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Prasanna S,

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No. 08, Arul Nagar, Seera Thoppu,

Maudhanda Kurichi, Srirangam,

Tiruchirappalli – 620102

Phone : +91 94896 71437 – info@iledu.in / Chairman@iledu.in



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EXPLORING THE ENVIRONMENTAL IMPACT OF PLASTIC UTILIZATION IN TAMIL NADU: AN IN-DEPTH ANALYSIS OF POLLUTION CONSEQUENCES

AUTHOR – BABITHA. W. K, SAVEETHA SCHOOL OF LAW, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES (SIMATS), Chennai-600077

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ABSTRACT

Pollution is the introduction of contaminants into the natural environment that cause adverse change. Pollution can take the form of chemical substances and cause negative impacts. Plastic pollution is the accumulation of plastic objects and particles in the Earth's environment that adversely affects wildlife, wildlife habitat and humans. Plastics are inexpensive and durable, and as a result levels of plastic production by humans are high. However, the chemical structure of most plastics renders them resistant to many natural processes of degradation and as a result they are slow to degrade. Together, these two factors have led to a high prominence of plastic pollution in the environment. The research investigates various facets of plastic pollution, ranging from single-use plastics to industrial waste, aiming to unravel the intricate ways in which these materials permeate and disrupt ecosystems. Particular attention is given to water bodies, soil, and air as recipients of plastic pollution, with an emphasis on elucidating the immediate and long-term impacts on environmental health. The research investigates various facets of plastic pollution, ranging from single-use plastics to industrial waste, aiming to unravel the intricate ways in which these materials permeate and disrupt ecosystems. Particular attention is given to water bodies, soil, and air as recipients of plastic pollution, with an emphasis on elucidating the immediate and long-term impacts on environmental health. A significant focus of the study is the meticulous analysis of the socio-economic dimensions intertwined with plastic pollution. By scrutinizing how marginalized communities bear a disproportionate burden, and evaluating the economic toll on local industries, agriculture, and public health, the research illuminates the interconnectedness of environmental challenges with broader societal implications. In assessing the effectiveness of existing policies and regulations governing plastic usage and waste management in Tamil Nadu, the study identifies gaps and challenges in their implementation. It advocates for refined policy measures and highlights the importance of community involvement and awareness campaigns to foster a collective responsibility towards mitigating plastic pollution. Moreover, the research explores potential alternatives to traditional plastics, such as biodegradable materials and sustainable packaging practices. It evaluates the feasibility and scalability of these alternatives, offering insights into their potential adoption to alleviate the pervasive plastic pollution crisis in Tamil Nadu. To lend empirical weight to its findings, the study employs a quantitative analysis, collecting and dissecting data on plastic consumption, waste generation, and pollution levels. This quantitative approach not only substantiates the research's claims but also provides a data-driven foundation for understanding the magnitude of the issue and formulating effective strategies for mitigation. In conclusion, this study aims to present a nuanced perspective on the environmental impact of plastic utilization in Tamil Nadu. By unraveling the complex interplay of pollution consequences, socio-economic implications, and policy effectiveness, it seeks to contribute actionable insights for policymakers, industries, and communities. Ultimately, the research advocates for holistic, collaborative efforts to address the pressing issue of plastic pollution in Tamil Nadu and

underscores the urgency of sustainable practices for the well-being of both the environment and society at large.

KEYWORDS – Plastic, Pollution, Chemicals, Environment, Human health.

1. INTRODUCTION

Over the past few decades, the escalating consumption of plastic products has led to a profound environmental crisis, transcending geographical boundaries and affecting ecosystems worldwide. Tamil Nadu, a state in southern India, is no exception to this global predicament. The ubiquitous use of plastics in various facets of daily life, coupled with inadequate waste management practices, has given rise to environmental degradation that demands urgent attention and intervention. The excessive use of single-use plastics, packaging materials, and other non-biodegradable items has led to a proliferation of plastic waste, posing a significant threat to the state's diverse ecosystems.

1.1 Evolution of the Topic

The use of plastic products in this 21st century has increased in huge amounts. This is due to the population growth and cheap rate of plastic products. The plastic products are weightless and flexible. They do not decay for decades. They cause soil pollution if they are dumped or thrown in soil. They cause water pollution if they are thrown in water bodies. They cause air pollution if they are burnt. In soil, they don't allow water to flow into the soil and cause water stagnation which leads to mosquito breeding. Also domestic animals and birds may mistakenly consume plastic as food which causes death to the species. In water the marine animals may consume them as food and die due to the plastic. If we burn plastic products it will release harmful chemical substances such as Xylene, Benzene, Ethylene oxide which causes various health problems to humans as well as to animals.

1.2 Government Initiatives

Plastic pollution has emerged as a global environmental crisis, with far-reaching consequences for ecosystems and human health. In the context of Tamil Nadu, India, the pervasive use of plastic materials has raised pressing concerns about its impact on the state's environment. This study endeavors to undertake a meticulous examination of the environmental pollution stemming from widespread plastic usage in Tamil Nadu. The proliferation of plastic products, characterized by their durability and versatility, has revolutionized various industries and daily life. However, the exponential increase in plastic consumption has given rise to a complex environmental challenge. Tamil Nadu, with its diverse landscapes, rich cultural heritage, and burgeoning urbanization, is at the crossroads of balancing economic growth and environmental stewardship in the face of mounting plastic pollution.

1.3 Factors affecting

By investigating the types and quantities of plastic consumed, evaluating existing waste management practices, and assessing the ecological consequences, this research aims to provide valuable insights that can inform evidence-based policy decisions and promote sustainable practices. In the face of escalating environmental challenges, understanding the intricate dynamics of plastic pollution in Tamil Nadu becomes imperative for fostering a healthier and more sustainable future.

