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PROPOSAL FOR THE MARINE ENVIRONMENTAL PROTECTION OF THE COAST OF MOROCCO: LEGAL AND INSTITUTIONAL ASPECTS

By

EL AMINE ABDELGHNI
Kingdom of Morocco

A dissertation submitted to the World Maritime University in partial fulfilment of the requirements for the award of the degree

MASTER OF SCIENCE

in

GENERAL MARITIME ADMINISTRATION

1993
DECLARATION

I certify that all material in this dissertation which is not my own work has been identified and that no material is included for which a degree has been previously conferred upon me.

The contents of this dissertation reflect my personal views and are not necessarily endorsed by the University.

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To my Parents,

I want to say thank you for teaching me and guiding me through all my years of childhood.

Your guidance has helped me to choose right from wrong and made me more confident and secure person.

I have got the best of you, and I want you to know that I couldn't have had better parents.

I will always be in love with you.
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E.A
ABSTRACT

The geographical location of Morocco and the heavy traffic of tankers along its Mediterranean and Atlantic coasts, make the country's marine environment vulnerable to the threat of pollution. In addition, there are various industries located along the coast that generate wastes, most of which are released into the sea.

Therefore, one can question whether there is any national policy aimed at providing the nation's marine environment with adequate protection.

In recent years, increased public awareness of marine pollution in Morocco and its consequences has resulted in the development of various measures aimed at marine environment protection. However, the existing legal system and institutional framework do not provide the required protection to the Moroccan marine environment which is one of the cornerstones for the country's economy.

The dissertation addresses this issue by analyzing the current situation, and making some recommendations for improvement.

In the first chapter, the writer describes the marine environment in Morocco, providing an overview of the activities related to it and highlighting its role in the country's economy. The second chapter documents the threat to this environment from both ship-sources and land-based sources of pollution by studying some recent cases of pollution in Moroccan waters.

The third chapter analyzes the current legal framework with regard to the protection of the marine environment in Morocco, and includes an evaluation of some new regulations.
in the matter. In the fourth chapter the author evaluates the existing institutional framework, highlighting the role of non-governmental organizations in promoting public awareness about the marine environment.

The fifth chapter describes the Canadian approach to the protection of the marine environment, suggesting that the Canadian legislation and practices may serve as guidelines for the improvement of the situation in Morocco. This chapter also underlines the importance of regional co-operation in the protection of the marine environment, with emphasis on the Barcelona and Lisbon Conventions. The last chapter presents some recommendations for the adoption of a rational approach to the management of the marine environment based on the relevant legislation and practices of other countries and on regional co-operation.
ABBREVIATIONS

BRPM : Bureau des Recherches et de Participation Minieres.
CCG : Canadian Coast Guard.
COPACE : Comité des Pêches pour l'Atlantique Centre Est.
CP : Civil Protection.
CSA : Canada Shipping Act.
DH : Dirham.
EEC : European Economic Community.
EEZ : Exclusive Economic Zone.
ELSA : Emergency Level Scale-Procedure.
GESAMP : Joint Group of Experts on the Scientific Aspects of Marine Pollution.
IFP : Institut Francais du Petrole.
IFREMER : Institut Francais de Recherche et d'Exploitation de la Mer.
IHO : International Health Organization.
ILO : International Labour Organization.
IMO : International Maritime Organization.
LBSP : Land-Based source of Pollution.
MARAD : Maritime Administration.
MMD : Merchant Marine Directorate.
MOFMM : Ministry of Ocean Fisheries and Merchant Marine.
MPH : Ministry of Public Health.
NGO : Non-Governmental Organization.
ODEP : Office d'Exploitation des Ports.
OILPOL : Oil Pollution.
OPA '90 : Oil Pollution Act 1990.
PNUD : Programme Des Nations Unies Pour le Developpement.
POB : Port Operating Board.
ppm : parts per million.
ppm : parts per million.
PPOs : Pollution Prevention Officers.
RN : Royal Navy.
SDR : Special Drawing Right.
SOPF : Ship-Source Pollution Fund.
VTS : Vessel Traffic System.
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Royaume du Maroc
CHAPTER ONE

DESCRIPTION OF THE MARINE ENVIRONMENT IN MOROCCO

1.1- INTRODUCTION

It is crucial to start this study with an overview of the Moroccan marine environment for two reasons:

a) To justify why it is important to establish an adequate legal and institutional framework to protect it;
b) To familiarize the reader with this topic, and raise his level of concern.

Located in the extreme northwest of the African continent, between 21st and 26th latitude North, and 1st and 27th longitude west, Morocco has a privileged position as a bridge between Europe and the Arab and African regions. Morocco is bordered in the north by the Mediterranean Sea; in the south by Mauritania; in the east by Algeria; and in the west the Atlantic Ocean.

Morocco is a country strongly oriented towards maritime activities, since it has the distinction of being the only African country to be bordered by the two seas mentioned above. This gives the country a 3500 km coastline, extending from the Mediterranean Sea in the north to the Atlantic Ocean in the south, which makes it the longest coastline among all (COPACE) countries (Centre East Atlantic Fishing Committee).

This geographical location favors maritime activities in the country, whose maritime tradition that has continued under different dynasties. This can be illustrated by the fact that until 1830 the Minister of Foreign Affairs was
called "Visir Al Bahr" which means the minister of the sea

1.1.1- MEDITERRANEAN SEA

This semi-enclosed sea, lying between Europe, Asia and Africa, covers about 2.5 million km² with an average depth of about 1.5 km and a volume of 3.7 million km³.

This sea is connected to the Atlantic Ocean by the Strait of Gibraltar. The maximum length of the Mediterranean Sea from Gibraltar to Syria is about 3,600 km. One third of the world's maritime traffic passes through this sea, and 1% of the oil transported in this sea is released into it. (1)

Eighteen countries are located along the Mediterranean coast, with more than 300 million inhabitants and 150 coastal cities. This generates considerable quantities of domestic pollution that is dumped into the sea, most of the time without any treatment or recycling. These factors are seen to be major reasons why this sea has lost 50% of its marine life. (2) This is seen to be very significant considering the long turnover time for the exchange of Mediterranean waters (roughly 80 years).

Morocco has a Mediterranean coast of 500 km, where fishing activities are conducted through the four main ports in the region. In addition, some aquacultural activities and fish industry processing factories are located along this coast.

The threat of pollution to Morocco's Mediterranean coast is varied: the River Moulouya, which flows 560 km northeast from the Atlas mountains to the Mediterranean Sea carries with it domestic wastes from the population that lives nearby. The neighboring country Algeria, which produces 64 million m³ of gas, and 1 million barrels of oil, exports
100% of those products via the Mediterranean Sea.

The shipborne pollution threat is increased by the roughly 56,000 ships which cross the Mediterranean annually, (3) of which about 5,000 are tankers of more than 100,000 dwt, that sail within 2 to 4 kilometers of Moroccan and Spanish coasts. 500,000 tons of oil plus 400,000 tons of chemicals pass daily along this coast. The threat is documented by the number and regularity of accidents that happened between 1977 and 1990. In this period, 137 accidents took place in the Mediterranean, 53% of them generating pollution (see Table 1.1). In addition to that, during the years 1980 - 1990, 143,500 tons of oil products were dumped into it from routine discharges or accidents. (4)

1.1.2 - The ATLANTIC OCEAN

Extending for 2950 km from Tanger to Laghouira, the Moroccan Atlantic coast seems to be less threatened by oil pollution since vessel traffic is more concentrated in the Mediterranean Sea. Still, a very significant amount of oil passes through these waters. About 200,000 tons per day are transported along the Moroccan Atlantic coast, which is the most productive for Moroccan fisheries. (5)

A number of Moroccan rivers flow generally northwestward to the Atlantic Ocean, including the Oum Errebia, Sebou, Bou Regrag, Tensift, Draa, and Sous.

Recent studies have shown that currents bring waste from the Canary Islands, Madeira Islands, Portugal, and the Azores Islands to the West African coast, including the coast of Morocco. This adds to the polluted waters coming from the Mediterranean Sea, since the volume of water
Table 1.1 shows the accidents which took place in the coast of Morocco between 1979 and 1990.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>04-03-79</td>
<td>Lat:36,06 N, Long:5,21 W (NE pt Europa - Gibraltar) runs aground &quot;Grey Hunter&quot; carrying 117,400 tons &quot;Arabian light&quot; - 770 tons spilled</td>
<td></td>
</tr>
<tr>
<td>11-08-82</td>
<td>Lat:33,43 N, Long:7,20 W (Mohammedia) runs aground &quot;Samir&quot; carrying 22,000 tons crude oil - no spill</td>
<td></td>
</tr>
<tr>
<td>26-05-85</td>
<td>Lat:36,08 N, Long:5,27 W (Algeciras - Spain) Fire/explosion &quot;Componavia/Petragen One&quot; - 99 tons fuel oil spilled</td>
<td></td>
</tr>
<tr>
<td>19-05-87</td>
<td>Mohammedia Harbour, pollution by the tanker &quot;Kriti Sea&quot; 4 oil slicks of 10,000 square meters</td>
<td></td>
</tr>
<tr>
<td>18-12-87</td>
<td>Lat:36,07 N, Long:5,26 W (Algeciras, Spain) collision &quot;Gokova/Spica&quot; no spill</td>
<td></td>
</tr>
<tr>
<td>19-12-89</td>
<td>Lat:34,35 N, Long:10,00 W. Fire/explosion &quot;Khark 5&quot; carrying 284,000 tons of crude oil &quot;Iranian heavy&quot; 90,000 tons spilled</td>
<td></td>
</tr>
<tr>
<td>14-01-90</td>
<td>Risk of pollution due to the Wreck of the cargo vessel &quot;Mariwood&quot; along Essaouira Coast.</td>
<td></td>
</tr>
<tr>
<td>24-01-90</td>
<td>Oil slick in the port of Agadir, due to the leakage of 78 tons of fuel oil from a pipe.</td>
<td></td>
</tr>
<tr>
<td>08-06-90</td>
<td>Lat:35,53 N, Long:5,57 W (Stright Gibraltor) collision LPG &quot;Hesperus&quot;carrying 35,000 tons of fuel oil and the &quot;Sea Spirit&quot; carrying 35,000 tons of chemical products. 12,000 tons of fuel oil spilled</td>
<td></td>
</tr>
<tr>
<td>05-11-90</td>
<td>Lat:35,55 N, Long:5,29 W (along Cap Cires) name unknown, oil pollution, oil slick 0,01 Km2</td>
<td></td>
</tr>
</tbody>
</table>

Source: MPMMM
crossing the Gibraltar Strait is estimated at 31,000 km$^3$ per year coming in and 29,000 km going out. The threats to the Moroccan coast are varied, including the discharge of deballasted waters from oil tankers related to the non-existence of reception facilities in most ports, and land-based pollution coming from rivers, population centers and industry.

1.1.3- MAIN PORTS

In discussing the protection of the marine environment, it is important to mention the role of ports either in polluting or preventing pollution, since all ships have one destination, namely a port facility. That generates a dense traffic in Moroccan ports. The quantity of goods coming to Moroccan ports in 1992 was 40.3 million tons of which 9.2 million tons were oil.(6) This paper will give an overview of the main ports in Morocco, in order to establish a link between the ports and the threat of pollution to the marine environment from ships calling at these ports.

There are ten major ports in Morocco in addition to other small ports. (see Figure 1.2) Most of the large ports are located along the Atlantic coast and the major goods handled include phosphate, sulphur, ammonia, triple super phosphate, phosphoric acids, citrus, fruit and vegetables. In addition, there are 5,800,000 tons of heavy oil and 660,000 tons of chemical products which disembark in Moroccan ports each year, while 1,700,000 tons phosphoric acid and 50,000 tons of refined oil products are exported from Moroccan ports annually.(7)

Since the beginning of 1985 the major ports have been under the authority of the Ports Exploitation Office (ODEP), which implemented a strategy of modernization of the ports
Figure: 1.2 Moroccan major ports.

Source: MPMMM
equipment and facilities. The two largest ports, which handle the majority of goods coming to or leaving Morocco, are the port of Casablanca and the port of Mohammadia.

a) Port of Casablanca

As mentioned, the vessel traffic in a port can represent a potential threat of pollution. The port of Casablanca is the largest in size and in the volume of goods handled. That, of course, generates a large number of ships moving around this port carrying all kinds of goods, including oil and some chemicals.

The port is located on the Atlantic coast of Morocco, and is the main platform for Moroccan foreign exchange. (see Figure 1.3). It plays an important role in the country's economy due to its location. Statistics show that it handles about 42% of the cargos leaving the country. (8)

There are 656 fishing vessels registered in this port, including both coastal and deep sea fishing vessels. To meet the needs for handling the huge quantity of cargo which passes through this port, the infrastructure is constantly being expanded. A Vessel Traffic System was established to help control the traffic in the area of the port. This port has also a special berth for tankers, isolated from the other berths, which can receive tankers with 30,000 dwt.

At this point it is significant to mention that the vicinity of the port itself is polluted by the sewage and the garbage which ships dump into the port waters while docking. This is a problem for the port authority which does not know the ship source of that pollution since they do not have a pollution control system in the area of the port.
b) Port of Mohammadia

Its specialization in oil imports, and the location of a considerable number of refineries in the area, in addition to the transshipment of oil to other ports after being refined, all these factors make the port of Mohammadia vulnerable to the risk of pollution. This port is also located in the Atlantic coast, 23 km north of Casablanca. (see Figure 1.4) The total cargo handled by the port represents 12% of all cargo handled in Moroccan ports. It is devoted to the reception of heavy oil for refining and redistribution through the Refinery Samir. This port is equipped with 3 sea-lines and 3 oil stations inside the port area, and can receive oil tankers between 100,000 and 120,000 dwt. (9) In 1992 it received 6.2 million tons of oil for refining and redistributing for other ports. (10)

Since Morocco does not have an oil industry, the country imports all its requirements of this vital product. The strong demand for oil within the country results in the importation of more than 8 million/T per year, which must be transshipped from this port to the other Moroccan ports for further distribution.

It should be emphasized that while the average age of the world tankship fleet is 14 years, "the average age is much greater in some areas of the world, especially in developing countries. Many tankers used in Moroccan waters are more than 20 years old. Yet they are still carrying oil, posing a greater risk every day to the country's marine environment. Can one be allowed some legal fantasies to wonder if the passage of an old oil tanker in the territorial waters can really be considered as innocent passage as specified by UNCLOS 1982?"
Figure: 1.3 Port of Casablanca

Source: MFMMM
Figure 1.4: Port of Mohammadia

Source: MPM MM
1.1.4- SHIPPING AND FISHING IN MOROCCO

There is no doubt that ships are one of the main sources of pollution. Therefore, as it was pointed out before the more ships the country has, the more the risk of pollution increases. One has to look not only at the risk of accidents which may occur but also at the routine discharges which, in the absence of serious control, take place in the territorial waters, especially while there still is a scarcity of reception facilities. Fishing vessels in Morocco are also a serious source of pollution. They generate wastes which are in most cases dumped within port areas.

As mentioned above, the geographical location of the country and the long coasts give Morocco a natural orientation to the sea. Shipping in the country dates from the Almohades Dynasty in the 11th century, when Morocco had 400 ships: 100 based at Mediterranean ports, 100 at Atlantic ports and the rest spread between Algeria and Tunisia. (11) Fishing activities started during the 16th century, when Moroccan waters started to attract the attention of Europeans. Today the overall shipping and fishing activities in the Morocco are characterized by the following:

a) Merchant Navy

Morocco has been involved in merchant commercial shipping for many centuries (since the 11th century), and has maintained its tradition as an active country in international shipping activities. This is illustrated by the tonnage carried by the Moroccan national fleet (e.g. 6 million tons in 1991), and by the 22 private shipping companies that have about 60 ships with a total of 511,769 dwt which carry about 52% of the cargo from and to
b) Deep sea fishing vessels

There are 452 vessels with a tonnage of 150,416.90 dwt. (13) This fleet operates within the Moroccan Economic Exclusive Zone, with an annual catch of 147,836 tons (1991). In addition to the Moroccan fleet, 800 EEC fishing vessels are fishing in Moroccan waters in keeping with the fishing agreement between Morocco and the EEC. The catches of deep sea fishing vessels are mainly export oriented, which brings to the treasury a considerable amount of hard currency (4.22 million Dirhams in 1991) in addition to the revenues from fishing agreements and fishing licences.

c) Coastal fishing vessels

This fleet is composed of about 2462 vessels, with a tonnage of 69,292.09 dwt. (14) It operates predominantly within the limits of Moroccan territorial waters and it is the main supplier of fish products to the local market. Since the fishing fleet is largely obsolescent, there is now a policy to modernize it. Fishermen can benefit from a "law of investment" which gives them certain advantages that encourages them to renew their old vessels. (15)

1.2- MARINE RESOURCES

For a country like Morocco that depends heavily on sea resources, both on the national and international levels (fishing agreements) it is compulsory to have adequate protection of the marine environment, which is not only the source of fish but one of employment.

