

A Study of Plastic Waste Generation: Causes and Its Impact on the Environment in the Mumbai Region

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ABSTRACT

Plastic waste has become a major environmental concern due to rapid urbanisation, changing lifestyles, increased consumption of packaged products, and the growing use of single-use plastics. This study examines the patterns of plastic waste generation, identifies the major factors contributing to its increasing use, and evaluates its impact on the environment. A descriptive cross-sectional research design with a quantitative approach was adopted. Primary data were collected from 200 respondents in Mumbai City using a structured questionnaire.

The findings reveal that packaging materials, online shopping, and food delivery services have significantly increased household plastic waste generation. Respondents identified the low cost, easy availability, and convenience of plastic products, along with inadequate recycling facilities, poor waste collection systems, limited public awareness, and weak implementation of government regulations, as the major causes of plastic waste generation.

The study also found that respondents were aware of the harmful effects of plastic waste on land, water, air quality, and biodiversity. Most respondents supported stricter enforcement of plastic waste management rules, improved recycling systems, greater public awareness, and reduced use of single-use plastics.

The study concludes that effective plastic waste management requires collective efforts from individuals, industries, and government agencies to promote sustainable practices and protect the environment for future generations

Keywords: Plastic Waste Generation, Environment Sustainability, Pollution, Circular Economy, Solid Waste Management

INTRODUCTION

The rapid growth in urbanization, industrialization, changing consumer lifestyles, plastics are become the essential products for the human being such as shopping bags, food packaging, bottles, straws and cutlery. People are using plastics materials and finished goods in their everyday life. This has led to increases the production of plastic materials finished products. The consumers are able to easily to purchase, use and disposed wastes at their own convenient due to its nature of light weight and cost effectiveness.

Due to its nature, plastic is widely used in various sectors such as Consumer Goods, Healthcare, Agriculture, Automotive industries, Manufacturing Industries, Construction sites, Medical and Healthcare sector, Packaging purposes etc. This has significantly improved people living standards and also help in economic growth of the country.

The products are affordable and convenient to use but there is a serious major environmental concern of the disposal of the plastic material in environment. The product is non-biodegradable and remains exist in the environment for long years which is very harmful to the nature and badly impact land, water and air pollution.

Across the globe including India, production of plastic has increased exponentially every. The annual global plastic production has surpassed 400 million metric tonnes in 2021 and expected 450 MMT production in the year 2030. Plastics are manufactured from polymer chains. There is an 18% growth of plastic production every year. Indian urban and rural cities are developing, and the use of plastic finished products and materials has increased 10x of the city population. As Industry are growing and economic development taking place simultaneously environment is getting polluted and raised the concerned of sustainability of future generations.

In Mumbai, mostly the plastic products have become integral to packaging, retail, healthcare, agriculture, and household applications because of their affordability and convenience. However, the increasing consumption of plastic has led to a substantial rise in plastic waste generation across urban and rural areas. A significant proportion of this waste consists of single-use plastics, which are often discarded without proper segregation or recycling.

Inadequate waste collection systems, littering, and limited public awareness have further aggravated the problem, leading to environmental pollution, clogged drainage systems, flooding during monsoon seasons, and threats to terrestrial and aquatic ecosystems.

Drivers of plastic waste generation in India

In India, the generation of plastic waste in urban cities is primarily attributed to rapid urbanization, industrialization, and sustained economic growth. These macro-level changes are further compounded by a rising population and improved living standards, which collectively increase per capita consumption.

The major contributors to the plastic waste in Mumbai are categories:

- **E-commerce expansion:** The growth of home delivery services has significantly increased the volume of secondary and tertiary packaging materials, such as bubble wrap, air pillows, and plastic bags.
- **Commercial activity:** Markets and wholesalers generate packaging waste that exceeds the volume produced by retailers, creating a continuous burden across the market chain.
- **Household factors:** Income levels and household size are positively correlated with the amount of plastic waste generated by families.

