

A REVIEW OF OIL AND INDUSTRIAL ACTIVITIES IN ASSALUYEH IN LIGHT OF ENVIRONMENTAL LAWS AND REGULATIONS

UMA REVISÃO BIBLIOGRÁFICA E LEGISLATIVA DAS ATIVIDADES INDUSTRIAIS E DE PETRÓLEO EM ASSALUYEH À LUZ REGULAMENTOS INTERNACIONAIS E AMBIENTAIS

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Abstract: Adverse effects on the environment as a result of human activities, especially in the industrial sector, reveal the particular importance of environmental considerations in the design, deployment, and operation of industrial and construction projects has great significance. Meanwhile, the oil industry requires specific attention due to its crucial role in the Iran economy and international trade and realising numerous pollutants from crude oil extraction and production to refining and consumption of oil products. Analyses of oil and industrial activities in the Assaluyeh region indicate that petroleum effluent, noise pollution caused by industrial and oil activities, incineration of separated gases in flares, crude oil transportation, non-compliance with environmental laws, etc., are the most critical issues of the region that cause the pollution of seawater, soil, air and its subsequent consequences. Observing ecological considerations in all aspects of oil and industrial activities is necessary to control and eliminate the harmful effects of oil and industrial activities in the region. While investigating environmental pollution caused by oil and industrial activities in Assaloye, the present study reviews the relevant international and national laws and regulations to examine their effectiveness in controlling and preventing pollution. Finally, some recommendations are

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provided to improve the present laws and regulations.

Keywords: Environmental law; Environmental Pollution; Oil and Industrial Activities; Regulations.

Resumo: Os efeitos adversos sobre o meio ambiente como resultado das atividades humanas, especialmente no setor industrial, revelam a importância particular das considerações ambientais na concepção, implantação e operação de projetos industriais e de construção. Enquanto isso, a indústria do petróleo requer atenção específica devido ao seu papel crucial na economia e no comércio internacional do Irã e na produção de inúmeros poluentes, desde a extração e produção de petróleo bruto até o refino e consumo de derivados de petróleo. As análises das atividades petrolíferas e industriais na região de Assaluyeh indicam que os efluentes petrolíferos, a poluição sonora causada pelas atividades industriais e petrolíferas, a incineração de gases separados em flares, o transporte de petróleo bruto, o não cumprimento das leis ambientais, etc., são os problemas mais críticos da região que provocam a poluição das águas do mar, do solo, do ar e suas consequentes consequências. Observar as considerações ecológicas em todos os aspectos das atividades petrolíferas e industriais é necessário para controlar e eliminar os efeitos nocivos das atividades petrolíferas e industriais na região. Ao investigar a poluição ambiental causada por petróleo e atividades industriais em Assaloye, o presente estudo analisa as leis e regulamentos internacionais e nacionais relevantes para examinar sua eficácia no controle e prevenção da poluição. Finalmente, algumas recomendações são fornecidas para melhorar as leis e regulamentos atuais.

Palavras-chave: Direito Ambiental; Poluição ambiental; Atividades Petrolíferas e Industriais; Regulamentos.

INTRODUCTION

As Iran's most important economic centre, Assaluyeh is considered one of the most significant areas of energy production in the world in the southernmost part of Iran. The industrialization and technological progress in Assaluyeh Region has prepared a platform to transition from a traditional society to the industrial, urbanized one. Considering the upward trend of industrial and oil activities and the importance of environmental protection, some relevant regulations and laws have been prepared at national and international levels. Considering the legal regime governing oil pollution in international law, despite the large

volume of international instruments in pollution control, oil pollution continues, representing an inefficient use of such documents and a lack of full implementation of the regulations. Drying sea, expanded oil installations, divestiture of protected islands, ship water balance, oil pipeline burst and oil spill into the Persian Gulf, death of marine mammals and aquatics, and chaos in management of coral reefs, etc., all reveal improper environmental management in the region.

