed regarding the barriers and difficulties to implementing effective EMS in the industry.

EMS adoption is still low in the Libyan petroleum industry. The majority of companies do not have plans to implement an EMS in the near future. However, where they have been implemented, they have brought many advantages to the company involved, especially in complying with environmental legislation and meeting a range of client requirements.

The primary barriers to implementing EMSs are lack of expressed interest from clients, lack of environmentally sound suppliers, and a weak environmental culture in the petroleum industry. However, the primary difficulties in implementing EMS are high implementation cost, lack of training provided to staff and lack of internal management support.

A range of educational and economic strategies are developed for removing the barriers and difficulties. Recommendations are made to optimize the effectiveness of educational and economic strategies.

**Key Words:** Oil, EMS, Impact, Environment

## 1. Introduction

The Environmental Management System (EMS) is a tool defining a formal and structured approach to enable organizations to systematically control and reduce their environmental impact. It demonstrates, with assurance, that an organization aims to comply with current policy and legislation and actively addresses environmental issues. Petroleum production activities have a myriad of environmental implications. Hence, petroleum companies must manage their environmental performance. The EMS represent a possible solution.

Organizations of all kinds are increasingly concerned to achieve and demonstrate sound environmental performance by controlling the impacts of their activities, products and services on the environment, taking into account their environmental policy and objectives. They do so in the context of increasingly stringent legislation, the development of economic policies and other measures to foster environmental protection, and a general growth of concern from interested parties about environmental matters including sustainable development (BSI,1996). Environmental protection is an important issue all over the world. In particular, it has been increasingly recognized that the petroleum industry has a significant impact on the environment. petroleum production activities are inherently disturbing to the environment such as groundwater contamination, soil and air pollution and disposal of waste. In general, environmental management addresses the environmental impact of an organization. It is a tool that enables organizations to achieve and systematically control their objectives aimed at resolving the environmental problems. The environmental management system established in an organization may be used more strategically to prevent pollution at source.

### 1.2 Aims and Objectives of the study

The aim of this study is to ascertain the barriers and solutions to the effective EMS implementation for the petroleum industry in Libya. By clarifying the concepts and principles of EMS, hoped that a better understanding and perceptions are made to the Libyan petroleum industry. It is also the hope of the study to bring up the awareness of them towards acceptance of EMS and its benefits.

In order to achieve this aim, the following objectives of the study have been identified;

1. To review the current nature of the Libyan petroleum industry and its associated environmental issues.
2. To review the concepts and principles of EMS.
3. To analyze the state of EMS in the Libyan petroleum industry.
4. To identify the barriers and difficulties in implementing EMS generally, as well as specifically in the Libyan petroleum industry.
5. To identify the solutions to encourage effective EMS implementation in the Libyan petroleum industry.

### 1.3 Research methods

A research methodology was developed in order to provide a means to achieve the aims and objectives. this study based on the cumulative assessment of the current environmental laws and regulations, interviews with some of the company's personnel

and telephone communications with some employees of the companies and filed visit to some oilfields.

### The Libyan petroleum industry

The Libyan petroleum industry was established for more than fifty years ago, this sector is one of the most important and largest industrial sectors in Libya, and it is the main source of hard currency and the expenses of projects on infrastructure and development. The Libyan economy is linked largely to oil, and oil revenues consider major supplier for the Libyan national income (Masoud, 2012).

Libya is a member of the Organization of Petroleum Exporting Countries (OPEC) and one of the major oil producers in the world and the biggest oil supplier to Europe among other oil supplies from North Africa. The oil production in Libya has increased in the last two decades which made the country faces a big challenge in protecting its environment while promoting the continued development and growth of its petroleum industry (Masoud and kamuka, 2015).

### The environmental impacts of the petroleum industry in Libya

The discovery of petroleum in Libya started in the 1950s, due to the need of development in the country the industry grows rapidly in the last decades to bring the needed income without thinking of the environmental costs. The development of the Libyan petroleum industry, coupled with population expansion and lack of environmental regulations, has led to considerable damage to country's environment. The potential for environmental deterioration and pollution in the country is massive due to the operations of both national and foreign petroleum producers.

According to the report published by the EGA that the present environmental situation in Libya is unacceptable due to industrial plants in general such as industrial waste sites, cement, steel and iron factories, upstream and downstream petroleum operations in particular (EGA, 2002).

The Libyan petroleum industry has a significant environmental impacts on the environment, these impacts has been reported during the field visit on October and November 2018 to some oil field sites The fieldwork shows that:

1. all of the visited oilfields has a significant environmental impacts (see plates 1 to 6).
2. The department of health, safety and environment in the NOC has recorded all environmental impacts of oil companies.
3. There were no clear understanding of EMS in the petroleum industry staff.
4. There were no reports or training programmes has been found in some visited sites regarding EMS or EIA.
5. There were no clear steps has been found regarding Implementation of an environmental management system.