With Morocco's coastline of 3500 km being the largest among COPACE countries, and with an EEZ of 200 miles, the country
is inevitably oriented to the sea, benefitting greatly from the extensive marine resources in the area.

1.2.1- Living Resources

The country's policies, long based on its orientation toward the sea, seek to take advantage of its location between the Atlantic Ocean and the Mediterranean Sea. The West African coast, which extends from Gibraltar to Laghouira, is considered to be one of the richest fisheries of the world.

Taking into account the previous information, a study carried out in 1981 by the Institut Scientifique des Peches Maritimes, in co-operation with the United Nations Food and Agriculture Organization, showed that the total national level of exploitation of Moroccan marine resources is between 1,100,000 and 1,600,000 tons per year.(16)

The country's fish stock consists of pelagic species, which live on the surface above the continental shelf and are estimated at between 600,000 to 1,100,000 tons, depending on the year and hydroclimatic conditions. The benthic species, which are more related to the deep sea, are estimated at 500,000 tons. The total catches of all these species in 1991 were 600,082 tons with a value of 4.22 million Dirhams.(17)

In addition to the natural marine resources, aquaculture contributes with a production of 559.7 tons per year (1991), and seaweed activities account for a production of 7.489 tons per year (1991).

1.2.2- Non-Living Resources

Drilling activities can represent a real threat to the
marine environment. Though Morocco is not an oil producer, the concern about oil industry has always been subject to many discussions. That is the main reason why the writer will like to give an overview on this matter, because before getting involved in this industry one should evaluate the risk of pollution which it may create and prepare the adequate protection measures.

Onshore drilling activities in Morocco have taken place since the end of the Second World War. They were located in the region of Sidi Kacem and the region of Essaouira. (see Figure 1.1). Later drilling activities moved offshore, notably to the deep waters between The Canary Islands and Morocco in the North part of Atlantic Ocean, also to other places where drilling licences were issued to some oil companies in association with the Bureau des Recherches et de Participations Minieres (BRPM). Unfortunately, the exploration operations have not had much success, but they are still being carried on.

The country imports all of the oil it needs for its industries, about 9.2 million tons per year through the main ports Casablanca and Mohammadia. The importation of crude oil for the refineries in Mohammadia and the subsequent transshipment of refined oil to other ports represents a permanent risk for the coastal environment. This risk is exacerbated by the old age of the tankers carrying this oil Most of the time sub-standard ships with an age in excess of 15 years are used.

Another threat to the marine environment comes from phosphate, which is one of the main natural resources in Morocco. It is exported through the port of El Jorf El Asfar on the Atlantic coast, averaging the total exports of 9.14 million tons annually. Morocco also exports a total of 2.12 million tons annually of fertilizers. All of these
products represent a threat to a marine environment that is crucial for the country’s economic well-being. (18)

1.2.3- THE ROLE OF THE SEA IN THE MOROCCAN ECONOMY

The need for a maritime policy to protect the marine environment in Morocco is fundamental, in view of the marine environment’s crucial impact on the country’s economy. It has been seen that sea products play a major role in feeding the nation, since 135,360 tons of sea resources are consumed in the local market annually. This represents 34% of the total catch of the coastal fishing fleet. The rest is allocated for exports to the European Economic Community, Africa, and the Middle East, which generates a total of 5.4 billion Dirhams to the treasury. Fishing also employs a considerable number of fishermen: approximately 150,000 persons are directly or indirectly involved in activities related to this sector. (19)

The Moroccan coasts on the Mediterranean Sea and the Atlantic Ocean provide extensive and beautiful beaches that attract a considerable number of tourists who visit Morocco mainly to enjoy the sun and the beauty of the beaches. Emphasizing its importance is the fact that tourism with earnings of 1 billion USD per year, is the second source of hard currency for the country. In 1992, of the 1.5 million tourists who visited Morocco, 60% spent their holidays on the coast. In addition, 60% to 70% of the local tourists regularly go to coastal cities for their holidays. (20)

Taking into consideration all the threats to this attractive marine environment, a delicate question arises, which is: What if an environmental accident occurs and damages this vital national economic source? Consideration must be given to the effects upon fishermen
who may lose their jobs the hotels which may have to close, the tourists that will not come to a polluted beach, and what all those losses could mean for the country’s economy.

While we cannot prevent accidents from happening, we can at least attempt to reduce their probability and limit their consequences. International conventions have set standards for the protection of the marine environment, many industrial countries have set unilateral requirements for ships calling at their ports.

For developing countries, sometimes the recognition of the importance of the marine environment to their national economy seems unclear, since they neither have ratified the international conventions nor have the means to establish unilateral standards. Being highly dependent on chartering vessels for the carriage of goods to the international markets, the presence of these countries is important. But at the same time this can be viewed as a strong argument for those states to establish an adequate legal and institutional framework for the protection of the marine environment and the provision of adequate response and compensation mechanism for such accidents. How that can be achieved in Morocco is the focus of the following chapters.

1.3- THE MAIN PROBLEMS OF THE MOROCCAN MARINE ENVIRONMENT

The Moroccan marine environment is very vulnerable, since in addition to the number of tankers which pass along Morocco’s coasts, various industries are located along these coasts that generate considerable amounts of waste that are simply dumped into the sea without treatment or recycling. Domestic sewage from urban areas and the hotel industry contributes to the chronic degradation of this environment.
One can question if under the existing situation of the marine environment in Morocco, there is a mechanism for the protection of the latter, bearing in mind the importance of this marine environment for the national economy.

An objective observer could easily say there is a large gap in the legal or institutional protection of the marine environment, since until now there exists no environmental law to protect the 200-mile EEZ. Most regulations are either outdated, too general, or hidden or dispersed in various topical areas. This make them easy to violate, or in most instances simply ignore. In addition a number of international conventions ratified by Morocco have not been incorporated into the national legislation.

Some winds of change have begun to blow these last years, bringing a commendable awareness of the importance of a legal environmental arsenal for the country. The result is that a few projects of environmental laws are either underway or already prepared and when promulgated, will provide vital protection of the environment in general and the marine environment in particular. The second chapter of this paper will treat this subject in more detail.

To be effective, environmental law needs an institutional framework for implementation as well as a national environmental maritime policy. In Morocco one can say there exists fragmented institutional concern for the environment, but without a specific institution in charge of it. Since each department deals with some environmental matters, none of them want to give up these responsibilities to one central entity. This raises the question of who should do what. The third chapter of this paper will attempt to address this issue.
PART IV: CONCLUSIONS

...
CHAPTER TWO

HISTORICAL BACKGROUND OF THE THREAT
TO THE MARINE ENVIRONMENT IN MOROCCO

2.1- BACKGROUND

Oil enters the marine environment through numerous sources. The most conspicuous type of oil pollution is, of course, accidental oil pollution. However, these spills actually make up a very small percentage of the total oil entering the marine environment.

More than half of the oil entering the sea comes from land-based sources. Of the over six million tonnes of oil which enter the ocean each year, only 500,000 tonnes are from shipping accidents. (1) Despite this, much of the focus to date has been on oil coming from ships—largely because of their visibility and the temporary awareness which is created by each major incident.

Land-based sources of pollution can be critical for a country, since most industrial facilities located along a coast and dump their wastes into the sea. However, it seems that this daily pollution does not attract the attention of environmentalists as much as accidental spills. Another very important source of oil pollution, especially in developing countries, may be oil discharged from routine tanker operations, which occurs mainly through the disposal of oil and water mixtures generated during tank cleaning and ballasting operations.

While a single pollution incident has the potential to have a significant and, in some cases, catastrophic impact on
the local environment and local economy, smaller levels of pollution in the form of operational discharges may also have serious long term effects. It should be born in mind that the ocean gives back to the land a little bit of what the latter dumps into it, and unfortunately it is the coast which is the most vulnerable recipient.

2.2- DELIBERATE POLLUTION FROM SHIPS

Ship-generated oil pollution has attracted considerable public attention, but dramatic as it is, the amount of oil discharged is considerably less than the amount discharged into the sea during routine tanker operations.

It has been estimated that in 1989 some 568,800 tons of oil entered the world's oceans as a result of shipping operations. (2) This oil is not spilled accidently or in collisions, but discharged as a part of routine tank cleaning and ballast operations.

Tank washing used to be a major cause of oil pollution from ships, but the pumping of oily water into ports and harbours or in territorial waters has long been prohibited either by national or international legislation. Due to the absence of any pollution control procedures, oily water discharges into the sea generates serious pollution. It has been estimated that 80% of the oil remaining in cargo tanks is discharged into the sea when dirty ballast is discharged. (3)

Morocco is seriously concerned about the two kinds of pollution, since, as mentioned before, the country has coasts on both the Mediterranean Sea and Atlantic Ocean, and is a traffic route for all types of ships mainly tankers. The behavior of most ships that sail not far from the coast represents a threat to the coastal state.
Figure 2.1 Traffic routes for oil
It was mentioned previously that Morocco imports all its demands for oil through the port of Mohammedia. There, this oil is refined and then transhipped to other ports, which means there are several discharging operations with the considerable quantity of oil going to the sea through these operations. (see Table 2.1) In addition to this, diesel fishing vessels contribute to the pollution of the sea this port. Some of these pollutants are even visible in the area of the port, and sometimes along the coast. (4)

2.3- ACCIDENTAL POLLUTION FROM SHIPS

In general terms, the major oil producing countries are not the major consumers of oil products, and therefore a great deal of oil has to be transported by sea. (see Figure 2.1) The increasing use of oil has led to an increase both in the number and, more importantly, in size of tankers. With the increasing number of tankers on the sea more accidents have occurred, and as tankers have gone up in size, so have the quantity of oil spilled. (5) Most of these accidents are the result of human error, a fact no one can dispute.

Maritime transportation has been estimated to contribute only 12% of all the potential pollutants that enter the oceans, (6) and the majority of accidents take place near a coast, e.g. the Braer in 1993. That is why accidental pollution from tankers often has dramatic and sometimes devastating consequences.

Structural failures are closely linked to the age of ships and are likely to increase as the present fleet of super tankers approaches middle and old age. The incidents in 1993 of the Braer, a 17-year old oil tanker, and the Aegean sea, a 19-years old combination, are further evidence of the high rate of incidents among old ships. (7)
### Table 2.1 Oil Traffic in Moroccan Ports

<table>
<thead>
<tr>
<th>Ports</th>
<th>Oil Traffic in Million Tons Import/Export Year 1992</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1992</td>
</tr>
<tr>
<td>Casablanca</td>
<td>0.72</td>
</tr>
<tr>
<td>Mohammedia</td>
<td>6.2</td>
</tr>
<tr>
<td>Jorf Lasfar</td>
<td>0.05</td>
</tr>
<tr>
<td>Tangier</td>
<td>0.14</td>
</tr>
<tr>
<td>Nador</td>
<td>0.16</td>
</tr>
<tr>
<td>Agadir</td>
<td>0.48</td>
</tr>
<tr>
<td>Kenitra</td>
<td>0.09</td>
</tr>
<tr>
<td>Sahara Ports</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Source: MPMMM

### Table 2.2 Tankers Traffic in the Straight of Gibraltar

(Year 1992)

<table>
<thead>
<tr>
<th></th>
<th>Number of Voyages</th>
<th>Capacity DWT in tons</th>
<th>Quantity Transported</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>West-East</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unloading in</td>
<td>427</td>
<td>58911584</td>
<td>54675670</td>
</tr>
<tr>
<td>Mediterranean Ports</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transiting in</td>
<td>3</td>
<td>466879</td>
<td>443535</td>
</tr>
<tr>
<td>Mediterranean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>East-West</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loading in</td>
<td>705</td>
<td>71511192</td>
<td>63314051</td>
</tr>
<tr>
<td>Mediterranean Ports</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transiting in</td>
<td>151</td>
<td>18064642</td>
<td>16976675</td>
</tr>
<tr>
<td>Mediterranean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1286</td>
<td>151954297</td>
<td>135409957</td>
</tr>
</tbody>
</table>

Source: MPMMM
Severe oil pollution resulting from a major accident in the vicinity of a resort is a different matter because of its direct impact on citizens who go to the beach and on the hotel industry, which employs considerable number of people in certain countries, to mention the impact on artisanal fishermen. It may well be beyond the means of the local community to deal with the incident, which generally is treated as a national emergency calling for a national response. This is the case for most developing countries. As most of them have taken no precautions and are not prepared to deal with this kind of disaster, they wait until the accident happens then start calling for help.

There is daily tanker traffic along the Moroccan coasts that represents a major threat to the country's marine environment. (see Table 2.2) This potential threat has been realized twice within a period of nine months, with the accident of the Iranian oil tanker Khark 5 in December 1989, and the Cheprus oil tanker Sea Spirit in August 1990. Because of the importance of the former, the author will try to highlight it in the following paragraph.

2.3.1- THE KHARK 5 ACCIDENT

On 18 December 1989, the Moroccan Atlantic coast was the dramatic scene of a major oil spill. While passing the coast on her way from Iran to Rotterdam, the Khark 5, a 15 years-old Iranian oil supertanker carrying 284,000 tonnes of crude oil, exploded and took fire. The explosion opened a breach of 20 metres width and 10 metres height in the hull. (8) After giving a quick SOS, without giving any details of the position the tanker, the crew left the tanker on fire which had started to lose its cargo of oil.

Since Morocco was not prepared to deal with such an accident, foreign help and expertise were very valuable.
Figure 2.2 Location and movement of oil spill during the khark 5 accident.
The Dutch salvage company SMIT TAK managed to stop the fire following the explosion within one day, but they could not stop the spilling of oil from the hole caused by the explosion. Therefore, from the day the accident happened to the day the danger was put away, some 90,000 tonnes of oil were spilled into the sea along a 500 km stretch of the country's coast, posing a serious threat. That area of the coast has many rich oysterbeds, and it is intensively used for sardine fishing. Furthermore, it is one of the most popular tourist resorts in Morocco, especially the coastal area near Agadir. That part of the coast is also of international importance for wildfowl, particularly migratory birds, and is a breeding place for the pink flamingo. The slick was sometimes 80 to 100 km of the coast of Moulay Bousselham (El Jadida) to casablanca (see Figure 2.2) hopfully, the wind moved it to Azemour, and Jorf Lasfar, where at certain stage the slick was at 37 km from Oualidia.

Two questions may arise at this stage: First, how did Morocco deal with that accident? second, what was the impact of that accident on the Moroccan marine environment and activities related to the sea?

a) To answer the first question, one can say that the country was not prepared to deal with such major accident. Nor did it have a contingency plan for combatting such spill. Therefore, an adhoc National Committee was established to follow up the cleaning operations, while all departments concerned were notified and a specific budget was approved for all necessary actions to support the operations of combatting the spill. (All means used are listed in table 2.3). Due to the generous support of different countries, either in the form of equipment or expertise,
Table 2.3 Means used for combating the pollution of the Iranian Tanker Khark 5, on January 1st, 1990

<table>
<thead>
<tr>
<th></th>
<th>Number of Units</th>
<th>Staff</th>
<th>Task</th>
<th>Place of Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROYAL NAVY</td>
<td></td>
<td></td>
<td>- Surveillance</td>
<td>Casablanca</td>
</tr>
<tr>
<td>-- Patrol craft</td>
<td>7</td>
<td>420</td>
<td>- Establishment of booms</td>
<td>El Jadida</td>
</tr>
<tr>
<td>-- Fregate</td>
<td>1</td>
<td>120</td>
<td></td>
<td>Jorf Lasfar</td>
</tr>
<tr>
<td>-- Zodiac</td>
<td>3</td>
<td>15</td>
<td></td>
<td>Qualidia</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Towing and pushing the tanker far</td>
<td>Safi</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>from the coast</td>
<td></td>
</tr>
<tr>
<td>MERCHANT MARINE &amp; ODEP</td>
<td></td>
<td></td>
<td></td>
<td>Id.</td>
</tr>
<tr>
<td>-- Tugs</td>
<td>7</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-- Private</td>
<td>3</td>
<td>20</td>
<td>Intervention on shore and at sea</td>
<td></td>
</tr>
<tr>
<td>ROYAL MOUNTAID POLICE</td>
<td></td>
<td></td>
<td>Intervention on shore and at sea</td>
<td>Id.</td>
</tr>
<tr>
<td>-- Trush</td>
<td>6</td>
<td>&gt; 200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-- Helicopter</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROYAL AIR FORCE</td>
<td></td>
<td>3</td>
<td>Surveillance of the zone</td>
<td>Rabat-Sale</td>
</tr>
<tr>
<td>-- C 130</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIRE BRIGADE</td>
<td></td>
<td></td>
<td>Surveillance and intervention on</td>
<td>Casablanca</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>shore.</td>
<td>El Jadida</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Jorf Lasfar</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intervention at shore.</td>
<td>Qualidia</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Safi</td>
</tr>
<tr>
<td>-- Permanent staff</td>
<td></td>
<td>1570</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-- Casual staff</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: MPMMM
Morocco managed to overcome this accident, which had greater psychological effect than a physical one.

b) The deleterious effects that oil can have on marine life and organisms in the water column are sometimes not visible. The visible and well-known effects are beach pollution and the death of fish and seabirds due to oiling.