Given the importance of the environment to humans, there will be a minimal chance to take advantage of the environment in a sustainable manner if there is no mechanism for pollution control. In this regard, considering the upward trend of air, water and soil pollution, which is mainly a result of technological and industrial development, in the early 19th century, the international community gradually felt the necessity of legislation of laws for pollution control and environmental protection. Later on, many global and regional conventions were adjusted. The number of international instruments indicates a dramatic improvement in international law on environmental issues, which has led to a new branch of international law called international law of the environment. The oil and industrial activities in Assaluyeh have imposed adverse effects on the aquatic and terrestrial environment. Accordingly, some international and regional laws and regulations have been set to prevent such pollution. The present study reviews oil and industrial activities in Assaluyeh Region in light of environmental regulations and laws.

1 MATERIAL AND METHODS

1.1 THE STUDY AREA

Assaluyeh Region is located in southwestern Iran, in Bushehr Province, between the attitudes 27° 27' N and 27° 46' N and the longitudes 52° 07' E and 52° 40' E. The region is the closest land point to the world's largest natural gas field, between Iran and Qatar offshore. It has become an important global energy source and vital for regional economic diversification. Since 1998, many coastal and offshore industrial projects have been completed or are in progress, causing long-term environmental impacts in the region (Alimohammad Kalhori et al., 2012). Figure 1 demonstrates the geographic situation of the Assaluyeh Region in Iran.

Fig. 1
Geographic situation of the Assaluyeh Region



1.2 THE RESEARCH METHODOLOGY

The present study is descriptive-analytical research focusing on the effectiveness of regulations and laws to control environmental impacts caused by industrial and oil activities in the Assaluyeh Region. In the first step, all the relevant literature was accurately reviewed by referring to the related organizations and research centres, including the Department of Environment (DoE), Vice President of Strategic Planning and Monitoring (VPSPM), Central Library & Documentation Center (CLDC) of the University of Tehran, Library of Islamic Consultative Assembly (LICA) and National Library and Archives Organization of Iran (NLAI). During data collection, some interviews were conducted with experts in the fields of environment and politics to bridge the gap in information available on environmental legislation procedures, both in Iran and worldwide. Afterwards, all conventions and protocols related to environmental issues were listed. In the analytical phase of the study, jurisconsults, lawyers and university professors were interviewed to specify potential drawbacks with present laws and regulations. Finally, some recommendations were offered to overcome the identified deficiencies and shortcomings.

2. RESULTS AND DISCUSSION

2.1 THE ENVIRONMENTAL IMPACTS OF INDUSTRIAL ACTIVITIES IN ASSALUYEH

Before focusing on available ecological regulations and laws legislated to control or mitigate environmental pollution, it was necessary to list all the environmental impacts caused by industrial activities in the region. For this purpose, an inventory of all industrial activities and their environmental damage was initially prepared (Table 1).

Table 1

A summary of the most critical impacts caused by industrial activities in the Assaluyeh Region

No.	Impact category	Industrial activities corresponding to the identified impact	Environmental impacts
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1	Impacts on air	<ul style="list-style-type: none"> - Exhaust, refining and combustion of gases, -Combustion processes such as diesel engines and gas turbines - Volatile gas emission from loading operations, storage and other processes such as refining, petrochemical activities, etc. - Distribution of dust particles and dirt from traffic during construction - Particles resulting from combustion sources of hydrocarbons, such as testing wells, etc. - Construction activities such as excavation and embankment 	<ul style="list-style-type: none"> - PM10, SOx, NOx, CO2, etc.
2	Impacts on aquatic and aquatic ecosystem	<ul style="list-style-type: none"> - Drilling fluids containing chemical compounds - Drainage water from washing and processing -Domestic and industrial wastewater - Cooling water -leakage -Water-based drilling mud -Operation of water desalinization plants 	<ul style="list-style-type: none"> -water salinity, -contamination of aquatic resources with heavy metals such as lead, barium and cadmium, inorganic salts, heavy metals, solids, , chemical salts, benzene, hydrocarbons and radioactive materials -Bio-accumulation of oil and its derivatives in tissues of aquatics - Rapid mortality of zooplankton - Loss of phytoplankton - Marine aquatics poisoning -Entering toxic substances into the food chain