The field work observations suggested that environmental impacts of petroleum industry are very significant and the EMS scope is to manage the environment and more specifically the management of environmental impacts from the Organizations. So implementing the EMS in the Libyan petroleum industry will help for protecting the environment.



Plate 1: dump site near the plants



Plate 2: gas burning

Plate 3: oil spoilage near the coastline  
desert

Plate 4: Lake of west water in the

Plate 5: oil spoilage due to pipe line failure  
drilling

Plate 6: Lake of produced waters from

### The environmental management system in the petroleum industry

The field of EMS has been growing rapidly in recent years; Environmental Management System (EMS), the international environmental performance standard, was introduced in 1996 and the Libyan environmental law No15 allows organizations to seek further accreditation on environmental management. But while EMS is certainly catching on and being implemented in some industries, they are not being widely implemented in the petroleum industry. There is no big picture analysis of what the major sources of resistance to implement EMS in this sector and what methods have been and could be used to overcome them.



## Legislative framework

In general, there are many environmental laws has been issued by the Libyan government to protect the environment, such as: soil erosion from overgrazing and other poor farming practices, desertification, dumping of raw sewage; petroleum refining waste; other industrial effluents leading to pollution of surface and groundwater. Law No7 of 1982 in regard to environmental protection, which is actually considered to be the most important law issued by the Libyan government in environmental protection which defined in a clear and strict from the precise conception and the clear meanings with all environmental aspects (GPC, 1982).

Due to huge concern about environmental protection in the world and the increased concern about environmental protection by the Libyan government, which led to a new law on the environment in 2003 has been issued to replace the law no7 which called (Law No15 of 2003) in protection and improving the environment. This law is an important milestone in the evolution of the Libyan EIA system and environmental management systems, also has significant implications on environmental protection in Libya. The Law contains a set of 79 Articles grouped into twelve chapters devolved comprehensively for all environmental protection and aimed to sustainable development (GPC, 2003). The most important laws regarding the petroleum industry in Libya are, (Law No 8 of 1973) in respect to prevention of oil pollution to sea waters. This law has a set of rules and provisions, these provisions are limited to oil pollution source comes from the equipment and machineries used in the ports in the cost line also from ships etc...(Ministry of Industry, 1973). In regarding to oil industry the NOC HSE Work Programme has been issued. The Programme aimed to support national policies to protect health and the environment and developed to link economic, environmental and social policies together to help the companies to achieve sound environmental performance by controlling the impact of their activities, products or services on the environment (NOC, 2004).

## The Environmental management systems (EMS)

Environmental management systems (EMS) is a set of guidelines that helps an Organization or company to reduce its negative environmental impacts. The International Organization for Standardization has issued a set of environmental management system (EMS) guidelines aimed to constantly improve environmental management by industry (Clapp, 1998). EMS specifies requirements for an environmental management system, to enable an organization to formulate a policy and objectives taking into account legislative requirements and information about significant environmental impacts. Thus, to formulate an effective environmental policy, the organizations can incorporate all the requirements of the EMS into their own environmental management systems (ISO, 1996).

The environmental management systems has been developed to be available to all types and sizes of organizations and to accommodate diverse geographical, cultural and social conditions. The system to be succeed depends on commitment from all levels and functions, especially from top management. A system of this kind enables an organization to establish, and assess the effectiveness of, procedures to set an environmental policy and objectives, achieve conformance with them, and demonstrate

such conformance to others. The overall aim of the standard is to support environmental protection and prevention of pollution in balance with socio-economic needs (ISO, 1996).

### Drivers towards EMS implementation

Environmental concern, growing public pressure and regulatory measure are changing the way people do business around the world. Consumer and shareholders are increasingly demanding environmental-friendly products and services that are delivered by socially companies. It is becoming increasingly important for organizations to demonstrate that not only their philosophies but also their investment strategies and day-to-day operations are sustainable. Almost all organizations within the petroleum industry face increasing pressure to broaden their understanding of environmental matters. Moreover, they must respond to commercial and public expectations for improved environmental business performance and commitment to environmental safeguards. There are increasing pressure from clients, investors, consumers, regulatory bodies and more generally the public on the environmental performance and environmental safeguarding of the industry (George, 1990). Therefore, the sources of pressures for company action on environment can be categorized under the following headings:-

#### **6.1 Regulation**

Regulatory pressures are paramount importance for most companies, particularly relevance for high-impact industries such metals, chemicals, energy, etc. which almost interrelated with the Petroleum industry. Environmental regulation, in general is still seen as a threat by industry. The adopting new regulations and standard inevitably require business to change the way that they carry out their business.