1.4 Current trends

Factors influencing a study on environmental pollution due to plastic usage in Tamil Nadu may include industrial activities, waste management practices, public awareness, government policies, and the socio-economic landscape. Examining these aspects can

provide a comprehensive understanding of the issue and guide potential solutions.

OBJECTIVES:

1. To Investigate the ecological consequences of plastic pollution on soil quality, water bodies, and wildlife habitats.
2. To Analyze the awareness levels and behavioral patterns of the public regarding plastic usage and recycling practices.

HYPOTHESIS

Null: There is a significant relationship between the educational qualification and use of biodegradable plastics.

Alteration: There is no significant relationship between the educational qualification and use of biodegradable plastics.

PLASTIC POLLUTION:

Plastic pollution is the deposits of synthetic plastic items in the environment to the point where they endanger human populations, wildlife, and their environments. An advancement in materials was brought about in 1907 with the introduction of genuinely synthetic plastic resins into global trade through the creation of Bakelite. Plastics were shown to be a persistent polluter of numerous environmental habitats by the end of the 20th century, ranging from the bottom of the sea to Mount Everest. Plastics have gained increased attention as a major pollutant, whether it is due to their being mistaken for food by animals, flooding low-lying areas due to clogged drainage systems, or just plain causing severe visual damage. Plastic production has increased exponentially, reaching 368 million metric tons in 2019 (**PlasticsEurope, 2020**).

The durability of plastics, coupled with their low rates of decomposition, has led to the accumulation of vast quantities in landfills and natural environments. Plastic pollution poses a myriad of threats to the environment. Marine ecosystems are particularly vulnerable, with an

estimated 8 million metric tons of plastic entering the oceans annually (**Jambeck et al., 2015**). This pollution disrupts marine life through ingestion, entanglement, and habitat degradation. The health implications of plastic pollution are a growing concern. Plastics can leach harmful chemicals, such as bisphenol A (BPA) and phthalates, into food and water supplies, potentially impacting human health (**Rochman, 2018**). Microplastics, small particles resulting from the breakdown of larger plastics, have been found in various food products. Single-use plastics, inadequate waste management infrastructure, and improper disposal practices contribute significantly to plastic pollution.

The convenience and versatility of plastics have led to their widespread use in packaging, agriculture, and consumer goods, exacerbating the issue (**Geyer et al., 2017**). Recognizing the severity of the issue, various international initiatives aim to combat plastic pollution. The United Nations Environment Programme (UNEP) launched the Clean Seas campaign to address marine plastic litter. Additionally, several countries have implemented bans on single-use plastics and imposed regulations to promote recycling (UNEP, 2018). Innovations in materials and waste management technologies offer promising avenues for mitigating plastic pollution. Biodegradable plastics, recycling advancements, and circular economy models are being explored to reduce the environmental footprint of plastic products (**Geyer et al., 2020**). Public awareness campaigns play a crucial role in addressing plastic pollution. Efforts to educate communities about the environmental impact of plastic usage, promote sustainable alternatives, and encourage responsible consumption contribute to behavioral change (**Stoll et al., 2019**).

POLLUTION IMPACT IN OCEAN:

The ocean receives the majority of the plastic debris produced on land because it is located downstream of almost every place on Earth. Every year, millions of tons of garbage, mostly

improperly dumped plastic waste, find their way into the world's oceans. 2014 saw the publication of the first oceanographic study to look at the quantity of near-surface plastic waste in the world's oceans. It calculated that there were at least 5.25 trillion individual plastic particles floating on or near the surface, each weighing about 244,000 metric tons (269,000 short tons). Bags, bottles, and takeout-related objects accounted for 44% of the plastic garbage found in rivers, oceans, and shorelines, according to a 2021 study (**Subha Ganguly , 2018**).

Also, educating and spreading the awareness among people to clean the water bodies like rivers, ponds and lakes can reduce the mortality of fishes and sea animals due to plastic pollution. The deleterious effects of plastic debris on the marine environment were reviewed by bringing together most of the literature published so far on the topic. A large number of marine species is known to be harmed and/or killed by plastic debris, which could jeopardize their survival, especially since many are already endangered by other forms of anthropogenic activities. It is nevertheless certain that the environmental hazards that threaten the oceans' biodiversity, such as the pollution by plastic debris, must be urgently addressed. (**Jose.D.B.Derraik, 2002**)

The majority of research and efforts to reduce plastic pollution still focus on the oceans and beaches. Oceans and beaches were the sites of the initial plastic pollution discoveries by scientists researching plankton in the late 1960s and early 1970s. It has been demonstrated that floating plastic debris gathers in five subtropical gyres, which comprise forty percent of the world's oceans. These gyres, which are found at Earth's midlatitudes, include the North and South Pacific Subtropical Gyres. Scientists and the media have been observing the eastern "garbage patches" of these gyres—zones where there is a significant concentration of plastic debris circulating close to the ocean surface. The Indian Ocean Subtropical Gyre, the North

and South Atlantic Subtropical Gyres, and the other gyres are the others.

Plastic pollution in the water has the potential to kill marine mammals directly by tangling on items like fishing gear, but it can also kill by ingestion, where it may be mistaken for food.