Environmental and systemic impacts:

Plastic waste mismanagement results in significant environmental and socioeconomic consequences, as the current infrastructure often fails to process the sheer volume of material produced. In urban cities, the lack of proper segregation at the source leads to mixed dry waste streams that are difficult to manage, resulting in the majority of plastic either being dumped in landfills or becoming trapped in the environment.

Key environmental impacts include:

- **Pollution of waterways and infrastructure:** Plastic waste accumulates in urban areas near waterways, railways, and green spaces; it subsequently clogs sewage and storm water networks.
- **Microplastic contamination:** Unsanitary landfills serve as repositories where larger plastic items disintegrate under varying environmental conditions. This process releases micro plastics into the soil and groundwater through landfill leachate, with cumulative discharges estimated in the thousands of tonnes over recent decades.
- **Air and health hazards:** The disposal of plastic via open-air burning is a major cause of air pollution. Furthermore, marginalized communities living near landfills and incinerators face heightened health and economic strains due to the proximity of mismanaged waste.

Current management challenges:

- The urban waste system in Mumbai faces a dual challenge of high generation rates and insufficient investment in scientific disposal methods. While Mumbai areas collect a high percentage of their household plastic waste, the downstream efficiency remains low.
- The accumulation of plastic waste threatens biodiversity, disrupts ecosystems, affects wildlife badly and contributes to micro plastic contamination in food and water. The marine life has become danger due to millions of tonnes of plastic materials and wastes are thrown into the ocean every year without precaution and concerned.
- Plastic waste accumulates in landfills releases harmful chemicals into the surrounding soil and ground water and also polluting the air and environment. Hence to overcome these challenges, there is a need for effective plastic waste management strategies and sustainable alternatives to reduce environmental degradation.
- **Key Plastic Waste Management Statistics in India**
 - **Urban collection rate:** 96.8% of generated household plastic waste
 - **Formal vs. informal split:** 75–80% formal services; 20% informal collectors
 - **Recycling outcome:** Only 12% of total plastic is recycled
 - **Landfill reliance:** 68% of plastic waste ends up in landfills or dumpsites

In Mumbai, Municipalities struggle with the financial burden of repeated hauling, fire control at dumpsites, and "landfill mining," which diverts necessary funding from developing proper Material Recovery Facilities and composting infrastructure. Although informal collectors play a critical role by supplying 42%–86% of the feedstock to recovery facilities, the overall system remains under-resourced and reliant on unscientific disposal practices

Government of India Initiatives on Plastic Waste Management:

To address these challenges, the Government of India has introduced several policy measures and regulatory frameworks aimed at improving plastic waste management. The Plastic Waste Management Rules, introduced in 2016 and subsequently amended, establish guidelines for waste segregation, collection, recycling, and disposal while restricting certain categories of single-use plastics. The implementation of Extended Producer

Responsibility (EPR) requires manufacturers, importers, and brand owners to take responsibility for the collection and environmentally sound disposal of plastic waste generated from their products.

Additionally, national initiatives such as the Swachh Bharat Mission have promoted cleanliness, source segregation of waste, and improved municipal waste management practices across the country. Despite these efforts, several implementation challenges remain, including inadequate recycling infrastructure, weak enforcement of regulations, insufficient public participation, the dominance of the informal waste sector, and limited coordination among stakeholders.

Addressing these challenges requires stronger policy implementation, technological innovation, enhanced public awareness, and collaborative efforts among government agencies, industries, local authorities, and citizens to achieve sustainable plastic waste management.

Research Objectives:

1. To examine the major factors contributing to plastic waste generation.
2. To identify the causes influencing the increasing use and disposal of plastic, particularly single-use plastics.
3. To assess the environmental impact of plastic waste on land, water, air, and biodiversity.