Fortunately, the effect of the Khark 5 was not fatal for the marine environment along the Moroccan coastline. However, it had a noticeable impact on the country’s environment which can be illustrated as follows:

i) The marine environment: an analysis of sediment carried out by the Institute Francais du Petrole (IFP) showed that, in general, there were no signs of important contamination at that time. Some samples taken from the area affected by the spill showed a relative contamination between 6.10 mg/Kg and 16 mg/Kg. (12) But to keep a watch on the evolution of the contamination was recommended at that time.

ii) Marine organisms: samples taken of some species proved that there was a low contamination of fish. Thus analyses carried out by the Institute Francais de Recherche et d’Exploitation de la Mer (IFREMER) and Laboratoire d’Analyse et de Recherche Veterinaire de Casblanca showed a contamination by sediment of the Maquerelle between 0.01mg/Kg and 0.14mg/Kg. (13)

iii) Socio-economic impact: during the period of the spill for and weeks thereafter, coastal fishing fleet were not able to go out fishing, which deprives the freezing of all activities related to the fishing
sector, bearing in mind that the coastal fishing fleet is the main supplier to fish factories and the internal market. The loss incurred was estimated at 31 million DH,(14) but that was not a final figure, because some sectors did not give estimations of their losses because of this accident.

iv) Tourism: tourists prefer beaches that are clean and free from oil, otherwise they stay away or go elsewhere, since tourism is a highly competitive sector. For Morocco, the impact of this accident on the beaches was not similar to that of the Torry Canyon, or Amoco Cadiz incidents. Still, it did have a psychological effect on tourists, who are very sensitive. This was seen in the dramatic decrease in the number of tourists who came to Morocco after the accident. However, the incident occurred a few months before the Gulf War, whose effect on tourism in Arab countries was also very important. Therefore, it was not easy to estimate the real effect of the Khark 5 accident on tourism in Morocco.(15)

2.4- LAND-BASED POLLUTION

Marine waters receive many wastes from point and non-point sources. Land-based pollutants pose a particular threat to the continued use and ecosystem health of estuaries and waters near the shore. This source of pollution was defined by GESAMP in 1987 as "the introduction by man directly or indirectly of substance or energy into the marine environment -including estuaries -which results in such deleterious effects as harm to living resources, hazards to human health, hindrance to marine activities including fishing, impairment of quality of use of sea water and reduction of amenities". Land-based pollutants are a growing threat to the quality of the marine
environment quality.(16)

During the last 50 years, the world community has become increasingly aware of the need to protect the marine environment from pollution. Meanwhile most of the new rules relate to ship-source pollution, which accounts for less than 10 per cent of the total marine pollution.(17)

Only recently has the awareness of land-based source of pollution increased, generating the development of a set of laws and regulations on the protection of the marine environment from this source of pollution which generates 90 per cent of the contaminants introduced by man into the marine environment.(18)

The degradation of the marine environment through land-based sources of pollution (LBS), varies in seriousness and depends on different national and regional situations: sewage, nutrients, synthetics, organic compounds, sediments, litter and plastic, metals, oil/hydrocarbons and polycyclic aromatic hydrocarbons. Many polluting substances originating from LBS are of particular concern to the marine environment, since they exhibit at the same time toxicity, persistence and bioaccumulation in the food chain.

Degradation of the marine environment can also result from a wide range of activities on land. Human settlements, land use, construction of coastal infrastructures, agriculture, forestry, urban development, tourism and industry.

Television has brought oil pollution spills directly into our homes. Because of their visibility, oil spills have stolen the limelight over recent years and blinded the public on the daily spills coming from LBS, which are not
visible—of course—but whose effects on the marine environment are much more serious in the long run, especially in coastal areas. These spills discharges are more insidious: they do not precipitate a quick catastrophe, but bring about a process of slow and steady degradation of the environment.

Although, there are some sets of regulations governing this type of pollution, there is as yet no global convention specifically on the subject. Of the 24 articles on the protection and preservation of the marine environment in UNCLOS 1982, only two articles deal with land-based sources of pollution namely articles 207 and 213:

Article 207: "States shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources, including rivers, estuaries, pipelines and outfall structures, taking into account internationally agreed rules, standards and recommended practices and procedures...."

Article 213: "States shall enforce their laws and regulations adopted in accordance with article 207, and shall adopt laws and regulations and take other measures necessary to implement applicable international rules and standards established through a competent International Organization or diplomatic conference to prevent, reduce and control pollution of the marine environment from land-based sources"\(19\)

LBSP is really an internal stage problem and its effects are more likely to be seen on national coasts. One can say it is more essential to deal with it on a national level, and where appropriate on regional and subregional levels.
What is the situation in Morocco?
Because of the ongoing rapid industrial expansion along the Moroccan coast, the condition of the marine environment is becoming more and more alarming and the effects of the toxic industrial wastes spilled into the sea from land-based activities can easily be seen on the coast.

The sources of LBP are spread out between Safi and Kenitra on the Atlantic coast, where the main industries of the country are located. A look at the map of Morocco shows the multiple pressures put on this area. Located on an extension of 300 km are two third of Morocco’s industrial activities and its main ports. In addition, the population density is the highest in the whole country: the average national density is 30 inhabitants per sq.km, but this figure exceeds 1400 inhabitants per sq.km in Casablanca, and 650 per km in Rabat-Sale.(20)

The reason why most of these factories are located along the coast is the need for sea water in their processing operations, and the need to use the sea for the disposal of waste waters, as this operation seems to be the most inexpensive means of to rid of the polluted waters without any control. In view of the harm that represents to the marine environment, especially in the coastal area which is an important element for tourism and coastal fishing.

In brief, it is easy to see how the coastal zone has been assaulted from all angles by different type of land-based industrial activities. The following paragraphs will focus on the most relevant LBSG which directly affect the marine environment, namely domestic and industrial pollution.

Domestic and Industrial Pollution: A large quantity of domestic and industrial wastes are noticeably disposed of
into the sea, which is the final destination of all this wastes in their toxic state without undergoing any treatment. For example:

a) 100,000 tonnes of oxidable substances are disposed of in the marine environment every year. This pollution is concentrated on the Atlantic coast. (21)

b) Rivers are also assaulted by 68,000 tonnes of oxidable substances every year, (22) especially Oued Sebou, Bouregreg, Oum-Er-Rbia and Moulouya, which are the most affected by this pollution, and which all together represent two thirds (2/3) of the hydraulic potential of Morocco.

Different industries contribute to this drastic pollution, namely:

i) The fishing industry: With all its factories located along the coast near fishing ports, but without any equipment for the treatment of the toxic substances generated from their activities, this industry simply dumps their wastes waters into the sea. Fat, blood and rubbish, in addition to the chlorinated waters used for desinfection and cleaning the amenities and equipments, caustic soda. All these substances are dumped into the sea without any control or awareness about their actions and their consequences on the sea.

ii) The oil industry: This industry also contributes to the coastal zone pollution through effluents produced directly by refineries of the, Societe Cherifienne des Petroles, whose wastes are directly dumped into the river Sebou, making its condition getting worse and worse, as seen in the color of the water in the latter
iii) The phosphate industry: The activities of the companies Maroc Chimie and Maroc Phosphate have a negative impact on the marine environment on the Atlantic coast, especially in the area near Safi where this industry is mainly located, and where there is a considerable stock of sardines. This industry discharges into the sea huge amounts of plaster, which harms not only the coastal environment but also the beaches.

iv) The petrochemical industry: Societe National d'Electrolyse et de Petrochimie releases into the sea around 1020 m³/day of polluting effluents, and one tonne per day of solid wastes.

v) The paper industry: The company Cellulose du Maroc plays an important role in the pollution of the marine environment in the west of Morocco, since its equipment anti pollution is linked to a pipe which dumps all the wasted waters without treatment directly into the sea.

Industrial wastes are in the spotlight nowadays, since the more industrialized the world gets the more the threat to the marine environment increases. This creates the problem of how to manage these industrial wastes.

Although the sea has a great capacity for degrading and ultimately diluting many waste products, the dumping of pollutants beyond certain amounts can adversely affect the marine environment. Meanwhile, one can see the lack of serious concern about the industrial wastes in developing countries. For example, Morocco suffers from a vacuum in this matter, since neither the legislation nor the institutions deal seriously with the problem.
An attempt has been made in this chapter to highlight the potential and existing threat to the Moroccan marine environment, taking into consideration both threats to this environment, ship source and land-based source, the next chapter will examine the national legislative framework, trying to identify weaknesses and strengths, with regard the protection of Moroccan marine environment.
ENDNOTES AND REFERENCES


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7- The Sea, n 105 March/April 1993, p 3.


9- Mme Idrissi Halima, Impact de la Pollution Accidentelle par Hydrocarbure sur le Littoral Marocain, pp 3-4, date unknown.


15- Interview by the writer Ministry of Tourism Morocco, January 1993.

16- GESAMP 1987.


22- Ibid p 65.
CHAPTER THREE

AN ANALYSIS OF THE LEGAL FRAMEWORK FOR
THE PROTECTION OF THE MARINE ENVIRONMENT
WITH EMPHASIS ON THE LIABILITY AND COMPENSATION
FOR DAMAGES

3.1- BACKGROUND

Environmental pollution is one of the major problems of the modern world. As in other fields, developing countries seem less prepared and less equipped to control the pollution within their territories.

The main characteristic of pollution is its international rather than national character. It is very difficult to completely isolate the effects of pollution incidents within the jurisdictional limits of an individual state. Hence, national laws relating to the pollution of the sea have almost always been considered as a part of international law, while international rules and standards are by their nature superior to the national law.

Nevertheless, often states are much more motivated to assure responsibility for the enforcement of their own national legislation. Therefore, the measures and schemes designed by national law are also important.

It is not surprising that article 210 (6), of UNCLOS states that, national laws and regulations shall be "no less effective" in preventing, reducing and controlling pollution of the marine environment by dumping than global rules and standards. Though UNCLOS is not yet in force, many of its requirements have already found their way into national regulations.
Among the primary objectives of this convention is the establishment of a legal order designed to facilitate international communication and promote the peaceful use of seas and oceans, the equitable and efficient utilization of their resources and the protection and preservation of the marine environment.

The provisions of the part xii of the UNCLOS convention, illustrate the first attempt at a legislative response to the problem of the marine pollution. It is the first comprehensive codification of the principles on marine pollution articulated at the 1972 United Nations Conference on the Human Environment (The Stockholm Conference).(1)

Article 192 of the UNCLOS convention states the the fundamental obligations of states in relation to the world’s marine environment: "States have the obligation to protect and preserve the marine environment."

Article 193 of the same convention relates the integration of the national economic interests of states with their obligation to respect the global interest in the protection and preservation of the marine environment: "States have the sovereign right to exploit their natural resources pursuant to their environment policies and in accordance with their duty to protect and preserve the marine environment".

Article 194 (1) invites states to take all necessary measures available for the protection of the marine environment "States are required to take all necessary measures using the best practicable means at their disposal and in accordance with their capabilities".(2)

In addition to the laws and regulations outlined above, for Muslim countries there is an other source of guidance for
the protection of the marine environment, which is their
religion. The principles of Islamic law not only confirm
that the sea is freely available to all, but also imply a
prohibition against polluting or otherwise abusing such a
communal public asset.

It is generally indicated by all sources of traditional
Islamic law that man must use water economically and
protect it from pollution. The same applies to the marine
environment, including coastal wetlands and shallows, which
provide food and shelter for waterfowl, fish, crustaceans
and molluscs and other marine resources, to which many
verses of the Quran refer.

Therefore, it is agreed that marine pollution is prohibited
in Islamic traditional law, whether it is from dumping by
vessels, land-based sources or any other source which
represents a threat to the marine environment.

Despite the traditional Islamic law proscription of
polluting the water, the contemporary Muslim world is in
general very little concerned about the marine pollution at
large. Like other parts of the third world, Muslim
countries do not treat pollution as an issue of great
concern, even if the Traditional Islamic Code can be
successfully utilized to justify the ideological and moral
bases for the protection of the marine environment.

3.2 - THE CURRENT LEGISLATION

One of the mechanisms for the efficient protection of the
marine environment is the legislative framework. Regulation
provides the administration with the necessary
framework within which to operate, defining the scope of
its authority and its powers to implement and enforce
measures for the regulation of maritime matters. But
maritime administrations, also have the task of revising and amending laws and regulations to keep abreast of changes that impact its activities.

The marine environment in Morocco is subject to multiple degradations which threaten its integrity. Although the country has an orientation to the sea (e.g. fishing, tourism) environmental concern in Morocco is very recent. Since environmental awareness started in the 1980s, a spotlight has been put on the existing regulations. The latter are outdated, as most of them were issued during the French colonial period and not revised to follow new developments in the maritime sector. They are not only outdated but also general and full of gaps, which makes it easy to breach them and escape from liability. Also they do not cover all kinds of pollution, and even those sources that are covered are treated in a general way.

All these elements have worked together to make these regulations less practicable, since they are dispersed into various areas and sometimes even look like a puzzle to lawyers, who long for having them all together in a coherent whole. (3) This shows that the quality of the regulations available does not meet the quality required of them, which leads to the conclusion that these regulations do not fulfill their role in the protection of the marine environment.

Another indication of the weakness of these regulations is the lack of an appropriate framework for their implementation. Such a framework should include survey stations, laboratories, research centres, inspections, environmental lawyers, etc. Not only that, but the lack of environmental standards to preserve the quality of the environment, the carelessness of the polluters, and the weak if not lacking influence of environmental
organizations—all these factors mean that these regulations violated, bypassed or simply ignored. This can be proved by the scarcity of disputes where victims of pollution sue the court for compensation for damage caused by pollution incidents.

To give the reader more background knowledge of the understanding of the legal framework, the following paragraphs of this chapter will analyze some of these regulations.

3.2.1—Regulation of the Unhealthy, and Dangerous Establishments (Act of 25 August 1914)

The provisions of this act, which have not been changed since 1933, reflect its outdatedness, since they do not reflect the changes which have happened in the maritime field since then, for example many industries which were not harmful at that time are now sources of threats to the marine environment.

Not only are the provisions of the former act out-date, but they are also neglected and violated, since these establishments can not be created without the previous permission of the Administration. Article 1 of the act states that "the general director of the public works can by a decision suspend either the construction or the exploitation of the abovementioned establishments".(4) In practice many of them are polluting the marine environment by dumping their wastes into the sea, but none of them has been subject to the provisions of this act. If enforced those provisions would require either the closure of the establishments or improvements in the treatment of of their wastes.
3.2.2- Police Measures Applicable to Foreign Ships Anchoring or Circulating in the French Zone of the Cherifien Empire (Act of 14 September 1932)

This act sets up various requirements that foreign ships in Moroccan territorial waters should meet, but in none of these measures is the prevention of pollution or the protection of the marine environment required.

3.2.3- Regulation on Ocean Fisheries (Act of 23 November 1973)

This act which governs ocean fisheries, has three articles concerning pollution from fishing vessels, namely articles 17, 18 and 19.

Article 17 states that: "it is forbidden to hold or use on board fishing vessels any substances or toxic baits that are likely to infect intoxicate or poison fish, molluscs or crustaceans or pollute the water". It is not only forbidden for fishing vessels according to this article, the use of any substance which is likely to harm either fish habitats or degrade or pollute the water, but also they are forbidden to hold on board such substances.

Article 18 states that: "it is forbidden to dump deliberately into sea waters any substances or toxic baits which are likely to infect, intoxicate or poison fish, molluscs or crustaceans or pollute the water". This article treats an other form of pollution, namely deliberate pollution by the dumping of harmful substances into the sea water, the latter is forbidden in all forms.

Article 19 states that: "it is forbidden for owners or those who run factories located along the coast, to spill deliberately into the sea, waters which have been used in
their industries if they are likely to destroy living resources. All new facilities for dumping waste waters, are subject to the prior authorization of the Minister of Ocean Fisheries". (5) This article deals with land-based pollution from industries which dump their wastes into the sea, with all that generate of harm to fish habitats and the water. Therefore, while dumping of waste waters is forbidden for the existing industries, while for the establishment of new facilities, the latters are subject to the previous permission of Ministry of Ocean Fisheries.

Examining the above articles, one can say that this act was courageous to deal clearly with the pollution from fishing vessel, and from land-based factories. Requiring that there be no deliberate discharge of any substance which may have a negative effect on the marine environment in the absence of other similar acts this act can be seen as a leader in this matter.

3.2.4- 200-Mile Exclusive Economic Zone (Act of 8 April 1981)

Although the UNCLOS convention is not in force, some of its principles have been widely used. Morocco, a signatory of that convention, has adopted one of its main principles namely the 200-mile Exclusive Economic Zone.