Numerous animals, including large cetaceans, most seabirds, small zooplankton, and marine turtles, have been shown to readily consume plastic debris, including bottle caps, cigarette lighters, and plastic bags. Plastic is eventually broken down into microplastics by sunlight and saltwater, which makes plastic accessible to zooplankton and other tiny marine creatures. Less than 5 mm (0.2 inch) in length, these tiny plastic particles account for a significant portion of the plastic debris found in the oceans. In 2018, it was discovered that over 114 aquatic species—some of which are exclusive to the deepest ocean trenches—had microplastics in their organs. At least 14 million metric tons (15.4 million short tons) of microplastic particles were thought to be resting on the ocean floor by 2020, according to scientific estimates. Additionally, research showed that deep-sea currents were causing "hot spots" of microplastic in some oceanic regions, like the Tyrrhenian Sea, which had almost two million microplastic pieces per square meter (roughly 186,000 pieces per square foot). Numerous studies underscore the global scale of plastic pollution, emphasizing its pervasive nature in oceans, rivers, and terrestrial environments (**Jambeck et al., 2015**). **Geyer et al. (2017)** estimate that by 2050, there could be more plastic than fish in the oceans, emphasizing the urgency of addressing this environmental crisis.

POLLUTION IMPACT IN WILDLIFE:

Every year, plastic kills millions of animals, including fish, birds, and other marine life. Plastics are known to have impacted about 700 species, some of which are endangered. Plastics are consumed by almost all seabird species. The accumulation of plastic and products made of plastic in the environment lead to plastic pollution which imposes

hazardous effects on wildlife and the human food chain and for reducing the incidences of plastic pollution research endeavors should be employed to convert petroleum based plastics to bioplastic (**Debosree Gosh and Pratap Parida, 2015**). Wildlife in terrestrial environments, including mammals and birds, may ingest plastics unintentionally. This can result from the ingestion of microplastics in soil or water sources. Ingested plastics may lead to physiological and reproductive complications, impacting the overall health of terrestrial wildlife (**Van Franeker and Law, 2015**).

Terrestrial wildlife, including birds and mammals, may become entangled in discarded plastic items such as six-pack rings, wires, or plastic bags. Entanglement can restrict movement, cause injuries, and interfere with natural behaviors like hunting and breeding (**O'Hanlon et al., 2017**).

Starvation and entanglement are the main causes of animal deaths. Six-pack rings and other discarded fishing gear strangle seals, whales, turtles, and other animals. More than 100 aquatic species, including fish, shrimp, and mussels that end up on our dinner plates, have been confirmed to have microplastics.

These microscopic fragments frequently pass through the digestive tract and are eliminated without any problems. However, it has also been discovered that plastics can penetrate organs or clog digestive tracts, both of which can be fatal. Starvation results from stomachs so full of plastic that they suppress the desire to eat. Plastic pollution in terrestrial environments disrupts habitats and nesting grounds for birds, reptiles, and mammals. The presence of plastic items can modify the physical structure of ecosystems, leading to changes in vegetation and soil composition, with subsequent impacts on resident wildlife (**Rochman et al., 2016**). Microplastics can enter the food chain, potentially reaching apex predators, and causing bioaccumulation of plastics and associated toxins. The trophic transfer of microplastics raises concerns about the overall

health and sustainability of ecosystems (**Wright and Kelly, 2017**).

Land animals including elephants, hyenas, zebras, tigers, camels, and other huge mammals have eaten plastics, sometimes to fatal results. Tests have also shown that there is damage to the liver and cells, as well as disturbances to the reproductive systems that cause some species—like oysters—to lay fewer eggs. A recent study reveals that fish larvae consume nanofibers during their early infancy, posing fresh concerns about the impact of plastics on fish populations.

POLLUTION IMPACT IN SOIL AND AIR:

Plastics accumulate in the soil and stop seedlings from germination. They are not biodegradable; thus, they remain in the soil for millennia without breaking down. When plastic is burned in landfills, harmful gasses such as carbon monoxide, carbon dioxide, phosgene, dioxins, and other harmful chlorinated compounds are released. Soil contains toxic solid residue that is left over after burning. Chemical cycles allow the dangerous gasses to seep into soils. Traditional plastics pose a serious environmental risk from the point of manufacture to the point of disposal. The area becomes unsightly and unsanitary as a result of the plastic bag waste that litters it. Traditional plastics have been linked to reproductive issues in wildlife and people. One of the compounds thought to be transferred from the manufacturing process to the nursing newborn through breast milk is dioxin, a very poisonous and carcinogenic byproduct. Burning plastics releases furan and dioxin into the atmosphere, particularly PVC. Dioxins are contaminants in the environment (**Cox et al., 2020; World Health Organization, 2022**).

They are among the hazardous substances known as persistent organic pollutants (POPs), or the "dirty dozen." The family of structurally and chemically related polychlorinated dibenzo para dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) is referred to as "dioxins" in many cases. Plastic bags have the potential

to contaminate food items by transferring bacteria and leaking harmful colors. Ignorant plastic bag disposal clogs drains, reduces soil porosity, and interferes with groundwater recharge (**Senathirajah et al., 2021**).

Plastic disrupts the microbial activities of the soil. Both marine and terrestrial animals mistake plastic waste for food, ingest it, and perish. Because plastic bags mix with manure and stay in the soil for years, they reduce soil fertility. The chemical nature of plastic trash causes it to degrade, releasing various gasses that can have diverse effects on the atmosphere. The emission of carbon dioxide and other gasses can lead to a variety of issues, including global warming, climate change, acid rain, and nosocomial infections. It may lead to the simple spread of airborne illnesses including pneumonia and tuberculosis, as well as COVID-19, which is currently devastating the world (**Duncan et al., 2019**).

