

Sea-based Economical Development & It's Effects on Marine Environment

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Abstract

Up to 1950s people believed the sea was limitless and capable of dissolving any amount of wastes. As global trade prospered through seas and maritime transportations increased, especially transportations of organic materials, preservation of maritime environment was brought to the attention of international societies and finally after the disaster of Torrey canyon supertanker , regulations were established in this regard . Maritime environment protection regulations to reduce maritime pollution by ships were established, so that watercrafts carrying oil derivatives must take controlling measures to reduce pollution risk. As technology and science advanced, more control requirements & equipments were imposed upon watercrafts, even oil tankers with one layered hull were banned and special regulations were established to reduce air pollution by ships and discharging ships ballast water.

But according to researches, only 4.7% of total 1.5 million square meters of pollution which annually enters the seas is caused by the ship and the maritime environment is still affected by other industries.

Economic activities and manufacturing industries in coastal areas such as aluminum plant, refinery, shipbuilding, power plants and etc, can be caused marine pollution.

In this case, some marine areas such as Persian Gulf and Oman sea, are more sensitive against pollution, due to geographical location, economic and business activities within them and marine traffics.

The Persian Gulf is considered as one of the major areas of global energy and there are more than 30% of world's oil resources in it. Low production costs, easy extraction, high quality, ease of transport, high production capacity and new resources are advantages of Persian Gulf in accordance to marine areas.

On the other hand, there is variety of habitats and biodiversity in Persian Gulf and Oman sea and more than two thousand and five hundred species of plants and animals are living in them and Pollution will have a negative impact on it's marine environment.

Therefore, because of unique environmental conditions and high traffic watercrafts, The Persian Gulf and Oman sea require perseveration and protection against marine environmental pollution. so national and international societies must consider protection of maritime environment more seriously.

Keywords:

Maritime environment – Economical development – Maritime Pollution –
Persian Gulf and Oman sea . Maritime Environment costs

Sources of Maritime Pollution

The photo of bird soaked in oil is a heart breaking seen that the press usually publishes in a case of maritime pollution to provoke public conscience, therefore the public opinion counts ship especially oil tankers, as one of the most important sources of Maritime pollution, but as mentioned before, only 5% of maritime pollutions is caused by these kind of pollutions. E.g. between 1978 and 1991, five large pollution out spreads took place in the Persian Gulf, each one alone was larger than Exxon Valdez oil spill in 1989 by the Americas shores. Great amounts of pollution, wanted or unwanted, annually enters other maritime regions by industries as a cost that environment must pay for technological advancement and to turn the wheels of the industry.

Zero pollution practically means complete halt to all economical activities which is obviously impractical, and on the other hand, the sea can process a certain amount of pollution, in other words, pollutions in controlled amounts and depending on the type and the regions conditions, can be discharged into the sea without causing environmental damages. This issue is specified as oil pour point in PPM in maritime conventions and regulations in special occasions permits disposal of wastes that can return to nature. But the amount of pollution must follow a general and comprehensive management which is defined for various regions and conditions. Such task is upon environment.

Maritime Environment Management

Pollution enters the Environment directly or indirectly, as materials or energy and harms organic resources and endangers human's health and prevents maritime activities such as fishing and also reduces the quality of the sea water and the number of recreation locations. Environmental pollutions are usually considered in two levels. Pollution control measures are not always carried out on rational and logical basis. Sometimes these measures are taken before comprehending the measure. Sometimes provoking unsuspecting public opinions may lead to urging to do anything as a remedy, or forces governments or a particular industry to take superficial measures. Such superficial activities may be harmless, but they bear costs and wastes resources better spent elsewhere. On the other hand, irrational measures for pollution control may aggravate the situation. To unify the procedures in pollution control, two general levels are considered for the environment:

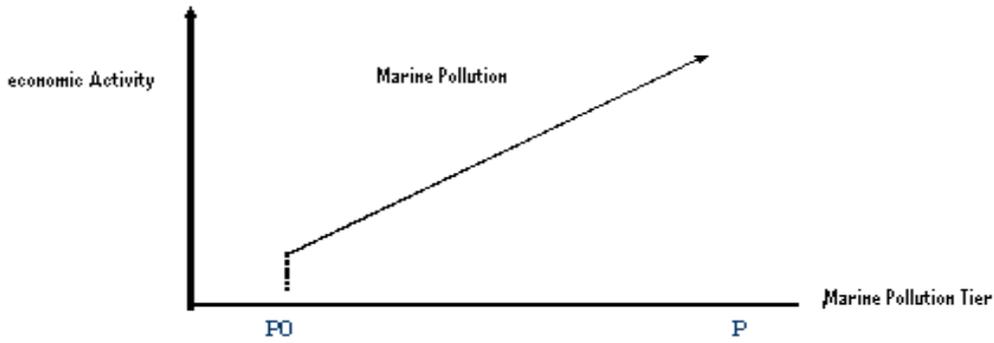
Level 1

The pollution level is lower than the sea processing capacity, like the time when oil was not the main source of energy and was scarcely transported. In this level the ships pollution bears no cost and is absorbed by the nature. Many regions are in this level and environment management is carried out traditionally (zero economic cost)