Article 1 of this act states that "an Exclusive Economic Zone is established above the territorial waters and adjacent to it. This zone is extended over 200 miles, starting from the straight base lines or normal base lines used to measure the width of the territorial sea"

Article 2 states "the Moroccan state has the sovereign rights in this zone for the purpose of exploring and exploiting, conserving and managing natural resources,
living and none-living, in the sea-bed, subsoil and waters superjacent, and with regard to other activities for the economic exploitation and exploration of the zone such as the production of energy from water, currents and winds"
3.3- PERSPECTIVES ON THE FUTURE: SOME NEW BILLS FOR THE PROTECTION OF THE MARINE ENVIRONMENT

Numerous international conventions have attempted to protect the marine environment from pollution and given guidelines to countries in this matter. Without listing all of them, it is compulsory at this stage to mention the most important ones.

The first attempt to prevent pollution from ships was made in 1954 by the International Convention for the Prevention of Pollution of the Sea by Oil (OIL POL 54), which was mainly concerned with the prevention of oil pollution from routine shipping operations.

The International Convention for the Prevention of Pollution from Ships, MARPOL 73/78, came to supersede OIL POL 54. Since the former, which is generally regarded as the most important international treaty ever adopted in the struggle against the pollution of the sea, deals with all forms of marine pollution except the disposal of land generated waste into the sea by dumping, which is governed by the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matters 1972.

At this stage one cannot ignore UNCLOS 1982, especially Part xii, which deals with the protection of the marine environment, and invites states to co-operate on regional, subregional and international levels to deal with pollution.

Last but not least, the Earth Summit held in Rio de Janeiro on June 14, 1992. That was one of the most important conferences attended by both developed and developing countries. This summit came up with Agenda 21, a package of measures designed to provide a comprehensive manual for
addressing the world's environment problems. Chapter 17 of the agenda deals with the protection of the oceans.

Morocco has taken part in all the above mentioned conventions and meetings, which has increased the country's awareness of the protection of the marine environment. This is illustrated by the series of measures taken to protect the marine environment during the last few years. Among these measures there are some new laws for the protection and the preservation of the marine environment. These are analyzed in the following paragraphs.

It is obvious for one to wonder why this chapter devotes a section to analyze some Moroccan new bills, since they are not yet into force. The answer is so simple, a rational environmental policy should aim to solve not only the present problems, but also those environmental problems which may arise in the future. An interim target, therefore, can be chosen to bring environmental problems under control. It should look at problems through a futuristic view. That is why these new bills once adopted will really bring to the country: adequate protection for the coming years.

3.3.1- The New Bill For the Protection and Appreciation of the Environment (1985)

This bill, which is the fruit of Ministry of Interior in Morocco, has a global vision of the environment as a system of interdependent elements. In contrast to the existing legislation, which is disharmonious, it has an integrated approach to the protection of the environment that focuses on both the protection and the appreciation of this environment, which of course will increase the awareness about it.
This bill also fills the existing gap in the field of environmental legislation, since it adopts a definition of the environment in its article 9 "(the environment) is the unity of natural and artificial elements as well as economical and social and cultural factors which favors the existence, transformation and development of environment, living organism and human activities". (7)

This definition makes the concept of the environment relatively clear for lawyers and, more importantly, for judges who have the legal duty to protect the environment. The bill comes also with a new concept which was neglected before, that is prevention. Therefore, the general obligation of prevention is the responsibility of the persons who run the polluting establishments. However, prior to any works that may be harmful to the environment, the administration can require an Impact Study (IS) to evaluate the effects of the project on the environment and plan the remedies.

While this bill governs the environment in general, articles 54-59 of its chapter five deal with the marine environment in particular. This chapter is devoted to the marine resources and maritime areas including the coast. The chapter foresees the rational protection and management of maritime areas and resources under national sovereignty, and establishes legal mechanisms to prevent and combat all acts of omissions likely to impair the quality of water and maritime resource, or harm humans, fauna, flora, and the maritime environment in general. It also deals with the exploitation and the exploration of maritime resources, and with all the necessary measures to prevent and combat pollution. Furthermore, it establishes the necessary criteria for the creation of special protected areas, this is subject to the approval of the relevant authorities.
Chapter 5 of this bill also takes comprehensive approach to the marine environment with the new concepts of the prevention and management. Besides this general law on the protection of the environment, which deals specifically with the marine environment, several other bills are in the air, some of which are in their final stage and may come into effect soon. To avoid any contradiction among all these laws, the drafting commissions have consulted with each other to harmonize their work and come up with modern, practicable and harmonized laws.

The most relevant one to this work is the Maritime Bill (Code Maritime): this intends to replace the Merchant Act and the Merchant Marine Disciplinary and Penal Act of 1919, and also the Ocean Fisheries Act of 1973.

This bill, which covers all kinds of marine pollution, is a new initiative to meet the national and international requirements for the protection of the marine environment. Therefore, the bill includes most internationally accepted principles with regard to the protection of the marine environment, since the drafting commission took into consideration all international and regional conventions in this matter, either ratified by Morocco or not, in addition to some foreign regulations. Which this gives the act a global spirit, placing it above national frontiers.

3.3.2- Maritime Bill (The Protection of the Marine Environment Bill)

This bill by tradition consists of general provisions principles, obligations and different definitions. The idea behind the definitions is to avoid any confusion or misinterpretation of the wording used in this act. Most of them are inspired by international conventions, e.g. the definition of pollution is almost the same as the one in
article 1 paragraph 4 in UNCLOS 1982. Article 1/23 of the bill states that pollution is "the introduction by man directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources, to marine fauna and flora; hazards to human health; hindrances to marine activities, including fishing, port and coastal activities and other legitimate uses of the sea; impairment of quality of sea water with regard to its use, and reduction of amenities".

This definition is general: it covers all aspects of pollution which may affect the marine environment, and it does not allow any possibility of misinterpretation or misunderstanding.

The provisions of the bill apply to all types of ships, e.g. nuclear ships, oil tankers, ships carrying dangerous goods, noxious or nuclear substances, etc. The only ships that are exempted from the disposition of this bill, warships and ships owned by the state. Meanwhile, these vessels do have the obligation of not polluting the sea during their innocent passage in the territorial waters (as stipulated in articles 2, 39).

Articles 4 to 13 list all of obligations ships should comply with. For example while they are passing through territorial waters, they have the obligation to carry an insurance certificate for the risk of pollution, and the obligation to notify the administration of any incident likely to generate any risk of pollution. All these provisions aim to prevent and combat pollution. The obligation of the captain to notify the administration of any incident likely to cause pollution is a measure for responding to pollution at the earliest stage, since the first moments in any accident of this kind are crucial.
Meanwhile, there are some peculiar cases where pollution is authorized by the administration, namely the immersion or incineration at sea (articles from 90 to 100). This is again inspired by international conventions, which have increased the role of the coastal states in the control of the marine environment while ships are passing their coasts. In addition to that, prior to any operation of immersion or incineration, there is a need for a previous authorization, and a permanent supervision of the operation is assured by the authority who gives the authorization.

To avoid any risk of pollution, this bill gives the state the right to seize any ship likely to provoke pollution or an accident at sea due to her unseaworthiness. At this stage the state has the right to suspend the right of innocent passage in the territorial waters. This is a very strict measure to keep danger away from the coastline, the area that is vulnerable to the threat of pollution.

This bill also gives the state the right of intervention on the high seas against any ship for the purpose of the prevention or reduction of pollution of the Moroccan maritime zone. This right is also outlined in the International Convention Relating to the Intervention on the High Seas in case of oil pollution casualties (Brussels November 29, 1969). The intervention of the coastal state on the high seas can be extended to the destruction of a wreck which represents a danger to Moroccan maritime waters (Article 109).

Articles 110 to 119 give the jurisdiction in case of pollution in Moroccan waters to the coastal state, which is in this case Morocco. Though this bill includes some sanctions against the polluters, the focus is much more on prevention. Thus, it fixes very high fines as a deterrent element for the polluter, for him to see the
difference between the benefit of polluting the sea deliberately and the fine he has to pay in case he is prosecuted.

3.4 - CIVIL LIABILITY AND COMPENSATION FOR DAMAGES

The oceans are the cradle of life, but they are seriously endangered by the actions of man. The most serious threat is pollution. The 1967 Torrey Canyon disaster demonstrated how much damage a major oil spill could cause. Therefore, damage caused by pollution to the marine environment and to the allied activities should be subject to a law establishing the liability of the polluter and the compensation for damage caused by the pollution.

Compensation for damage caused by oil spills from pollution is governed by two international conventions: the 1969 International Convention on Civil Liability for Oil Pollution Damages (Civil Liability Convention) and the 1971 International Convention on the Establishment of an international Fund for Compensation of oil Pollution Damage (Fund Convention). Both the abovementioned conventions were elaborated under the auspices of the International Maritime Organization (IMO).

The Civil liability Convention governs the liability of a shipowner for damage caused by the escape or discharge of oil from his ship. This convention lays down the principles of strict liability for the shipowner and creates a system of compulsory liability insurance. The ship owner is normally entitled to limit his liability to an amount which is linked to the tonnage of his ship.

Following a meeting of the IMO, the compensation available to the victims of oil spills will be increased. The total payment is currently limited to around £ 54 million. The
initial amount is paid by the shipowner up to a limit of around £ 12 million, the new system will increase the total payment limit to around £ 122 million, with the initial amount now raised to a limit of 14 million Units of Accounts (the Special Drawing Right SDR) of the International Monetary Fund which is currently equivalent to £ 0.91.(8)

Following this over view of the international legal framework with regard to liability and compensation of damage caused by oil, one may ask, Where does Morocco stand in all this framework? the following section will attempt to address this issue.

3.4.1- CIVIL LIABILITY

3.4.1.1- Current Legislation

3.4.1.1.1- Act of Obligations and Contracts 1913

This civil act like most contemporary civil acts, has no specific provisions governing serious damage caused to the environment. Nevertheless, one can mention article 91, which has a modest approach to this matter. The article states that "neighbors have the right to take action against the owners of unhealthy and Dangerous establishments, either for the removal or to make the necessary changes to remove the source of drawback..."

This article gives to those who are affected by pollution the right to ask for the removal of the source of the threat, and the previous authorization from the administration to build the establishment cannot stop this action. Even if this article is somewhat general, it can be applied to the marine environment, especially the coastal areas, where most factories are located. The sectors
which will suffer most in this case are tourism and fishing.

3.4.1.2- NEW BILLS

3.4.1.2.1- The New Bill For the Protection and Appreciation of the Environment (1985)

This bill focuses more extensively on the prevention of pollution, as can be easily seen through the impact study it requires from all establishments likely to be harmful to the environment. However, bearing in mind that we can never reach a 100% level of prevention, there is a section dealing with the liability of the polluter, whether he is the direct or indirect cause of pollution. This is what we call objective liability, which does not take into consideration whether the polluter is at fault, but favors the victims of pollution.

Furthermore, this bill gives individuals the right to require that the Minister in charge carry out an inquiry on the activity of any establishment when they have clear grounds that the pollution generated by that activity affects their health or harm theirs human heritage (in this case the marine environment). If the inquiry results show that there is real damage, the victims can ask for compensation for damages or losses resulting from this pollution.

3.4.1.2.2- Maritime Bill (The Protection of the Marine Environment Bill)

When a case of pollution occurs, the focus is mainly on civil liability and the compensation for damage caused by this pollution. However, it would also seem necessary to outline the new concept of penal liability in this bill.
Unlike the traditional penal rules, where a person is innocent until proven guilty, this bill reverses the situation. In case of immersion or incineration, the burden of the proof is on the author of pollution, who is penally liable. He has to prove that he acquired a previous authorization, and that his action were in line with the requirements of the provisions of this act.

Again, the concept of civil liability is based on objective liability coupled with an indemnity Fund and the obligation to have insurance. It does not necessarily require the acknowledgment of the fault or the infraction of the author of pollution. The "polluter pays" principle finds its application in this matter, since the liability is based on the risk of pollution from the carriage of harmful substances by sea. The person liable in this regard is the carrier or the shipowner.

The liability can also be placed on the carrier who loaded the cargo, when it is based on the dangerous nature of goods carried by sea. All these persons are liable either individually or jointly with the possibility the author in the latter to turn against the originator of pollution damage. The two main aspects of civil liability as regards marine pollution are discussed below.

a) Civil liability for damage caused by oil: this is dealt with in articles 15 to 23, where we can easily read the influence of CLC 1969. The shipowner cannot limit his liability in the case of a nautical error. In this case he has to cover the total damage caused by the error. He has also the obligation to keep on board a certificate of periodic visits and a certificate of prevention of pollution, in addition to a contract with an insurance company or any other financial company which can be held liable for the damage by oil to the
marine environment.

b) Civil Liability for damage by noxious or dangerous substances: in this case the shipowner is liable for the damage caused by noxious or dangerous substances to the marine environment. If the damage is caused by more than one ship at the same time, all shipowners are liable jointly. When the damage caused by a ship carrying noxious substances other than oil is due to a human or intentional error, there is no limitation on liability and the compensation is complete.

The terminal operator who loaded the cargo and the shipowner are jointly liable for the damage. The shipowner has to pay the full compensation, meanwhile, he has the right to sue the carrier who loaded the cargo, if the latter did not tell him about the nature of the substance carried on board. In the case where the carrier who loaded the cargo has deliberately not informed the shipowner, he is the only one liable for the compensation.

3.4.2- COMPENSATION FOR DAMAGE

When dealing with civil liability, some principles of compensation are jointly dealt with, since article 16 requires that the shipowner of tankers carrying more than 2,000 tonnes in bulk have an insurance or other financial policy, covering their liability for damage caused by oil. The shipowner can limit his liability for the compensation. In this case, the total amount for each event is calculated as specified in article 16. Nevertheless, for oil damage, the total limitation of liability calculated in paragraphs (a) and (b) of the previous article cannot exceed 59.7 million counted units. The conversion in Dirhams (national currency) will take
place on the date of the construction of the Fund mentioned in article 20. The base of the parity is established by the National Institute of Emission.

If the amount of compensation exceeds the limitation of liability of the shipowner, the Fund Convention 1971 takes over, since Morocco ratified it in November 9, 1992. Article 66 states that a ship source of pollution damage can be subject to seizure, as well as any other property belonging to the shipowner. Meanwhile, the latter can avoid this procedure by proving the establishment of the Fund mentioned before in article 20, which is constituted by presenting a petition to the competent court, which is:

a) for Moroccan ships, the court of their port of registry;
b) for foreign ships, the court of the nearest port to the place where the accident takes place.

The court distributes the compensation proportionally among the victims who suffered damage from the accident, but the claimants have the right to contest and appeal if they are not satisfied with the compensation distributed to them.

This chapter has examined the existing legislation and the problems it faces due to its being out-dated and widely violated or ignored. At the same time, it has outlined some new bills which once adopted will bring considerable support to the protection of the marine environment.

In conclusion, it is prudent to say that with regard to the environment the winds of change which started blowing in Morocco, have achieved their first goal, and not only the legal framework has benefitted, but the institutional framework as well. The latter, has the responsibility to face this new challenge, and to ensure the implementation of all laws and regulations formulated for the purpose of
the protection of the marine environment. In the final analysis, the most important thing is not to have a mountain of laws and regulations in this matter, but to have an effective institutional framework in charge of the implementation.
ENDNOTES AND REFERENCES


4- Dahir portant réglementation des établissements insalubres, incommodes ou dangereux. (25 Aout 1914).

5- Dahir formant règlement sur la pêche maritime (23 Novembre 1973).

6- Dahir portant promulgation de la loi n 1-81 instituant une zone économique exclusive de 200 milles marins au large des cotes marocaine (8 Avril 19981).

7- Projet de loi sur la protection et la mise en valeur de l'environnement (1985).

8- IMO News n 1 1993 p 1.
CHAPTER FOUR

AN ANALYSIS OF THE INSTITUTIONAL FRAMEWORK
GOVERNING MARINE ENVIRONMENT MATTERS

4.1- THE MARITIME ADMINISTRATION: BACKGROUND

The objective of a maritime administration (MARAD), within the framework of a country's overall maritime activities, is to provide the government with the machinery which would enable it to satisfactorily and efficiently undertake these functions which are embodied within the country’s merchant shipping legislation (i.e. national maritime law). These functions would include the implementation of the requirements of international maritime conventions, and national rules and regulations framed under the authority of the merchant shipping act. (1) Therefore the roles and functions of a MARAD would tend to fall into the following categories:

1) advisory functions;
2) administration functions;
3) regulatory functions; and
4) development / promotional functions.

These functions take the form of:

a) registration of ships;
b) maritime safety;
c) marine personnel;
d) maritime casualty investigation;
e) protection of the marine environment; and
f) management of living and non-living resources. (2)

As indicated by the functions listed above, MARAD has the
duty of the protection of the marine environment. This can be done through an environmental policy, but environmental policy at sea alone has never been really effective. The sea is too big, it does not belong to anybody, and too many ships use it, too. Therefore, it is very difficult to catch polluters in the act. Hence, even if the authorities manage to catch a ship polluting the sea, there is a tedious process through national and international regulations, and ultimately national governments still have to enforce the verdict. (3) That is why the best way to have an adequate system for protecting the marine environment is through an efficient MARAD which will carry out the above mentioned functions, since it is better to prevent than to cure.

