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**WORLD MARITIME UNIVERSITY**

Dalian, China

**RESEARCH ON ENVIRONMENT MANAGEMENT  
LEGISLATION FOR THE BOHAI SEA**

By

**CHENG PING**

**The People's Republic of China**

A research paper submitted to the World Maritime University in partial  
fulfillment of the requirements for the award of the degree of

**MASTER OF SCIENCE**

**(MARITIME SAFETY AND ENVIRONMENTAL MANAGEMENT)**

**2014**

## DECLARATION

I certify that all the materials in this research paper that are not my own work have been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this research paper reflect my own personal views, and are not necessarily endorsed by the University.

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Last but not least, I would like to dedicate this research paper to my family, especially my beloved wife and my little daughter who has grown up so much during this period.

**Title:** Research on Environment Management Legislation for the Bohai Sea

**Degree:** MSc

## ABSTRACT

The Bohai Sea is the only semi-enclosed sea in China. It plays an important role in China's history, especially for the successful and rapid Circum-Bohai Sea economic development in last decades. However, the special geographic location and complex administrative management have resulted in serious pollution which leads to ecosystem deterioration in the Bohai Sea.

Scientists, environmentalists and the public keep appealing for actions to recover the Bohai Sea environment. Governments at all levels have done lots of work, which slows down the pollution but has not solved the Bohai Sea problem thoroughly. A consensus on the Bohai Sea environment is that the legal system, including legislation and implementation, is in need of improving.

This thesis researches on the Bohai Sea environment management and the main body is divided into 7 parts.

Firstly, a brief introduction of the research, the situation of the Bohai Sea environment and the present legal system are given by Chapter 1 and Chapter 2.

The causes of the Bohai Sea pollution are discussed in Chapter 3. In Chapter 4 and 5, the necessity and feasibility of the legislation for the Bohai Sea environment management is analyzed.

Proposals for the legislation are given in Chapter 6 from different aspects with particular details about the work China MSA should do, e.g. designation of PSSA. Lastly, a short conclusion is given in order to summarize the whole research.

**Keywords:** The Bohai Sea; Environment; Legislation; PSSA

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## **LIST OF ABBREVIATIONS**

GPPEBS	The General Plan to Protect Environment of the Bohai Sea
QBCME	The 2010 Quality Bulletin of China's Marine Environment
BSAP	The Blue Sea Action Plan for the Bohai Sea
MEPL	Marine Environment Protection Law of the People's Republic of China
AIS	Automatic Identification System
MSA	Marine Safety Administration
PSSAs	Particularly Sensitive Sea Areas
N/P Ratio	Nitrogen-phosphorous Ration
EIA	Environment impact assessment
MFZ	Marine function zoning
SEPA	The State Environmental Protection Administration (SEPA, renamed as the Ministry of Environmental Protection in 2008)
UNCLOS	United Nations Convention on the Law of the Sea 1982
RCO	Regional cooperation organizations
MAC	Maximum accepting capacity

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Study Purpose**

As the only semi-enclosed sea in China, the Bohai Sea has been playing a crucial role in the history. It is the origin of Chinese marine economy and maritime civilization. It is shaped like the letter “C” surrounded by Liaodong Peninsula, Shandong Peninsula and North China Plains, which belong to different administrative regions. The special geographic location and abundant nature resources ensure its essential status in the country’s development. The Circum-Bohai Sea Region has been developing fast in recent decades--a lot of new coastal economic zones or similar new districts have been set up alongside the Bohai Sea in provinces of Hebei, Liaoning and Shandong. They have been attracting substantial investment by favorable policies.

The purpose of the study is to give advice for the Bohai Sea environment management legislation based on the analysis of root causes of pollution, the necessary of special regime and regulations from the point of the MSA. The study offers basis of legislation theoretically and practically, which may speed up the progress of the legislation for the Bohai Sea. It also solves the conflicts between sea-based management and shore-based management, the conflicts of using the sea and environment protection, the conflicts between different departments, etc.

A high integrated management regime is going to be established, which will benefit the coordination of protecting sea environment by all coastal districts from shore and sea. An overall coordination and sustainable development with a reasonable and efficient mechanism based on the new legislation will also provide an example for other comprehensive treatments in other sea areas.

## 1.2 Study Background

With the successful and rapid Circum-Bohai Sea economic development in the last decades, the ecosystem, especially the sea environment, is under tremendous pressure never faced before. A series of ecological and environment problems emerged, e.g. fishery resources depleting, red tide and oil spills, etc. The 2011 Penglai 19-3 oilfield oil spill caused by a sea floor leak made the Bohai sea environment a focused issue around the whole nation due to its devastation to the fishery. Many scientists, sociologists and the public criticized the indulgency of the Bohai Sea environment deterioration.

For a long time, the central government of China has paid high attention on the Bohai Sea environment issue. Quite a few plans and measures have been introduced, nationally and locally, to save the sea. However, the situation has not been turned around; the even worsened nature environment indicates that national laws and regulations do not work perfectly and have not achieved their expectations.

Apart from the nature features of itself, the root cause of the failure is that the present management regime and environment legal system are impractical. Only by establishing special rules for the Bohai Sea area regionally can the problem be solved. A special consolidated law is necessary to standardize the development of the sea and coastal areas, to enhance the procedures of ecosystem protection, to create a healthy and sustainable economy and society.

There are quite a few examples of special legislation dealing with environment problems for individual waters successfully, e.g. *Law Concerning Special Measures for Conservation of the Environment of the Seto Inland Sea*(the Seto Law, Japan), *the Arctic Waters Pollution Prevention Act (AWPPA, Canada)*, *the Canada-United States Great*

*Lakes Water Quality Agreement, Pollution Prevention Regulations for Northern Australia, etc.*

China has its own experience and ability to legislate specially for the Bohai Sea area since it has tried from many aspects to change the passive situation. A series of regulations and actions have been taken even though the outcome is not optimistic. As the concepts of low-carbon economy, sustainable economy and green shipping are encouraged extensively, all walks of life and governments at all levels are trying to take more efficient measures to deal with the Bohai Sea environment problems. A lot of specialists, scholars have argued and proved the necessity, importance, and urgency of a special and integrated law. All of these push the process of the special legislation.

### **1.3 Main Contents and Methodology**

Based on the situation the Bohai Sea faces currently, the study analysis the responsibilities and difficulties China MSA have encountered, the necessity and feasibility of special legislation for the Bohai Sea. It also provides evidence and principle for the legislature by proposing special regulations involving shipping and other aspects.

The study carried out research by data collection, questionnaire survey, analyzing typical domestic and overseas cases, etc. The main contents consist of the following 5 aspects:

- 1) The actuality and existing problems of the environment together with their cause analysis;
- 2) Analyzing the situation of environment protection and the trends of pollution in future;
- 3) Discussing the necessity of specialized environment management legislation based on the reality of the essential role of the “Circum-Bohai Sea Economic Zone” and the

influence of the environment issue on economy;

4) Discussing the feasibility of such legislation by analysis of local socio-economic conditions, policies, legal system, legislative technique, and by comparative analysis of local laws and regulations of other countries and regions;

5) Conceiving the guiding ideology, legislative principles, hierarchy, difficulties and key points of such legislation; presenting the legislative proposal for a better pollution prevention regime. All of these are based on the experiences of work done for the Bohai Sea environment protection.

## **CHAPTER 2**

### **THE SITUATION OF THE BOHAI SEA ENVIRONMENT**

#### **AND ITS LEGAL SYSTEM**

The sea is the origin of life. It covers 70% of the planet surface and plays a most important role for all living beings as it supplies resources, regulates the climate and accepts pollutants. However, the sea could not bear overexploitation. With high speed economic development in the last few decades, Circum-Bohai Sea Region has become the third economic circle in China (other two are Pearl River Delta and Yangtze River Delta). Development brings with unprecedented pressure to the ecosystem of the Bohai Sea. Most local governments have weighed economy over the protection of the environment. Significant accidents such as the 2010 Dalian oil pipeline explosion and the 2011 Penglai 19-3 oilfield oil spill destroyed the Bohai Sea seriously. Inhabitants living around the sea are affected directly. The fishery industry becomes harsh because of dirty seawater and lessened fish resource.

#### **2.1 Main Features of the Bohai Sea**

As inland water, the Bohai Sea (See Figre 1) is embraced on three sides by lands of three provinces, Liaoning, Hebei and Shandong, and one city, Tianjin. It is located between four lines: 37°07'N in the south, 41°0'N in the north, 117°35'E in the west and 121°10'E in the east, with 500 km from north to south, 346 km from east to west and the total area is 77,284 km<sup>2</sup>. It consists of the Liaodong Bay in the north, the Bohai Bay in the west, the Laizhou Bay in the south, the central sea basin and the Bohai Strait. Geology shows the Bohai Sea was an inland basin around 19,000 year ago. The continent surrounding and below it slopes down from the outside to the center. The total Bohai

Sea coastline is 3,784 km, including 3,024 km shoreline. The mean depth is 18 meters; the average water temperature is 1.2°C in winter and 20°C in summer. (Shen, 2012, p. 4)

The Bohai Sea connects with the Yellow Sea by the Bohai Strait, which has a breadth of 59 nautical miles. An archipelago, Miaodao Liedao, consists of more than 30 islands distributing in and around the strait, e.g. Nan Changshan, Tuoji, Qindao, Huangcheng, etc. Bohai Strait is the only water way that must be passed from outside to Beijing and Tianjin, which are the most important political, military and economic centers. The water is complicated and there are 8 traffic lanes of different widths distributed in the strait.

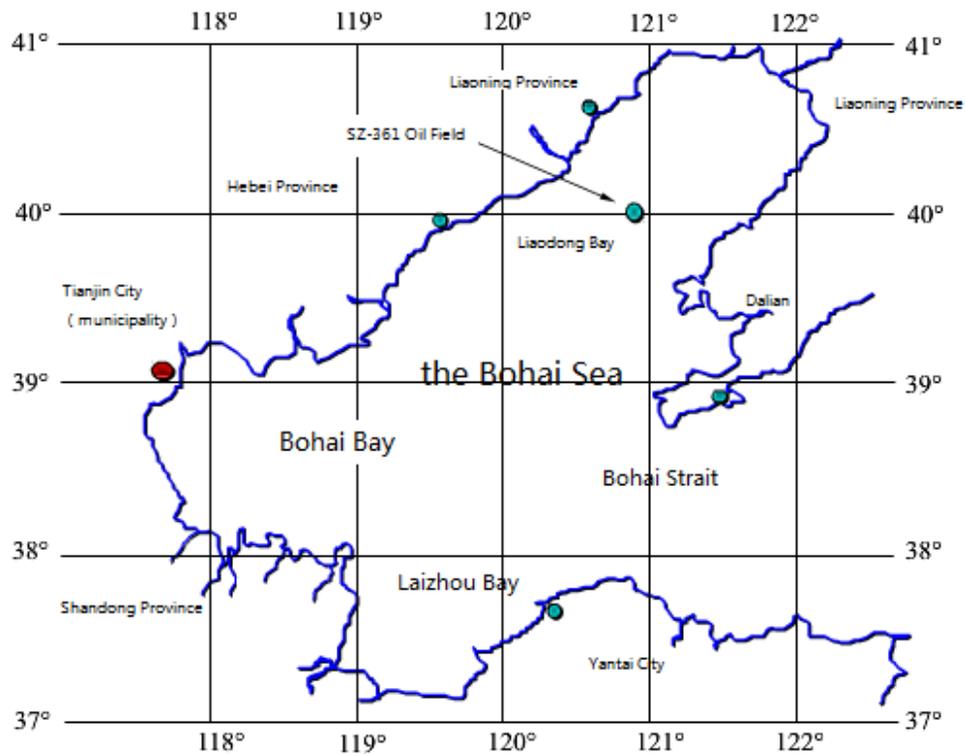


Figure 1-The Bohai Sea  
Source: Internet

## **2.1.1 Hydro Meteorology**

### **2.1.1.1 Climate**

The wind direction is usually north between every November and the next April, with mean speed 6-7m/s and the maximum speed 30m/s. In spring, wind of south and southwest are in the majority, account for 20% each, north and northwest coming next, and the total mean speed is 4-6m/s. In summer, wind of southeast is the most common, with a proportion of 20%, followed by south and southwest. The severe weather comes in summer accompanied with rainstorm or storm tide caused by typhoon and cyclone, and wind can reach force 10 (24.5-28.4m/s) or above. Autumn, October usually, is short but the winter monsoon comes frequently. The monthly average wind speed is 5-6m/s. The tropical cyclone attacks the Bohai Sea almost yearly, usually happens in July and August and sometimes comes in June and September.