Level 2

The pollution level is higher than the sea and the public opinion capacity and bears additional costs (external cost). The pollution management must make sure that the polluter pays this additional cost. In this level, the higher the economic activities are the higher environmental preservation costs will be. The following Graph depicts this issue:

Economic Activity Graph:

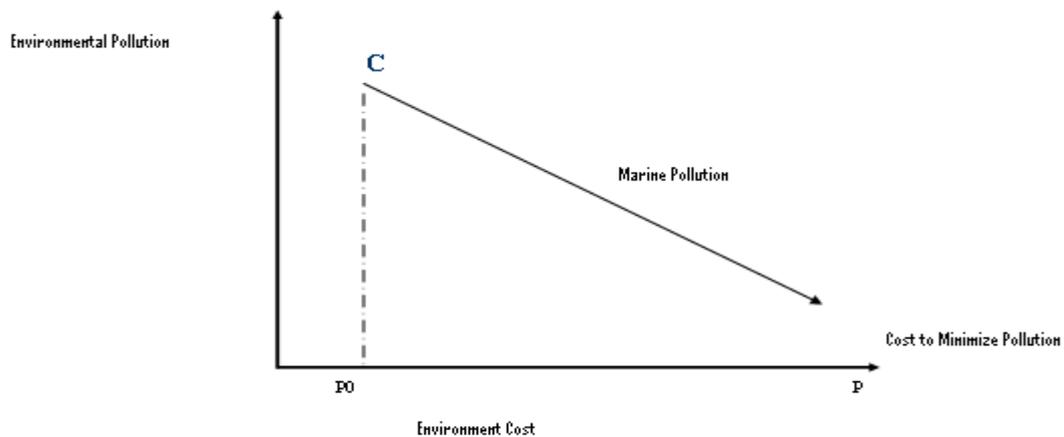


The Relation between Environment pollution and Economic Activity

Graph 1: the relationship between environmental pollution and economical activities

Graph 1 shows environmental pollution has a direct relation with economical activities, when economic activity increases, so does the environment pollution increases. These pollutions start from PO point; in fact PO point is the environment pollution acceptance level in which it can process pollutants without harmful effects. But after this point pollution becomes evident in the environment and it is directly affected by the economic activity, so in other words, before PO level 1 management is implemented and after PO, level 2.

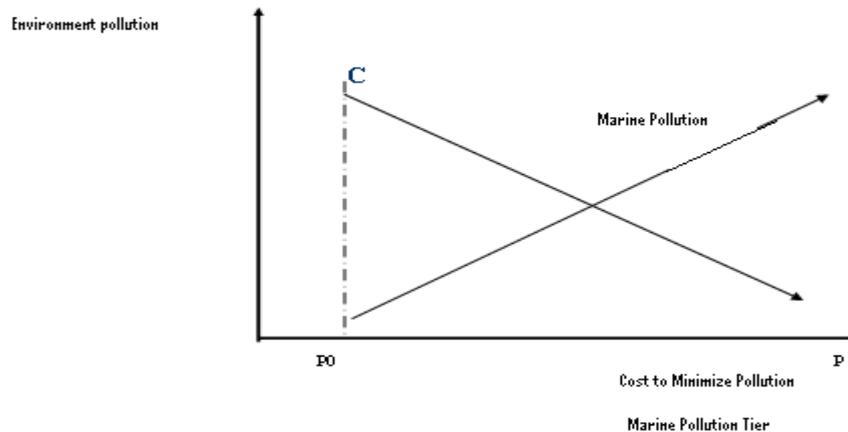
Environmental Costs Graph:



Graph 2: Environmental Costs Graph

The above graph shows that environmental pollution has reverse relation with costs incurred by reducing effects of the pollutions. Therefore, as more is invested in reducing pollution effects, the environmental pollutions decreases, leading to a healthier economy, but the pollution never reaches zero. The curve continues horizontally after p1.

Compare the two graphs:



By examining these two graphs we will have this:

Po XP is the corrective cost, such as cleanup cost for oil spills or indemnifying tourism or fishing industries or the people.

Preventive cost, such as making double bottom oil tankers, can replace the corrective cost.

The X point is the balance between critical profit and critical cost, meaning that costs of reducing pollution risk and environment pollution meet in the X point. This is the optimum point for pollution and environmental costs with an acceptable cost for an acceptable profit. After this point, as the costs increases, no profits shall be gained by the economy and by polluting another unit same damages incurs. Therefore economic activities and maritime environment should always be considered as two important factors and their interactional effects on each other should be studied.

Maritime Environment costs

Current global approach to environment degradation, which incur exorbitant costs for regeneration and takes long times and sometimes can never be regenerated, is first to prevent and reduce harmful effects on the environment and then to collect the costs of environment regeneration from the polluter. According to MARPOL international convention, all beneficiaries of the sea, including producers, oil transporters and shipping companies, are obliged to be prepared for countering oil accidents according to the international instructions in addition to take preventive measures for oil spills.