What is the current situation in Morocco?

Undoubtedly, managing the marine environment is a hard task which cannot be dealt with separately from all other activities related to it. An effective MARAD must look at this matter with a rational view and try to reach an equilibrium between all interests (economy, ecology, etc). This can be realized through a smooth co-ordination among all the institutions concerned.

Two approaches are on the scene: some countries chose the creation of a ministry in charge of all environmental matters, while others chose the the classic and less expensive situation which consist of spreading the environmental tasks among different existing institutions. (4)

Morocco has chosen the second solution, since the environment is the concern of different departments. This chapter tries to outline the existing practices in this field.
4.2- The MINISTRY OF OCEAN FISHERIES AND MERCHANT MARINE (MOFMM)

The Ministry of Ocean Fisheries and Merchant Marine was created in 1981, and the field of its activities is defined clearly in the Act (Dahir) of its creation, dated on 29 January 1985 and amended 5 December 1990. Therefore, by reading through this act, one will see an outline of the functions of this institution, which are the formulation and implementation of the government's policy in the field of ocean fisheries, fish industry processing, and the merchant marine, and in general to co-ordinate the overall maritime activities.

A breakdown of the activities of this ministry will give us a clear idea about its responsibilities in the protection of the marine environment. Therefore, a glance at the organizational chart of this ministry would be helpful for this breakdown. (see Figure 4.1).

The Ministry consists of a central administration and regional offices (Quartiers Maritimes). At the head of the Ministry is the Minister of OFMM with his Cabinet, and under his authority is the Central Administration which is broken down as follows:

- Secretary General
- General Inspectorate (GI)
- Ocean Fisheries and Aquaculture Directorate (OFAD)
- Fish Industry Processing Directorate (FIPD)
- Merchant Marine Directorate (MMD)
- International Relations, Training and Legal Affairs Directorate (IRTLAD)
- Administrative and General Affairs Division (AGAD)
- Conservation and Maritime Mortgages Service (CMMS)(5)
The regional offices acts as the local maritime authority, and the representative of MOFMM in the maritime region. They are responsible for the control, co-ordination and development of MOFMM activities related to the safety of navigation, fisheries and the combat of coastal pollution. Each is headed by a Regional Deputy of Maritime Affairs.

4.2.1- Merchant Marine Directorate (MMD)

This directorate is in charge of the protection of the marine environment. Its functions, as listed in the act creating MOFMM, are to represent Morocco in international and regional institutions, and to ensure the implementation of international maritime conventions adopted by Morocco related to transport, safety, maritime labour and marine pollution. It also assures, in collaboration with other administrations, the formulation of plans for combatting and preventing marine pollution and the implementation of all regulations related to the protection of the marine environment.

These latter functions are performed by the Service of Prevention and Combatting Pollution, which belongs to the Division of Maritime Navigation and Seamen, one of the three divisions which form the Merchant Marine Directorate. The mandate of the the Service of Prevention and Combatting Pollution comprises:

a) the formulation of national standards;
b) the implementation of international standards;
c) the inspection of Moroccan ships;
d) the survey of foreign ships; and
e) inquiries in case of immersion of oil into the sea without previous authorization.(6)

To undertake its functions, the MMD is supported by a
4.2.2- Maritime Navigation Security Centre (MNSC)

The MNSC headquarter is in Casablanca, with four regional offices in Tangier, Safi, Agadir and Tetouan. The location of this centre in Casablanca is the result of the heavy concentration of maritime activities in the area of Casablanca / Mohammedia. Among other tasks, the centre is in charge of examining and giving opinions on all technical matters related to the safety of life at sea, monitoring health conditions on board ships, checking all certificates and anti-pollution installations, and participating in all operations for the reduction and combat of pollution of the marine environment. All this is done through the provisions of:

- the National Maritime Act (Code Maritime);
- the International Convention for the Safety of Life at Sea, SOLAS 74/78;
- the International Convention for the Prevention of Pollution from Ships, MARPOL 73/78;
- the International Convention on Load Lines, 1966; and
- the ILO Convention Concerning Minimum Standards in Merchant Ships (Convention 147 of 1978).

To carry out its mandate the MNSC has the following equipment:

a) a complete V.H.F radio system, with constant contact not only with ships, but also with the inspectors while they are carrying out inspections;
b) four motorized lifeboats; and
c) three aeroplanes.

After the Khark 5 accident in December 1989, in
collaboration with the government of the Netherlands, this centre is now using a computer network system that provides a new diagnostic tool for assessing the seriousness of accidental pollution of the marine environment. (see Table 4)

**Table 4**-1 Accidents gravity scale description (7)

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<td>Insignificant Spill</td>
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<tr>
<td>1</td>
<td>Minor Accident</td>
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<tr>
<td>2</td>
<td>Medium Accident</td>
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<td>3</td>
<td>Major Accident</td>
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<td>4</td>
<td>Severe Accident</td>
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<td>5</td>
<td>Minor Calamity</td>
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<td>6</td>
<td>Medium Calamity</td>
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<td>7</td>
<td>Major Calamity</td>
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<td>8</td>
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<td>9</td>
<td>Minor Catastrophe</td>
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<tr>
<td>10</td>
<td>Medium Catastrophe</td>
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<td>11</td>
<td>Major Catastrophe</td>
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<tr>
<td>12</td>
<td>Severe Catastrophe</td>
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Source: MNSC

In this approach, attention is given to the hazards of accidental pollutants, the behavior of the substances once released and the potential impact of different pollutants on both the marine environment and users of the sea. This helps in providing a comprehensive and rapid approach to situation analysis in the earlier stages of spill accidents.
which is very important for decision making.

This system, called Emergency Level Scale-Procedure (ELSA), is a scaling procedure including the physical behavior, quantity released, site of release and dangerous aspect to human life as well as to the marine environment (8). The MOFMM is well structured for playing the preliminary role in the protection of the marine environment, meanwhile there is a hidden conflict of jurisdictions, and a lack of coordination among different institutions concerned with the marine environment, since in addition to MOFMM there are some other departments dealing with maritime matters including marine environment protection.

4.3- OTHER DEPARTMENTS INVOLVED IN THE MARINE ENVIRONMENT

4.3.1- The MINISTRY OF PUBLIC WORKS

The involvement of this ministry in maritime matters derives from its authority in the most important ports in Morocco. It has the principal responsibility for port operations, which is exercised through two separate bodies:

a) Ports Directorate-Casablanca and Mohammedia Ports Directorate
b) Ports Operating Board (ODEP)

4.3.1.1- Ports Directorate: Casablanca and Mohammedia Ports Directorate

This body has the duties of:

a) formulating and implementing national port policy;
b) building and improving port infrastructures;
c) maintaining breakwaters and channels in ports;
d) providing water police;
e) carrying out ports management;  
f) maintaining aids to navigation along Moroccan coastline;  
and  
g) controlling and co-ordinating port activities.

4.3.1.2- Ports Operating Board (ODEP)

This body was created in 1984 to meet the changes which had occurred in the world of shipping, especially in the port sector; to promote and effectively co-ordinate Moroccan ports; and to bring them up to international standards. Its Act of establishment, specifies that this entity is an industrial and commercial body under the authority of the Ministry of Public Works. With its General Directorate in Casablancal and some offices at the local level, the Ports Directorate operates the most important ports in Morocco.(9) With regard to its duties as the ports management board and as an industrial and commercial body, the Directorate is in charge of:

a) construction and storage of wharves storage areas, warehouses etc;  
b) management of maritime rail stations, and all maritime public domain;  
c) management of graving docks and other facilities for shipbuilding and ship repair;  
d) services to ships including pilotage, towage, bunkering and supplies;  
e) lighterage, handling, storage and warehousing of goods of all kinds and all types of packaging;  
f) handling of bulk liquids, handling and storage of bulk solides.

ODEP is also involved in the protection of the marine environment, especially in the area of the port. It has 19 tug boats, and 2,000 metres of boom -the only ones
existing for the protection of 3500 km long Moroccan coastline-. All of this modest equipment was used in combating the oil spill caused by the accident of the Iranian Oil Tanker Khark 5 in December 1969, where it participated actively. Currently this ODEP is drafting new bills for the protection of the marine environment which were not available at the stage of writing this dissertation. The introduction of these laws could help in carrying out analyses with regard to other new regulations on the scene.

To conclude, one can say that this board has wide authority over the most important ports in the country. The issue of authority, which is the main point in the implementation of an environmental policy, poses problems if there is one body which formulates the policy another body which is entitled to implement it. Should Morocco ratify MARPOL 73/78, which requires the establishment of reception facilities. In view of the duties of MOFMM as regards the implementation of maritime international conventions, Morocco will have a conflict of jurisdictions between the body which operates the ports, ODEP, and the body which formulates the policy.

4.3.2- The ROYAL NAVY (RN)

In line with its maritime tradition its extensive coastline of 3500 km with an important fisheries potential, its vulnerable marine environment, and its geographical position as a coastal state bordered by an important strait (Gebraltar), Morocco has established an adequate navy which defends the national waters and guarantees Moroccan sovereignty at sea.

In collaboration with other Royal Armed Forces, the Royal Navy is in charge of the following matters:
a) national maritime defense at any time;
b) safeguarding the territorial integrity at sea and along
   the coast;
c) surveillance and protection of national waters
   (territorial waters and EEZ)
d) Safety of maritime traffic in national waters;
e) Coast Guard;
f) Fisheries Police;
g) suppression of customs frauds, control of smuggling at
   sea;
h) surveillance and response to marine pollution;
i) salvage and rescue;
j) scientific research in oceanography, hydrography and
   marine meteorology;
k) representing Morocco abroad.

As can be concluded from the above functions, the RN plays
an important role in maritime matters, notably the
protection of the marine environment. They have the means
to fulfill this duty with the cooperation of the Merchant
Marine Directorate.

The involvement of the RN in the protection of the marine
environment and combatting pollution was illustrated
during the accident of the Iranian Oil Tanker Khark 5,
where they played a crucial role.
After the beginning of the spill, 555 persons from the RN
were mobilized for the tasks of surveillance, placement of
boom and spill treatment. In addition, seven patrol
vessels, one frigate and three zodiacs were fully employed
in the operations from the starting point. (10)

Because of the lack of both technical and financial means
for MOFMM, the RN plays an important role in the protection
of the Moroccan marine environment, and the implementation
of laws and regulations in this regard in national waters. Indeed it is a good tool for the surveillance of Moroccan waters. It should be born in mind that among the duties of this institution is the defense of national waters. Since the marine environment is a part of the national sovereignty, any threat to this environment represents at the same time a threat to the state itself. Therefore, it is necessary to have the RN involved in the protection of the marine environment.

4.3.3- The CIVIL PROTECTION (PC)

The Act (Dahir) that created this institution (30 April 1955), in its article one, defines its duties, and stipulates that this body is in charge of co-ordination and rescue in case of disasters. This article does not mention the marine environment, and a disaster can happen inland as well as at sea. However an oil spill is always a serious disaster and therefore disasters at sea can also fall under the umbrella of this Act. But because of the lack of the appropriate equipment to carry out cleaning operations offshore, the PC only exercises this function along the coast, notably by installing boom in case of oil spills, and assisting with the cleanup operations and waste incineration.(11) It is important to mention that, the PC participated actively in the protection of the coast during the Khark 5 accident, for which it mobilized 1620 persons. (12)

4.3.4- The MINISTRY OF PUBLIC HEALTH (MPH)

The reader may wonder what this ministry has to do with the protection of the marine environment, but if one looks at it through the eyes of the citizens who consume sea resources and go swimming at beaches, one can easily see the close link between the two. In addition, the
contamination of the sea water can bring ecological disorder, when consideration is given to the toxicity of the substances dumped or spilled into it. Morocco has a very important fisheries potential, as well as a tourist potential because of the beaches on both the Mediterranean and Atlantic coasts, where series of hotels and holidays clubs are located especially in Agadir and Tangier with lesser concentrations in Rabat, Casablanca, Tetouan, Alhouceima, Nador and Saidia. To maintain these activities there is a need for a serious monitoring of the coastal area in order to avoid any microbiological contamination.

The National Institute of Hygiene carried out bacteriological control between October 1979 and September 1983 in Capo-Negro (Mediterranean side of Tetouan) -The monitoring was done through an international programme with the International Health Organization IHO and the United Nations Environmental Programme UNEP for the surveillance of the water quality in the Mediterranean, which included all countries bordered by the Mediterranean Sea.(13)

From the analysis, it was concluded that from the bacteriological point of view, the quality of Moroccan marine waters has not been affected and therefore they can be used for recreation purposes. Meanwhile there is a alarming point next to the mouth of Oued Martil, which leads to a well frequented beach. This alarming point is due to the dumping of wastes of the city of Tetouan, but the threat is not very serious since the quality of water in this area is considered "acceptable." 200 meters north of this point, the water quality is found to be "satisfactory." Therefore epidemiological risks are not excluded in the short or long run, which means there is a need to restrict the dumping of wastes in this area, and to start a cleanup operation before the quality of the water becomes critical.(14)
Another project, called project PNUD/UNESCO MOR/90/00, has been underway since 1988 with the aim of establishing a national strategy for the protection of the marine environment and for sustainable development. This project required the following questions which were sent to all departments concerned:

1- Does your department have projects or studies related to the protection of the environment?
2- What are the titles of these studies or projects?
3- What are the objectives outlined by these projects or studies?
4- What are the actions to be taken within these projects or studies related to the protection of the environment?

The answers to these questions, on one hand, will undoubtedly help to broaden and improve the information base concerning the state of the environment; while, on the other hand, they will help in the establishment of a mechanism for continued environmental surveillance. The result which was expected from this project at the starting point was:

a) a national action plan for the environment;
b) a national report on the state of the environment;
c) a regional monograph of the environment;
d) a national laboratory for the environment.

As regards combatting water pollution caused by industrial wastes, MPH has several responsibilities:

a) a project for the analysis and surveillance of domestic and industrial waste waters, and the sites where they are dumped;
b) the establishment of criteria for water quality in the sites which receive these wastes.
c) the establishment of experimental standards for the dumping of domestic and industrial wastes;
d) the establishment -after a period of transition- of standards for dumping domestic and industrial wastes.

In view of the above initiatives, one can say that MPH is seriously involved in the protection of the environment in general and the marine environment in particular. Inspite of the lack of available information at the time of writing this dissertation, the writer can say that there is a greater focus on the Mediterranean Sea, and lesser one on the Atlantic coast.

4.3.5- UNDER SECRETARIAIT OF STATE FOR THE ENVIRONMENT (USSE)

Since the Stockholm Conference in 1972, where the awareness about the environment started to find its way into the government's maritime policy, the environment has been dealt with by different departments, each within the field of its own jurisdiction like a spider net. This has always raised the issue of coordination between all these departments.

The Earth Summit held in Rio de Janiero in June 1992 was a cornerstone for the creation of the above mentioned department, since the latter was created in August 1992, just after the representative of Morocco returned from this summit. Morocco was represented at a high level, as Crown Prince Sidi Mohamed was the head of the Moroccan Delegation.

The USSE, which is under the authority of the Ministry of Interior, was created with the main objective being to give a new spirit of dynamism to the existing environmental policy, and to ensure an efficient co-ordination among all departments involved in environmental matters.
A glance at the organizational chart of the USSE (see figure 4.2) will outline its main duties, which are as follows:

a) co-ordination and promotion
b) evaluation and surveillance
c) management of the environment
d) legislation and regulation
e) awareness, education and training

4.3.5.1- Coordination and Promotion

As mentioned before, the management of the environment during these last decades has been carried out by different departments and therefore co-ordination among them was not effective. The USSE was established to fill this gap and ensure better management of the environment through efficient and well-structured co-ordination on the one hand and a programme of action for the protection of this environment on the other hand.

The promotion role is exercised through the mobilization of all means and capacities available for the protection of the environment and the conservation of natural resources with the efficient participation of all bodies concerned notably ministries and local collectivities.

Among the objectives of USSE, we also find scientific knowledge of the environment. Bearing in mind the international dimension of the environment, a particular attention will be given to international co-operation in order to ensure the contribution and participation of Morocco in all regional and international meetings.
4.3.5.2- Evaluation and Surveillance

It is obvious that scientific knowledge and the acquisition of data on the environment are fundamental bases for decision making and better management. In this matter, USSE is working on some projects relating to the evaluation and surveillance of the environment, namely:

a) Project for a National Strategy for the Protection of the Environment and Sustainable Development: this is in collaboration with UNDP and UNESCO. The objectives of this project are to define a national strategy for the protection of the environment and to establish a mechanism of continued surveillance which will introduce concern for the environment in decision making.

b) The National Laboratory for Studies and Surveillance of Pollution and Harmful Substances: this new institution was created by Morocco with the assistance of the Federal Republic of Germany and the UNDP. Its mission is to meet the need for a scientific tool capable of ensuring the continued evaluation and a permanent surveillance of all kinds of pollution. The duties of this laboratory are mainly the analysis of water, air and soil in order to have a general database, the establishment of national standards governing all pollutants, and the establishment of environmental impact studies (EIS). This laboratory has been functioning since 1992.