POLLUTION IMPACT IN HUMAN BEINGS

Plastics can be ingested, inhaled, or come into physical contact with plastics and the chemicals used as plastic additives by humans and other species in a number of ways. According to estimates, humans in the US ingest anywhere from 39,000 to 52,000 microplastic particles annually from food and drink alone, or 0.1–5g on average each week. Other species that have been shown to consume plastic include seabirds, fish, zooplankton seabirds, and marine mammals (**Nelms et al., 2019**).

Plastics can be inhaled by humans and other terrestrial species in addition to being consumed. The washing of synthetic textiles, rubber tires, agriculture, dried sludge, and municipal and home dust are among the processes that release micro- and nanoplastics (MNPs) and plastic fibers into the atmosphere (**Wright and Kelly, 2017; Karbalaei et al., 2018; World Health Organization, 2022**). Even relatively easy operations, such as cutting and opening plastic containers and packing, can produce MNPs (**Sobhani et al., 2020**). Although

there is currently uncertainty regarding the fate of inhaled MNPs and their subsequent uptake in lung tissue (**Amato-Lourenço et al., 2021**), airborne exposures can happen outside from particulate matter as well as indoors from household items and clothing (**Kasirajan and Nguajio, 2012**). Human exposures also result from interaction with objects including plastic toys and personal care products, medical device exposure, and occupational exposure (**Zarus et al., 2021**).

The invention of plastic played a significant role in advancing human civilization. Plastic Products Have become an integral part of human lives. However, the usage of plastics generates a huge amount of waste. Studies indicate that about 79% of the plastic the world has ever produced returns into the environment as waste. Microplastic accumulation has been observed in marine animals at various Levels of the food web (**Barboza et al., 2020**). This observation could indicate that microplastics may potentially impact human food safety through the consumption of seafood. Unfortunately, there isn't enough data to establish the Long-term impacts of microplastic pollution (**Wilcox et al., 2015**). This paper will discuss the current status of global plastic pollution with its environmental impacts. The current state plastic pollution and its ecological impacts are solely a man-made crisis fueled by human ignorance. This is also a reflection of our irresponsible behavior against the environment. Human Addiction To Single-use plastic items is a major contributor to the plastic waste crisis the world is facing today. With Proper Strategies And Actions, this problem could have been solved years ago. (**Zaman, Rakeen Zaman and Robert Sizemore, 2019**)

INITIATIVES TO REDUCE POLLUTION:

Addressing the challenge of plastic pollution in Tamil Nadu requires a multi-pronged approach that encompasses policy interventions, community engagement, and innovative solutions. The following are key strategies to mitigate plastic pollution in the state:

Stricter Regulation and Enforcement:

- Strengthening existing regulations on the production, use, and disposal of single-use plastics.
- Enhancing enforcement mechanisms and imposing penalties for non-compliance.

Promoting Sustainable Alternatives:

- Encouraging industries to adopt sustainable packaging alternatives, such as biodegradable materials or reusable packaging.
- Incentivizing businesses that reduce or eliminate single-use plastics from their operations.

Waste Management Infrastructure Improvement:

- Investing in robust waste collection and disposal systems, with a focus on efficient segregation of plastic waste at the source.
- Expanding recycling facilities and promoting the use of advanced technologies for plastic waste processing.

Public Awareness Campaigns:

- Launching extensive public awareness campaigns to educate communities about the environmental impact of plastic pollution and the importance of responsible consumption.
- Promoting behavioral change through school programs, community workshops, and media campaigns.

Community-Led Cleanup Initiatives:

- Facilitating community-led initiatives for plastic waste cleanup in urban and rural areas.
- Providing support and resources to local communities to organize regular cleanup drives.

Circular Economy Practices:

- Encouraging a circular economy model by promoting recycling, upcycling, and reusing of plastic materials.
- Supporting businesses and initiatives that contribute to a circular economy in the state.

Research and Innovation:

- Investing in research and development of alternative materials that have a lower environmental impact.
- Supporting innovations in plastic recycling technologies to improve efficiency and reduce environmental harm.

Collaboration with Industry:

- Collaborating with industries to implement extended producer responsibility (EPR) programs, making manufacturers responsible for the end-of-life disposal of their products.
- Fostering partnerships with businesses to develop sustainable packaging solutions.

Incentivizing Plastic Recycling:

- Providing financial incentives for individuals and businesses that actively participate in plastic recycling programs.
- Establishing buy-back schemes for collected plastic waste to create economic incentives for waste collection.

Government-Led Cleanliness Drives:

- Implementing periodic state-wide cleanliness drives to raise awareness, engage communities, and clear plastic waste from public spaces.
- Mobilizing government agencies, NGOs, and volunteers to participate in these cleanup campaigns.

Integration of Informal Waste Pickers:

- Integrating informal waste pickers into the formal waste management system to improve efficiency and inclusivity.
- Providing training and support for waste pickers to handle plastic waste responsibly.