### **2.1.1.2 Tide and Current**

Different tides distribute according to the geography within the Bohai Sea, including regular and in regular diurnal current and semi-diurnal current. A special case comes up in the Laizhou Bay, lying in the southern corner of the Bohai Sea, with regular semi-diurnal current in the west and irregular semi-diurnal current in the east. The average current speed is between 20 cm/s and 80cm/s, with the highest speed usually coming up at the center of the Bohai Strait. The rising tide drives water into the Bohai Sea from the north of the strait, and vice versa. The velocity of flow is around 50cm/s with maximum 150cm/s. (Shen, 2012, p. 5)

### **2.1.2 Nature Hazard**

Cold wave with strong wind attacks the Bohai Sea and its surrounding regions frequently in winter, and sometimes in late winter and early spring. It results in

accidents on land and at sea almost every year.

Storm surge, induced by typhoon or extratropical cyclone, causes sea level rise abnormally. The Bohai Sea is a semi-enclosed sea which is easy to suffer from storm surge in spring, autumn and summer.

### **2.1.3 Environmentally Sensitive Resource in the Bohai Sea Area**

The Bohai Sea is a good sea for reproducing, inhabiting and growing of many sea creatures, e.g. fish, shrimp, prawn, crab, shellfish, etc. Until the year of 2010, 8 National Marine Nature Reserves, total area 1135,700 hectare, and 8 National Special Marine Reserves, with total area 177,200 hectare, had been set up in the Bohai Sea. (Shen, 2012, pp. 6-7)

### **2.1.4 Ports**

As important infrastructure, ports play a crucial role in the world trade, which contributes to the economy to a large extent. More than 60 ports are located around the Bohai Sea, which shapes as “C” and has coastline as long as 5,800 km. The Circum-Bohai Sea Region is one of the most concentrated ports areas in China and in the world (See Figure 2). The ports can be subdivided into 3 port groups according to the space, namely, northeast port group with Dalian as the center, Shandong port group with Qingdao as the center and Tianjin port group.



Figure 2-Contrail of the ships in Bohai Sea  
Source: Shandong MSA VTS Center

## 2.2 The Bohai Sea Environment

Pollution and over exploitation have almost destroyed the ecosystem of the Bohai Sea. *The 2010 Quality bulletin of China's Marine Environment (QBCME)* describes the general situation of the Bohai Sea environment as follows:

In 2010, the clean area of the Bohai Sea is 44,570 km<sup>2</sup>, 58% of the total area, less than that in 2009. One third of the Bohai Sea encounters seawater pollution to different degrees. 66% of the functional zone meets the seawater quality standard. 74% of coastal effluent outlets drain water which contains pollutants above limit. Seawater in 40% areas close to the effluent outlets is sub-standard. 12 moderate and minor oil spills and 7 red tides happened over the year, which are more frequently than 2009. (Li, 2006, p. 41)

### **2.2.1 Aggravation of Land-based Pollution**

According to *the General Plan to Protect Environment of the Bohai Sea (GPPEBS)*, released in 2009, under the joint effort of all sides, the seawater quality did not deteriorate apparently between 1995 and 2010, but the situation was in little optimism as the coastal area of the sea was still heavily polluted, especially coastal cities such as Cangzhou, Tianjin, Yingkou, Panjin, etc. Inorganic nitrogen, reactive phosphate and petroleum were found out of limits in the seawater. However, most pollution sources at sea are under control except oil spill. (GPPEBS, p.10)

As an enclosed sea, it has poor self-cleaning ability to undertake tremendous pollutants from shore. About 50 rivers are criss-crossing along the bank of the Bohai Sea, including 19 in the Laizhou Bay, 16 in the Bohai Bay and 15 in the Liaodong Bay. The amount of pollutants directly entering the Bohai Sea accounts for 40% of the gross quantity in China. *The 2010 QBCME* shows that only 46% of shore effluent outlets are equipped with standard treatments.

Industrial wastes, domestic garbage, chemical fertilizer and pesticide are typical pollutants entering into the sea from land. The Bohai Sea has been suffering from land-based pollution seriously, e.g. 3 contaminated rivers in the Dagang District of Tianjin enter into the Bohai Bay directly, which havocs the ecology nearby and in turn damages fishery in the Bohai Bay. The 2010 data shows that among the 94 monitored effluent outlets (including rivers), 30 industrial effluent outlets, 15 municipal public outlets, 28 effluent rivers and other 21 outlets, 12 outlets discharged into specialized areas, 60 outlets were directly into sensitive functional areas. As much as 74% of effluent outlets along the Bohai Sea discharged beyond standards set by the environment departments (See Table 1) and more than 80% of the total pollutant discharged into the Bohai Sea was land-based.( QBCME, 2010, p.17)

The situation above indicates that only by stopping excessive discharge of effluent from shore can the Bohai Sea environment problem be solved.

Table 1-The situation of monitored effluent outlets

Administ-ration	Quantity of Effluent Outlets	Standard Outlets	Sub-standard Outlets	Over- standard Rate
Shandong	19	2	17	89%
Hebei	31	14	17	55%
Tianjin	14	1	13	93%
Liaoning	30	7	23	77%

Source: QBCME, 2010

There are countless shipyards along the coast of the Bohai Sea due to the boom of China's shipping industry. Ship recycling is also a big industry in the Bohai Sea Region. Tremendous garbage, waste oil, sludge and oily water are produced which lead to serious pollution in many coastal areas due to improper disposal.

In addition, with the rapid economy growth in the area surrounding the Bohai Sea, harbor construction has never stopped. Exploitation always brings with destruction to the ecosystem.

### 2.2.2 Sub-healthy Ecosystem

Water with rich nutrition results in unbalance of N/P ratio and some organisms have higher arsenic content. Phytoplankton and zooplankton have higher quantities than normal, but marine species have been reduced and the amount of larva fish has declined. Since early 1970s, the structure and function of the Bohai Sea ecosystem have been violated gradually, and fishery resources have been minimized on a large scale.

Overfishing is the most crucial reason for the depletion of fishery.

Moreover, the dumping areas in the Bohai Sea have been overloaded with dredged materials, construction wastes and other mucks, which are harmful to the ecosystem.

### **2.2.3 Increasing of Major Oil Spill**

Oil impacts the Bohai Sea seriously and usually it lasts for decades. Marine traffic accidents, oil fields incidents and spill from oil storage units account for the major oil spill in the Bohai Sea. Oil kills many sea creatures and the nutrition in oil leads to red tide frequently, 7 times in 2010 with total area 3,560 km<sup>2</sup>, some of which are noxious.

The Bohai Sea is located in the center of the Northeast Asia Economic Circle and is the important gateway for the trade between North China and the world. With about one million port calls by commercial ships per year, the navigation environment is complicated. Moreover, the demand for petroleum increases rapidly which leads to quick escalation of petroleum transportation by ship and more establishment of oil storage facilities. (See Figure 3)

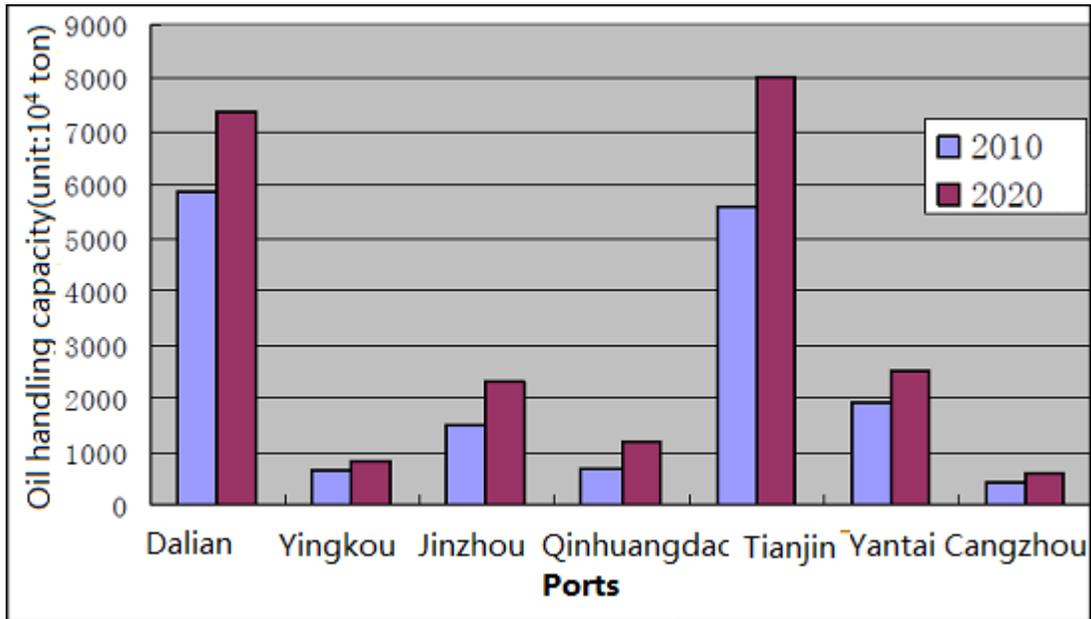


Figure 3-The oil handling capacity forecasting for the main ports in the Bohai Sea  
Source: (Shen, 2012, p.57)

Various marine accidents, e.g. stranding, collision, explosion, capsizing, result in harmful substances entering into the sea and lead to serious pollution. The probability of accidental oil spill has become high in recent years. Oil spill from ships happened 3 times per year according to the records in 10 years between 2000 and 2010, with less than 2.3 times between 2000 and 2002 and up to 9.3 times between 2008 and 2010. Other records indicate the Bohai Sea contributing to 26 times of the oil spill with 50 tons and above of oil entering into water between 1973 and 2007. The corresponding number oil spills happened in China's territorial sea is 79.