In case of pollution control caused by activities in the bed of seas such as the Persian Gulf, the countries must seriously consider implementing exact and specific instructions for oil companies utilizing national laws. Such system can cover the following cases:

- Reporting sufficient information to the governments by the performer of the activities
- Constant supervision of the operations and recommending technical and safety standards with serious implementation guarantees
- In the national level there are lots of attention to the oil pollutions caused by the ships .Therefore countries that have not enacted laws to prevent sea pollutions yet must consider such measures and those countries lacking such regulations should make an effort to utilize uniform measures.
- Enacting and implementing effective national regulations for each coastal countries and invigorating current laws.

Therefore industries must evaluate environment and consider current scientific methods for reducing harmful effects on the environment, and while they are polluting the environment, they must contribute to the regeneration costs.

Pollution's costs depend upon the following cases:

- Properties of the pollutant
- Scope and time of the pollution
- Location and time of the pollution
- Weather conditions

Assessing the costs Incurred by Maritime pollution

Currently in countries across the world many instructions are used, namely EPA Oil Spill Compensation Estimation Instruction, International Oil pollution Compensation funds, regional pollution Damage Assessment and Guide and Mimek Damage Compensation claim Instruction. Maritime environment costs include cleanups, Compensation for transferring activities on the shore (corrective cost), costs for providing reception facilities in the ports and for constructing two layered tankers (preventive costs) and preventive measures (enacting laws) and can control the pollution within the optimal level. Preventive costs can have economic value only if the costs are lower than profits gained by such measures. Pollution costs include direct costs, loss of goods, lost economic profit and damage to unique & rare resources which can be difficult to assess. A review of the instruction shows that the stages for determining oil Pollution Compensation are the same in most of them and their only difference is in the method of assessment and its economical evaluation.

Sea pollution Capacity & Opinion

Generally the values for final satisfaction from goods and services produced traditionally by nature and not transacted in any market can be assessed with the tools of “Willing to pay” (WTP) and “Willing to Accept” (WTA). These can be used as criterion for evaluating values raised from final satisfaction. Decision-making & policymaking organizations have extensively used tools to obtain necessary information about the value of ecosystem services. WAT means the maximum amount a person would be willing to pay, sacrifice or exchange for a good and WAT on the other hand is the amount that a person is willing to accept from the government or other organizations to abandon a good or tolerating conditions which is not satisfying for them, which is also called compensation cost.

Factors affecting WAT include:

- Income level in a region brought by various incomes levels for any type of pollution and its profit & loss are different in various countries
- Humans WAT in great disasters leading to large pollution outspreads
- Mass media
- Difference between optimal pollution levels in different countries is the biggest problem in implementing effective environmental regulations

Conclusion

- 1- The higher the economic activities are the higher environmental preservation costs.
- 2- Environmental pollution has a direct relation with economical activities, when economic activity increases, so does the environment pollution increases.
- 3- Environmental pollution has reverses relation with costs incurred by reducing effects of the pollutions
- 4- Maritime regions and special zones such as Persian Gulf, because of unique environmental conditions and high traffic watercrafts, require perseverance and protection against environmental pollution. Studies show that protection against oil pollution is the first environmental priority in these regions.
- 5- Marine pollution can be harmful to human health and has negative impact on the economy and ecology of marine environment and enacting and implementing national & international laws can be very effective in reducing pollution, therefore it is suggested that:
 - Encouraging the marine's countries to join responsibility for oil pollution conventions and establish an international oil pollution compensation fund , ballast water and a related international system
 - Enacting and implementing effective national regulations along with cooperation for implementing conventions and making an effort to further improve this cooperation
 - Considering the specialized aspect of discerning direct and indirect damages to the maritime ecosystem caused by pollutions and need for exact information about international sailing regulations and environment preservation, a court must be established as soon as possible by countries without maritime court for investigating maritime crimes and ruling by specialized judgments and resolving current legal flaws.
 - Training courses for the personnel, officials and local coastal residents so that all will do their share in case of pollution.
 - Promoting national maneuvers to prepare the Seafarers and coordinating communications in case of an accident and informing and utilizing coastal peoples in such a case.
 - Public notification in the coasts cities about the value of the region's ecosystem and national wealth so that in case of oil pollution they can defend their rights and properties.

- Establishing non-government organizations (NGO) and private section so that they would act immediately in case of an accident because often the private section environmental organizations have an important role in case of accidents.
- Improving control and inspecting system, systematic patrols of the region and constant environmental preservations and supervision.
- Facilities to receive ballast water in the oil terminals.
- Programs to investigate toe amount and effects of pollution in the Persian Gulf by the Environment protection, port and marine organizations, the Oil Ministry's Research center and also the universities.

References

1. [http://maritimesafety.pmo.ir/marine environment protection-maritime sensitive zones](http://maritimesafety.pmo.ir/marine_environment_protection-maritime_sensitive_zones)
2. <http://www.imo.org> -Special Areas under MARPOL
3. <http://www.ropme.org/>
4. www.oceansatlas.org/cds_static/en/marpol_special_areas4-
5. Douglas m lambert.,:Fundamental of marine economy
6. www.pmo.ir