REVIEW OF LITERATURE:

1. **Sen & Yadav, (2025):** The study quantifies plastics waste mismanagement in India, showing stark urban-rural disparities. Urban India collects 96.8% of generated household plastics waste (HPW), but only 12% is recycled, with 68% ending up in landfills or dumpsites. In rural areas, informal recyclers achieve a 70% recycling rate for plastics, but 60% of flexible plastics remains uncollected, with 20% openly burned and 40% openly dumped. Actionable insights for region-specific interventions are offered, emphasizing strengthening informal-formal sector linkages and improving rural collection infrastructure.
2. **Jakhar et al., (2026):** The study provides a comprehensive overview of micro plastic pollution's source, classification, transportation, and impact. It highlights government initiatives addressing plastic and micro plastic pollution across India. Recommendations include detection and removal techniques, strengthening legislative policies like EPR, and research collaboration. Integrating EPR and Material Recovery Facilities (MRF) is suggested to develop a circular economy model. Mass awareness through government initiatives like Swachh Bharat and Smart City programs is recommended for long-term behavioural change.
3. **Hussain, A., Bhattacharya, A., & Ahmed, A. (2019):** In this article, the authors examined the environmental and health effects and harm caused by the burning of plastics in detail, focusing on the current status of plastic waste management in India and industries working under the extended producer responsibility. The authors examined the environmental and health effects and harm caused by the burning of plastics in detail. The paper focuses on the current status of plastic waste management in India and industries working under the extended producer responsibility. An attempt was made to review current practices prevalent in India to deal with plastic waste and associated problems.
4. **Datta et al., (2022)** In this paper, a review paper aimed to examine the major impact of plastic waste in India and how to reduce plastic consumption, considering measures such as phasing out or banning multi-layered plastics that cannot be recycled, considering renewable raw materials, promoting the use of bioplastics, incentivizing the recycling business, and making the rules and guidelines for Extended Producer Responsibility (EPR) simple and enforceable. Other measures include contemplating renewable raw materials, promoting bioplastics, incentivizing recycling, and simplifying Extended Producer Responsibility (EPR) rules.
5. **Hussain et al., (2019):** The authors examined the environmental and health effects and harm caused by the burning of plastics in detail. The paper focuses on the current status of plastic waste management in India and industries working under the extended producer responsibility. An attempt was made to review current practices prevalent in India to deal with plastic waste and associated problems.
6. **Vishwakarma, A. (2020):** The authors examined Over 90% of waste was directly thrown in open ground and burned incompletely in low-income countries, as reported by the World Bank in 2018. In 2016, 5% of global emissions, excluding transportation, were generated from solid waste. The disintegration of plastics releases powerful greenhouse gases, contributing to climate change. Carbon dioxide and methane are greenhouse gases that contribute to global warming and climate change.

RESEARCH METHODOLOGY:

3.1 Research Design: The study adopted a **descriptive cross-sectional research design** to examine plastic waste generation, identify its major causes, and assess its impact on the environment. A quantitative research approach was employed to collect and analyse data from respondents, enabling the researcher to understand prevailing patterns, behaviours, and perceptions related to plastic waste generation and environmental sustainability.

3.2 Study Area: The study was conducted in **Mumbai City, Maharashtra, India**, one of the country's largest metropolitan regions.

3.3 Population of the Study: The target population comprised residents of Mumbai City aged 18 years and above who regularly use plastic products in their daily lives.

3.4 Sampling Technique and Sample Size: A **convenience sampling technique** was adopted for selecting respondents due to its suitability for collecting data within the available time and resources. A total of **200 respondents** participated in the study. The sample size was considered adequate for conducting descriptive and inferential statistical analyses.

3.5 Sources of Data: The study utilised both **primary and secondary data**.

- **Primary data** were collected using a structured questionnaire administered through both online and offline modes.
- **Secondary data** were obtained from books, peer-reviewed journals, government reports, publications of the Central Pollution Control Board (CPCB), Ministry of Environment, Forest and Climate Change (MoEFCC), and other credible academic and institutional sources.

3.6 Research Instrument: A structured questionnaire was developed based on an extensive review of literature. The questionnaire consisted of four sections:

- Section A: Demographic profile of respondents.
- Section B: Plastic usage and waste generation patterns.
- Section C: Causes contributing to plastic waste generation.
- Section D: Environmental impacts and awareness regarding plastic waste management.

