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## Marine Pollution - Effects and Control Measures

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### Abstract

**M**arine pollution is a kind of pollution of marine water due to undesirable physical, chemical, and biological changes harmful to human welfare. The main source of such pollution are: i) industrial effluents, ii) Marine ship effluents, iii) oil spillage, iv) inflow of fertilizer and pesticides, v) Nuclear waste and dumping of nuclear wastes, vi) Eutrophication. Oil spill is a worst kind of pollution which may be caused by an oil well blow out a platform accident a large marine pipe line leakage or oil tanker accidents. Several accidents of marine spills have occurred world over. Nuclear tests and dumping of nuclear waste in oceans by the developed countries is another cause of marine pollution. Inflow of agrochemicals and industrial effluents must be minimized and these should be discharged. Various available techniques such as chemical control, physical containment techniques, bioremediation process and use of cheap absorbents *etc.*, should be adopted to minimize loss of the aquatic life.

### Introduction

**A**lthough marine aqua system covers about four times more area (71% of earth) than land or terrestrial system of earth, yet civilized man by uncivilized activities has caused marine pollution to the alarming level. Marine pollution is a kind of Aquatic pollution in which undesirable changes of physical, chemical and biological properties harmful directly or indirectly to human welfare caused. Impacts are reported from a wide range of organisms, microbiota, invertebrates, and vertebrates (Galloway *et al.*, 2017; Law, 2017). A large number of marine vertebrate species were documented to interacted with marine litter, including fishes, seabirds, sea turtles, and marine mammals (Thiel *et al.*, 2011; Miranda-Urbina *et al.*, 2015; Ory *et al.*, 2017). The term refers to the pollution of sea, ocean and estuaries. The main sources of marine pollution are:

1. Industrial effluents
2. Marine ship effluents
3. Oil spillage
4. Inflow of fertilizer and pesticides
5. Nuclear tests and dumping of nuclear wastes
6. Eutrophication

### 1. Effects of Marine Pollution

#### Effects of Industrial Effluents

**I**ndustrial discharges and dumping of waste products into the sea badly and adversely affect the dissolved oxygen and develop oxygen poor or depleted conditions. Oxygen deficiency causes suffocation to the aquatic life leading to their death. Such situation further arguments the pollution level. One such example to of minimata diseases caused due mercury pollution.

### Effects of Oil Spillage

Most affected communities of oil spillage are shore based communities including various species of crabs, starfish, Bivalves, Lobster, Barnacle and seaweeds. The mass scale fishes were died by oil spills. The oil spill causes high mortality rate of seabirds. About 50,000 to 25,000 birds are killed every by oil split. Hydrocarbons and benzopyrene accumulate in food chain and consumption of contaminated fish by man may cause cancer.

### Effects of Agriculture Wastes and Pesticides

Toxic agricultural waste and pesticides reaching sea with the inflow of river water causes disastrous effects of marine life. The killing of the various forms develops the secondary pollution. Recently the marifarming in India has been banned in Tamil Nadu court because of excess usage of chemicals and antibiotics in the process. These have been found damaging marine ecosystem.

### Effects of Nuclear Tests and Dumping of Nuclear Wastes

Developed countries which produce radioactive substance test them for potential and finally discharge their nuclear waste in the oceans considering that silent ocean is the most suitable place for testing and dumping forget the hazardous consequences of their activities. Nuclear pollution is most hazardous as its effects persist from generation to generation.

### Effects of Coral Reefs

The increased inflow of sewage and sediments leads to excessive growth of algae and the submerged vegetation which clogs the coral and reduces oxygen supply to the coral animals. The coral become the brittle and stunned in such area.

### Steps to Prevent the Marine Pollution

- Stop using plastic and littering garbage as they not only choke up the drains but also releases into the oceans.
- Ensure that chemicals are not used near the water area.
- Volunteer or initiate beach cleanup activities and spread awareness about the same in the nearby vicinity.

## 2. Control Measures of Marine Pollution

During the recent years several techniques have been developed to minimize loss due to oil spillage.

Physical containment of oil is carried out mainly by the replacement of specially designed floating booms. The oil can then be mechanically collected off the water surface by specialized oil skimming barges, Surface pumps, floating absorbents etc. Technology has developed cyclone recuperator and nenufar recuperator capable of separating oil film spread on sea water surface.

Chemical control methods have also been worked out chemical dispersants which helps breaking up surface oil slicks into numerous droplets which are then dispersed into the large volumes of water and carried away.

Bioremediation process is a recent method to reduce loss occurring due to oil spillage. The process involved the degradation of organic contaminates as a result of biochemical activities of micro organisms. Such as bacteria convert complex organic substances into substances like fatty acid and carbon dioxide. Some new strains of pseudomonas have been developed by genetic engineering techniques which break hydrocarbon into simple compounds rapidly and reduce such pollution. Some bacterial have been popularly known as superbugs. Some cheap absorbents like saw dust, peat moss, pine bark etc., are sometimes used to absorb and prevent further spreading of the spilled oil.

## Conclusion

Marine pollution is a biggest world problem to impact the aquatic system. It is important to think seriously to solve all pollution in the sea because it is a place to keep marine species survives, as they also consider one of the important sources for humanity. Marine water is contaminated it will directly impact on human health and marine organisms and also destroy habitat of marine organisms.

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