4.3.5.3- Management of the Environment

In line with the new vision of the environment, and its integration in the process of sustainable development, an important project for the management of the environment (PGE) was drawn up in collaboration with the World Bank, with the objective of assisting the public and private
sectors in the transfer of technology. The aim is to help them to apply new technology in the field of pollution prevention, reinforcing the institutional and legal framework related to the environment.

4.3.5.4- Legislation and Regulation

As outlined in Chapter Three, Moroccan legislation is fragmented and, in most cases, "dilapidated", which is why it was necessary to rebuild this legislation by elaborating a series of laws and regulations either general or sectorial.

Since the creation of USSE in August 1992, the new bill for protection and the appreciation of the environment has been introduced to the council of the government for its approval, as well as the new maritime bill which was also previously introduced to the latter for approval and from their make their ways to the parliament. Many other new laws are in the drafting stage or even in their last stage, namely the National Water Act, the Industrial Investment Act, the Mining Act, and the National Plan for the Combat of Marine Oil Pollution.

4.3.5.5- Awareness, Education and Training

Different programmes and activities related to environmental matters have started through environmental associations, local collectivities, mass media, specialized bulletins, etc. The objective of all these activities is to contribute to the creation of public awareness about the environment.

There is also an outstanding programme in collaboration with UNESCO and FNUAP aimed at increasing public awareness about the environment and organizing periods of training.
for the personnel involved in environmental matters.

To conclude, one can say that the USSE is an umbrella which co-ordinates all environmental matters and ensures the implementation of the government's strategy in this matter. It is indeed a tool in the hands of the government to fill the gap which existed before, as the National Council for the Environment (CNE), which was created in 1980, did not succeed in fulfilling its task of co-ordination. Its work was limited to giving advice and recommendations through studies and making an annual report on the state of the environment in Morocco. Therefore, the USSE has taken up the challenge to correct the existing situation by unifying efforts towards a national strategy for the protection of the environment.

4.4- THE ROLE OF NON-GOVERNMENTAL ORGANIZATIONS (NGOs) IN THE FIELD OF THE PROTECTION OF THE MARINE ENVIRONMENT

A number of regional and specialized NGOs, have integrated into their programmes, cultural events and activities dealing with the marine environments. These associations are a good partner to the public authorities and local collectivities in the protection of the marine environment.

During the international seminar on Environment, Development and Pollution organized in Morocco by the Inter-Associations Committee for the Environment His Majesty King Hassan II, the king of Morocco, addressed the participants and called on them a National Charter for the Environment. This reflects the hope placed in these associations with regard to safeguarding of the national marine environment, improving education and increasing public awareness. These associations are very numerous, which makes it impractical to mention all of them. However, it would seem very informative to list some of
the most active ones, with a little focus on the one of which the writer is a member. The ones he would like to mention are, the Regional Association for the Socio-Economic Development and the Environment, the Moroccan Association for the Protection of the Environment, the Moroccan Association for the Environmental Law and the Moroccan Association for the Sea.

As was mentioned before the writer became member of the Moroccan Association for the Sea, which was created in October 1989. Its objectives as outlined in Article 3 of its charter the following:

a) to establish links and contacts with all people concerned with the sea in Morocco and abroad;
b) to promote and increase the knowledge of the marine environment in all its aspects;
c) to participate in all efforts for the protection of the marine environment and the safeguarding of the Moroccan maritime natural and cultural heritage;
d) to increase the awareness of the role of the sea and its resources for our country and the perspectives which it offers for the country’s economical and social development;
e) to support studies and research in Mediterranean Sea, and participate in the fulfillment of the objectives of the Action Plan for the Mediterranean Sea.(17)

By reading through Article 3 of the charter of this association, one sees to what extent this association is concerned with the protection and preservation of the national marine environment. During these last years, because of the new winds of awareness about the environment in general and the marine environment in particular, many environmental associations have come to the surface, and some of them are very active. Furthermore, some are in
fact members of drafting commissions for various new laws dealing with the environment, in particular the marine environment.
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CHAPTER FIVE

UNILATERAL AND REGIONAL PERSPECTIVES
FOR INCREASING AND IMPROVING THE PROTECTION
OF THE MARINE ENVIRONMENT

5- BACKGROUND:

Numerous international conventions have establish for states important rights and equally obligations to pursue the protection of the marine environment and its resources. Article 197 of UNCLOS 1982 required that states co-operate on a global or regional basis: "States shall co-operate on a global basis, and as appropriate, on a regional basis, directly or through competent international organization, in formulating and elaborating international rules, standards and recommended practices and procedures consistent with this convention for the protection and preservation of the marine environment, taking into account characteristic regional features". This article is a clear invitation to co-operation on a regional levels to protect the marine environment from pollution either from ships or land-based.(1)

Agenda 21, chapter 17, of UNCED calls for national, subregional, regional and global efforts in dealing with the protection of the marine environment. In paragraph 17.5, it establishes the duty of coastal states to integrate management and sustainable development of coastal areas and marine environment under their national jurisdiction. And in accordance with their policies, priorities and resources, they should commit themselves to preventing reducing and controlling degradation of the marine environment, and to integrating protection of the marine environment with the relevant general
environmental, social, and economic development policies

The worldwide attention which has accompanied the new approach to the protection of the marine environment has received numerous responses, not only at the international level, but also at the national level. Some countries have not only incorporated international standards into their national regulations, but have gone further, dealing with this issue on an unilateral basis, to protect their marine environment, since no matter how international conventions try to give adequate protection to the marine environment, they cannot provide 100% protection. The marine environmental issues are too vast to cover completely; hence in some cases a unilateral approach is welcome.

One of the most recent and obvious examples of this is the United States Oil Pollution Act 1990 (OPA’90), which is one of the strongest measures of unilateral protection of the marine environment. This act has created a lot of discussion because of its tough measures, and has served as a guide for some countries which have included some of its measures in their national regulations, e.g. Canada, whose model will be outlined in the next section.

5.1- UNILATERAL APPROACH TO THE PROTECTION OF THE MARINE ENVIRONMENT. (CANADIAN CASE STUDY)

In the post-TORRY CANYON period, Canada has often been considered a leader in new approaches to marine pollution prevention. This has not always been popular with the shipping industry, but today it is generally acknowledged that the Canadian approach was indicative of the rising world interest in environmental protection. Canadian legislation has often been considered as a model for marine pollution prevention legislation.(2) In this regard, the
choice of Canada as a case study for this paper has two perspectives. Firstly, Canadian legislation and practices related to the protection of the marine environment seem of valuable interest and without any doubt useful in identifying appropriate recommendations and proposals for further improvement of the protection of the marine environment in Morocco. Secondly, the examination of the experience of Canada in this matter, is educative and helpful to see how the work of the draftsmen hand in hand with the work of the administration for the benefit and protection of the marine environment. The aim of this study is not to take the Canadian model and enforce it at home, but to learn from it and thereby help Morocco to save time and efforts.

It is the tradition in most countries after every oil disaster to have a critical view of the existing situation, and look for the weaknesses in the existing system.

In December 1988, the tug Ocean Service struck the tank barge Nestucca off the coast of Washington state (USA), resulting in an 875-tonne oil spill that affected Canada’s west coast. This accident led to growing concern about marine environment and maritime safety in Canada. A Public Review Panel on Tanker Safety and Marine Spills Response Capability was appointed on June 9, 1989 with the mandate to review and evaluate(3):

1- the measures currently in place to ensure the safe movement of oil and chemicals by tankers and tank barge through Canadian waters;
2- Canada’s ability to respond to marine spills of these products;
3- provisions for compensation for damage resulting from spills of oil and chemicals; and
4- Canadian legislation and international conventions which
regulate the movement of vessels transporting oil and chemicals.

The major findings of this panel were as follows

i - The capability to respond effectively to a spill of any significant magnitude did not exist anywhere in Canada.

ii - Each year, based on current levels of tanker traffic Canada can expect over 100 small oil spills, about 10 moderate spills and at least one major spill. A catastrophic spill (over 10,000 tonnes), for which Canada is not prepared, can be expected once every 15 years.

iii - Canada's tanker fleet is old and needs replacement.

iv - Overall, foreign tankers pose a greater threat to the Canadian coast than domestic tankers.

v - The Coast Guard is seriously under-resourced and cannot provide the level of monitoring, inspection and surveillance required to adequately protect Canada's waters.

vi - The Coast Guard's investigative and prosecution efforts are seriously inadequate and do little to deter polluters.

vii - Industry relies inordinately upon the Coast Guard for spill response.

viii - Regional contingency plans are for the most part poorly designed, uncoordinated and untested.

ix - The current international and domestic framework
relevant to prevention, preparedness, liability and compensation need to be overhauled.

In response to the situation outlined above, the abovementioned Panel made 107 recommendations, of which 51 focused on specific local or regional concerns. The writer will examine two aspects of relevance to the topic of this paper, namely the role of the Coast Guard in the prevention of pollution and the legislative framework related to the protection of the marine environment.

As regard the role of the Coast Guard in the prevention of pollution, it was recommended that:

a- The Canadian Coast Guard must be provided with the additional resources it requires to significantly expand its capacity to inspect foreign tankers, and ensure on-board compliance with statutory Manning requirements and schedules.

b- In cooperation with petroleum industry association and terminal companies, the Coast Guard must develop more stringent operating and chartering guidelines for tankers.

c- The Coast Guard must work closely with the chemical industries to develop: training and certification programs for tanker and terminal personnel that emphasize safety and pollution prevention, and design, construction and inspection standards for chemical barges and tankers.

d- To deter polluters, the Coast Guard must deploy three dedicated aircraft, equipped with the latest spill-detection and evidence-gathering technology. To improve its investigative and prosecution capability, the Coast
Guard must deploy additional personnel, appropriate technology and equipment, and designate larger numbers of more rigorously trained Pollution Prevention Officers.

e- The Coast Guard must also issue stricter regulations governing loading, unloading and transfer operations at terminals to reduce the risk of operational spills.

f- To minimize illegal dumping, reception facilities for oily water and other waste must be required at all terminals and their use must be mandatory.

g- A range of navigational aids, such as hydrographic charts, Vessel Traffic Services, buoys, markers and radar coverage must be made available or upgraded in a number of regions.

Regarding the legislative framework, the Panel proposed a number of ways to overhaul the existing regulations and laws governing marine spills. In order to ensure compliance with them, the Panel recommended significantly higher fines for polluters, more generous compensation for victims of spills and more vigorous enforcement and prosecutions. This is intended to oblige the companies to act in environmentally sensitive ways by making the cost of polluting prohibitively and the likelihood of getting caught significantly higher.

5.1.1- Canadian Institutional Framework dealing with the Protection of the Marine Environment

The Pollution Prevention Officer Manual, issued under the authority of the Minister of Transport, sets forth the methods by which the surveillance, reporting, investigating and enforcement of provisions of Part XV of Canada Shipping
Act, "pollution Prevention and Control" are to be accomplished. Under the latter there is a special body dealing with pollution prevention and control.

5.1.1.1- Pollution Prevention Officers (PPOs)

Appointed by the Minister of Transport, their duties and responsibilities depend on the powers conferred on them in the PPO's certificate of designation and on the instructions which may be given, by regional and national authorities. Such duties and responsibilities may include:

a- surveillance of Canadian and adjoining waters from aircraft or ships;

b- co-ordination of the investigation of reported incidents of pollution by ships;

c- boarding of any ship to carry out any inspection that may be necessary to establish that the condition of the ship, its machinery and equipment is in accordance with the requirements of the certificate held on board;

d- boarding of any ship believed on reasonable grounds to be discharging a pollutant;

e- arranging for the taking of samples of polluted water and other evidence from the water;

f- arranging for the analysis of polluted water and samples of oil or any other pollutant;

g- questioning witnesses, or other persons who might have been witnesses, with respect to any incident of pollution;

h- reporting results of investigations to an immediate
supervisor and making recommendations with regard to implementing prosecution action where the investigation involves a non-Canadian ship in, or proceeding to, non-Canadian waters; to submitting details of the investigation to regional authorities for onward transmission to the Coast Guard Ship Safety Branch, Ottawa;

i- directing ships to proceed per the PPO's instructions;

j- declaring an emergency zone if a major spill has occurred or if there is imminent danger of one occurring;

k- In addition whenever a PPO receives a complaint from any ship or otherwise becomes aware that reception facilities at the Canadian ports or terminal are inadequate; the PPO investigates to determine whether or not the facilities are indeed inadequate and what should be, or is being done by the port authorities to correct the situation. Whether the facilities are found to be adequate or inadequate, a report must be submitted to the Director General, Ship Safety. Whenever a PPO is informed by a Canadian ship that reception facilities in a foreign country are inadequate, the PPO should submit a report on the matter to the Director General Ship Safety, which will be forwarded to the port state through External Affairs for investigation and action by that state.

From the above mentioned responsibilities, one can say that the field of action of the PPOs in the prevention of pollution is very wide. Meanwhile, many other agencies and persons are also involved in the protection of the marine environment. It would be useful in this matter to
outline these bodies which are the right hand of the government in the implementation and enforcement of its environmental policy.

5.1.1.2- Canadian Coast Guard (CCG)

The objectives of this civilian body are to ensure the provision of operational policies and programs for the use of the water transportation interests in order to contribute to the safe, efficient and economical conduct of marine activities and to contribute to the protection of the quality of the marine environment in waters under the jurisdiction of the Government of Canada; and, where appropriate, to develop, operate and maintain specific elements of the marine transportation system. This body, which is under the authority of the Ministry of Transport Canada, Ship Safety Service, has in addition to the its headquarters in the former Ministry ten branches in the ten Canadian Coast Guard Regions and Districts. (4)

The primary responsibility of this body is the prevention of pollution of Canadian territorial waters, Arctic waters and fishing zones by ships. The role of the Coast Guard fleet is primarily confined to the surveillance by both ships and aircraft, and the reporting of suspected incidents of pollution to the nearest ship safety office. Due to the location of a pollution incident, or where no other PPO is available, it may be the Coast Guard officers who are appointed as PPOs to carry out an investigation and become involved in the enforcement action, Coast Guard ships and aircraft may also be required to assist other PPOs in carrying out investigations and in enforcement actions.
5.1.1.3- Department of National Defense

Aircraft of the Department of National Defense carry out aerial surveillance covering coastal waters and fishing zones. Where suspected pollution from ships is observed, reports are relayed to the Regional Manager Ship Safety and the incident is reported using pollution violation reports, photographs and sketches. (5)

5.1.1.4- Royal Canadian Mounted Police (RCMP)

Even though members of this body are not appointed as PPOs as in the case of some members of the Coast Guard. They can assist in the protection of the marine environment in Canada in many ways on request from a PPO, such as the serving a summons or executing of a warrant. If a violation involving a foreign ship is encountered by or reported to the RCMP and a PPO is not available, the RCMP conducts an investigation and, if there is enough evidence, proceeds with prosecution. If upon completion of the investigation there is insufficient evidence to prosecute, the circumstances are reported to the nearest office of the Canadian Coast Guard Ship Safety Branch, or to the Headquarters, so that Transport Canada—the Ministry under which is placed CCG—may be advised before the ship departs from Canada. Offences involving Canadian ships are reported to the nearest Canadian Coast Guard Ship Safety Office as soon as possible. (6)

This overview of the Canadian institutional framework for the protection of the marine environment, has outlined the strict measures taken by the administration in this regard, and the responsibility of the PPOs in the implementation and enforcement of national and international laws and regulations adopted by Canada. At this stage it seems of great relevance to highlight some
specifics of Canadian regulations focussing on the points which the author found most of particular interest for Morocco.

5.1.2- Some Aspects of Canadian Legislation Governing the Marine Environment

Even though Canada’s record of implementing and applying international law is lacking (of the 42 international maritime conventions and protocols, Canada has accepted only 18 of these instruments(7)), however, Canadian legislation has often been considered as an excellent model for marine pollution prevention legislation.

The main body of Canada’s legislation with regard the protection of the marine environment is the Canada Shipping Act CSA, Part XV, (Pollution Prevention and Control) and Part XVI, (Civil Liability and Compensation for pollution). To avoid any misinterpretation, this Act in Article 654 gives a clear definition of an operational discharge, which means for the purpose of this act, any discharge of a pollutant from a ship that results, directly or indirectly, in the pollutant entering the water and includes, without limiting the generality of the foregoing, spilling, leaking, pumping, pouring, emitting, emptying and dumping. This definition is very wide and it covers all types of discharges. Therefore, it will be very difficult for the originator of the discharge to prove that his action is legal. The term shipowner was also defined, as sometimes it is easy to escape liability by denying the ownership of ships found guilty. The owner is defined as the person having, for the time being, either by law or by contract, the rights of the owner of the ship as regards its possession and use.

