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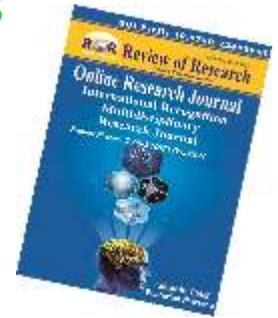
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## MARINE POLLUTION IS ALARMING COASTAL VILLAGES IN KANYAKUMARI DISTRICT - AN ANALYSIS



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### ABSTRACT

The only reserve for millions of fishermen in the world is the marine resources. They are solely depending upon the sea for their livelihood. Due to marine pollutants, the fishermen as well as the people who consume fish have adverse effect like skin irritations, eye irritation, blindness, lung and liver problems, low fertility and poor birth survival rates. Further, there is a drastic fall of marine fish from 60 per cent in 1990-91 to 36.70 per cent in 2012-2013. The recent research states that the world's largest landfill is not on land but in the Pacific Ocean. Adding to that, 80 per cent of all marine pollution originates from land-based sources which are primarily industrial, agricultural and urban. Therefore, this research paper focuses on addressing the readers and the policy makers about the extent of pollutants that are submerged in the sea water and its serious effect on both marine and human life. Results indicate that 52.4 per cent of the sample respondents yearly income is less than ₹1, 00,000 per annum due to depletion of fish in the sea. 45.8 per cent of the sample respondents spend above ₹10000 for medical purposes. Therefore this paper offers some valuable suggestions to control the marine pollution and save both human and marine lives.

**KEYWORDS :** *Marine Pollution, Coastal, Diseases.*



### INTRODUCTION :

The United Nations working group called "Group of Experts on Scientific Aspects of Marine environmental Protection (GESAMP) defines Marine Pollution as "introduction by man, directly or indirectly of substances or energy into the marine environment resulting in such deleterious effects as harm to living resources, hazards to human health, hindrance to marine activities including fishing, impairment of quality for use of seawater and reducing of

amenities". For coastal cities, one of the options for disposal of the waste is sea outfall. Wastewaters are partially treated at treatment plants and discharged into the marine environment. The major aim is to use the natural assimilating capacity of huge water bodies to minimize the adverse effects of the discharged wastewater. Coastal and estuarine ecosystems have been, and still are, heavily influenced by the human species through pollution and habitat loss throughout the world. This coastal pollution and its impacts have resulted in a number of environmental issues including the enrichment of enclosed waters with organic matter leading to eutrophication, pollution by chemicals such as oil, and

sedimentation due to land-based activities or sea level rise due to the global change. Over 80 per cent of all marine pollution originates from land-based sources which are primarily industrial, agricultural and urban. Pollution accompanies most kinds of human activities, including offshore oil and gas production and marine oil transportation. The recent research made by the Scientists states that the world's largest landfill is not on land at all but in the Pacific Ocean. Hence marine pollution has a serious effect on both marine and human health.

### STATEMENT OF THE PROBLEMS

When God created the world, the universe is free from pollution. So every human being, flora and fauna experienced good health and happiness. There is an old proverb that 'illnesses are the curse from God'. Now this concept has changed and the sad truth is that every person in the world is vulnerable and they have to face some form of pollution on a daily basis. We are living in a world where convenience is considered to be important to a person's survival; the use of industrial machinery, transport and people's ambition to own the most technological advanced equipment is the catalyst behind pollution. This in turn has caused a number of negative effects, specifically on our environment and health. The pollution in the ocean is a major problem that is affecting the both the land and water bodies. Its pollution directly affects the ocean organisms and indirectly affects human health and resources. As per the statistical report of National Institute of Oceanography, the coastal pollution in India stems from population growth, urbanization, agriculture and industrialization, all of which release a wide range of pollutants into the ocean each year. Coastal areas are usually thickly populated and attract many recreational activities and related facilities that have been developed for fishing, boating, snorkeling and scuba diving, swimming, nature parks and preserves, beaches, and other resident and tourist attractions. Oil waste that invades and pollutes these areas and negatively affects human activities can have devastating and long-term effects on the local economy and society. Property values for housing tend to decrease, regional business activity declines, and future investment is risky. In addition, oil affects coral reefs in a negative way. These reefs are not only beautiful but they provide a habitat for many sea creatures. Oil also clogs up the gills of the fish that live there and suffocates them. When oil floats on the surface, it blocks sunlight and prevents marine plants from utilizing the light for photosynthesis. These plants are an important in both the food chain and the reef habitats found in the ocean. At this juncture a few questions arise in the minds of the researcher like the extent to which there is the pollution in the marine sea, whether there is any decline in the fish production due to pollution. What the earning capacity of the fishermen is and how much they spend for medications. To find fitting answers to the above questions this research problem is undertaken.