#### **6.2 Customer preferences or demands**

The significantly increasing of pollution incidents, have change the customer preferences toward more green products rather than just concerning the functionality and cost of the products. The increasing transparency of the petroleum industry process, make the companies more aware the needs of customers.

#### The main barriers facing the EMS implementation

The pressure for improving environmental management in the Libyan petroleum industry is likely to increase. This is in part because the driving forces originate from a broad range of sources, not just one or two points. The firms in the Libyan petroleum industry are generally aware of the pertinent environmental legislation. They mainly put their efforts on waste disposal control rather than environmental management for exploration and production. This demonstrates that the main efforts is put on the process rather than planning, for example, preventing or reducing the environmental effects at the initial stage.

The fear of environmental failure is perhaps a more potent consideration in driving corporate environmental policy for many companies than is the prospect of expanding market share through green claim (Howes, *at al.* 1997). This statement is further attested by the fieldwork result which indicated that compliance with environmental legislation was the most important motivator to the firms.

However, the driving forces are also largely positive. That is, benefits can be obtained by responding effectively to them. The driving forces represent strong incentives for change, but the barriers hinder the entire process and difficulties are encountered during the process.

The study result concluded that prior to EMS implementation, the firms saw the external factors such as lack of client or customer interest, weak environmental cultural among the competitors and lack of environmental sound supplier as the major barriers to the adoption of EMS (industrial barriers). Conversely, after implementing EMS, the firms discovered that the major difficulties in the process were internally within the organization itself (organizational barriers), for example, high implementation cost, lack of training or interest from staff and lack of management support. Satisfying client's specification or needs was the top priority of the firms when embarking a project at the planning stage. This highlights the fact that firms are motivated by environmental failure rather than the anticipation of environmental success. They are reluctant to put sufficient efforts or resources into running the system, hence difficulties are noticed during implementation.

Therefore, firms in the petroleum industry should be more proactive in the development of EMS. Effective environmental management may be a prerequisite to the maintenance or the enhancement of the competitiveness, or even survival of the organization. Identified barriers and difficulties, however, could be overcome if appropriate strategies could be established.

#### Solutions to remove the barriers of EMS implementation

From the above mentioned incentives and programs, in order to make them effective in encouraging EMS adoption, those incentives and programs need to be carried out simultaneously and supplemented by the regulatory control. Educational programs will enhance the familiarity of the firms towards EMS implementation. After gaining the knowledge, the economic incentives will act as an accelerator in stimulating the EMS implementation. Friendly advice and information is thus followed by clear guidance and finally by formal control. In this respect, regulation stands at the end of linear sequence of more and less forceful intervention. Even though government bodies play an important role in helping achieve these goals, the efforts of non-government or non-profit agencies are also important in accelerating the progress.

Therefore, by introducing the economic instruments and educational programs the identified barriers and difficulties can be eliminated, or at least minimized. Education plays an important role in providing the clients, users, employees, professionals, and managers with the necessary knowledge of environmental management or EMS. This will help stimulate the demand and supply of environmentally sound products and services in the Petroleum industry. In summary, EMS implementation is necessary in order for firms to be sustainable both environmentally and competitively.

## CONCLUSION

The aims and objectives of this research have been achieved successfully through comprehensive literature reviews supplemented by fieldwork visit and interview with employees in the visited sites.

Lowering the major barriers of client disinterest, lack of training or support from staff and high implementation costs of EMS implementation will take some time' However, the recommendations above can help speed the process of mainstreaming EMS implementation in the Petroleum industry. when a critical mass of people in our society recognize this and mainstream petroleum professionals and firms within the petroleum industry feel the pressure of public and government towards environmental protection, EMS status will become the industry standard, as is has already with quality management systems'

Although the Petroleum industry can expect to see steadily increasing environmental pressures, these are at the same time creating business opportunities in fast growing, emerging markets. But those who enter these markets will have to be alert to changes in regulations and policies that may come out of shifts in market-oriented incentives and penalties and the quest for sustainable development methods' It will be important for every Petroleum firm to be alert to changes in the environmental sector because of the growing impact on. an ever-widening span of its customer base' clients will expect Petroleum companies to be informed, and those that become adept at giving worthwhile consultation and advice are likely to make strong competitive gains in the marketplace as a result (Joint and Forum, 1997).

A more sustainable petroleum industry will have a vital part to play in ensuring that the Libya itself faces a healthier, more competitive and sustainable future' Finally' the firms in the Petroleum industry should be able to cope with the opportunities, threats and uncertainties presented by the environmental issues, and this is made possible by developing and using an effective EMS. A properly designed and implemented EMS can therefore form the link between strategic business objectives and environmental demands (welford, 1994). EMS is a fundamental and essential tool for Petroleum firms to demonstrate sound environmental management.

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