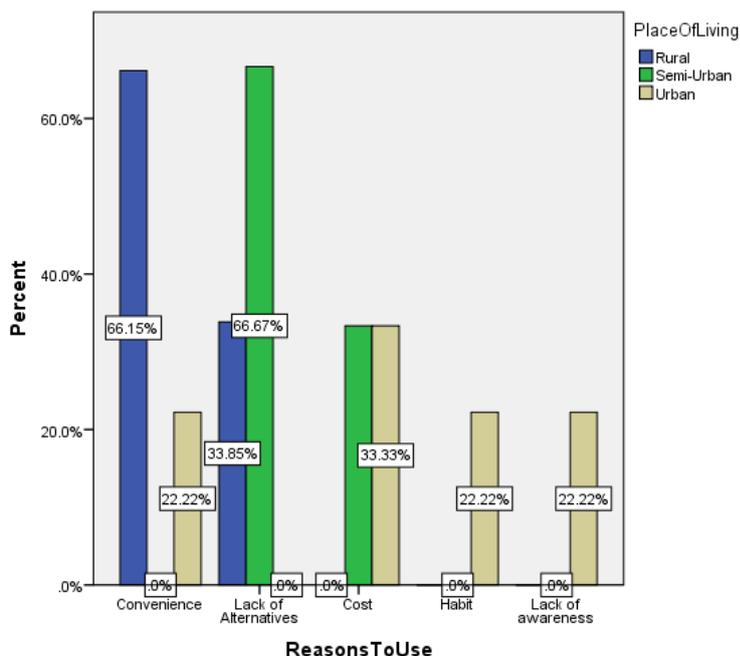
Implementing these strategies collectively and collaboratively can pave the way for a significant reduction in plastic pollution in Tamil Nadu. The success of these measures will depend on the commitment of government agencies, industries, communities, and individuals to work together towards a more sustainable and plastic-responsible future.

METHODOLOGY

The research method followed here is empirical research. A total of 119 samples have been collected through a convenient sampling method. The sample frame is taken in public areas in and around Kanyakumari. The independent variables are name, age, gender, place of living and educational qualifications. The dependent variables are usage of plastic products, awareness of plastic ban, effects of pollution due to plastic. The statistical tools used here are correlation and graphical representation.

ANALYSIS

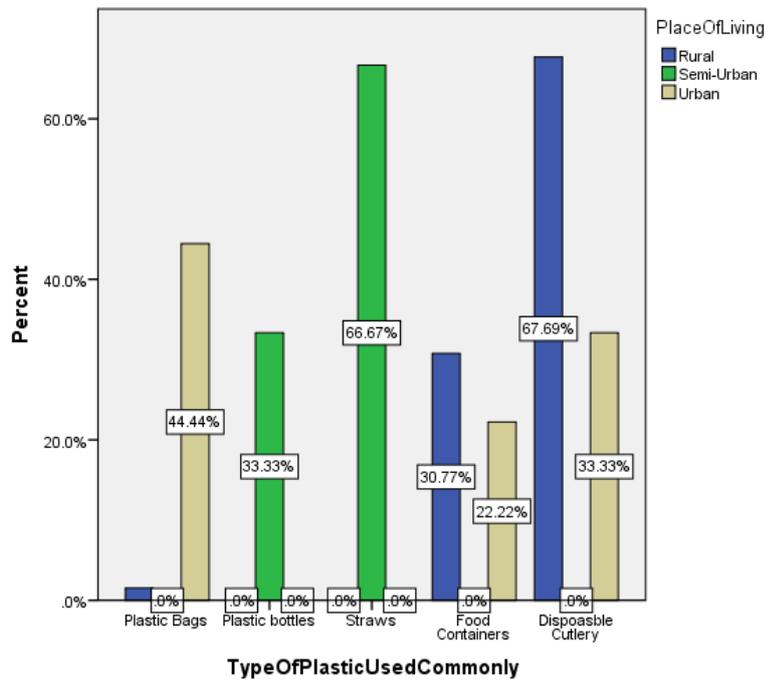
FIGURE 1



Legend:

Fig. 1 represents the correlation of place of living of the respondents and the reasons to use the plastic products.

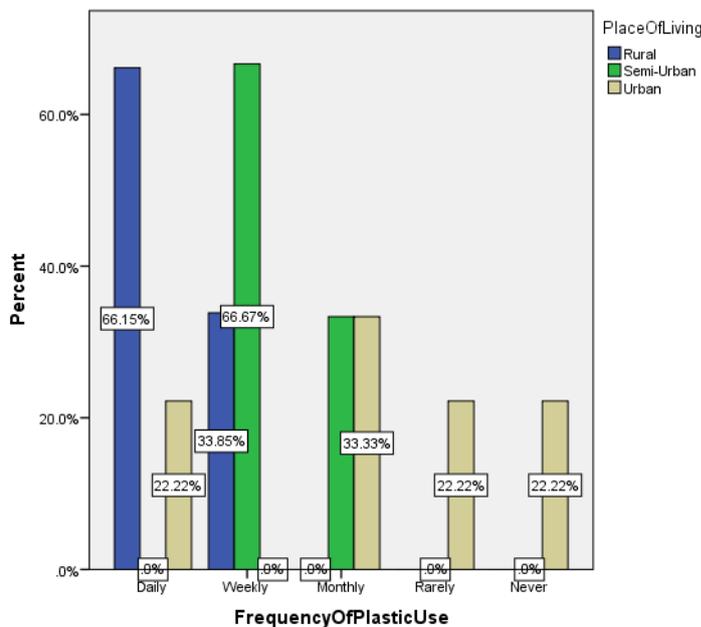
FIGURE 2



Legend:

Fig. 2 represents the correlation of place of living of the respondents and the commonly used plastic products