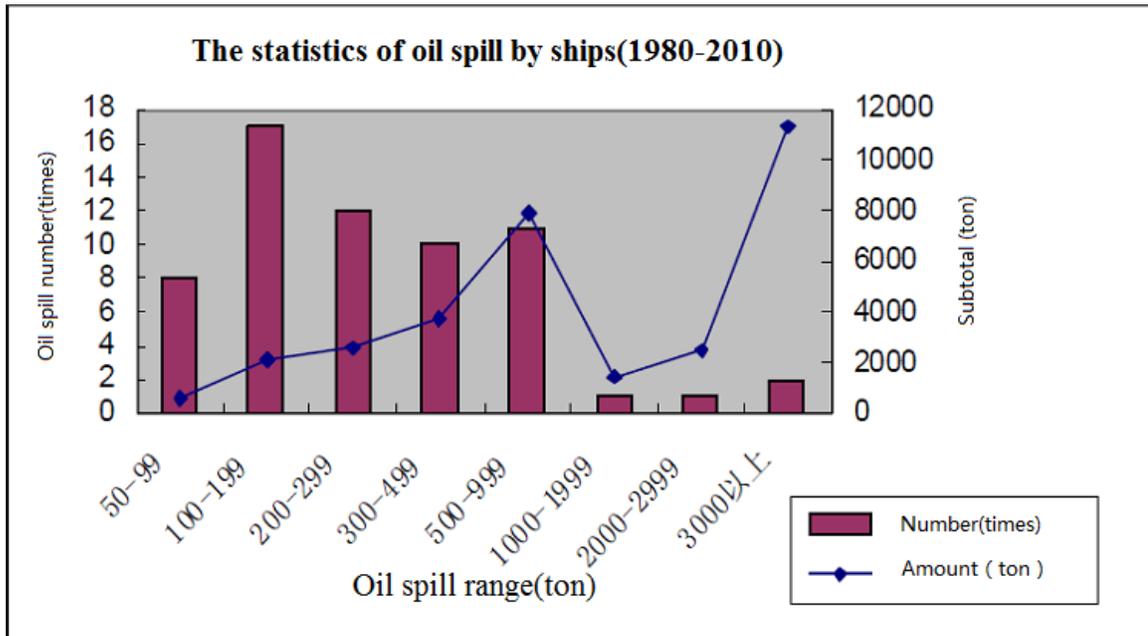


Figure 4-The statistics of oil spill by ships  
Source: (Shen, 2012, p.30)

Marine oil exploitation destroys the environment seriously as lots of wastes are produced, for example: accidental oil leaking, spilling and blowout; industrial wastes and oily water; and domestic garbage. Most of these wastes remain in the sea and are harmful to the sea environment. In 2010, 24 offshore oil and gas fields were in operation in the Bohai Sea. They generated waste water, drilling fluid, drilling cuttings and domestic sewage with 6,231,900 m<sup>3</sup>, 10,400m<sup>3</sup>, 30,400 m<sup>3</sup> and 120,500 m<sup>3</sup> respectively.

The average frequency of oil spill from transmission pipelines in the Bohai Sea is much lower--0.1 times per year. The frequency of oil spill from platforms caused by fire or blowout is 0.2 times per year.

Oil pollution by accidents of oil storage units has an even lower probability. However, the consequence is always very high. The Dalian oil pipeline explosion, which happened on July 16, 2010, led to 1,500 tons crude oil spill to the Bohai Sea, was the

most serious oil spill that had ever happened in the sea area of the Liaoning Province. The crude oil will last in the water and influence the ecosystem for decades according to its nature. (Zhou, 2006, P. 2)

#### **2.2.4 Other Pollution from Ships**

Apart from bigger oil pollution, oily water and waste, harmful noxious substances, garbage and sewage are important pollution sources from ships during ordinary navigation. Oily ballast water, tank washing water, bilge water in machinery spaces and cargo holds, and small quantities of cargo (oil, chemical, etc) disposed to the sea... small for one ship, accumulated, brings with large pollution.

With the increase of chemical demand, more and more noxious substances are shipped in the Bohai Sea. No such accidental chemical spill has been reported, but the tank washing and cargo operation could leave harmful substances in the sea easily.

Sewage, garbage and ballast water are frequently disposed into the sea directly without treatment. Most small vessels and fishing boats are neither equipped with qualified anti-pollution equipments nor manned with qualified seafarers. It is a habit to simply discharge them to the sea. Sewage and garbage are not as harmful as oil and noxious substances, but they take time to degraded or bring bacteria and fertilizer to the water. In addition, ballast water from other ports carrying harmful aquatic organisms and pathogen impacts the local ecosystem seriously.

The NO<sub>x</sub> and SO<sub>x</sub> contained in the exhaust gas emission pollute air which in turn affects the sea by acid rain. The anti-fouling paint usually contains heavy metals and chemicals which are harmful to the sea creatures. (Miao& Luo, 2011, p.3)

A lot of ships have been penalized by authorities. Penalization has promoted awareness of sea environment protection to a large extent but the water quality is still going down.

### **2.3 The Legislation History for the Bohai Sea Environment Protection**

In order to solve the problem of the Bohai Sea pollution, the central government and local governments have invested huge amount of money, made a variety of plans and taken multifarious actions. Typical examples are as follows:

In 1978, the central government adopted *the Work Key points of Environment Protection*, which listed the Bohai Sea and the Yellow Sea as the first and most important batch to be protected. Since then, the study about pollution prevention of the two seas has been highlighted. (Li, 2008, p. 9)

In 1998, an application about bringing the Bohai Sea as the key national environment protection area, drafted and reported by the *State Environmental Protection Administration* (SEPA) was accepted by the central government. Consequently, a program called “the Blue Sea Action Plan” was set as a focus of the state environment work.

In 2001, the central government accepted and began to implement “the Blue Sea Action Plan” formally. The program was planned to invest 55.5 billion RMB in 15 years to change the Bohai Sea environment thoroughly. It was the first time the anti-pollution action was taken for the Bohai Sea from the national level. (BSAP, 2001, P.4)

However, the trend did not change at all in the next years according to the Quality Bulletin of China’s Marine Environment, which is released annually by the State Oceanic Administration. The pollution of the Bohai Sea intensified continuously, the ecosystem worsened gradually, the polluted area expanded quickly, red tides came frequently and major pollution accidents occurred occasionally... all of these indicated the failure of “the Blue Sea Action Plan”.

In 2009, a *General Plan to Protect Environment of the Bohai Sea (2008-2020)*, compiled

by the State Oceanic Administration, was approved by the State Council. A budget of 40 billion RMB was determined on the plan. The final effect is unpredictable as the plan is feasible but the cooperation between different administration departments is still pessimistic. (GPPEBS, 2009, pp. 42-55)

In addition, a series of laws and regulations were promulgated, e.g. *Environmental Impact Assessment Law of PRC*, *Administrative Law of Sea Area Use*, *Fisheries Law of PRC*, *Regulations on Prevention of Pollution from Ships at Sea*, and quite a lot of policies and plans have been established, e.g. *Contingency Plan for Major Oil Spill from Marine Petroleum Exploration and Exploitation*, *Contingency Plan for Red Tide*, *Marine Oil Spill Contingency Plan*. Regulations made by the local governments are even more.

## **2.4 Ineffectiveness of the Legal System**

*The Marine Environment Protection Law of the People's Republic of China (MEPL)*, promulgated in 1982 and revised in 1999 and 2013, is the dominating law about sea environment. It offers a general framework covering all aspects of sea environment protection but lack of detailed supporting regulations. Other laws and regulations also have not met the expectations. Some environmental standards are still waiting for setting up.

### **2.4.1 The Existing Problems of Legislation for the Bohai Sea Environment Management**

The Bohai Sea has a very important strategic position in China's economic development. However, there is not any special formal legislation to protect the Bohai Sea environment even though national laws have delineated the general regime of the sea environment protection. The major defects of legislation are concluded in the

following aspects:

Firstly, the current laws and regulations are not operable. The current major law, *MEPL*, only regulates in principle. It does not offer enough exercisable details to guide the law enforcement departments, who may wish to safeguard the sea environment but have no clear rules and regulations. Other rules have the same problem. Some plans are practicable but have no legal enforcement. A few local rules may avoid such deficiency but have not been popularized for all involved regions. (Li, 2006, p.53)

Secondly, lack of integrated laws and regulations. Integrated legislation can organize authorities in good coordination. It also ensures reasonable and effective management of marine exploitation, usage and protection. Most developed marine countries, e.g. America, France, Canada, and Japan, have appropriate integrated laws or regulations. The history of marine legislation shows that China's authorities and legislatures used to establish regulations for dealing with single problems after their happening. Legislation was done passively and many factors were ignored.

Thirdly, rights and responsibilities are not clear. In China, most public affairs are governed independently by local governments or different administrations. The Bohai Sea involves 3 provinces and 1 city, which deal with environmental issues on their own. Different places seldom coordinate with each other. Even two adjacent coastal districts in one province may handle the sea environmental problems in totally different ways. There are several administrations in charge of sea affairs. The State Environmental Protection Administration, State Oceanic Administration, Marine Safety Administration, Oceanic & Fishery Administration and Department of Transportation have their own regulations and local statute according to their own rights and responsibilities. However, each administration makes regulations in its own way, sticking up for its own interest and trying not to encounter the difficulties. This situation results in the failure of an integrated legal system for the Bohai Sea environment.

*MEPL* stipulates that regional cooperation organizations can be set up to promote law enforcement and implementation of special plans for specific waters. However, there is not any supportive regulation or guideline giving details about their legal status and the procedures to establish such organizations.

#### **2.4.2 Existing Problems of Legislation for the Prevention of Pollution from Ships in the Bohai Sea**

The current laws and regulations for ship's pollution prevention are generally for all waters of the country, without considering the special geography, characteristic, or development of economy and society. With the increasing risk of pollution from ships, the conflict between the requirements of the Bohai Sea and the existing law and regulations has been worsened in the last decade.

Firstly, lack of pollutant discharging standards. The Bohai Sea has a very poor self-cleaning ability. It can accept less pollutant than other open waters to keep the water above standards. However, the existing laws and regulations stipulate the same standards for all the sea waters of the country. In addition, *Effluent standard for pollutants from ship (GB3552-83)*, entered into force in 1983, is out of time and does not meet the new international standards. As a result, the amount of oily water, garbage, toxic substances and other harmful substances entering into the Bohai Sea exceeds its self-cleaning ability. The accumulation of pollutants contributes to the present situation of the Bohai Sea to a large extent.

Secondly, complex navigation environment: Ships sailing in the Bohai Sea suffer from high wind, typhoon and heavy fog frequently due to the bad meteorological conditions. Meanwhile, the increasing traffic flow in the Bohai Sea increases the probability of marine accidents, especially major pollution incidents. The present laws and regulations do not consider these for the Bohai Sea.

*Marine Oil Spill Contingency Plan* has been established at all levels in the country, but the emergency response ability should be promoted and the high risk of pollution should be paid more attention in order to prevent accident happening or minimize the severity of pollution.

Moreover, untreated effluent water discharged by ships, especially domestic ships, is popular due to the ambiguous of the rules and law enforcement. It happens frequently and contributes much more than pollution from marine accidents. Some regulations stipulate explicit standards whereas compromise is made soon under pressure from shipping company, classification society, etc.