An important point to mention is that the policy of Canada
on the ratification of international conventions is logical, since before ratifying any convention they adapt their national legislation to its provisions, and prepare themselves as well as the industry to meet the requirements outlined in it. This was applicable in the case with MARPOL 73/78, even if, as mentioned to the writer during his 3-week field study research program, that some provisions of the national legislation are tougher than those of that convention, i.e., the discharge of oil in inland waters in Canada is allowed only up to 5 parts per million (ppm), while in MARPOL 73/78 it is 15 ppm.

Having mentioned Canada’s policy on ratifying conventions, it is very important to highlight the proposal of the Canadian Coast Guard to implement the 1989 Salvage Convention and the 1990 Oil Preparedness Response and Cooperation Convention (OPRC). The Coast Guard argued that these amendments intend to improve oil spill prevention, response and control.

Regarding the 1989 salvage convention, the CCG said that, this instrument will serve to modify the "no cure no pay" principle under which the ship and its cargo were the only objects of a salvage operation. For the first time, it will provide compensation to the salvors whose efforts prevent or reduce pollution damage, since the aim is to compensate the salvors if their actions are beneficial to the environment, even if those actions do not lead to the successful recovery of the vessel.(8)

The majority of the proposals to amend the CSA deal with the 1990 OPRC convention. The principal change relate the requirement for vessels and oil handling facilities to carry approved oil pollution emergency plans. These plans will require the implementation of a private sector funded and operated response capability to meet the plan
requirements.(9)

As can be understood from the previous paragraph, Canada also involves industry in the implementation of environmental policy. The CSA also establishes a body of Pollution Prevention Officers (discussed in section 5.1.1.1) This is the tool provided by the Government for implementing the provisions of this act. Strict penalties were established for any contravention of this act. Therefore, any person or ship that discharges a pollutant in contravention of any regulation of this act is guilty of an offence and liable on summary conviction to a fine not exceeding two hundred and fifty thousand dollars.(10)

Where a ship has been charged with an offence under the CSA within thirty days after the making of a the detention order and thirty days after the day on which the ship was charged with the offense, if no one has appeared on behalf of the ship to answer to the charge, and the security of one hundred thousand dollars has not been given, the minister may, after giving reasonable notice, sell the ship and may, by bill of sale, give the purchaser the valid title of the ship free from any mortgage or other claim on the ship that is in existence at time of the sale. This is a very tough measure to avoid any delay in the application of the provisions of the CSA. The offender has to pay for his offence; Otherwise, if he tries to delay the procedure, his ship may be sold with all that means for him in term of losing the ownership of his vessel.(11)

With regard to liability, the owner, as defined in Article 654, is liable for the damage caused by his action, and his liability does not depend on the proof of a fault or negligence. However, he can escape liability if he establishes that the occurrence:
(a) resulted from an act of war, or of any exceptional, inevitable and irresistible character; 
(b) was wholly caused by an act or omission of a third party with intent to cause damage; or 
(c) was wholly caused by the negligence or other wrongful act of any government or other authority responsible for the maintenance of lights or other navigational aids, in the exercise of that function.

In addition to the two international conventions adopted by CSA, namely the the Civil Liability Convention and the Fund Convention, CSA has a Ship-source Oil Pollution Fund. Therefore, a person, other than a public authority in Canada, or a public authority in a state other than Canada that is a party to the Civil Liability Convention -who has suffered loss or damage or incurred costs or expenses in respect of actual or anticipated oil pollution damage, may file a claim with the Administration for such loss, damage, costs or expenses. Also, it is possible to claim for loss of income. This is a protection of fishermen and the fishing industry who derive benefits from the sea, and who will be the first persons to suffer from an oil spill. They may claim against the Ship-source Pollution Fund (S.O.P.F) when the aggregate liability of the aforesaid conventions is exceeded.

The S.O.P.F, which came into force on April 24, 1989, was created by the CSA to succeed the Maritime Pollution Claims Fund (M.P.C.F) which had existed since 1973. The former is a special account established in the accounts of Canada upon which interest is presently credited monthly by the Minister of Finance (about 7.14% per annum). This institution is funded from three sources:

(a) The M.P.C.F. 
(b) Interest payable by the Minister of Finance,
compounded monthly.

(c) A levy: the Minister of Transport has a statutory power to impose a levy of 34.99 cents per metric tonne of "Contributing Oil" imported into or exported from Canada in bulk as cargo on a ship.

The S.O.P.F. is liable to pay claims for oil pollution damage or anticipated damage at any place in Canada or in Canadian waters caused by the discharge of oil from any ship except where the Arctic Waters Pollution Prevention Act applies. This Fund also can be used to pay claims for mystery spills where the author of the spill is unknown.

(12)

To sum up what has been said, one can say that the CSA provides the legislative authority for establishing the anti-pollution programme for shipping, and for protecting Canadian waters from any source of pollution.

After this overview of the provisions of section XV of the CSA dealing with pollution prevention and control, it is important to mention that there are voices asking for the amendment of certain provisions of this act. The author mentioned the proposals of the Coast Guard in this matter, which are a part of Cdn $100 million "green plan" —the Marine Environmental Emergencies Response Strategy—announced by the Canadian Minister of Transport. The goal of this plan is to protect Canada's oceans, coastlines, and inland waters from oil and chemical spills.(13)

The amendments to the CSA proposed under this plan call for the increase of the maximum fine for the illegal discharge of pollutants from $250,000 to $1 million, and give the Canadian courts more leverage in sentencing parties found guilty of oil or chemical spills.
New spill legislation has also been introduced, and may come into force soon. It consists of a new approach to the environmental threat posed by oil spills from tankers. The core of this legislation is to achieve many of the objectives of the US 1990 Oil Pollution Act while staying within the framework of International Maritime Organization conventions. This approach is regarded as a significant compromise between unilaterally protecting the environment from tanker spills and preserving the international framework of the shipping industry.(14)

Canada also has a "polluter pays" approach to spill clean-up and is encouraging the development of private spill response capabilities. But control of a spill remains with the Coast Guard. Regional response capacity and responsibility is also encouraged. Thus, regions should be able to address spills of up to 10,000 tons, while catastrophic spills over 10,000 tons are a national responsibility, in which case the Canadian Coast Guard must automatically assume management of the response and apply the provisions of the national response plan.(15)

It would be useful at this stage to mention the Canada Fisheries Act which deals in its sections 35 to 43 with fish habitat protection and pollution prevention. This act sets some strict requirements for all activities that dump their wastes into the sea. For example any work or undertaking that may result in harmful alteration, disruption or destruction of a fish habitat requires a previous authorization from the competent department. Also subject to previous authorization is the dumping of any quantity of wastes or pollutants under any conditions. Moreover, no person can deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or at any place under any conditions where the deleterious substance may enter any such water.
The Governor in Council in Canada may make regulations determining the deleterious substances authorized the waters and places where deposits are authorized, the quantities or concentrations and conditions required for the deposits, and the person authorized.

In any case, where a person carries on or proposes to carry on any work or undertaking that results in or is likely to result in the alteration, disruption or destruction of a fish habitat, or in the deposit of a deleterious substance in water frequented by fish or in any place where this substance may enter such waters, the person must, on the request of the Minister, or without such request in the manner and circumstances prescribed by regulations, provide the Minister with the plans, studies, schedules, analyses, samples or other information relating to the work or undertaking relating to the water, place or fish habitat that is or is likely to be affected by the work or undertaking. This enables the Minister to determine whether that activity constitutes or would constitute an violation of regulations and what measures, if any, would prevent that result. Based on the information previously mentioned, the Minister, or a person designated by the Minister, may require the modification or addition of any measures, restrict the operation of the work or undertaking, and in some cases order the closing of the latter.(16)

A group of inspectors carries out inspections in all premises and places involved in the previously mentioned activities, and submits reports with their observations to the Minister. In a prosecution for an offence, it is sufficient proof of the offence to establish that it was committed by an employee or agent of the accused, whether or not the employee or agent is identified or has been prosecuted for the offence, unless the accused establishes
that the offence was committed without his knowledge or consent and that he exercised all due diligence to prevent its commission.(17)

The liability in the case of prosecution is absolute, and does not depend on proof of fault or negligence, unless the accused can prove that the occurrence giving rise to the liability was wholly caused by an act of war or of an inevitable and irresistible character, or by an act of omission.(18)

From the above mentioned provisions, it seems clear that Canada's approach to the marine environment, including institutions and legislation is very protective, and sets strict standards and measures for preventing any kind of accidents from happening, either from ship sources or from land-based sources. Since the best way to remedy the problem of pollution is to prevent it from occurring, a comprehensive approach is needed, the study of the previously mentioned frameworks provides a good example of realizing benefits this statement.

5.2- REGIONAL APPROACH TO THE PROTECTION OF THE MARINE ENVIRONMENT, UNEP's REGIONAL SEAS PROGRAMME

The work of the United Nations and its specialized agencies in the field of international maritime law, including marine environment protection, is usually associated with universal codification efforts. Yet, in parallel with this global process, another new body of law to protect the world's oceanic and coastal resources has emerged under the auspices of the United Nations Environment Programme (UNEP) established in 1972. This body of law entitled the Regional Seas Programme, has created eleven different regional programmes aimed at managing the marine
environment.

The regional Seas Programme began in 1974, and currently includes the following regions: the Mediterranean, the Persian (Arabian) Gulf, West and Central Africa, the South-East Pacific, the Wider Caribbean, Eastern Africa, the East Asia Seas, South Asia, the South West Atlantic, the South Pacific, and the Red Sea and the Gulf of Aden. These 11 regions comprise 120 participating coastal marine states and the goal is to link assessment of the marine environment and the causes of its deterioration with programmes designed to facilitate management and development of regional action-oriented programmes and legal agreements. (19)

These programmes are more successful in combating the threat of pollution, since while the focus on the international level has concentrated on the threat of oil, these regional agreements have focused on all harmful substances entering the marine environment. (20) Therefore they allow the international community to focus upon particular problems associated with particular locales.

5.2.1- The Mediterranean, Barcelona Convention 1976

To date, the Mediterranean agreement is an example of how successful a regional action plan can be, (21) as it is the "prototype" convention under U.N.E.P's Regional Seas Programme. The Barcelona convention, which covers the Mediterranean Sea proper, including its gulfs and seas, was adopted in 1976, and entered into force in 1978. Eighteen Mediterranean states are parties to it. (22) The objective of this Convention is to achieve international co-operation for a co-ordinated approach to marine environment protection in the Mediterranean. Therefore state, parties to this Convention should act within its spirit and:

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a) take appropriate measures to prevent and abate pollution from dumping from ships and aircraft or resulting from seabed exploration and exploitation or from land-based sources;

b) co-operate in dealing with pollution emergencies, whatever their cause;

c) co-operate in order to establish pollution monitoring programmes;

d) co-operate in scientific and technical research;

e) co-operate in establishing procedures concerning determination of liability and compensation and adopt the two protocols that entered into force in 1978, namely, the Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft, and the Protocol Concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency.

The first protocol deals with dumping into the Mediterranean Sea. It operates on a permit system whereby there is a list of the substances which are either prohibited, or require a prior permit. The second protocol calls for the establishment of a regional headquarters to co-ordinate response actions in the event of oil spills. In this regard, the Regional Oil Combatting Centre (ROCC), established in Malta in 1976, has expanded its mandate to include spills of toxic chemicals. Furthermore, the Centre has also assisted many coastal states to set up their own national contingency plans to deal with emergencies. (23)

In addition to the abovementioned protocols, there are some
other protocols dealing with other aspects of pollution:

- the Protocol for the Protection of Mediterranean Sea Against Pollution from Land-based Sources adopted in 1980 and entering into force in 1983. The objectives of this protocol are to control pollution caused by discharges from rivers, coastal establishments and from any other land-based sources within the territories of the state party to the Convention, which must establish programmes and standards for regulating such discharges.

- the Protocol Concerning Mediterranean Specially Protected Areas, approved in 1982, calling for states to protect areas of biological interest within their territorial waters.

- the Protocol on Pollution Associated with Seabed Exploration and Exploitation, which is now at an advanced stage of preparation. After adoption of this protocol, the Mediterranean states will have completed most of the legal work envisaged by the Mediterranean Action Plan.

There is also a long-term programme for pollution monitoring and research in the Mediterranean called MEDPOL. It started in 1975, with seven pilot projects, and this has gradually reached a number of 13. As a result of this programme, Mediterranean states have been able to move beyond the evaluation phase and set some concrete standards and guidelines for the region. For instance, work has been done in relation to mercury discharges and the quality of water required for shellfish-growing and bathing. Moreover, at a meeting in Geneva in 1985, the parties agreed on priorities for the period 1985-1995 which included the establishment of sewage treatment plants in all cities with more than 100,000 inhabitants and appropriate outfalls or treatment plants for all towns with
more than 10,000 inhabitants. (24)

It is important to mention that UNEP plays the role of co-ordinator for the whole spectrum of the action plan for the Mediterranean.

What is the role of Morocco in all these schemes? Morocco participated in the negotiations and is signatory to all the previously mentioned instruments, but until now Morocco has not ratified these instruments, despite their usefulness in the protection of the Mediterranean marine environment of Morocco. These instruments can be important to Morocco. Firstly, these programmes establish the ground for the co-operation among Mediterranean states for protecting this vulnerable sea from pollution. Since the existing international conventions with regard to the prevention of pollution do not meet the requirements for protecting this sea, the Barcelona Convention represents an important regional effort which deals with local environmental issues in specific areas. The second reason why the abovementioned instruments can be useful in Morocco's geographical situation, bordered by the straight of Gibraltar, with all the traffic through that waterway and the pollution caused by the movement of vessels which makes the condition of this sea critical, is that, this area is now covered by the convention providing Morocco with a legal basis for the protection of its Mediterranean coast. Because of the large volume of international traffic, national measures alone cannot protect this part of the Moroccan coastline from the permanent risk of pollution. Therefore, co-operation among the states concerned is the right way to deal with this problem and the Barcelona Convention provides the best legal instrument.

Morocco has also proposed the establishment of a fund for
the liability for and reparation of damage resulting from marine environment pollution. There are some benefits which Morocco has already generated from this action plan, such as the establishment of scientific institutions in charge of research and analysis of different pollutants which harm the marine environment. These scientific institutions have benefited from foreign support.

There is also a programme called Technical Assistance for the Protection of the Marine Environment (METAP), which was started in 1988 by the World Bank in collaboration with the European Bank for Investment. The principal objectives of this programme are to provide support to Mediterranean countries in order to formulate an efficient environmental policy for the protection of the marine environment, in particular the reinforcement of the institutions in charge of environmental matters, the establishment of a Fund for the investment in projects in the field of the environment and the elaboration of adequate regulations. In this regard Morocco has already been carrying out an adjustment study for the coastal zone of Martil on the Mediterranean Sea since 1992.(25)

After this overview of the legal protection of the marine environment in the Mediterranean Sea, it is logical to ask what is being done about the Atlantic Coast?

5.2.2- Lisbon Convention 1990

This convention for co-operation in the protection of North-East Atlantic waters from pollution was concluded by E.E.C, Morocco, Portugal and Spain. The principal objective of the Convention is to reinforce and organize co-operation among the signatory countries in case of marine pollution by oil or other harmful substances. Its coverage extends from the north of France to the southern
borders of Morocco.

The Lisbon convention requires of parties that they work in collaboration with the concerned industries for the establishment of a national system for the prevention and combat of pollution from accidents. This involves the availability of the minimum equipment to face the spillage of oil or other harmful substances; and the adoption of a national plan for intervention in case of pollution. Also the countries should encourage training and the exchange of information on:

a) their national capabilities to deal with pollution accidents;
b) any new methods to avoid pollution incidents; and
c) all incidents where any of the countries is involved.

The parties also are required to ask all captains of ships carrying their flags or platforms in their waters to report without delay any incident on board their ship or platform which may generate pollution by oil or other harmful substances.

The parties agreed to take necessary measures to facilitate in case of an accident, the efficient intervention in their territories of the other parties for the purposes of locating the accident, rescuing the survivors, and eventually participating in the combat of pollution.

Centres of contact should be designated for the reception and submission of reports on accidents. Morocco has designated the Ministry of Ocean Fisheries and Merchant Marine as a centre for the reception of the reports on accidents, and the Ministry of the Interior to be in charge of assistance. In addition, within the coverage of this convention, an International Centre for the Combat of
Pollution of the North Atlantic (CAPLIN) was created to assist countries in facing pollution accidents at sea more effectively.

The overview of the Barcelona and Lisbon Conventions confirms that Morocco is theoretically well protected from any threat of pollution, since the Mediterranean coast of Morocco is covered by the former convention and the Atlantic coast by latter. Therefore, Morocco benefits from both conventions to establish an adequate protection to its marine environment on both coasts.
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6- op.cit p 32.


9- Ibid.

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11- Canada Shipping Act, (February 1990), Canada p 347.


13- Op-cit p 1.


15- op.cit p 54.