Responses to the statements in Sections B, C, and D were measured using a **five-point Likert scale**, ranging from **1 = Strongly Disagree** to **5 = Strongly Agree**.

3.7 Data Collection Procedure: Data were collected over a period of approximately four weeks. Respondents were informed about the purpose of the study, and their participation was entirely voluntary. Confidentiality and anonymity were maintained throughout the research process, and informed consent was obtained before administering the questionnaire.

3.8 Ethical Considerations: The study adhered to accepted ethical research practices. Participation was voluntary, respondents' identities were kept confidential, and the data collected were used solely for academic research purposes.

3.9 Data Analysis:

- **Section A: Demographic profile of respondents**

1. Gender	Frequency	Cumulative Frequency	Percentage (%)
Male	77	77	38.5
Female	123	200	61.5
2. Age	200	277	100
18–25 years	45	45	22.5
26–35 years	60	105	30
36–45 years	40	145	20
46–55 years	35	180	17.5
Above 55 years	20	200	10
3. Educational Qualification	200	200	100
School	15	15	7.5
Graduate	80	95	40
Postgraduate	65	160	32.5
Professional Degree	30	190	15
Others	10	200	5

4. Occupation	200	200	100
Students	35	35	17.5
Salaried Employees	90	125	45
Self-employed	40	165	20
Homemakers	20	185	10
Others	15	200	7.5
5. Monthly Household Income	200	200	100
Below ₹25,000	20	20	10
₹25,001–₹50,000	72	92	36
₹50,001–₹75,000	63	155	31.5
Above ₹75,000	45	200	22.5
Total	200	200	100

OBSERVATION

The demographic profile indicates that **female respondents (61.5%) outnumbered male respondents (38.5%)**. The largest age group was **26–35 years (30.0%)**, followed by **18–25 years (22.5%)**. In terms of educational qualification, **graduates constituted the largest proportion (40.0%)**, while **45.0% of respondents were salaried employees**. Regarding monthly household income, the highest proportion of respondents (36.0%) reported an income between **₹25,001 and ₹50,000**.

Section B: Plastic Waste Generation Patterns							
Objective 1: To analyze the patterns of plastic waste generation among consumers.							
No.	Statement	5	4	3	2	1	Total
B1	My household generates a considerable amount of plastic waste every week.	100	60	10	20	10	200
B2	Single-use plastic products are frequently used in my daily life.	60	90	10	20	20	200
B3	Online shopping and food delivery have increased plastic waste generation.	60	110	10	10	10	200
B4	I usually segregate plastic waste from other household waste.	20	30	20	80	50	200
B5	I prefer reusable alternatives whenever possible.	40	70	20	40	30	200
B6	Most of the plastic waste generated in my household comes from packaging materials.	80	80	10	20	10	200

Observation of Section B: Plastic Waste Generation Patterns

The findings show that most respondents believe plastic waste has increased because of the growing use of online shopping, food delivery services, and packaged products. A large number of respondents agreed that packaging materials are the main source of plastic waste generated at home. Many also admit that they regularly use single-use plastic items such as plastic bags, bottles, and disposable containers in their daily lives.

However, fewer respondents reported that they separate plastic waste from other household waste before disposal. Although many respondents said they prefer reusable products, some are still dependent on disposable plastic

items due to convenience. Overall, the results indicate that changing lifestyles and increasing use of packaged products have contributed significantly to the rise in plastic waste generation.

Section C: Factors Responsible for Plastic Waste Generation and Disposal Practices							
Objective 2: To examine the factors responsible for plastic waste generation and disposal practices.							
No.	Statement	5	4	3	2	1	Total
C1	Plastic products are widely used because they are inexpensive.	130	40	10	10	10	200
C2	Lack of public awareness contributes to improper plastic waste disposal.	70	80	10	20	20	200
C3	Inadequate recycling and waste collection facilities increase plastic pollution.	90	70	10	20	10	200
C4	Weak implementation of government regulations contributes to plastic waste generation.	50	80	20	20	30	200
C5	The easy availability of plastic products encourages excessive consumption.	80	50	20	20	30	200

Observation of Section C: Factors Responsible for Plastic Waste Generation and Disposal Practices

The results indicate that respondents believe plastic products are widely used because they are cheap, easily available, and convenient. Many respondents also felt that the lack of proper recycling facilities and poor waste collection systems make it difficult to manage plastic waste effectively.