A regulation issued by the Ministry of Communications in 2003, namely *Regulations on Lead- sealing Procedures for Pollution Prevention Equipments of Ships Operated within the Bohai Sea*, is the only rule specially for the Bohai Sea environment protection. It prevents commercial ships, operating or staying within the Bohai Sea for one month and above, from discharging any oily water to the sea. All discharging facilities shall be sealed by MSA officers. Up to 10 years implementation of this regulation has proved that it is a useful method. However, oily water discharge by commercial ships is only a small part of pollution to the Bohai Sea. Only when most sources are stopped by effective rules, can pollution be controlled.

The central government and local governments at all levels encircling the Bohai Sea have enhanced efforts to deal with the Bohai Sea environment problem as it has been polluted extremely. However, most actions are only limited to special management plan and campaign even though some cooperation schemes among different districts may be established. No matter what actions have been taken, the expectations have not been met as desired. Lack of special legislation is usually considered as the most important root cause.

## CHAPTER 3

### CAUSES OF THE POLLUTION

The following figure shows the general trends of the Bohai Sea environment in recent years. They reflect the effectiveness of the laws and plans on the Bohai Sea.

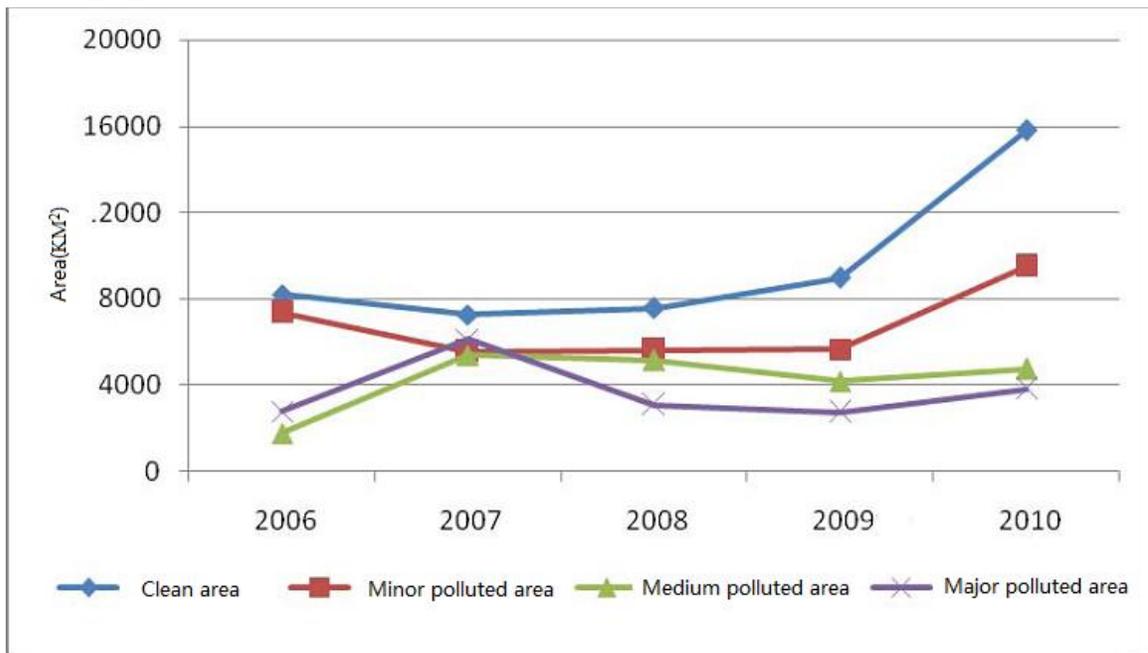


Figure 5-The Bohai Sea water quality variation (2006-2010)

Source: QBCME 2010

We find out that the Bohai Sea pollution has not been under control--the expectation of related laws, regulations and schemes has not been achieved, the sea environment and ecosystem are still in severe conditions.

#### 3.1 Poor Self-cleaning Ability

As an inland sea, the exchange of the inner seawater with the outside water is very slow in the Bohai Sea. It takes about 15 years to clean the Bohai Sea by water exchange.

The result is that the pollutants accumulate much faster than the self-cleaning speed.

### **3.2 Population Explosion and Resource Exhaustion**

The population keeps increasing rapidly in the last decades, together with the improving living standards, which pushes people to acquire food, energy and other resources from sea. The Bohai Sea is typical for fishing, oil exploitation, sand excavation, etc. Moreover, reclaiming land from sea has been an important policy to acquire more land, especially for real estate market, which destroys the natural environment and reduces the sea area.

### **3.3 Side Effects of Economic Boom**

With the rapid growth of China's economy, the new concept of the "Circum-Bohai Sea Economic Zone" pushes local governments to accelerate the growth of economy. It has been performed well as the Circum-Bohai Sea Region is the base of China's industrial and most involved cities have advantages in politics, economics, science, and logistics.

Economy brings with increase of total pollutants discharged into the Bohai Sea. A critical factor is that the industrial input has been developing too fast but the policy, management technology and facilities of anti-pollution could not follow up.

### **3.4 Poor Consciousness of Marine Environment by the Public**

Lack of consciousness of sea protection causes excessive disposal of garbage into the sea and hinders the implementation of the policies aimed at saving the dying sea. Improper garbage and effluent disposal into the sea, over using of pesticide, over fishing and other exploitation... all of which contribute to the decrease of fishing resources, habitat of sea creatures and deterioration of seawater in the Bohai Sea. (Miao & Luo, 2011, p.2)

### **3.5 Decentralization of Rights and Responsibilities**

According to the pollution sources, 5 departments, namely, the State Environmental Protection Administration(SEPA), State Oceanic Administration(SOA), Marine Safety Administration(MSA), Oceanic & Fishery Administration and military environmental protection department, are designated to take charge of pollution prevention from land-based pollution and coastal construction projects, ocean engineering projects and dumping of waste and other matters, ships in ports except military ships and ships out of ports except fishing boats and military ships, ships except military ships in fishing ports and fishing boats out of fishing ports, military ships respectively.(Li, 2006, p.41)

Although *MEPL* allocates the general responsibilities to each department clearly, disputes never stop. Rights and responsibilities overlap frequently which causes repeated law enforcement and dispute over rights and responsibilities, especially in grass-roots level.

Firstly, too many administrations are involved but lack of joint efforts. The present policy seems that all aspects of environment issues are covered and all administrations are doing well. However, some departments only focus on the sea, while others only focus on the land; some are only involved in discharge prevention, while others only have the rights to deal with the existing pollution. Each member only cares about their own responsibilities, and in fact, they do not have rights to deal with problems beyond their own. In addition, every department likes more rights and tries to shirk responsibilities, which lead to loopholes in the Bohai Sea environment protection.

Secondly, too many local governments are involved but the responsibilities are difficult to be confirmed. All relative governments in Shandong, Tianjin, Liaoning and Hebei declare their positive attitude and unlimited efforts to protect the environment, but actions are taken separately without cooperation.

### **3.6 Confusion of Environment Monitoring**

As technical support, environment monitoring is a key step for the legislation and law enforcement. It offers data for the environment impact assessment (EIA) for projects, pollutant discharge control, marine function zoning (MFZ), effluent outlet setting, pollution tax levy, etc. Marine environment monitoring is divided into two categories: tendency monitoring and function area monitoring. The former is used to supervise the overall sea water quality and pollutant quantity entering into the sea. The latter includes monitoring of ecosystem, coastal tourism and recreational areas, bathing beaches, red tide, marine reserves, aquiculture areas, projects relating to sea, marine accidents, etc.

Different departments carry out monitoring duties according to their rights and responsibilities. Disadvantages turn out. Firstly, cost is high as almost every department has to monitor the same areas for each other's purpose. Secondly, various standards and data exist as different departments monitor with different means. In addition, information, especially details, is not shared or published.

## CHAPTER 4

### THE NECESSITY OF LEGISLATION FOR THE BOHAI SEA

#### ENVIRONMENT MANAGEMENT

##### 4.1 Importance of the Bohai Sea Environment

Life originated in the sea and the sea plays a key role for temperature maintaining, atmospheric circulation, humidity keeping, climate change and fresh water source supplying. It also offers a lot of natural resources.

The Circum-Bohai Sea Economic Zone usually includes coastal districts in Liaodong Peninsula, Shandong Peninsula, Hebei Province and Tianjin City. It also influences neighbor regions such as Shanxi Province, Inner Mongolia and other inland cities in Liaoning and Shandong because seaborne trade via the Bohai Sea is a most important logistics channel for these places.

Even though the economic integration has not formed, the Circum-Bohai Sea Region plays a crucial role in China's and even the world's economy. It becomes a logistics center which connects Eurasia continent and the Pacific. The commercial market surrounding the Bohai Sea will be more important and will attract more attention with the economic growth of the world, especially China itself. (Li, 2006, p.21)

However, the essential role of the Circum-Bohai Sea Economic Zone could not cover up the environment crisis. The rapid economic growth brings with excessive pollution to the Bohai Sea, resulting in increasing pressure to the ecosystem, and in turn, the environment will restrict the development of many relevant industries.

## **4.2 The Impact of the Bohai Sea Pollution on the Regional Economy Circle**

The ecosystem of any sea areas can burden limited exploitation. Resource depletion and ecological disaster will come up when this limit is broken. The Bohai Sea environment plays a key and sensitive role in the regional economy and people's life but its limit for exploitation and pollution is lower than the other territorial seas.

### **4.2.1 The Conflication between Environment and Development**

The Circum-Bohai Sea Region has been the biggest industrial base in China, especially the heavy industry. With thriving production of steel, petroleum, coal, heavy machineries, building materials, automobile, chemical, etc, many industrial clusters have been established. However, the poor self-cleaning ability weakens the ecosystem which is affected very easily by human activities. In addition, the failure of actions in the last decades results in large amount of accumulation of pollutants which restricts the development of the Circum-Bohai Sea Region, especially the sustainable economy.

We should leave good environment for future generations. Sustainable development requires the utilization of resources not only satisfies the current demand but also benefits the future. The economic growth should keep at a steady pace considering the environment changing, resources consumption and social development. For many years, the Circum-Bohai Sea Region has developed economy with extensive mode. High energy consumption and serious pollution lead to incompatibility of economy and environment in the region.

### **4.2.2 Increasing Cost due to Environment Matters**

China's GDP has been ascending at a high speed for a long time, but it does not consider the environmental costs. The increasingly prominent environment problems reflect the drawbacks of the existing economic development model, which is realized by scientists,

governments and the public as environmental disasters, e.g. haze, acid rain, red tide, species extinction, happen frequently in recent years.

Water pollution and air pollution are the two typical problems in the Circum- Bohai Sea Region. The environmental costs will increase if we continue to sacrifice the environment for the economy growth. The costs may not be paid immediately but they shall be paid. The cost of recovery is usually much higher than the benefit of the violation. As a result, the high environmental costs can weaken the regional economy in the long-term.

#### **4.2.3 Barriers Reducing Outside Investment**

Investment is one of the most essential driving forces for economic growth. In the last decades, tremendous foreign capital has stimulated the economy in the Circum-Bohai Sea Region, but the escalating threat of severe weather (e.g. haze, sand storm), water shortage, water pollution, etc, stops many potential foreign investments in the region. (Miao& Luo, 2011, p.3)

### **4.3 Probable Solutions for the Bohai Sea Environment**

#### **4.3.1 Revise of the Existing Law and Regulations**

As mentioned above, the existing rules relating to sea environment are in need of revise. Proper assessment and amendment may promote their availability in case the Bohai Sea is taken into consideration. It is simpler than new legislation, but national rules are seldom to highlight the regional problem, especially the detailed management points.