16- Canadian Fisheries Act, (as at December 31, 1992, Department of justice, canada, p 13.

17- op.cit p 16.

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CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

FOR AN

EFFECTIVE LEGAL AND INSTITUTIONAL PROTECTION OF

THE MARINE ENVIRONMENT IN MOROCCO

This dissertation has dealt with the protection of the marine environment in Morocco, outlining its importance for Morocco’s economy, and questioning whether there is effective protection of this environment. An attempt has also been made to analyze the existing legal and institutional framework, and to draw up proposals for the improvement of the existing situation based on a study of the conventions which bind Morocco. This final chapter will offer some general conclusions regarding a comprehensive approach to the marine environment, in order to reach the main goal this paper, which is an adequate legal and institutional protection to the marine environment in Morocco.

It has been seen that the geographical location of Morocco gives it a maritime orientation. The latter is documented by the heavy economic dependence on the sea, since 90% of Moroccan foreign trade is carried by sea, (1) in addition to the benefit drawn from the sea (fishing and tourism).

All these factors represent cornerstones of the Moroccan economy, which makes the protection of these interests vital, and inevitable, this can be realized through the protection of the marine environment.

It has been demonstrated, that the marine environment of Morocco is vulnerable because of the dense vessel traffic along the Moroccan coasts, and the potential threat which
that represents for recurring marine pollution. Different chapters attempted to illustrate complex issues. The author has attempted to examine the complex issues which underlie the marine pollution problems faced by Morocco as regard both ship-source and land-based source pollution.

As already apparent in the course of this paper, the Moroccan legal and institutional frameworks governing the marine environment need to be enhanced and improved in order to preserve the conditions of the Moroccan marine environment previously outlined. It has also been established that the legal and IT has also been established that the existing legal and institutional framework are not in line with the regulations and practices of other nations, where the institutions in charge of the marine environment are well defined, and regulations are clear and updated regularly to meet the present needs. Therefore, concern about the protection of the marine environment must stay at the forefront of government's maritime policy considerations as well as the public awareness.

In this matter, it has been underlined that winds of change have started to blow in Morocco generating a commendable move towards the achievement of an adequate environmental policy able to provide an efficient protection of the marine environment. This is documented by the promulgation of some new bills which will provide the protection required, because they include important innovations to the existing legislation that gives it a new spirit and a new push forward.

The inspiration of this legislation by international conventions and by other country's legislation with regard to the protection of the marine environment, has resulted in a consolidated piece of legislation able to fill the
earlier legislative vacuum from which Morocco has suffered. Meanwhile, there is still a lack of a regime for the regulation of pollution from land-based sources, which requires immediate intervention on both the legislative or the institutional levels to fill the gap since the latter, as previously emphasized, is an important source of the pollution entering the sea.

To arrive at a clear determination of a comprehensive institutional framework, this paper has analyzed the existing one, with a focus on the role of co-operation and co-ordination among departments involved in the protection of the marine environment.

It was underlined that there is still a need for an improvement in the existing situation, since even with the commendable creation of a new department in charge of co-ordination, the responsibilities are still fragmented among different departments, and there is no single department designated to take the load in the protection of the marine environment as in the case in some other countries (the Coast Guard in Canada). This dissertation included the case study of Canada not as a model to adopt, but as a country whose extensive experience in this area could be useful for Morocco in readjusting the existing national maritime structures, especially as it relates to the central maritime administration and local units.

It is important at this stage to emphasize that while the approach to the topic of this dissertation was analytical and sometimes critical, the spirit which guided the writer during the whole process was the strong motivation to place added emphasis on the ongoing legal and institutional changes. His motto was always the following: "we protect our countries from war, we are in a war to protect our environment". (2)
At the end of this paper, the writer would highlight that the effort made through the pages of dissertation are a humble contribution to the abovementioned war to protect the Moroccan marine environment. Finally, the paper will propose some strategies and recommendations drawn from environmental lectures at World Maritime University, and from the writers experience gained in other countries which the writer was able to witness during the extended field studies and research with the Canadian Coast Guard, and the field trips to United States Coast Guard, and to Scotland.

Since this work dealt with legal and institutional aspects of the protection of the marine environment in Morocco, the recommendations are also directed at the same two mechanisms to achieve marine environment protection.

A) Recommendations for the Legal Protection of the Marine Environment in Morocco:

i) The primary action to be taken in this respect is the amendment of regulations dealing with any kind of work or undertaking related to the sea, taking into account the current legislation, industry codes of practices, technical development, consumer needs and community expectations, to ensure that the activity does not pose unnecessary environmental risks.

ii) Specific regulations should be adopted related to land-based sources of pollution, since ship-source pollution is covered under the Maritime Act.

iii) Morocco should ratify all five annexes of the MARPOL 73/78 Convention, in order to limit the discharge of oil off its coasts, to provide for safe carriage of bulk and packaged chemicals, and to limit
environmental damage resulting from the discharge of sewage and garbage from ships.

vi) Morocco should ratify The International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969, which will allow the country to take necessary measures on the high seas in case of oil pollution which threatens Moroccan coasts.

v) Morocco should ratify the United Nations Convention on the Law of the Sea 1982, to benefit from the global protection to the marine environment provided under this convention and from the rights of states to protect and preserve the marine environment within their national jurisdiction laid down in the latter.

vi) Morocco should ratify the International Convention on Salvage, 1989, in order to encourage salvors to prevent, minimize, and clean up pollution.

vii) Morocco should ratify the Oil Preparedness Response and Cooperation Convention, 1990, which requires vessels and oil handling facilities to provide approved oil pollution emergency plans.

viii) Morocco should ratify the Barcelona Convention, 1976, which will provide the Moroccan Mediterranean coast with a cooperative protection mechanism from any form of pollution.

ix) Morocco should ratify the Lisbon Convention, 1990, which provides a cooperative protection mechanism for the Moroccan Atlantic coast.

ix) Seminars and meetings should be organized between
lawyers and judges to discuss environmental laws and regulations and their application, and to establish a permanent communication between the two bodies to avoid any misinterpretations on their enforcement.

B) Recommendations for the Institutional Protection of the Marine Environment in Morocco:

i) The role of each department involved in environmental matters should be clarified, and the Ministry of Ocean Fisheries and Merchant Marine should be given more authority in the ports, which play an important role in the protection of the marine environment and the prevention of pollution.

ii) In order to deter polluters, a continuous and intensive aerial surveillance programme over all Moroccan waters should be implemented and enforced. This requires the employment of dedicated surveillance aircraft equipped with the latest spill-detection and evidence-gathering technology, other alternative may be the satellite surveillance.

iii) In order to deter deliberate marine pollution, the Maritime Navigation Security Centre with the Royal Navy, should significantly improve its system of investigation of pollution incidents and aggressively prosecute polluters by:

- expanding their investigative and prosecution capability through the deployment of additional qualified personnel, as well as appropriate technology and equipment, including advanced evidence collection and analysis technology; in this regard video cameras in port areas can be very effective in prevent pollution in the vicinity of ports;
- implementing selective sampling of fuel and cargoes
of vessels docking at Moroccan ports for purposes of securing potential evidence for fingerprinting purposes; and
- publishing the identity of convicted polluters.

iv) In order to minimize the illegal dumping of oily bilge waters, regulations should be introduced which:
- require terminals to provide reception facilities adequate for receiving all ballast, slop and bilge water from all tankers docking there;
- require terminals to receive oil-contaminated water from tankers before allowing them to depart;
- ensure the availability of reception facilities capable of handling wastes in an environmentally acceptable manner; and
- require that inspections be conducted to ensure that reception facilities are being used.

v) The Under Secretary of State of the Environment must ensure the coordination between industries, universities and all departments concerned, in adopting a common environmental policy and creating public concern about the protection of the marine environment.

vi) In order to increase public awareness of marine pollution and its effects on the environment, measures must be taken to:
- publish an annual report on marine pollution along the Moroccan coasts;
- address marine pollution issues through the provision of educational packages to universities and school boards; and
- inform fishermen of regulations concerning all forms of pollution and its impact on their activities on marine resources and encourage them to report
sightings of marine spills.

vii) A comprehensive environmental and risk assessment should be conducted along the Moroccan coast to locate the sensitive areas which need special protection, taking into account biological, touristic and economical factors. This study can provide specific knowledge of the Moroccan marine environment and give a clear idea about the elements to be taken into consideration while elaborating any policy for the protection of the marine environment.

viii) Morocco should increase the role of regional units (Quartiers Maritimes) in the prevention of pollution and combating of oil pollution, and provide them with the equipment necessary for this purpose.

ix) Polluting industries should be involved in the cleaning operation—in case of spills caused by the latter—under the supervision of the department concerned.

x) The risk of major spills caused by collisions and groundings should be reduced by installing Vessel Traffic Systems in all ports.

xi) The cooperation within Maghreb countries should be increased under the umbrella of the Arab Maghreb Union (U.M.A), in order to have a common regional policy with regard to the protection of the marine environment.

xii) A mechanism should be provided to educate, train and motivate employees in polluting industries to conduct their activities in an environmentally responsible manner.
xiii) Morocco should develop and maintain emergency preparedness plans in conjunction with emergency services, relevant authorities and local collectivities.

xiv) Morocco should recognize environmental management as being among the highest corporate priorities and establish practices for conducting operations in an environmentally sound manner, in line with sustainable development.

In conclusion, despite the winds of change which have brought some innovations to Morocco, there is still a need for improvement in certain areas. Therefore, the writer hopes that the principles discussed in this paper will be useful at various stages in the development of a rational and effective maritime policy that will take into account the importance of having adequate laws and institutions to ensure the required protection of the marine environment.

Moreover, this paper has been an ambitious attempt to contribute to the ongoing concern and new developments with regard to the marine environment. The writer does not advocate more laws and regulations or the creation of more specific institutions, but proposes to improve the existing ones, and have a more rational approach to the marine environment so that it is given adequate protection.
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"It is not the critic who counts, not the man who points out how the strong man stumbles, or where the doer of deeds could have done them better.

The credit belongs to the man who is actually in the arena; whose face is marred by dust and sweat and blood, who strives valiantly; who errs and comes short again and again; who knows the great enthusiasms, the great devotions; who spends himself in a worthy cause; who, at the best, knows in the end the triumph of achievement; and who, at the worst, if he fails, at least fails while daring greatly."

( THEODORE ROOSEVELT. )
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B) FRENCH MATERIALS


4. - Dahir portant promulgation de la loi n 1-81 instituant une zone economique exclusive de 200 milles marins au large des cotes marocaine (8Avril 1981).

5. - Dahir portant reglementation des etablissements insalubres, incommodes ou dangereux. (25 Aout 1914).


8. - Mme Idrissi Halima... Impact de la Pollution Accidentelle par Hydrocarbures sur le Littoral Marocain. Institut Scientific des Peches Maritimes, Casablanca.


16.- Minister de la Santé Publique, Direction de l'Epidemilogie et des Programmes Sanitaires, Division de l'hygiene du Milieu, Service de Salubrité de l'Environement, Projet PNUD/UNESCO, MOR/90/00.


## Oil Spill Response — A Model for Authorities and Capabilities

<table>
<thead>
<tr>
<th>Organization Responding</th>
<th>Management and Control</th>
<th>Response Capacity</th>
<th>Spill Locations</th>
<th>Equipment &amp; Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level I — Facilities</strong></td>
<td>Facility/operator (may require pre-arranged local industry co-op assistance)</td>
<td>Facility/company manages spill (Canadian Coast Guard monitors with authority to assume command if necessary)</td>
<td>Site-specific (usually less than 100 tonnes)</td>
<td>At the site of the commercial/industrial facility</td>
</tr>
</tbody>
</table>

**Level II — Regions**

(a) Industry area cooperative(s) within current Coast Guard regions

- Industry manages spill response using Level I and Coast Guard equipment (Coast Guard monitors with authority to assume command if necessary)
- Total regional capacity of 10,000 tonnes
- Within present Coast Guard regions comprising one or more industry cooperative areas
- Dedicated personnel and equipment appropriate for the conditions within each region

(b) Coast Guard Regional Marine Response Organization

- Coast Guard takes command under certain conditions and always in the Arctic
- Arctic, Northern Region
- Major Coast Guard Northern Region capacity in personnel and equipment; industry co-op at Tuktoyaktuk

**Level III — National**

- Coast Guard immediately assumes command and responsibility to deploy and support regional, industry, government and international resources
- Over 10,000 tonnes or major spills (less than 10,000 tonnes) deemed to have potential catastrophic impact
- Anywhere in Canada
- Coast Guard access to:
  - industry, co-op and government equipment and personnel;
  - international resources as may be required

**Source:** MSS Canada
<table>
<thead>
<tr>
<th>Liability</th>
<th>Limitation of Liability</th>
<th>Penalty</th>
<th>Requires Contingency Plan</th>
<th>Imposes Duty to Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA</td>
<td>Strict (direct damage, clean-up) if SOPF, loss of income</td>
<td>$200 per tonne.* to a maximum of $24 million</td>
<td>Max $250,000</td>
<td>No</td>
</tr>
<tr>
<td>AWPPA</td>
<td>Absolute against shipowner; some defences to shipowner’s insurer</td>
<td>Same as CSA</td>
<td>Against person: max $5,000 Against ship: max $100,000</td>
<td>No</td>
</tr>
<tr>
<td>Fisheries</td>
<td>Absolute (clean-up costs and loss of income for fishermen)</td>
<td>None</td>
<td>Max $50,000 or $100,000 (2nd and subsequent)</td>
<td>Yes</td>
</tr>
<tr>
<td>CEPA</td>
<td>Costs of measures to remedy, reduce or mitigate danger to the environment</td>
<td>None</td>
<td>Max $300,000 or 6 months (summary conviction): max $1 million or 3 years (indictable)</td>
<td>Yes</td>
</tr>
<tr>
<td>OGP CA</td>
<td>Absolute (direct damage, clean-up costs, loss of income)</td>
<td>If negligence, no limit. If no negligence, $25 million or $40 million (except where AWPPA applies)</td>
<td>Max $100,000 (summary); max $1 million (indictable)</td>
<td>Yes</td>
</tr>
<tr>
<td>WACSA</td>
<td>Absolute (actual and future wildlife harvest lost, damage to harvesting tools and property)</td>
<td>No statutory limits. Limits may be pre-negotiated case by case</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>CPC A</td>
<td>Polluter liable for damages to port property and removal of nuisances</td>
<td>None</td>
<td>$500 or 30 days</td>
<td>No</td>
</tr>
<tr>
<td>SSAA</td>
<td>No specific provision; common law applies</td>
<td>No specific limit of liability</td>
<td>Max $1,000</td>
<td>No</td>
</tr>
</tbody>
</table>

* Dollar figures obtained by conversion of Special Drawing Rights at a rate of $1.50.

Source: MSS Canada 1990
**Appendix IV**

**UNEP Regional Sea Areas and Action Plans**

![Map of the world with regional sea areas labeled A to K.]

<table>
<thead>
<tr>
<th>Regional Sea Area</th>
<th>Action Plan adopted</th>
<th>Published in RSRS*</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Gulf</td>
<td>April 1978</td>
<td>No. 35 (1983)</td>
</tr>
<tr>
<td>C West/Central Africa</td>
<td>March 1981</td>
<td>No. 27 (1983)</td>
</tr>
<tr>
<td>D Southeast Pacific</td>
<td>November 1981</td>
<td>No. 20 (1983)</td>
</tr>
<tr>
<td>F Caribbean</td>
<td>April 1981</td>
<td>No. 26 (1983)</td>
</tr>
<tr>
<td>G Eastern Africa</td>
<td>June 1985</td>
<td>No. 61 (1985)</td>
</tr>
<tr>
<td>H South Pacific</td>
<td>March 1982</td>
<td>No. 29 (1983)</td>
</tr>
<tr>
<td>I East Asia</td>
<td>October 1981</td>
<td>No. 24 (1983)</td>
</tr>
<tr>
<td>K South Asia</td>
<td>in preparation</td>
<td></td>
</tr>
</tbody>
</table>

*RSRS = UNEP Regional Seas Reports and Studies*

For an earlier map showing the action plan regions as initially planned, see E. Mann Borgese, 'The Law of the Sea', *Scientific American* 248 No. 3 (1983) 35.

*Figure*
Appendix V

Location of major industrial areas along the Mediterranean coastline

(Source: UNEP/IWG. 18/IN.4, Annex I/3)
Appendix VI

Situation of rivers included in the pollution source inventory
(Source: UNEP/WG. 18/INF. A. Annex I/7)
SOURCE OF OIL POLLUTION INTO THE SEA

Industrial Waste etc.  
60,8%

Offshore production  
2,1%

Other shipping  
14,4%

Tanker accidents  
4,7%

Tanker operations  
6,6%

Refineries/terminals  
1,2%

Natural sources  
10,3%

(source: UN Environmental Programme (UNEP) 1990)

PSCR-EXT:OS-1

INTERTANKO
Appendix VIII

Major inputs of petroleum to the marine environment.

Source: HELNEPA