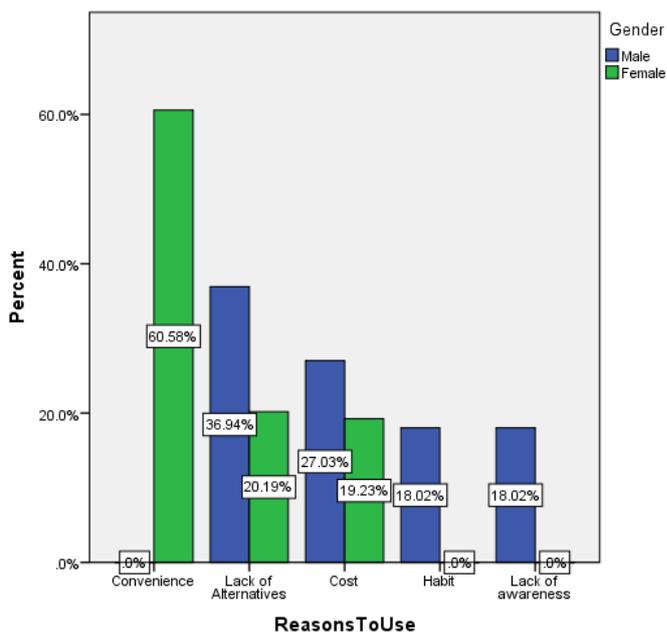
FIGURE 3



Legend:

Fig. 3 represents the correlation of place of living of the respondents and the frequency of plastic usage

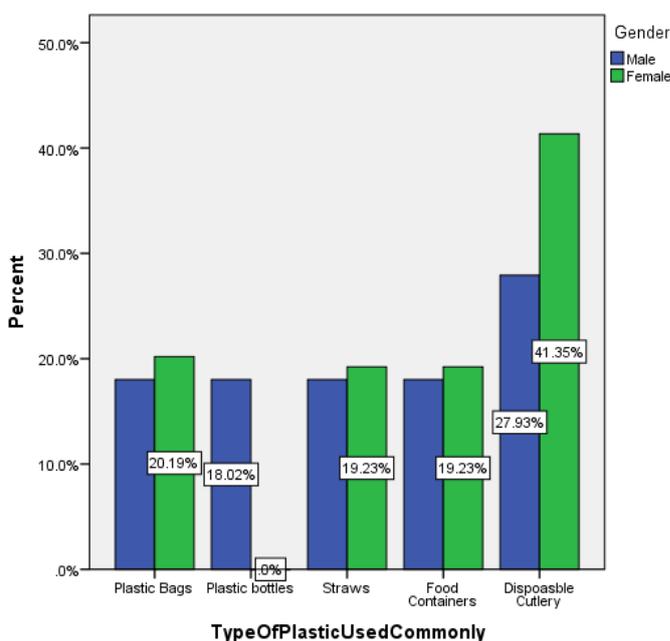
FIGURE 4



Legend:

Fig. 4 represents the correlation of gender of the respondents and the reasons to use the plastic products.

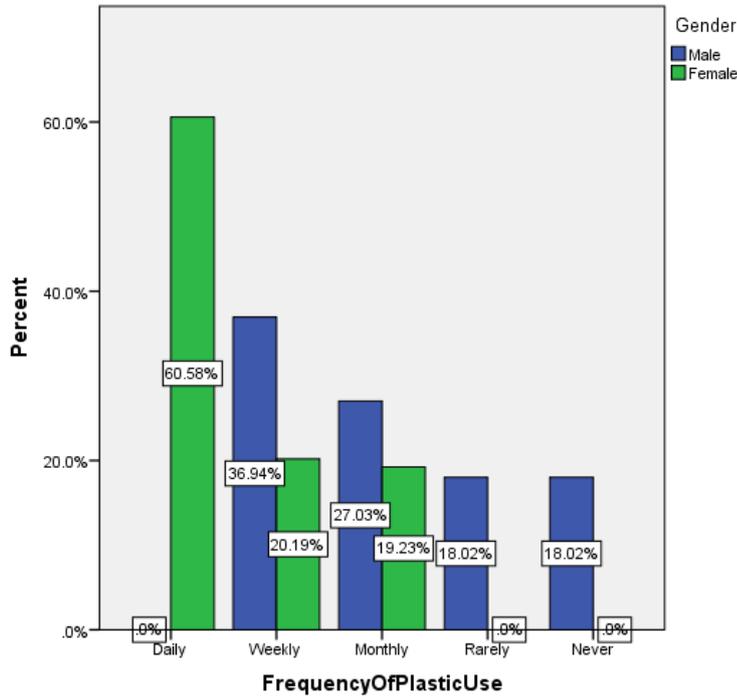
FIGURE 5



Legend:

Fig. 5 represents the correlation of gender of the respondents and the commonly used plastic products

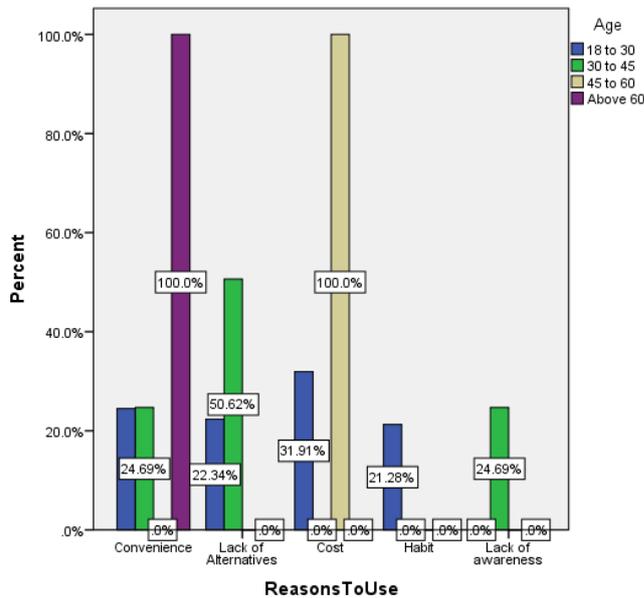
FIGURE 6



Legend:

Fig. 6 represents the correlation of gender of the respondents and the frequency of plastic usage

