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PROBLEMS FACING TOWARDS PLASTIC POLLUTION IN MARINE ENVIRONMENT WITH SPECIAL REFERENCE TO THOOTHUKUDI

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Abstract:

Plastic pollution is present all over the ocean and in marine life. Plastic pollution is a major problem affecting the marine environment. It threatens ocean health, the health of sea creatures, food safety and quality, human health, coastal tourism and causes climate change. In the present research primary data were collected by structured questionnaire from 100 respondents in Thoothukudi. The main objectivity of the study was to To determine the problems facing towards plastic pollution in marine environment with special reference to Thoothukudi. The collected data was analysed using simple percentage, Z test and ANOVA. The study concludes that Ocean pollution puts the lives of all living things at risk. People are also affected by marine pollution by consuming seafood, which causes many health problems. Often seen as India's Green Team, the National Green Court has done enough to eradicate marine pollution. NGT is a statutory body established to prosecute environmental issues.

Key Words: Gadgets, Plastic Pollution in Marine Environment, Time, Problem, Factors, Influencing, Future, Etc.,

Introduction:

Plastic is a synthetic material made from petroleum, with ideal properties for many applications such as packaging, construction, household and sporting goods, automobiles, electronics and processing farm. More than 400 million tons of plastic are produced each year, half of which is used as a product such as bags, glasses and straws. Plastic waste can harm the environment and biodiversity if not disposed of properly. At least 14 million tons of plastic end up in the oceans every year. Plastic debris is the most common type of debris in the ocean, making up 80% of all marine debris found in everything from surface water to the deep ocean. Plastic has been found on the coasts of all countries, with large amounts of plastic waste found near popular tourist destinations and settlements. The main sources of plastic waste found in the ocean are urban and storm water runoff, runoff, garbage, poor waste management, work, tire use, construction and soil from illegal dumping. The main causes of ocean pollution are fishing, marine activities and aquaculture. Plastics, sunlight, ultraviolet radiation, wind, water, etc. Their small size allows them to be easily eaten by marine life. Many countries lack infrastructure to prevent pollution, for example: sanitation facilities; fire stations; renewable resources and circular economy; proper management and disposal of waste machinery. This leads to "plastic reduction" in water and oceans. International legal and illegal trade of plastic waste can also harm the ecosystem because waste management systems are not suitable for processing plastic waste. Plastic pollution is present all over the ocean and in marine life. Plastic pollution is a major problem affecting the marine environment. It threatens ocean health, the health of sea creatures, food safety and quality, human health, coastal tourism and causes climate change.

Impacts on Marine Ecosystems:

The most significant impact of plastic waste is the consumption, respiration and mixing of hundreds of marine species. Sea creatures such as seabirds, whales, fish and turtles mistake plastic waste as animals; many people starve because their stomachs are full of plastic. They also suffer from lacerations, infections, decreased buoyancy, and internal injuries. Floating plastics also help transport invasive species in the sea, threatening marine biodiversity and food webs.

Effects on Food and Human Health:

Micro plastics are found in tap water, beer, salt and all samples collected from the world's oceans, including the Arctic. It is known that many chemicals used in the production of plastic materials are carcinogenic and cause growth, development, development and immunity in humans and animals by affecting the endocrine system. Micro plastics have recently been found in the human placenta, but more research is needed to determine if this is a serious problem. Contaminants can also build up in plastic products due to prolonged exposure to seawater. When marine organisms eat plastic waste, the pollutants enter the digestive tract and accumulate in food over time. The transmission of infectious diseases between marine animals and humans through the consumption of seafood has been shown to be detrimental to health, and research continues.

Impact on Tourism:

Plastic wastes affect tourism negatively and reduce tourism income. It also includes significant operating costs associated with maintaining and maintaining the site. Garbage collection on beaches can adversely affect the country's economy, wildlife, and people's health and well-being.

Impact on Climate Change:

Plastic products contribute to climate change. If plastic waste is incinerated, it releases carbon dioxide and methane (from the landfill) into the atmosphere, increasing emissions.

Review of Literature:

G.G.N. Tushari, JDM Senevirathna (2020) Plastic pollution is recognized as a serious problem in coastal and marine ecosystems worldwide. Anthropogenic resources cause an unprecedented and high plastic pollution impact to the aquatic environment, causing direct and/or indirect impacts on ecosystem structure, operations, services and benefits. The main sources of these pollutants that enter the oceans in various ways are soil and seas. In this review, we highlight several factors related to plastic pollution in beaches and oceans. Plastic pollution is distributed in ecosystems in different types such as macro plastics, macro plastics, meso plastics and micro plastics. Primary and secondary forms of micro plastics are widely distributed in water, sediment and biota of marine and coastal waters. Micro plastic levels in different beaches and marine ecosystems in different aquatic environments around the world are about 0.001-140 particles/m3 in water and 0.2-8766 particles/m3 in water. Micro plastic accumulation in coastal and marine organisms ranges between 0.1-15.033. Therefore, plastic pollution has many negative ecological and socioeconomic effects. Impacts include toxicological effects of plastic ingestion, respiration, starvation, dispersal and entrainment of organisms, provision of new habitats and introduction of invasive species, significant ecological impacts and threats to biodiversity and trophic relationships. The degradation (change in ecosystem state) and alteration of marine systems is associated with the loss of ecosystem services and values. The resulting pollution affects the economy of the community by negatively affecting tourism, fisheries, transportation and human health. Plastic pollution prevention, 3R (reduce, recycle), knowledge and resource development, and producer/producer responsibility are strategies for coping with the worst case scenario. Current and approved regulations, laws, policies and leaders of the world, region and country play an important role in reducing plastic waste in the oceans and beaches. Generating proposals/solutions for critical research can open new avenues for solving this environmental problem effectively and scientifically. In conclusion, this article presents the current pollution situation in seawater and raises people's awareness of a future plastic-free ocean. Chapter

Derraik (2002) examines the degradation of plastic waste in the marine environment, bringing together much of the literature published to date on the subject. Many marine animals are known to be injured and/or killed by plastic debris, which can endanger their survival, especially since many marine species are already threatened by other activities of humans. Marine animals are often affected by the circulating and ingestion of plastic waste. Other less serious threats include the use of plastic waste by "invasive" species and the rise of PCBs through plastic consumption. Less common materials such as plastic pellets and "cleaners" are also dangerous. Tackling plastic waste in the ocean is a daunting task that requires a number of approaches. Some ways to solve this problem are discussed.

Matthew McLeod , Hans Peter H. Arp, I B. Tekman, Annika Jahnke accumulated plastic pollution in the environmental area is significantly "irreversible" if the natural mineralization process is slow and engineering cannot be resolved. If these areas are adversely affected by plastic pollution, they may become irreversible. The irreversible effects of plastics include changes in carbon and nutrient levels; changes in soil, sediment and aquatic ecosystems; damage or keystone-related integration; ecotoxicity; and social impact. The main response to the global threat from the generation of harmful and irreversible plastic waste is to rapidly reduce emissions by reducing the amount of plastic waste and to coordinate international waste management strategies.

Objectives:

- To study the overview of plastic pollution in marine environment.
- To determine the problems facing towards plastic pollution in marine environment with special reference to Thoothukudi

Limitations of the Study:

- The study was limited to Thoothukudi only.
- Time is the major constraint while doing surveys.
- It's difficult to explain the survey questions to the people.
- Some people would not have given their true information; this may not give us accurate results also.

Research Methodology:

- Sample People
- The study was based on marine environment

Period of the Study:

- The study was carried out from April 2022 to May 2022.

Area of the Study:

The present study regarding plastic pollution in marine environment covers the area of Thoothukudi.

Data Type/Collection:

Both primary and secondary data were used in this study. The primary data was collected from people by means of questionnaire. The secondary data was collected from scholarly articles, e books and websites

- Tools for Analysis
- Simple percentage
- Z test
- Anova

Analysis and Interpretation:

Table 1: Personal Profile

Factors	No. of People	Percentage
Gender		
Male	60	60
Female	30	30
Age		
Below 25	30	30
26-40	47	47
40-50	8	8
Above 50	15	15
Occupation		
Agriculture	23	23
Employee	42	42
Business	23	23
Others	12	12
Educational Qualification		
Upto SSLC	53	53
HSC	12	12
Under graduate/ Diploma	19	19
Post Graduate/ Professional	16	16
Family Income per Month		
upto 25000	30	30
25001-40000	58	58
40001-60000	12	12

The profile of data collected from 100 show that, 60 percent were male, 47 percent were in the age group of 26-40 years, 53 percent of the people were upto SSLC and 58 percent of the respondent's monthly family income was between 25001 to 40000. Z Test is used to study the opinion of the People on the basis of their gender.

Null Hypothesis: On an average both male and female have the same opinion on the problems facing towards plastic pollution in marine environment like Plastics, Macro plastics, and Micro plastics.

Table 2: Z Test between Gender and Problems Facing Towards Plastic Pollution in Marine Environment

Problems	Gender	N	Mean	S.D	|Z|	Sig.
Plastics	Male	60	21.51	5.18	0.24	0.905
	Female	40	21.63	5.22		
Macro Plastics	Male	60	14.68	14.68	0.583	0.378
	Female	40	14.41	14.41		
Micro Plastics	Male	60	19.73	3.03	0.18	0.719
	Female	40	19.96	3.3		

Table 2 reveals that, the calculated value are greater than 5% level of significance, hence the null hypothesis is accepted. It is inferred that, on an average both male and female have the same opinion on the problems facing towards plastic pollution in marine environment. ANOVA is used to analyse the influence of demographic variables like age, education level and family income of the respondents problems facing towards plastic pollution in marine environment.