### OBJECTIVES OF THE STUDY

The general objective of the study is to discuss the extent of pollutants that merge in the sea water and to find out its repercussion. The following are the specific objectives of the study:

- To find out the various kinds of pollutants that are submerged into the sea water particularly in the study area
- To analyze that the extent to which pollution reduces the fish production as well as the income of the fishermen in the sample area. And,
- To offer suitable suggestions to overcome the pollutants in the sea which harm the life of the sample respondents

## METHODOLOGY

This study is based on both Primary and Secondary data. The primary data were collected from the three coastal taluks in Kanyakumari District wherein the coastal belt is located. These belts consist of 47 villages and from each taluk two villages had been selected for this study: one with the highest population while the other with the lowest population. From each taluk 75 samples were collected that is 50 samples from the village that has the highest population and 25 samples from the village with lowest population on the basis of multi stage sampling. Further, the 225 respondents are chosen on the basis of simple random sampling basis. The secondary data were collected from various books, journals and websites.

## DATA AND DISCUSSIONS.

Pollution becomes part and parcel of our day to day activities. As per the statistic report of National Institute of Oceanography, the annual pollutant is discharged in the Indian coastal environment as given in the following table.

Table 1.1: Annual pollutant discharge in the Indian coastal environment

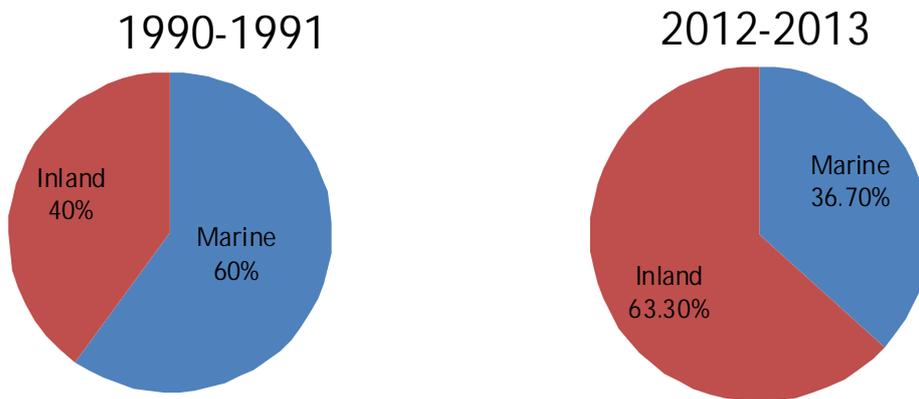
Input/Pollutant	Annual Discharge
Sediments	1.6 billion tonnes
Industrial effluents	$50 \times 10^6 \text{ m}^3$
Sewage – largely untreated	$1.41 \times 10^9 \text{ m}^3$
Garbage and other solids	$34 \times 10^9$ tonnes
Agriculture fertilizer residue	$5 \times 10^6$ tonnes
Synthetic detergents – residue	130,000 tonnes
Agriculture pesticides – residue	65,000 tonnes
Petroleum hydrocarbons (tar ball residue)	3,500 tonnes
Mining rejects, dredged spoils, sand extraction	$0.2 \times 10^6$ tonnes

Source: National Institute of Oceanography (2008).

The above table clearly gauges the extent of pollutants that are discharged by the land-based sources such as agricultural run-off, discharge of nutrients and pesticides and untreated sewage including plastics, globally. Moreover, the various research states that Elliott Norse, President of the Marine Conservation Biology Institute, located in Beklevue WA, checked 300 Albatross chicks on Midway Island, 1600 km from the nearest land. Each chick had plastic in its stomach. According to the Marine Academy's Oceanography website, there are over 46,000 pieces of plastic floating in each square mile of ocean sour of the Northeast coast of the United States. This plastic contributes to the death of 100,000 marine mammals and two million sea birds yearly. The US Fish and Wildlife track the daily death toll from the British Petroleum oil spill in the Gulf of Mexico. As of mid-June, 2010, the spill has contributed to the death of 658 sea birds, 279 sea turtles, 36 sea mammals, and countless fish. 60 percent of a rare species of iguanas on the Galapagos Islands died after an oil spill off the coast of those islands in 2001.