#### **4.3.2 Normative Documents or Departmental Rules**

Normative documents and departmental rules are applied widely in various domains in

China when existing laws and regulations are in vain for certain issues. They are the most convenient choice as all the competent authorities can establish such documents and rules according to internal procedures which are usually much easier than the procedure of legislation.

Some normative documents and departmental rules should be approved by the legislature, namely People's Congress, and promulgated by the State Council, while others only ratified by local governments. However, such documents and rules are usually initiated by departments, e.g. ministries, local governments. Some ones may cover different departments but the cooperation is ineffective. The Bohai Sea environment problem involves with several parties. It is not possible to be settled by normative documents or departmental rules.

#### **4.4 The Necessity of Legislation for the Bohai Sea Environment Management**

The Circum-Bohai Sea Economic Zone contributes to the national economy to a large extent with the side effect of high environment pressure to the Bohai Sea. As economy construction is the center of China's development plan, the industry in the Circum-Bohai Sea Economic Zone will continue to improve. A lot of factories will be built, the reclaiming land from sea will continue, more business brings more seaborne trade, larger population demands more seafood... all of these could result in further pollution to the Bohai Sea, directly or indirectly.

The complexity and emergency of environmental issues determine the difficulty of problem solving. Based on the analysis above, we have to make a right choice, not just focusing on the economy growth, but putting the environment as a top priority. An effective method is to legislate for the Circum-Bohai Sea Economic Zone.

#### **4.4.1 The Requirement of the Bohai Sea Itself**

Like all closed and half closed waters, slow water exchanging, poor self-cleaning ability and low pollutant acceptability make the Bohai Sea ecosystem fragile. The increasing annual pollutant entering into the sea leads to substandard water condition, red tide, depletion of fisheries and ecosystem unbalance... all of which come together frequently and impact people's life seriously. This in turn interrupts industrial growth.

The failure of previous actions indicates that any single plan without persistent enforcement could not control pollutants discharging into the Bohai Sea, either from shore or from ships. Several successful cases, e.g. *the Seto Inland Sea*, *the Arctic Waters*, *Great Lakes*, *Northern Australia* show that the most important step is to enhance regional cooperation and the most effective way is regional legislation.

#### **4.4.2 The Requirement of the Sustainable Development**

For decades, further and more pollution has come up along with protective actions. The total pollution exceeds the effect of protection. Most local governments prefer economic growth to environmental protection. They only care about their own development, neglecting environment law enforcement or even breaking the law themselves frequently. However, no mechanism can stop local governments from unreasonable exploitation.

There are 3 typical high-speed coastal economic zones in the Circum-Bohai Sea Region, namely, Tianjin Binhai New Area, Liaoning Coastal Economic Zone, Yellow River Delta Economic Zone. The rapid economic growth has stimulated more local governments to establish economic zones, which will bring about even more pressure to the ecosystem of the Bohai Sea. An integrated law is urgent to standardize effluent water discharge and other maritime activities. Otherwise, the situation will be worsened and the

development shall be unsustainable. (Miao & Luo, 2011, p.4)

#### **4.4.3 The Requirement of Law Enforcement and Integrated Management**

About 75 rules, including national laws, regulations, and local regulations, can be applied to the environment protection of the Bohai Sea. However, this large legal system does not adapt to the Bohai Sea according to the analysis above. It is divided by different industries and affairs without considering systematicness and coordination. Responsibilities are not clear but overlapped frequently. It also lacks detailed and strict marine environment standards and discharge standards. Excessive law enforcement departments involve agriculture, industry, fishery, shipping, petroleum, tourism, etc. An integrated management is difficult to be established in order to take all factors relating to sea and land into consideration.

In addition, an effective mechanism of responsibility identification is in need to ensure law enforcement.

If it takes time to optimize the setting of departments from the national level or re-legislate for the sea protection, a special law is necessary to join efforts of different departments and establish an integrated mechanism for the Bohai Sea environment protection.

## CHAPTER 5

### THE FEASIBILITY OF LEGISLATION FOR THE BOHAI SEA ENVIRONMENT MANAGEMENT

#### 5.1 Experience of Regional Legislation in the World

There are 15 closed and half closed waters crossing-boundaries in the world. Most of them are protected by treaties, conventions or other agreements established bilaterally or multilaterally. There are 6 closed and half closed waters crossing-districts within single countries in the world, 3 of them, namely the Seto Inland Sea, the Chesapeake Bay and the San Francisco Bay, have special legislation, besides, Hudson Bay has a big area (819,000 km<sup>2</sup>) with little pollution, and legislation for the Gulf of California has been required strongly.

##### 5.1.1 The Developing Process of Regional Legislation

The typical process to establish effective mechanism to prevent environment pollution for closed and half closed waters is from common law to special regional law, from temporary measures to formal scheme, from single rules to integrated regulations. Many successful waters experienced such process, e.g. in Japan, *Water Pollution Control Act* was established in December 1970, followed with *Marine Pollution and Calamity Prevention Act* in July 1972, and in February 1973, *Law Concerning Temporary Measures for Conservation of the Environment of the Seto Inland Sea* came up according to the serious pollution of the Seto Inland Sea. It was in 1978 that the temporary measures act was transformed into formal law, namely *Law Concerning Special Measures for Conservation of the Environment of the Seto Inland Sea*.

When abnormal pollution is identified in certain water, most authorities take temporary measures due to the emergency and lack of experience at the beginning. In the long

term, some temporary measures are cancelled while others become permanent schemes according to the effect of the measures. Permanent schemes are implemented via enforcement of special legislations.

The environment management and legislation should keep pace with times. Like the improvement of MAPOL 78/95, at the early stage, people only took measures to prevent oil pollution from ships, namely Annex 1, but after several decades, another 5 annexes have been introduced to protect sea from pollution of all aspects, including noxious liquid, harmful substances, sewage, garbage and air, most waters in the world have experienced the process from simplicity to integrity.

### **5.1.2 Learning from the Environment Management of the Gulf of Mexico**

The Gulf of Mexico, the ninth largest body of water in the world and referred to as the "Mediterranean of the Americas," is located at the southeastern corner of North America. The Gulf is bordered by the United States to the north (Florida, Alabama, Mississippi, Louisiana, Texas), five Mexican states to the west (Tamaulipas, Veracruz, Tabasco, Campeche, Yucatan), and the island of Cuba to the southeast. (EPA, 2014) It is the most important and valuable marine ecosystem as it contains abundant natural resources. The annual production of oil and gas accounts for about 90% of the total national output. 30% of domestic marine products are supplied by the Gulf of Mexico. The five American states benefit from the gulf to a large extent, but the sea environment, especially the coastal area, has been in danger due to excessive exploitation and pollution.

The largest marine oil pollution in the US, the Deepwater Horizon oil spill, began on 20 April 2010 and stopped on 15 July 2010, resulting in about 4.9 million barrels of crude oil entering into the sea. The 2011 Bohai bay oil spill was a series of oil spills that began on 4 June 2011 at the 19-3 oil field of ConocoPhillips China in the Bohai Bay.

Around 3,200 barrels of crude oil and oil sludge was discharged into the sea. Both of the accidents caused serious damage to the local ecosystem which will last for decades.

Compared with the Bohai Sea, the Gulf of Mexico has a much bigger area (1.5 million km<sup>2</sup> VS 78,000 km<sup>2</sup>), depth (1,512 m VS 18 m on average), flow and self-cleaning ability. Even though the industry and other activities pollute the region intensively, the ecosystem and environment of the Gulf of Mexico maintain is much better than the Bohai Sea.

Firstly, less pollutant enters into the Gulf. The harmful substances in the effluent have to be separated before being disposed into the sea while in China they are discharged into the Bohai Sea directly.

Secondly, information disclosed prompt and transparent. The Gulf of Mexico is monitored by environment protection authorities regularly and usually the related data is released to the public. In China, the relative data is usually kept to the involved authorities, and is not accessible to the public and even the other environment authorities. In addition, some accidents, e.g. the 2011 Bohai Bay oil spill, are not publicly disclosed in time.

The differences suggest that a crucial factor to improve the Bohai Sea environment is attitude--do what should be done and let all involved people know what should and must not be done to protect the sea.

### **5.1.3 Learning from the Environment Management of the Mediterranean**

The Mediterranean is the largest inland sea with a very low water-exchanging speed, taking about 100 years to renew water with the Atlantic and the India Ocean. It was surrounded by 18 coastal countries, most of which are industrially developed or abound in fossil oil. Industrial and oil production impact on the local environment badly.

Effluent and industrial waste disposed into the sea by Spain, France, Italia, Greece... is massive.

In order to stop excessive pollution and save the Mediterranean, *Convention on Protection of the Mediterranean from Pollution (Barcelona Convention)* was established by the coastal states on 16 February 1976. A series of actions were taken to protect the environment of the Mediterranean following the enforcement of the convention. In 1981, a center aimed at protecting endangered animals and plants was set up in Tunisia to monitor related areas. In 1984, another special protection center was established to control water pollution in the Mediterranean. In 1985 and 1986, contracting parties take efforts to control the number of jellyfish which reproduced rapidly due to water pollution. In 1995, contracting parties offered fund to carry out regional pollution investigation.

A convention could be established and implemented by 18 coastal countries effectively. The Bohai Sea, surrounded by 3 provinces and 1 city, should do the same effort and establish similar regional law.

#### **5.1.4 Learning from the Successful Management of the Seto Inland Sea**

The Seto Inland Sea has an area of 9,500 km<sup>2</sup>. It is a typical inland sea with successful environment management.

The *Seto Law* plays a key role in pollution controlling. The Bohai Sea is similar with the Seto Inland Sea geographically, namely, inland seas with poor water exchanging and self cleaning ability, fragile ecosystems, surrounded by lots of cities with large population and massive factories.

The experience of the Seto Inland Sea and its law can give a lot of reference and guide to the Bohai Sea environment management. (Xu, 2007, P.3)

#### **5.1.4.1 The Treatment Process**

The half-enclosed Seto Inland Sea was a natural fishery until about the end of the 2<sup>nd</sup> World War, after which the coastal regions became important industrial base, accounting for 40% of the national industry, as the distribution of Japan's industry moved to coastal area in order to improve its economy. Following the economy boom, a huge amount of effluent water, containing heavy metals and chemicals, was discharged into the Seto Inland Sea every year. After 1955, the pollution speeded up and brought with red tide frequently. 1/3 of the seabed was mudded. Fish and shrimp were almost extinct. The attack of Minamata disease astonished the world in the 1950s.

The Japanese government started to act in 1970. In the 1980s, the water quality recovered to a high standard and fishery resource exceeded the amount in the year of 1950. So far, the economy in the territory is in good level, while the environment and the sea ecosystem are kept in good conditions.

#### **5.1.4.2 Measures Taken**

- Allocation of responsibilities is clearly and properly. The routine work of environment protection is the duty of the Environment Agency. Japan Coast Guard (JCG) deals with pollution at sea. Local governments are responsible for monitoring the pollution. A special meeting attended by governors of 5 coastal cities and 13 coastal counties is held regularly. The meeting plays a very important role in the prevention of environmental pollution.
- Monitor the water closely. In 1970s, 700 hundred observation stations were built to monitor the water conditions and pollution incidents automatically and consecutively. Studies about the water have been carried out many times through investigations and assessments.