	Impacts on soil	<ul style="list-style-type: none"> -Construction activities such as excavation and embankment -Drilling operation - Oil exploration - Oil spill -Transportation -Waste disposal 	<ul style="list-style-type: none"> - loss of soil structure, soil pollution, Disease, ugly landscape and fetid odour, etc.
3	Impacts on mangrove forests	<ul style="list-style-type: none"> Oil spill into the region Oil exploration Drilling operation 	<ul style="list-style-type: none"> - coverage of aerial roots by oil stains interrupts plant respiration -Reduced light penetration and a lower rate of photosynthesis -decreased birds and aquatics population - Solar radiation absorbed by the oil layer on the aerial root increases the temperature of the water

As Table 1 suggests, industrial activities in Assaluyeh are followed by many adverse environmental impacts. Codifying appropriate rules and regulations with proper enforcement could effectively mitigate the ecological consequences of oil and gas exploration and production at international and national levels.

1.1 INTERNATIONAL REGULATIONS RELATED TO INDUSTRIAL AND OIL POLLUTION

Due to the extensive damages caused by oil and industrial contaminations, there have been enormous treaties, laws, rules and protocols focusing on control of adverse impacts caused by them. Table 2 provi-

des a brief list of all relevant international attempts to eliminate oil contaminations.

Table 2
International conventions on oil pollution

No.	Title	Venue	Date	Description
1	International Convention for the Prevention of Pollution from Ships, known as MARPOL	London	1978	<p>Aims to</p> <ul style="list-style-type: none"> - minimize pollution of the seas, including dumping, oil and exhaust pollution. - preserve the marine environment through the complete elimination of pollution by oil and other harmful substances - minimize the accidental discharge of harmful substances
2	International Convention on Oil Pollution Preparedness Response and Cooperation Known as OPRC Convention	London	1990	<p>Aims to provide a global framework for international cooperation establishing systems for preparedness and response to pollution incidents</p>

3	International Convention for the Control and Management of Ships' Ballast Water and Sediments, known as the BWM Convention	London	2004	It aims to control and manage ships' ballast water and sediments.
4	Kuwait Regional Convention for Cooperation on the Protection and Development of the Marine Environment and Coastal Areas against pollution, known as ROPME	Kuwait	1978	It aims to coordinate the Member States' efforts towards protecting the water quality in the ROPME Sea Area, protecting the ecological systems and marine living, and abating the pollution caused by the development activities of the Member States. In addition, ROPME requested the Member States to exert their maximum efforts to protect the marine environment and prevent the reasons for pollution.
5	The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Known as the London Convention	London	1972	Aims to control pollution of the sea and deliberate disposal at sea of wastes or other matter from vessels, aircraft, and platforms

6	The United Nations Convention on the Law of the Sea (UNCLOS), is also called the Law of the Sea Convention.	Jamaica	1982	It aims to define the rights and responsibilities of nations in their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of marine natural resources.
7	Convention on the Continental Shelf	Geneva	1958	It aims to codify the rules of international law relating to continental shelves.
8	The International Convention for the Safety of Life at Sea (SOLAS)	London	1974	It aims to specify minimum standards for safe ship construction, equipment and operation.
9	International Convention on Maritime Search and Rescue (SAR)	Hamburg	1989	Aims to develop an international SAR plan so that, no matter where an accident occurs, the rescue of persons in distress at sea will be coordinated by a SAR organization and, when necessary, by cooperation between neighboring SAR organizations

10	International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties	Brussels, Belgium	1969	It aims to protect the interests of coastal States directly affected or threatened by the consequences of a maritime casualty which might result in oil pollution of the sea or coastlines.
11	International Convention on Civil Liability for Oil Pollution Damage (CLC)	Brussels	1969	It aims to ensure adequate compensation is available to persons who suffer oil pollution damage from maritime casualties involving oil-carrying ships.
12	International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, known as Fund Convention	Brussels	1971	It aims to provide compensation for pollution damage

