

# The Pollutants Emerging From Anthropogenic Activities into the Aquatic Ecosystem: A Review

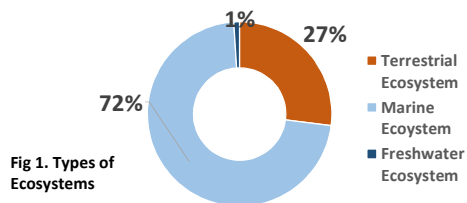
Sub Theme: Emerging Pollutants in Aquatic Ecosystems

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## Abstract

The aquatic ecosystems provide home to various water dependent animals, plants and microbes. Increasing population, higher industrialization and rapid urbanization has led to pressure on the marine and freshwater ecosystems (collectively aquatic ecosystems) as they provide components for fertilizers, cosmetics, additives and water for sanitation, drinking, industrial and agricultural purposes respectively which are crucial to human beings and their well being. The anthropogenic activities which are mostly land based pollute the aquatic ecosystems, directly or indirectly and affect many aquatic organisms even though the source of pollutant is distant from sink. The purpose of the study is to analyze the threat and the environmental impacts various anthropogenic activities on the emergence of pollutants in the aquatic environment and presents the various methods that can be used to lower their effect on the aquatic life and to some extent the human life.

## Introduction



**Marine ecosystems** include estuaries, coral reefs, open oceans, salt marshes, and oceans while **fresh water ecosystems** include lentic and lotic, wetlands ecosystems. Since the beginning of civilization, humans have had the maximum disadvantageous effect on environment.



### Oil Spill

**Source:** Leakage from tankers, wells drilling rigs and offshore platforms

**Emerging Pollutants:** Crude oil, distilled products of oil (e.g.: gasoline, diesel, kerosene, hydraulic oils, lubricating oils)

**Remediation Techniques:**

1. Physical
2. Chemical
3. Thermal
4. Biological
5. Nanomaterials



### Plastic Waste and Micro Plastics

**Source:** Packaging waste, products like plastic bags, bottles, containers

**Emerging pollutants:** Polyethylene terephthalate (PET), low- and high-density polyethylene (PE), polypropylene (PP), polyvinyl chloride (PVC), and polystyrene (PS), Polyester, Polyamide (PA)

**Remediation Techniques:** 1. Physical sorption and filtration. 2. Biological removal & ingestion 3. Chemical treatments



### Untreated Sewage Disposal

**Source:** Coastal and estuarine outflows from waste water treatment plant or from vessels or commercial ships

**Emerging Pollutants:** Micro plastic particles, soaps, fats, pesticides, fertilizers, oils, different chemicals, radioactive materials, acids, salts

**Remediation Techniques:**

1. Phytoremediation
2. Constructed wetlands

## Mitigation of Global Warming by Aquatic Ecosystems



## Conclusion

The various anthropogenic activities have effects on the aquatic ecosystem due to the source of the pollutants, the type of pollutants and life cycle of the pollutant. Due to their dire effect on the aquatic ecosystems it is important to determine the remedies for reducing emerging pollutants to improve quality of life for aquatic species as well as the water bodies. It is concluded from this study that in order to remove pollution due to micro plastics and plastic waste membrane technologies are the suitable for maximum removal. Moreover, for recovery of oil from oil spill site boom and skimmer system. Lastly, for removal of pollutants due to untreated sewage disposal in marine and fresh water environment phytoremediation method is an accurate technique to reduce contaminants.

## References

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Oil Spills	Plastic waste and Micro Plastic (MP)	Sewage Disposal
<ul style="list-style-type: none"> <li>• A thin layer of oil is formed over water surface.</li> <li>• Lack of oxygen for plants &amp; animals</li> <li>• No photosynthesis</li> <li>• Fur on the sea animals affected-insulator</li> </ul>	<ul style="list-style-type: none"> <li>• Degradation of plastic waste by constant exposure to UV radiation &amp; low temperature</li> <li>• Cannot differentiate b/w food and MPs</li> <li>• Bio magnification</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of biodiversity, community shifts, physiological &amp; behavioral changes in species, fish mortality, eutrophication of water bodies</li> </ul>