- Establish scientific research institutions for water quality pollution prevention and marine biotic environment research. Some other government institutions, universities, and Non-Governmental Organizations also do research on the environmental and ecological issues of the Seto Inland Sea. The research offers sufficient technical assistance for protection of the ecosystem.
- Publicity of the importance of sea environment. The support of all folks is the most important factor of the success. With the sense of importance and necessity of sea environment, inhabitants stop discharging untreated effluent water into the Seto Inland Sea from shore and ships. Continuous publicity cultivates the environmental sense and arouses activities by some nongovernmental associations.
- Remove the pollution source. Actions were taken to cut off heavy pollution source by moving away major pollutant makers such as chemical plants. Cutting down the area of reclaiming land from sea and establishing national parks were also effective measures. Besides, more than 800 Wildlife Nature Reserves were set up.

#### **5.1.4.3 Enlightenment**

Lots of similarities and differences can be found by comparing the legislations for the Bohai Sea and the Seto Inland Sea. The latter one offers lots of experience.

**Time:** Japan's industrialization was much earlier (1945-1970) than China. Its legislation for sea environment was also early. When Japan realized the impact on the ecosystem by economy growth, it took measures to control the pollution immediately. Japan's

*Public Water Landfill Act* was established in 1921, *Sea Coast Law* in 1956, *the Seto Law* in 1973, *Law on Environment Impact Assessment* in 1997. China's laws and legislations involving in sea environment were all established after 1980s. Actually,

China had enough time to study the Japan's failure in environment protection in early years, but it repeated the failure and went through the similar way, namely destroying first, and recovering it afterwards.

**Quantity:** Japan has only 5 laws related to sea environment, namely *Public Water Landfill Act*, *Sea Coast Law*, *Basic Environment Law*, *the Seto Law*, and *Law on Environment Impact Assessment*, whereas China has dozens of environment laws and regulations involve sea. We have to doubt the law implementation and enforcement as so many laws have not controlled the deterioration of the Bohai Sea ecosystem.

**Timeliness** :except *Basic Environment Law* and *Law on Environment Impact Assessment*, other environment laws have been revised from time to time, e.g. *Public Water Landfill Act* was amended 13 times before 1979, *Sea Coast Law* was amended 12 times between 1958 and 1978, *the Seto Law* was a temporary law when it was established in 1973 and turned to be a permanent law in 1978, it experienced 6 modifications until 1996. On the contrary, all China's environment laws and regulations have not been amended except *MEPL* (revised once in 1999) and *Fisheries Law* (revised once in 2000).

This situation shows that the importance of laws, their effectiveness and timeliness are taken seriously. Japanese authorities are strict in their law enforcement and management, which ensures the effectiveness and efficiency of the legal system. The conflict between China's environment legislation and the current situation of the Bohai Sea requires authorities to focus on the function of law and its implementation.

**Pattern of legislation:** special law plus general laws is the successful way to deal with the Seto Inland Sea pollution in short time. The general laws regulate the common issues of environment, while the special law focuses on the specific issues and difficulties. China does not establish a formal special environment law for special

areas such as the Bohai Sea even though a lot of effort has been made, e.g. plans and special campaigns, which have no enforcement and are easy to be given up halfway.

**Emphasis of law enforcement:** In Japan, *Basic Environment Law* stipulates that the Prime Minister must participate in drawing up the national environment plan and make final decision. *The Seto Law* requires involved local governors to make regional plans, which are reported to Prime Minister directly, aimed at protecting the Seto Inland Sea based on the principle of national environment plan. The Central Government and local governments are clear about each other's responsibilities and carry out their duty fully. Meanwhile, the Central Government gives specific and explicit orders or requirements to local governments concerned. All of these are settled down relying on the performance of legal system and the successful recovery of the Seto Inland Sea ecosystem proved the effect of law enforcement.

The high status of environment issue ensures the enforcement of laws and plans, avoiding interruptions from any parties. Without a senior coordinating official, the confusion of responsibilities among excessive authorities leads to chaos of environment management.

**Measures stated by laws:** protection measures for the Seto Inland Sea are specifically detailed according to the Seto Law, which provides control methods of setting up particular facilities, preventing measures for water eutrophication and natural coast protection, etc. The Prime Minister, the Executive of Environment Agency and local governors have to take responsibilities and do their parts for the decided measures. China's environment laws provide many more principle rules than specific regulations and no officials are assigned with detailed duties. The principle rules are flexible and usually allow involved authorities to do little virtual work.

**Supporting measures and funding:** the *Seto Law* provides ways to get capital support from the government and other parties. It also provides legal ground for actions to clean sea area, prevent oil spill from marine accidents, promote technological development, remedy for fishery victims caused by pollution such as red tide and oil spill...almost every involving aspect is included with operability regulations. As for the Bohai Sea, only some special plans or projects stipulate the approaches of collecting funds. However, these plans and projects are not followed as there is not any supportive law for fund collection. Lack of fund makes some authorities frustrated and most plans and projects suspended.

#### **5.1.4.4 Sub-conclusion**

Successful cases proved that only by effective legislation considering the special features of closed or enclosed seas can environment and ecosystem be managed. The Bohai Sea is on the way to become a “dead sea”. Effective actions are in desperate need. The analysis above shows that the ecosystem of the Seto Inland Sea was improved depending on the practical legislation at an early stage, whereas China has even more laws and regulations concerning the Bohai Sea environment than Japan, but none is specific and practical for the region. In a word, Japanese authorities act appropriately to the situation while China still needs to find specific ways for the Bohai Sea.

## **5.2 Experience of Regional Legislation in China**

In the last two decades, authorities of China have made a lot of efforts to protect its waters. Even though failures are repeated, some successful cases indicate the importance of regional legislation and offer some valuable references, typical examples are the *Interim Regulations of Water Pollution Control for the Huaihe River* promulgated by the State Council in 1995, the ninth Five-Year Plan to Prevent Water

Pollution for the Dianchi Lake Basin approved by the State Council in 1998, *Regulations of Sand Excavation Management for Changjiang River* issued by the State Council in 2001, etc.

### **5.2.1 The Huaihe River**

Pollution of Huaihe River started in the late 1970s and pollution incidents happened frequently in the 1990s. One typical event in July 1994 resulted in 1.5 million residents living along the Huaihe out of clean fresh water supply for 54 days as it has been the main drinking water source. Another major pollution incident took place between July 16 and July 20 in 2004. Heavy rainfall in some upstream areas of Huaihe River drove tens of millions of cubic meters effluent water to downstream and formed a pollutant ribbon of about 130 km to 140 km in length.

People's life, industry and agriculture on both sides of the river had suffered from water pollution for decades. Lack of water supply, regional interest, unreasonable industrial structure, ineffective pollution control actions and improper supervision were considered the reasons for the serious pollution. (Deng, 2012, p. 25)

In 1995, the State Council promulgated the *Interim Regulations of Water Pollution Control for the Huaihe River* which altered the traditional way of water protection. It allocated specific duties to involved authorities clearly, adjusted the industrial structure and closed down heavy pollution factories, established a regime with public supervision and lawsuit. The regulation also specifies the support by the central government and imposes environment tax to involved factories. In the last decade, it has been implemented perfectly and no serious environment incident has happened since 2004.

### 5.2.2 The Changjiang River

With the rapid economic growth alongside the Changjiang River since the 1990s, the demand for sand, an essential building material, has increased quickly. The climbing sand price drives sand ships of all sizes to crowd together in parts of Changjiang River in provinces of Hubei, Jiangxi, Anhui and Jiangsu, which are abundant in high quality sand.

The lack of proper regional legislation and unified management indulged illegal sand excavation, some of which destroyed embankment or altered the bed of the river, increasing the risks of flooding and traffic accidents.

The *Regulations of Sand Excavation Management for Changjiang River* was entered into force on 1 January 2002. It started a new scheme of sustainable management based on special regional legislation. Most of the disordered sand excavation activities have been under control and risks are reduced as low as reasonably practicable.

The *Regulations of Sand Excavation Management for Changjiang River* works successfully because some crucial regulations are specified in it and implemented by the authorities.

First and for most, integrate the responsibilities and rights which were decentralized among quite a few departments. The *Regulations of Sand Excavation Management for Changjiang River* was the first special regulation for the management of a single river. It explicates that the supreme leader of local government in charge of sand excavation management overall and water conservancy administrations carry out specific duties. As supporting authorities, The Yangtze River Waterway Administration, MSA and Police Station play certain roles with clear responsibilities. The puzzle of multiple management existing for decades in the history was solved and a scheme of unified

management according to law was formed. After a few years, the excessive and irregular excavation was eliminated and a good order was formed.

### **5.3 The Difficulties and Complexity of the Legislation**

After decades of work and research on the Bohai Sea environment issue, a lot of experience has been acquired but difficulties remain.

#### **5.3.1 Controversial Ideas Exist in the Related Legal System**

Even though people from all walk of life appeal for special regional legislation, many specialists object to establish more regulations. They deem that the crucial point is law enforcement. The existing laws and regulations have covered all aspects of the Bohai Sea problems and the failed experiences only proved the unsuccessful implementation. More efforts should be put to ensure the effectiveness of the present regulations rather than make new ones. Amendments may be needed to improve the availability of the present laws and regulations. Besides, the Bohai Sea environment involves many regions, industries, departments and people. Every place has its own characteristics which require different measures. A new law or regulation is difficult to unify all the regions and involved departments.

However, the existing departments setting and legal system have interrupted the effective management of the Bohai Sea. If they are not be changed or optimized in time for political reasons, the best and the only way is to get a special integrated law which will be based on the success and failure of existing rules.

#### **5.3.2 The Resistance of the Existing Management System**

The predominant weakness is multi-departments of the present sea management scheme. At least 5 departments (See 3.5) are in charge of the sea environment protection issues.

They belong to different ministries from each aspect and overlap frequently. They have no rights to take care of responsibilities of others. The lack of integrated and comprehensive management results in little cooperation, information sharing, and many loopholes. It is also the primary reason why so many laws and regulations have been established with low efficiency of law enforcement.

A new law shall be strict and highly effective; otherwise it will only make the legal system more complex. It requires reformation and should introduce better schemes to cope with the difficulties in enforcement. Resistance may be encountered due to the breaking of complex tradition.

## **5.4 Basic Conditions of Legislation for the Bohai Sea**

### **5.4.1 Social and Economic Condition**

The Circum-Bohai Sea Region is the most important economic zone with the largest scale in north China. Not only does the economy of the coastal districts like Liaoning, Shandong, Hebei and Tianjin rely on the Bohai Sea, but also all the neighbor inland regions, e.g. Beijing, are influenced by the seaborne trade via the Bohai Sea. With more than 30 years' reform and open policy, the continuous economy growth has brought the Circum-Bohai Sea Region many advantages, e.g. economic power, culture, science, tourism, etc. The ability of legislation for the Bohai Sea has come up and it is expected by the public, just like other social problems such as food security. (Miao& Luo, 2011, p.4)

### **5.4.2 Policy Conditions**

The special location, developed port infrastructure, marine resources and heavy industry lay the foundation of the prosperous future for the Circum-Bohai Sea Region. The political center of Beijing also influences the development of the region. The

importance of the Bohai Sea has encouraged the central and local governments to realize the severity of its environment problem. Actions have been taken frequently though some of them ended in failure (See Chapter 2). Governments have shown the will to improve the Bohai Sea environment. The consequence of pollution such as depletion of fishery resources, sea food security, and severe weather impacts daily life of residents nearby and draws a lot of public attention. The intensified pressure brings more and more policies which allow a new special regional law or regulation aiming at establishing a sustainable Circum-Bohai Sea Economic Zone. (Miao & Luo, 2011, p.3)

#### **5.4.3 Legal System Basis**

A series of laws, regulations and plans have been issued for the Circum-Bohai Sea Region since the 1990s. They were issued by different levels of governments and authorized departments based on shore or sea or both. Though some cases conflict with others, they act as references for the Bohai Sea special legislation. The successful cases will be cited directly or with some changes, while the failed ones offer important preventive for the coming legislation.