Development and population growth in major cities of the country can lead to product diversity and, consequently, a variety of wastes and hazardous materials. Production of hazardous wastes such as oil sludge, chemical matter derived from formulations, compounds containing heavy metals, pharmaceutical and medical wastes, compounds containing Polychlorinated Biphenyls (PCBs), and triphenyl can cause irreparable damage to the social and environmental impacts if no new managerial approaches are adopted based on proper regulations and laws. Table 3 presents the international conventions on industrial pollution.

Table 3

International convections and programs on industrial pollution

No.	Title	Venue	Date	Description
1	Stockholm Convention on Persistent Organic Pollutants (POPs), known as Stockholm Convention	Stockholm	2002	It aims to protect human health and the environment from toxic chemicals that are persistent, bioaccumulative, and toxic.
2	The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, known as Rotterdam Convention	Rotterdam	2003	It aims to promote shared responsibilities in relation to the importation of hazardous chemicals.

3	The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, known as the Basel Convention	Basel	1989	It aims to protect human health and the environment against the adverse effects of hazardous wastes.
4	Strategic Approach to International Chemicals Management (SAICM)	Johannesburg	2002	It aims to provide a policy framework to foster the sound management of chemicals.

2.3 DOMESTIC LAWS TO PREVENT OIL AND INDUSTRIAL POLLUTION

As Table 4 presents, the basic structure of the domestic laws in Iran concerning oil and industrial activities was established in 1974 for environmental protection and improvement.

Table 4
Domestic Rules

No.	Title	Date	Related Articles	Description
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1	Environmental Protection and Improvement Act	June 18, 1974	1, 7, 9, and 11	Whereby protection and improvement of the environment, as well as prevention of pollution and any adverse actions that disturb environmental balance as well as all matters related to wildlife, are considered among the duties of the Department of Environment (DOE)
2	Conservation Law of Sea and Border Rivers from Being Contaminated by Petroleum	January 24, 1976	2, 3, 4, 5, 6, 7, 8, 9, 13, 14, 16, 18, and 19	Whereby contamination of Iranian border rivers, internal waters and sea to oil or any oil compounds is forbidden.
3	Maritime Zones Act of the Islamic Republic of Iran in The Persian Gulf and Oman Sea	April 19, 1993	6, 14, and 18	Whereby any contamination of the marine environment is against the rules of the Islamic Republic of Iran and will be subjected to criminal and civil provisions
4	Petroleum Law	October 1, 1987	7	Whereby while proper supervision and planning in oil activities, Oil Ministry is obliged to act in coordination with relevant organizations to preserve and protect oil reserves, natural resources and facilities and to prevent environmental pollution

5	Law For Establishment of Oceanography Supreme Council	August 11, 1991	Single Article	Whereby to promote knowledge, achieve a principled policy and to coordinate national and international activities related to valuable resources of the Persian Gulf, Oman Sea and Caspian Sea, the “Iranian Supreme Council of Oceanography” is to be founded.
6	Water Pollution Prevention Bylaw	May 8, 1992	2, 3, 4, 5, 6, 7 and 8	Whereby any activities that cause water pollution are forbidden.
7	Regulations for Construction and Use of Facilities in the Continental Shelf and Iranian Exclusive Economic Zone of the Persian Gulf and Oman Sea	December 19, 1978	2, 10, 12, 13 and 14	Whereby while proper supervision and planning in the Construction and Use of Facilities in the Continental Shelf and Iranian Exclusive Economic Zone of the Persian Gulf and Oman Sea

8	Bylaw for Conducting Manner of Scientific Researches In Marine Areas of the Islamic Republic of Iran in the Persian Gulf And Oman Sea	May 5, 1998	2-10	Whereby establishment and use of all installations, artificial islands, floating facilities or equipment for scientific research in Iranian marine areas must obtain prior approval and be conducted under the government's announced conditions.
9	Laws and regulations by the Ports and Maritime Organization	1969	3	Whereby any construction in riparian zones without permission of the Ports and Maritime Organization is forbidden.