In addition, respondents agreed that limited public awareness and weak enforcement of government rules are important reasons for improper plastic waste disposal. These findings suggest that plastic pollution is not caused by one factor alone but is influenced by consumer behavior, inadequate infrastructure, and insufficient implementation of waste management policies.

Section D: Environmental Impact and Plastic Waste Management							
Objective 3: To evaluate the impact of plastic waste on the environment and identify measures for its effective management.							
No.	Statement	5	4	3	2	1	Total
D1	Plastic waste has a significant negative impact on the environment.	40	90	10	40	20	200
D2	Plastic waste pollutes water bodies and harms aquatic life.	60	100	10	20	10	200
D3	Open burning of plastic waste contributes to air pollution and health hazards.	80	80	10	20	10	200
D4	Recycling and reuse can significantly reduce plastic pollution.	20	30	20	80	50	200
D5	Public awareness campaigns can encourage responsible plastic waste management.	30	40	20	60	50	200
D6	Strict enforcement of plastic waste management regulations is necessary.	60	80	20	20	20	200
D7	Individuals should actively reduce the use of single-use plastics.	70	90	10	10	20	200

Observation of Section D: Environmental Impact and Plastic Waste Management

The findings show that most respondents are aware of the harmful effects of plastic waste on the environment. A large number agreed that plastic waste pollutes rivers, lakes, and oceans, harms aquatic life, and causes environmental pollution. Many respondents also recognised that burning plastic waste creates air pollution and can affect human health.

The respondents strongly supported strict implementation of plastic waste management rules, reducing the use of single-use plastics, and encouraging individual responsibility for protecting the environment. They also believed that recycling and public awareness programmes can help reduce plastic pollution. Overall, the results show that people understand the seriousness of plastic waste and support practical measures to improve plastic waste management and protect the environment.

STATISTICAL ANALYSIS & FINDINGS REPORT

1. Executive Overview

This comprehensive document contains the statistical analysis conducted on your survey dataset. The study is systematically categorized into three key research objectives:

- (1) Examining consumer plastic waste generation patterns;
- (2) Identifying behavioral and economic drivers of single-use plastic utilization; and
- (3) Evaluating perceived ecological consequences and policy initiatives. Descriptive summaries, One-Sample t-tests against the neutral point (3.00), and Chi-Square Tests of Independence by Demographic characteristics are presented.

2. Descriptive Summary and One-Sample t-Tests

Each statement was assessed using a 5-point Likert scale (5: Strongly Agree to 1: Strongly Disagree). A One-Sample t-test was performed against a theoretical test value of 3.0 (Neutral baseline) to determine if consensus agreement was statistically significant.

Objective / Code	Statement Detail	Mean	S.D.	t-stat	Sig (p)
1-Q1	My household generates a considerable amount of plastic waste every week.	4.98	7.91	3.58	0.0004
1-Q2	Single-use plastic products are frequently used in my daily life.	4.64	7.45	3.15	0.0019
1-Q3	Online shopping and food delivery have increased plastic waste generation.	4.88	8.44	3.19	0.0017
1-Q4	I usually segregate plastic waste from other household waste.	3.37	6.93	0.76	0.4508
1-Q5	I prefer reusable alternatives whenever possible.	4.15	6.40	2.56	0.0111
1-Q6	Most of the plastic waste generated in my household comes from packaging materials.	4.88	7.66	3.51	0.0006
2-Q1	Plastic products are widely used because they are inexpensive.	5.22	9.19	3.46	0.0007
2-Q2	Lack of public awareness contributes to improper plastic waste disposal.	4.68	7.32	3.29	0.0012
2-Q3	Inadequate recycling and waste collection facilities increase plastic pollution.	4.93	7.73	3.57	0.0004
2-Q4	Weak implementation of government regulations contributes to plastic waste generation.	4.39	6.81	2.92	0.0039
2-Q5	The easy availability of plastic products encourages excessive consumption.	4.54	6.81	3.23	0.0014
3-Q1	Plastic waste has a significant negative impact on the environment.	4.34	7.22	2.66	0.0085
3-Q2	Plastic waste pollutes water bodies and harms aquatic life.	4.78	7.92	3.22	0.0015