#### **5.5 Feasibility Analysis**

Based on the analysis of the feature, ecological evolution, current situation and future development of the Bohai Sea and its circum region, and the comparison of legislation and management of similar waters at home and abroad, we can conclude that all conditions concerning society, economy, policies, legal system and legislative techniques of the Circum-Bohai Sea Region and the whole country have met the requirements already.

The pressure of pollution has aroused public expectation of effective and practical measures to improve environment in the Circum-Bohai Sea Region. Environmentalists

and authorities have tried a lot of efforts on the Bohai Sea. A typical consensus for the region is to establish a special regional law, which is urgent in order to avoid further pollution. It is also the necessity of high speed economic growth of the region.

Such special legislation meets the regulation 211(4) of *United Nations Convention on the Law of the Sea 1982 (UNCLOS 1982)*, which support Coastal States adopting laws and regulations for prevention, reduction and control of marine pollution from vessels.

Meanwhile, it is supported by the Regulation 23 of the *MEPL*, which provides that special protective measures and reasonable developing methods can be adopted for particular sea areas with special geographical conditions, ecosystem, resources and developing requirement. Special marine protection areas can be set up in such circumstances. Obviously, the specialty of the Bohai Sea requires special measures other than the general rules for the whole territorial sea.

## CHAPTER 6

### LEGISLATIVE PROPOSALS

#### 6.1 Legislative Principles

The Bohai Sea is not big in area. It has encountered most difficulties of management as other territorial seas in China, for example, complexity of authorities and abundance of laws and regulations. Moreover, the mixture of exploitation and management of the Bohai Sea by tens of cities in 3 provinces and 1 municipality makes it more difficult to be controlled.

To avoid repeating failure, the special law for the Bohai Sea should regulate all the activities affecting the ecosystem, including shore and sea activities concerning individuals, corporations, and other organizations. The natural characteristics, the history, current actuality and development trends should be analyzed. The sustainable development should be the top priority which coordinates the demand of economic growth and protection of the ecosystem.

##### 6.1.1 Unified Legislation

A most essential point is the effectiveness and operability of the legislation. Chaos and failure must be avoided. The crucial solution is to establish a law or regulation at the national level so that it can be applied to all the involving regions, especially Liaoning, Shandong, Hebei and Tianjin. It must include articles regulating industry, agriculture, fishery and sea transportation in details, preventing excessive pollution and designating proper in-charging administrations.

A lot of communication and cooperation should be done before accomplishing a comprehensive and integrated law or regulation, which will stop confliction and

impracticability of the current law and regulations. (Miao & Luo, 2011, p.5)

Apart from the cooperation and positivity of local governments, departments, industries and other social organizations, science and technology should keep pace with the development and support the environment management.

### **6.1.2 Covering Activities at Sea and on Shore**

Activities at sea, e.g. shipping, ship building and recycling, oil exploitation, fishery, are undoubtedly the most important and pollution sources, whereas shore activities such as reclaiming land from sea, untreated effluent water discharge, excessive use of chemical fertilizer and pesticides account for increasing violation of ecosystem. The legislation for the Bohai Sea should pay attention to both ends, considering all domains.

### **6.2 Investigation and Analysis of the Bohai Sea Environment Management**

Analysis on the Bohai Sea environment management has been done widely by various authorities. One questionnaire investigation was done by the author with the assistance of the branch MSA which the author works for.

The questionnaires (See Table 2) were sent to the departments and experts involving the Bohai Sea environment management closely, e.g. MSA, Yantai Oil Spill Response Technical Center of China MSA, shipping companies, port authorities, Ocean and Fishery Bureaus, the Ministry of Environment Protection, departments of rescue and salvage, etc.

**Table 2-Questionnaire for the Bohai Sea environment management**

<b>Questionnaire for the Bohai Sea environment management</b>		
<b>1. The environment situation of the Bohai Sea</b>	① Good	<input type="checkbox"/>
	② Acceptable	<input type="checkbox"/>
	③ Poor	<input type="checkbox"/>
<b>2.Existing problems ( multi-choice )</b>	① Defective legislation	<input type="checkbox"/>
	② Undemanding law enforcement	<input type="checkbox"/>
	③ Lack of coordination between departments and unified law enforcement	<input type="checkbox"/>
	④ Others :	
<b>3. Necessity of legislation for the Bohai Sea</b>	① Necessary	<input type="checkbox"/>
	② Not essential	<input type="checkbox"/>
	③ Unnecessary	<input type="checkbox"/>
<b>4. Legislation mode for the Bohai Sea</b>	① Establish a special law	<input type="checkbox"/>
	② Review the existing laws and regulations	<input type="checkbox"/>
	③ Need further study	<input type="checkbox"/>
<b>5.Measures of pollutions prevention (multi-choice)</b>	① Establish a total quantity control system for pollutant discharge into the Bohai Sea	<input type="checkbox"/>
	② Establish unified environmental management coordination institution for the Bohai Sea	<input type="checkbox"/>
	③ Set up stricter pollutant discharge regulations	<input type="checkbox"/>
	④ Set up stricter punishment for the violation	<input type="checkbox"/>
	⑤ Prohibit single-hull tankers entering the Bohai Sea	<input type="checkbox"/>
	⑥ Set up limitations for ships sailing in the Bohai Sea	<input type="checkbox"/>

	⑦ Equip AIS for fishing boats in and near the Bohai Sea <input type="checkbox"/> ⑧ Set up the pollution fund for the Bohai Sea <input type="checkbox"/> ⑨ Prohibit using of oil dispersant within the Bohai Sea <input type="checkbox"/> ⑩ Enhance the ability of the oil spill emergency response <input type="checkbox"/> ⑪ Establish high efficient pollution monitoring system <input type="checkbox"/> Others :
<b>6.Other suggestions :</b>	

Source: the Author

The questionnaire shows that 94% of the respondents consider the Bohai Sea environment in bad condition (See Figure 6).

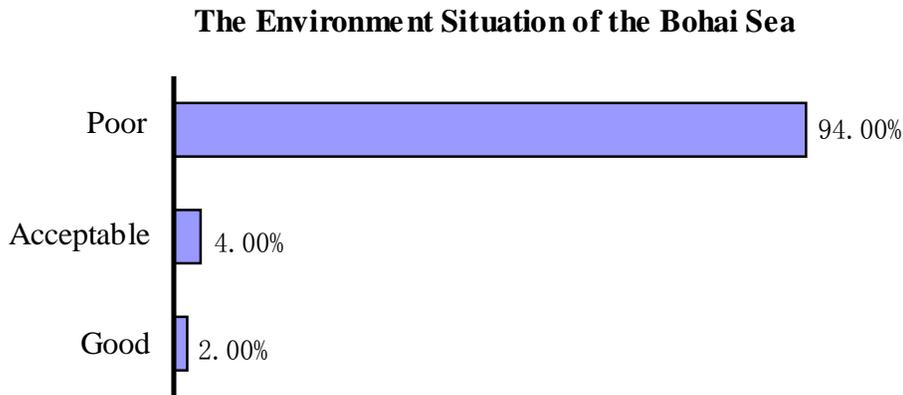


Figure 6-The environment situation of the Bohai Sea  
Source: the Author

All the 3 choices for the existing problems of the Bohai Sea environment protection were ticked by almost all the respondents. Quite a few people gave some ideas other than the fixed ones.

Also 94% of the respondents thought that the special legislation for the Bohai Sea was necessary while only 6% did not think so (See Figure 7).

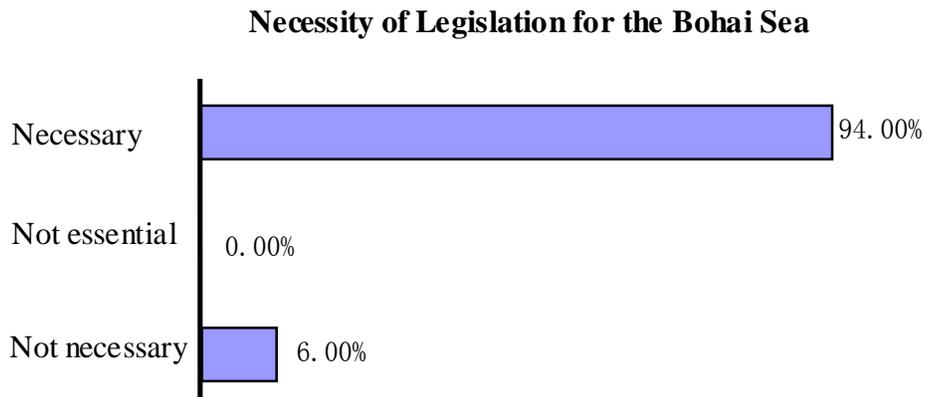


Figure 7-The necessity of legislation for the Bohai Sea  
Source: the Author

90% of the respondents thought that the best solution to the Bohai Sea environment was to establish a special law. Only 8% chose to revise the existing laws and regulations and 2% chose to do further research.

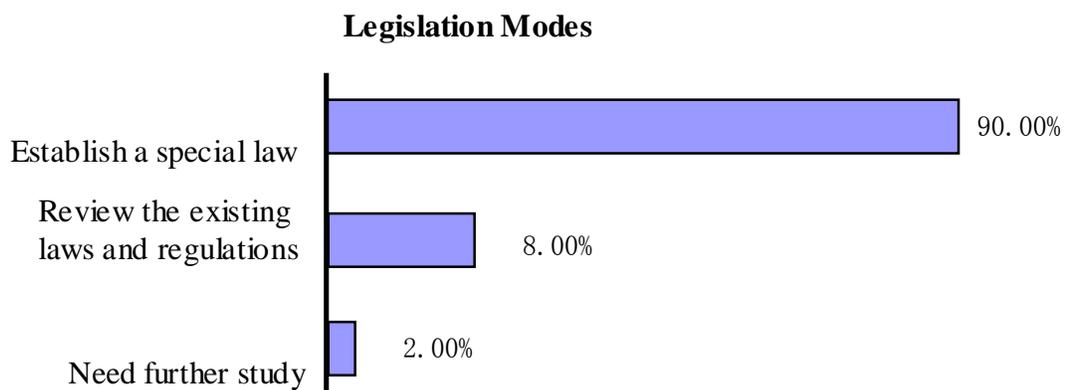


Figure 8-Legislation modes for the Bohai Sea  
Source: the Author

For the measures preventing pollutions from ships, about 90% of the respondents chose the options of ①, ②, ⑧; about 95% chose ③, ④, ⑤, ⑥; about 85% chose ⑦, ⑩, ⑪ and only about 25% chose ⑨, namely prohibit using of oil dispersant within the Bohai Sea.