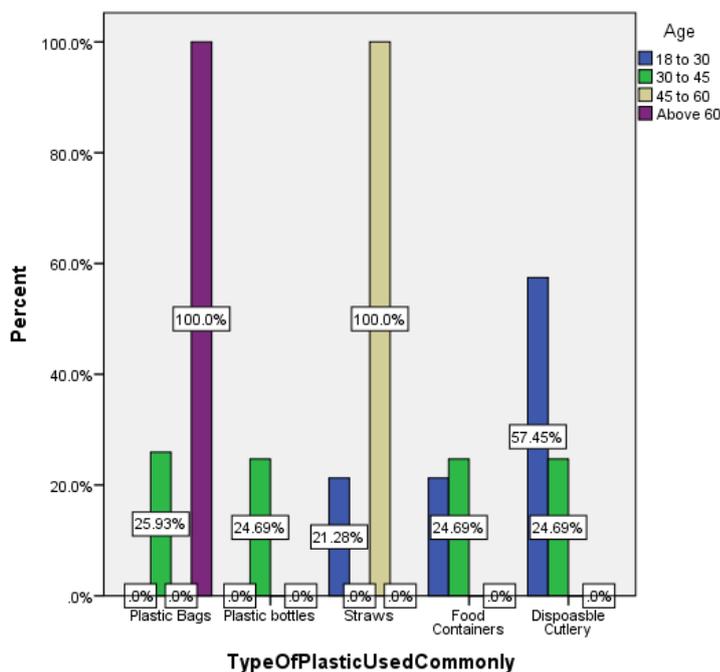
FIGURE 7



Legend:

Fig. 7 represents the correlation of age of the respondents and the reasons to use the plastic products.

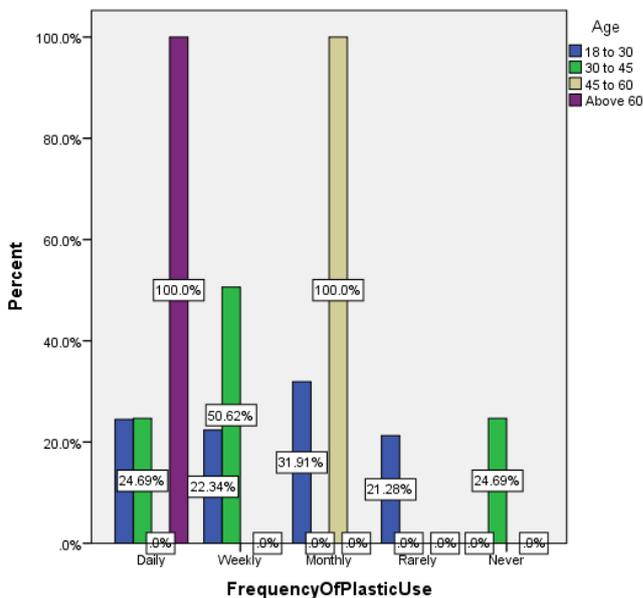
FIGURE 8



Legend:

Fig.8 represents the correlation of age of the respondents and the commonly used plastic products

FIGURE 9



Legend:

Fig. 9 represents the correlation of age of the respondents and the frequency of plastic usage

TABLE 1

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	203.549 ^a	12	.000
Likelihood Ratio	218.849	12	.000
Linear-by-Linear Association	9.521	1	.002
N of Valid Cases	215		

a. 6 cells (30.0%) have expected count less than 5. The minimum expected count is 1.86.

Legend:

Table 1 represents the crosstabulation of age and the frequency of the use of plastic products

TABLE 2

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	182.762 ^a	8	.000
Likelihood Ratio	238.725	8	.000
Linear-by-Linear Association	85.039	1	.000
N of Valid Cases	215		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.58.

Legend:

Table 2 represents the crosstabulation of the place of living and the reasons to use plastic

Result:

(Figure 1) This figure reveals that a notable proportion of semi-urban residents rely on plastic due to limited alternatives, signifying a significant impact on their choices and behaviors. (Figure 2) The majority of rural residents prefer disposable cutlery, indicating a

prevalent use of single-use plastic items in this setting. This highlights a specific trend in the choice of plastic products among rural demographics. (Figure 3) The observation that 66.67% of semi-urban residents use plastics every week emphasizes the regularity of plastic consumption within this demographic, suggesting that it has become an integral part of their lifestyle. (Figure 4) Convenience

emerges as a significant factor influencing female respondents to choose plastic. This insight underscores the importance of convenience in driving plastic use among women. **(Figure 5)** The finding that 41% of female respondents prefer disposable cutlery indicates a specific preference within this demographic, shedding light on the types of plastic products favored by women. **(Figure 6)** The observation that 60.58% of female respondents use plastics daily highlights a habitual and frequent reliance on plastic among women, suggesting a deeply ingrained behavior. **(Figure 7)** Respondents aged 30 to 45 predominantly attribute their plastic usage to the lack of alternatives, providing insights into the motivations of this age group regarding plastic consumption. **(Figure 8)** Notably, 100% of respondents above 60 years identify blasting bags as a commonly used plastic. This specific identification suggests a distinct awareness or preference for a particular type of plastic within this age group. **(Figure 9)** Half of the respondents use plastics weekly, indicating a widespread and consistent incorporation of plastic in their routines. This figure provides an overall perspective on the regularity of plastic usage among the surveyed population. **(Table 1)** The Pearson Square value is 0.002 which is greater than 0.5. Hence, there are significant variants which accept the null hypothesis. **(Table 2)**. The Pearson chi-square value is 0, which is greater than 0.5 hence there is a significant variant which accepts the null hypothesis.