Table 3: ANOVA between Age and Problems Facing Towards Plastic Pollution in Marine Environment

Factor	Age	N	Mean	S.D	|Z|	Sig.
Plastics	Below 25	30	21.62	5.73	0.912	0.598
	26-40	47	21.07	4.81		
	40-50	8	24	5.31		
	Above 50	15	21.6	4.85		
Macro Plastics	Below 25	30	14.82	1.54	0.862	0.685

	26-40	47	14.42	1.46		
	40-50	8	13.75	1.98		
	Above 50	15	14.6	1.29		
Micro Plastics	Below 25	30	20.11	3.37	0.349	0.79
	26-40	47	19.73	3.31		
	40-50	8	19	2.82		
	Above 50	15	20.06	2.46		

Table 3 indicates that, the calculated value are greater than 5% level of significance hence the null hypothesis is accepted. It is inferred that, on an average different age group have the same opinion on the problems facing towards plastic pollution in marine environment like Plastics, Macro plastics and Micro plastics.

Table 4: ANOVA between Education and Problems Facing Towards Plastic Pollution in Marine Environment

Factor	Education	N	Mean	S.D	|Z|	Sig.
Plastics	Upto SSLC	53	20.66	7.42	3.85	0.160
	HSC	12	22.41	4.81		
	Under graduate/ Diploma	19	19.00	4.10		
	Post Graduate/ Professional	16	23.62	4.50		
Macro Plastics	Upto SSLC	53	14.50	2.31	0.81	0.975
	HSC	12	14.50	1.27		
	Under graduate/ Diploma	19	14.66	1.46		
	Post Graduate/ Professional	16	14.50	1.71		
Micro Plastics	Upto SSLC	53	21.25	2.63	1.633	0.211
	HSC	12	19.75	3.48		
	Under graduate/ Diploma	19	20.12	2.49		
	Post Graduate/ Professional	16	18.75	3.19		

From the table 4 it is understood that, the calculated value are greater than 5% level of significance except in Learning Activities, hence the null hypothesis is accepted. It is inferred that, on an average different educational group have the same opinion on the problems facing towards plastic pollution in marine environment are Plastics, Macro plastics and Micro plastics.

Table 5: ANOVA between Family Income and People Preference towards Plastic Pollution in Marine Environment

Factor	Family income	N	Mean	S.D	|Z|	Sig.
Plastics	upto 25000	30	21.06	4.61	0.85	0.473
	25001-40000	58	22.42	6.08		
	40001-60000	12	21.66	4.92		
Macro Plastics	upto 25000	30	14.64	1.42	5.6	0.005
	25001-40000	58	14.62	1.41		
	40001-60000	12	13.00	2.36		
Micro Plastics	upto 25000	30	20.69	3.16	7.8	0.007
	25001-40000	58	18.77	2.82		
	40001-60000	12	18.00	2.44		

The table 5 indicates that, the calculated value are greater than 5% level of significance, hence the null hypothesis is accepted. It is inferred that, on an average different family income group have the same opinion on the problems facing towards plastic pollution in marine environment like Plastics. The calculated value is lesser than 5% level of significance indicating that, the null hypothesis is rejected. This means that People with different age groups do not have the same opinion on Macro plastics and Micro plastics.

Conclusion:

The ocean provides most of the oxygen we need to survive. It can be said that our life is thanks to the ocean. Humans are destroying these water bodies by introducing many pollutants into the ocean. The more India develops, the more it harms the natural environment. Pollution in the seas becomes more serious due to the construction of many industries and sewage is discharged into the sea without proper treatment, which is very dangerous for the world. Marine environmental pollution not only affects the life of animals and plants, but also affects human life. Ocean pollution is very dangerous and can kill humans and other creatures. Sea water serves many purposes, so it should be as clean and healthy as possible. But due to the progress of human activities, the ocean has become very bad for everyone. If the ocean isn't all-purpose, it's our fault, no one's. The main sources of marine pollution are domestic wastewater and sewage discharged into the ocean, seabed mining activities, oil spilled from ships, bad gas in the air, and nearby garbage and plastic waste. Or on the beach. The main cause of ocean pollution is due to human activities, less so than natural disasters like tsunamis. We can experience the peace of the beach precisely thanks to the sea. It looks like the beach is clean and nobody likes to sit and watch the dirt, but ironically,

dirt is what we give it to. Saving the ocean from people is now more important than saving people. Aquatic animal life is at risk as many animals are on the verge of extinction due to the introduction of deadly chemicals into the ocean by humans. Vegetation at the bottom of the sea stopped growing. Ocean pollution puts the lives of all living things at risk. People are also affected by marine pollution by consuming seafood, which causes many health problems. Often seen as India's Green Team, the National Green Court has done enough to eradicate marine pollution. NGT is a statutory body established to prosecute environmental issues. NGT has been working intensively on marine pollution since its establishment.

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