The result of statistical data is an evident to show that how the fish is reduced due to pollutants in the ocean in the following diagram 1.1. There is a drastic fall of marine fish from 60 per cent in 1990-91 to 36.70 per cent in 2012-2013. It requires greater attention of the policy makers.

Figures 1.1  
Fish production



Source : Annual Report – 2013 – 2014 Department of Animal Husbandry, Dairying & Fisheries pg.no.57

#### ENVIRONMENT POLLUTION OF COASTAL VILLAGES IN KANYAKUMARI DISTRICT

The river Pazhayar which originates from the forested area of Surulacode, carries small streams from Mahendragiri peak and flows through Thovalai and Agastheswaram taluks. The total length of the river is about 37 km and it passes through Bothapandi, Thazakudi, Putheri, Nagercoil, Suchindrum and finally joins with the Arabian Sea. This river is polluted with chemical properties which come from both domestic sewage as well as the waste from hospitals. An average value of the water quality index for Pazhayar river was 81.59 indicating that this river is under very poor quality rating. People nearby this river mainly depend upon this river as a source for drinking and domestic purpose. These people are affected to water borne diseases and when it merges with the Arabian Sea, it affects the fish stock as well as fishermen community whose daily food is fish.

The entire stretch of 190 km coastal line from Kilakarai (Ramanathapuram district) to Kanyakumari could face an environmental threat, owing to oil spill which might happen because of transportation by shipping of huge quantity of crude oil to the Tuticorin Port Trust. As a result the sea water is polluted and brings danger to fish stock and fishermen in general.

The pathogenic microorganisms invade into the marine environment through human and animal excreta through river runoff, rain water, kitchen wastes, land agricultural waste, industrial wastes, etc. All these contaminate the coastal waters and render the beach unsuitable for recreational and fishing activities. The recent research states that the landing centre of Colachel was observed to be more polluted than Kadiyapatnam which may be due to the poor sanitary condition which affects the marine environment.

The coastal populace spend huge amount on fire crackers, especially at the time of church festivals. The cracker remains fly into the sea when there was a wind blow and it is absorbed by the sea. Once again these pollutants affect the fish stock and the employment of the fishermen in general.

In situ radiometric survey carried out in 81 revenue villages of Kanyakumari District, using a portable radiation dosimeter/detector has revealed the existence of radiation hotspots along the coastal belt. A close observation of the coastal villages have specifically, revealed high background radioactivity in 14 coastal villages. A very high intrinsic anomalous radioactivity of 41.03  $\mu\text{Sv h}^{-1}$  was observed, in a famous tourist spot in the coastal belt of Kanyakumari District. This is the highest level of radiation registered in South India, which is extremely higher than the permissible world average and is suggestive of causing severe clinical problems on continuous and prolonged exposure.

Kanyakumari district, being one of the tourist places in India attracts thousands of people for their recreational activities. As the result they throw the plastic and toxin items into the sea which pollutes the sea water

In general, the marine sea is polluted with tremendous domestic sewage, industrial sewage, plastic items which harm not only the health condition of the fishermen but also all those who consume fish and damage the coastal eco -system. The following table clearly depicts the average income of fishermen in the study area

Table 1.2  
YEARLY INCOME OF THE RESPONDENTS (IN ₹.)

S.No	Yearly Income (in ₹.)	Frequency	Percentage (%)
1	Less than 100000	118	52.4
2	100000-200000	70	31.1
3	200001-300000	27	12.0
4	300001-400000	8	3.6
5	Above 400000	2	0.9
	<b>Total</b>	<b>225</b>	<b>100.0</b>

Source: Primary data

52.4 per cent of the sample respondents' yearly income is less than ₹1, 00,000 and 0.9 per cent of the sample respondents are earning above ₹4, 00,000. It is evident that the fishermen income is less due to depletion of fish in the sea, since the marine water is polluted because of domestic and industrial sewage and plastic litters. Moreover the sample respondents are affected due to poor hygiene and polluted environment. The diseases retard their activities and prevent them from going to sea for fish catch on regular basis. The following table clearly depicts the amount spent for medications due to illness:

Table 1.3  
AMOUNT USED FOR THE HEALTH OF THE RESPONDENTS

S.No	Amount used for health ( in ₹.)	Frequency	Percentage (%)
1	Below 10000	122	54.2
2	10000-20000	43	19.1
3	20001-30000	22	9.8
4	Above 30000	38	16.9
	<b>Total</b>	<b>225</b>	<b>100.0</b>

Table 1.3 indicates that 45.8 per cent of the sample respondents spend huge amounts for health which is above ₹. 10000 and 54.2 per cent of the sample respondents spend less than ₹. 10000. It is inferred that the houses of respondents being thickly populated, lack sanitation facilities and the fish they consume may contain toxins due to pollution which harm their health conditions. Moreover, the previous studies state that skin irritations, eye irritation, blindness, lung and liver problems can affect marine life of all kinds over a long period of time. Illnesses that occur as a direct result of exposure to the toxins found in oil can make animals sick for years. Oil contaminants can cause low fertility and poor birth survival rates that have an adverse effect on the marine population in the polluted area. Hence they spend huge amount in hospitals for treatment which requires the attentions of the policy makers.

#### FINDINGS

- The extent of pollutants are discharged by the land-based sources such as agricultural run-off, discharge of nutrients and pesticides and untreated sewage including plastics globally
- Plastic contributes to the death of 100,000 marine mammals and two million sea birds yearly.
- There is a drastic fall of marine fish from 60 per cent in 1990-91 to 36.70 per cent in 2012-2013.
- The entire stretch of 190 km coastal line from Kilakarai (Ramanathapuram district) to Kanyakumari could face an environmental threat, owing to oil spill which might happen because of transportation by shipping of huge quantity of crude oil to the Tuticorin Port Trust. As a result ,the sea water is polluted and brings danger to the lives of fish stock and fishermen in general.
- 52.4 per cent of the sample respondents yearly income is less than 1, 00,000 and 0.9 per cent of the sample respondents are earning above 4, 00,000. It is evident that the income of the fishermen is less due to depletion of fish in the sea, since the marine water is polluted because of domestic and industrial sewage and plastic litters.
- 45.8 per cent of the sample respondents spend above . 10000 for medical purposes and 54.2 per cent of them spend less than . 10000. It is inferred that the respondents live in thickly populated area, they lack proper sanitation facilities and the fish they consume contain toxins due to pollution which adversely affect their health conditions.

#### SUGGESTION

- The municipality authorities can regularly collect garbage and dispose it in an appropriate place and use it for recycling purpose which might make coastal villages a part of 'Clean India'.
- The Government can construct proper drainage channels to dispose the household wastages which in

turn reduce the mosquitoes, flies, germs and worms.

- The Government can set up a special monitoring force to impose certain penalties for all those who pollute the common places as well as the sea, as it has been practised in the developed countries.
- The Government can create awareness to the general public especially to the fishermen about the evil effects of pollution with the help of NGOs as well as through student communities in the form of street display or role play.
- The Central Government either should ban the manufacture of single – use plastic bags or the cost of bags must be very expensive in order to minimize the usages of plastic bags
- Like the cleaning of river Ganges, the politicians should take steps and measures to clean up all the pollutants in the sea which might allow the fish to grow in healthy coastal eco system.
- Government can give continuous media coverage through TV News/ show, Radio or Social networking or Newspapers / Magazine about the importance of cleanliness and hygiene to experience a healthy life and leave a safe environment for the future generation.
- The fishermen can avoid seashore for excreta and use the toilets at home or public toilets which will not contaminate the sea water.
- The port trust authorities can check the conditions of the ships before it could sail into the sea, so that the leakage of oil can be minimized

## CONCLUSION

A large and growing part of the population now lives close to coasts. Several coastal villages experience an increase in the intensity of sea erosion which leads to loss of long stretches of coastline and damage to properties annually. These are the adverse effects of marine pollutants in the sea. Hence, both the citizens of our country as well as policy makers have to do something to eradicate the pollution in the sea. Otherwise, the nation would be wiped away. Hence prevention is better than cure and everybody should make a resolution not to pollute the sea.

## ACKNOWLEDGEMENT

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