Discussion :

Figure 1 suggests that a majority of semi-urban residents resort to using plastic, primarily because of a lack of available alternatives. In **Figure 2**, it is observed that rural residents commonly use disposable cutleries as their preferred type of plastic. **Figure 3** indicates that a significant portion of semi-urban residents incorporates plastic usage into their weekly routine. The insight from **Figure 4** highlights that convenience is a key factor influencing plastic usage among female respondents. **Figure 5**

brings attention to the fact that a notable percentage of female respondents favor disposable cutlery. Daily usage of plastics is prevalent among 60.58% of female respondents, as depicted in **Figure 6**. For the age group of 30 to 45 **(Figure 7)**, plastics are commonly used due to a perceived lack of alternatives. Respondents above 60 years, as shown in **Figure 8**, unanimously identify blasting bags as a commonly used plastic. **Figure 9** indicates that a substantial number of respondents integrate plastics into their weekly routines. In **Table 1**, the Pearson Square value (> 0.5) signifies significant variance, supporting the acceptance of the null hypothesis. **Table 2** emphasizes a notable Pearson chi-square value (> 0.5), indicating a significant variant that aligns with accepting the null hypothesis.

CONCLUSION

Based on the research it is concluded that the use of plastic products increased and the environmental pollution due to plastic products increased. So the Ban of Plastic Act must be implemented to control the pollution. If the manufacture of the plastic products stopped then there will be no plastic products for using so the pollution due to plastics products is stopped. The use of Biodegradable products should increase than the non-biodegradable plastic products. While you are going shopping you should carry Eco-friendly bags. Moreover, the use of plastic products should be stopped by the public.

REFERENCE

- 1) Debosree Ghosh and Pratap Parida, 2015, Air Pollution and India, International Journal Of Current Research, 7, 11, 22194-22196.
- 2) Subha Ganguly, 2018, Plastic pollution and adverse impact on environment and ecosystem, International conference on recent trends in Arts, Science and technology, 14-16.
- 3) Francois Galgani, Christopher Kim Pham, Julia Ruisser, 2017, Plastic Pollution,

- Frontiers in marine science, 4, 307, doi: 10.3389/fmars.201700307
- 4) Ramamohana Reddy ReddyAppannagari, 2017, Environmental pollution causes and consequences, North Asian International Research Journal of Social Science & Humanities, 3, 8, 151-161.
 - 5) Suad Becirovic and skenderovic ibro, 2015, Environmental pollution and waste management, Balkan Journal of Health Science, 3, 1, 1-10.
 - 6) Richard C. Thompson, 2017, Future of the Sea: Plastic Pollution, Foresight, Government Office for Science, 4-24.
 - 7) Pavani, Raja Rajeswari, 2014, Impact of plastic on environmental pollution, Journal of Chemical and Pharmaceutical Sciences, 87-93.
 - 8) Marcus Eriksen, Laurent C. M. Lebreton, Henry S. Carson, Martin Thiel, Charles J. Moore, Jose C. Borrero, Francois Galgani, Peter G. Ryan, Julia Reisser, 2014, Plastic pollution in the world's ocean, plos one, 1-15, doi.org/10.6084/m9.figshare.1015289
 - 9) Christopher J. Rhodes, 2018, Plastic pollution and potential solutions, Science Progress, 101, 3, 207-260, doi.org/10.3184/003685
 - 10) Barcelo, 2016, Plastic waste in the marine environment, Science of the total environment, 566-567, 333-349, doi.org/10.1016/j.scitotenv.2016.05.084
 - 11) Jort Hammer, Michiel H S Kraak, John R Parsons, Plastics in the marine environment, doi: 10.1007/978-1-4614-3414-6_1.
 - 12) Kanwal D. P. Singh, Aakriti Mathur, 2019, Plastic Pollution in India: An Evaluation of Public Awareness and Consumption Behaviour, OIDA International Journal of Sustainable Development, 12, 7, 25-40,
 - 13) Leighton Walter Kille, Rachael Stephens, 2014, Journalist's research, Plastics, human health and environmental impacts, doi: 10.1515/reveh-2012-0030.
 - 14) Dan Zhang, Ee Ling Ng, et.al., 2020, Plastic pollution in croplands threatens long-term food security, Primary research article, 26,6,3356-3357, doi/full/10.1111/gcb.15043.
 - 15) Winnie W. Y. Lau, Yonathan Shiran, Richard M. Bailey, Ed Cook, Martin R. Stuchtey and Julia Koskella, 2020, Evaluating scenarios toward zero plastic pollution, research article, 369, 1455-1461, DOI: 10.1126/science.aba9475
 - 16) Yoo Eun, Yong-Joon, 2018, Current research trends on plastic pollution and ecological impacts on the soil ecosystem, Environmental pollution, 240,387-395, doi.org/10.1016/j.envpol.2018.05.008
 - 17) Nicola J.Beaumont, Margrethe Aanensen, Melanie C.Austen, TobiasBörger, James R.Clark, MatthewCole, TaraHooper, Penelope K.Lindeque Christine Pascoe, Kayleigh J.Wyles, 2019, Global ecological, social and economic impacts of marine plastic, Marine pollution bulletin, 142, 189-195, doi.org/10.1016/j.marpolbul.2019.03.022
 - 18) Zaman, Rakeen Zaman and Robert Sizemore, 2019, Plastic pollution of the ocean, Advances in science and technology, 13, 1&2, 1-8,
 - 19) Jose.D.B.Derraik, 2002, The pollution of the marine environment by plastic debris, Marine Pollution Bulletin, 44, 9, 842-852, doi.org/10.1016/S0025-326X(02)00220-5