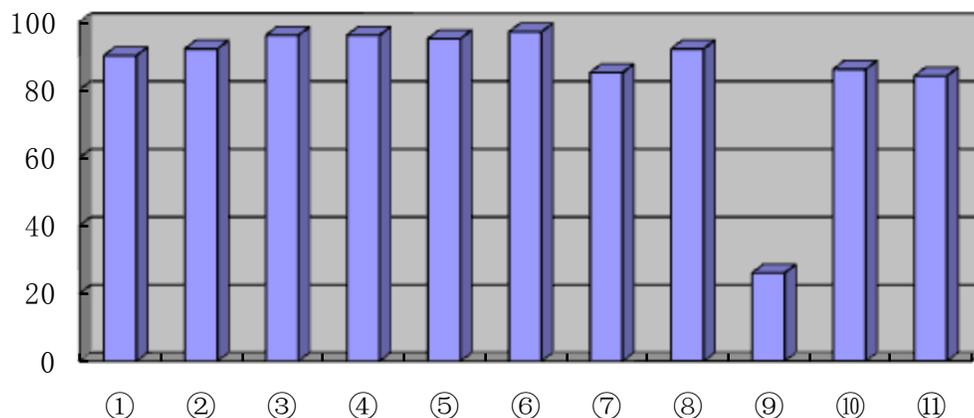


Figure 9-Measures of Pollutions Prevention  
Source: the Author

Other suggestions focused on establishing a strict law or regulation, enhancing the enforcement, and setting up a higher authority. Most showed their concern of the Bohai Sea environment and wished to take actions as soon as possible.

### 6.3 Legislation Proposals for the Bohai Sea Environment Management

#### 6.3.1 Establishing Coordination Mechanism for the Bohai Sea Environment

Even though *MEPL* provides the right to set up regional cooperation organizations (RCO) for marine environment and ecosystem protection in special waters, there is not any guideline for how to operate and what functions and legal status the RCO should have.

The regional legislation for the Bohai Sea should give priority to the coordination mechanism. Details should focus on establishing an explicit RCO which ensures its

legal status, leader status, rights and responsibilities. It should act as a commander which can allocate, supervise, investigate and review the duties of all involved departments. (Miao & Luo, 2011, p.6)

China MSA played an essential role in the disposal of “7.16” oil spill in the Dalian Port in 2010. The successful experience urged the decision that the Ministry of Transport would be the leading administration in charge of the major marine oil spill emergency response. As the maritime authority, China MSA will carry out such duties.

### **6.3.2 Strict and Impartial Law Enforcement**

Economic growth has been the top priority of the most Chinese local governments in the last two decades. Most enterprises, including state-owned enterprises and multinational corporations, pursue high profit and ignore environmental protection. They are reluctant to invest on equipments and technique of pollution prevention. Some local governments indulge the behavior of pollution for the rapid development in short-term. The related departments could not enforce the environment policy effectively under the pressure of governments and the economic demand.

The law enforcement is a crucial step of environment management. It has been the most important reason for the worsened Bohai Sea environment. A good legal environment with strict and impartial law enforcement is essential for avoiding nonfeasance and privilege.

### **6.3.3 Encourage the Public Participation**

The participation and supervision by public, e.g. civilians and organizations, is very helpful for law enforcement. It is not only because the public can push the governments, authorities and enterprises to take right actions for environment protection, but also the public are everywhere in the society, and they can disclose any illegal

activities and malfeasance. A typical example is the Seito Inland Sea environment management. The public supervision was a key factor for its success. However, in China, the public usually do not participate in environment management. Civilians do not care about what the governments, authorities and enterprises are doing to influence the environment until they are harmed by pollution such as severe water quality, air pollution, global warming and other atrocious weather. The tolerance of the public slows down the legislation and law enforcement which in turn encourages pollution.

In the last years, the public awareness has been aroused, but their voice has not been heard widely by governments and authorities due to the lack of legal support. The legislation for the Bohai Sea should consider the influence of the public and support public supervision.

#### **6.3.4 Total Pollutant Discharge Quantity Control**

Each water has a maximum accepting capacity (MAC) for pollutant. The total quantity control aims at bringing down the quantity of pollutant discharge in order to keep the water quality above standards.

The new special law for the Bohai Sea should stipulate the responsibilities and methods of controlling pollutant discharge. The MAC should be determined by considering the features of the sea area, the properties of the pollutant and the water standards. A scheme should be established to monitor the effluent water discharge from shore, ships and other sources.

#### **6.3.5 Land-based Pollution Control**

Since more than 80% of the pollutant is from land in the Circum-Bohai Sea Region, the special legislation should establish a mechanism to coordinate with departments responsible for shore pollution prevention. (Wang, 2012, p.36)

## **6.4 Legislative Proposals from the Point of China MSA**

### **6.4.1 Duties of Sea Environment Protection**

Prevention of pollution from ships is one of the main responsibilities of China MSA according to its function approved by the central government. *MEPL*, entered into force on 1 April 2000, stipulates that China MSA is responsible for supervision of marine pollution from ships in ports except ships of war and troopships, and ships out of ports except ships of war and troopships and fishing vessels. It is also in charge of administration investigation of pollution accidents caused by such ships. (Chapter 1, Regulation 5)

### **6.4.2 Work Has Been Done and Further Expectation for the Bohai Sea Environment**

As a department in charge of pollution prevention from ships, China MSA has done a lot of routine work according to international conventions, especially MARPOL 73/78, and national laws and regulations, e.g. *MEPL*, *Regulations on Prevention of Pollution from Ships at Sea of the People's Republic of China*. China MSA has taken or participated in some special measures:

China MSA has established the Oil Spill Response Technical Center, located in Yantai, a most important Bohai Sea coastal city in Shandong Province. It is famous for techniques such as remote sensing, oil print analysis and oil spill response.

It established ship's pollution response and coordination plan, which is divided into 3 layers, namely the State, sea areas and ports. A joint cooperation mechanism has been formed so that emergency resources, techniques and even manpower can be managed and shared. The ability to handle major marine pollution has been improved. The Bohai Sea is a typical sea area that benefits from the mechanism.

The regulation about oil pollution compensation fund was another milestone for oil pollution prevention. It started charging ships with 0.3 RMB per ton of oil cargo since July 1, 2012. Financial guarantee has been established for dealing with pollution by cargo oil from ships. (Zhang, 2009, p.42)

The MSA keeps supervising ships in the Bohai Sea in order to avoid marine accidents, prohibit ships' illegal discharge of oil and other pollutants. The special regulation of *Lead-sealing Procedures for Pollution Prevention Equipments of Ships Operated within the Bohai Sea*, has been applied for ships sailing within the Bohai Sea, setting a higher standard for the Bohai Sea environment protection.

China MSA has participated in drafting, compiling and implementing almost all plans mentioned above. It has accumulated some useful experience from the success and failure of environment protective activities.

However, prevention of ship's pollution is only an important aspect of the Bohai Sea environment management, other aspects are also essential for the Bohai Sea environment management and may be introduced into the regional legislation, e.g. monitoring of sea surface inside and outside of ports, pollutant tracing competence, emergency response ability, reception devices, accident investigation, etc.

To designate the Bohai Sea as a Particularly Sensitive Sea Area (PSSA) is a most important step for its environment management. A PSSA is an area that needs special protection because of its significance for recognized ecological or socio-economic or scientific reasons and which may be vulnerable in international maritime activities. (IMO Website)

A PSSA can be deemed as special regional legislation. According to A.982 (24), namely *Guidelines for the Identification and Designation of Particularly Sensitive Sea*

*Areas*, the Bohai Sea could be designated as a PSSA under the procedure of the IMO. IMO is the only organization to designate PSSAs and China MSA may push it.

If the Bohai Sea is a PSSA, it will bring a lot of advantages for the regional environment management.

Firstly, it reduces pollutant discharging. Zero discharge from ships could be achieved by strictly compulsory measures, e.g. forbidding discharging of oily water, harmful substances, garbage, sewage, ballast water and tank washing water into the Bohai Sea. As the major pollution source, land-based pollution will also be limited by corresponding regulations and stricter law implementation. (Zhao, 2013, P.28)

Secondly, it reduces risk of oil spill by marine accidents. Accident happens frequently in Bohai Sea area. It is possible to avoid marine accidents by special protective measures, e.g. traffic separation scheme (TSS), compulsory reporting system, keeping away from islands and reefs, compulsory pilotage...

More importantly, it highlights and raises awareness of the Bohai Sea environment. As a PSSA, the Bohai Sea will attract more technical and financial support at home and abroad. Organizations such as IMO will pay more attention on the area and ships call at the area will be more cautious of safety and pollution prevention. The people involved with industry, effluent water discharging and environment protection around the Circum-Bohai Sea will improve their attitude to sea environment protection.

In a word, the designation of PSSA and special regional legislation shall manage the Bohai Sea environment effectively—turn back the trend and restore the ecosystem which in turn improves the sustainable development of the Circum-Bohai Sea Region with effective and reasonable use of the marine resources.

## CHAPTER 7

### CONCLUTIONS

The Bohai Sea environment issue has already restricted the economic development in the Circum-Bohai Sea Region. It arouses concerns from the public, governments and authorities at all levels. It is time to take actions as soon as possible.

Land-based pollution and marine pollution are the two most important sources contribute to the Bohai Sea environment deterioration. Over fishing and exploitation are additional reasons to the ecosystem destruction.

The existing national laws and regulations are inadaptable with the requirement of the Bohai Sea protection. The continuous unsuccessful environment management urges new regional legislation for the Bohai Sea. The new regional rule will consider all crucial aspects relating to the Bohai Sea management and will coordinate all concerning authorized departments. As for China MSA, apart from new law establishment and enforcement, it is a key step to designate the Bohai Sea as a PSSA.

Based on the situation and risks confronted by the Bohai Sea, this paper analyzes the root causes of the Bohai Sea environment deterioration, the deficiency of the existing marine environment legal system. Further study focuses on the necessity and feasibility of special regional legislation for the Bohai Sea. Successful cases at home and abroad are referred to support the viewpoint of the paper. Ship's pollution is discussed in more detailed.

Some legislative suggestions are proposed according to the research and investigation by the author.

As a conclusion to this paper, the author holds the opinion as follows:

- The Bohai Sea is facing with serious pollution from shore-based activities and marine activities. It must be cured with effective methods as soon as possible.
- Special legislation is proved to be the most possible and efficient way to deal with the Bohai Sea environment. The legislation and implementation should be conducted by higher authorities, e.g. the State Council, than the existing laws and regulations. Without strict law enforcement and effective coordination among involved departments, little improvement will be achieved even a perfect legal system is established.
- China MSA should play a key role in the Bohai Sea environment legislation and management, taking actions to restrict pollution from ships and other marine activities. The designation of PSSA is an essential step to speed up the Bohai Sea environment recovery.

If the special legislation and the designation of PSSA for the Bohai Sea come true, the environment management will have an effective legal basis which is essential for the recovery and future management of the Bohai Sea.

The Bohai Sea environment management is significant to the whole national marine environment protection. We believe that after decades of development accompanied by lessons learned from environment and ecosystem issues at home and abroad, China already has the ability to protect its marine environment and it will do it much better soon.

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