Moreover, whatever is mentioned in Table 4, the most essential rules in Iran emphasizing environmental protection are as follows:

- The 50th principle of the Islamic Republic of Iran Constitution states, “In the Islamic Republic of Iran, conservation of the environment where the present and coming generations should continue a growing social life is considered a public duty. Therefore, economic and other activities which may be followed by the irreparable pollution or destruction of the environment shall be prohibited”.
- Environmental Protection and improvement Regulation approved in 1975
- Conservation Law of Sea and Border Rivers from Being Contaminated by Petroleum approved in 1976
- Law for Proper Use of Water Resources approved in 1982

- Water Pollution Prevention Bylaw 1992
- Third Economic, Social and Cultural Development Plan Act of the Islamic Republic of Iran was approved in 2000.
- Law on Environmental Protection and Development approved in 1991
- Protection Law against natural, environmental damages approved in 1991
- Environment Bylaw approved in 2000

OUTCOMES AND RECOMMENDATIONS

Due to the increasing need of industrial countries, growth in oil and natural gas development activities seems undeniable. Although these activities should be accompanied by environmental conservation and minimal environmental adverse impacts, only a few countries are committed to taking ecological observations. Local governments should also have a clear understanding of the exploration and production operations as well as their environmental impacts. Accordingly, the activities of governments and companies should be complementary and lead to a practical, economic, and environment-friendly approach. Although adequate international and regional convection colls on oil and industrial activities, the contaminating polluting trend of Assaluyeh reveals the need to revise existing laws and rethink the effective implementation procedure of the statutes by authorised organisations and management structures.

In the end, the authors have some recommendations to overcome the shortcomings of the international convention on oil and industrial pollution control in the Persian Gulf and Oman Sea:

- Establishing an international and coherent control regime to control oil contamination;
- Considering that the International Regime on Liability and Compensation for Oil Pollution Damage deals with unstable oil compounds, it is highly recommended to consider oil leaks from the fuel tank of empty ships;
- Compiling instructions by the UN or IMO on how to compensate

damages caused by war and obligating the blamed country to make certain payments; and

- Strengthening conventions for implementing the nationally approved regulations and more observation of international organisations such as UNEP.

In connection with overcoming the shortcomings in the domestic law of countries bordering the Persian Gulf and Oman Sea associated with oil contamination, the following suggestions are provided below. Particularly in the case of controlling the contamination resulting from activities over the Countries bordering the Persian Gulf and Oman Sea, there should be strict, detailed and specific assignments to the oil companies with imposing national laws. Such a system can cover the followings:

- Sufficient information reported to the governments;
- Continuous monitoring and providing technical standards and implementation of the obligations with a solemn guarantee;
- At national levels, special attention should be paid to oil pollution from shipping in the Persian Gulf. To this end, countries that have not approved any federal laws on the prevention of sea pollution from shipping should do so with the adoption of uniform standards from the Oil Pollution Treaty of 1954 and its amendments in 1969;
- Strengthen existing regulations on national manoeuvring of personnel for disaster preparedness;
- Increasing the country's southern oil terminals in case of oil waste reception centres;
- Public awareness of the values of the southern coasts as a national wealth to protect them against oil pollution;
- Foundation of non-governmental organisations and the private sector to take action during the incident, promptly improving the existing check and inspection systems;
- Required facilities to receive water balance at oil terminal by relevant organisations, including the Ministry of Oil and Ports and Shipping Organization; and
- Providing plans on investigating the effects of pollution in the

Persian Gulf by the relevant organisations.

In general, the feedback from oil and industrial activities and their environmental effects are extensive, complex, and increasing, so solving the consequent problems is impossible.

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