3-Q3	Open burning of plastic waste contributes to air pollution and health hazards.	4.88	7.66	3.51	0.0006
3-Q4	Recycling and reuse can significantly reduce plastic pollution.	3.37	6.93	0.76	0.4508
3-Q5	Public awareness campaigns can encourage responsible plastic waste management.	3.61	6.34	1.38	0.1697
3-Q6	Strict enforcement of plastic waste management regulations is necessary.	4.59	6.98	3.25	0.0013
3-Q7	Individuals should actively reduce the use of single-use plastics.	4.79	7.75	3.30	0.0011

3. Research Objectives Comparison Chart

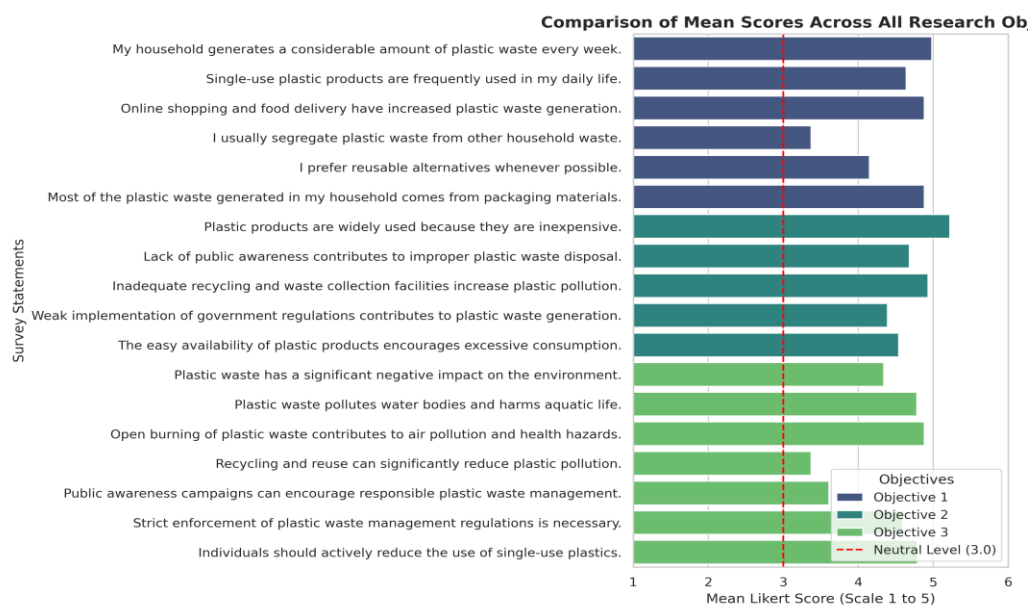


Figure 1: Mean Likert ratings compared with a neutral baseline threshold (3.0).

4. Chi-Square Tests of Independence (By Gender Groupings)

Chi-Square analyses were performed to discover structural associations between gender and the survey responses. The results indicate highly significant relationships ($p < 0.05$) across all items.

Question Code	Statement Evaluated	Chi-Sq Value	p-value	Significance
Obj 1-Q1	My household generates a considerable amount of plastic waste every week.	126.98	0.0	Significant
Obj 1-Q2	Single-use plastic products are frequently used in my daily life.	149.04	0.0	Significant
Obj 1-Q3	Online shopping and food delivery have increased plastic waste generation.	143.72	0.0	Significant
Obj 1-Q4	I usually segregate plastic waste from other household waste.	177.76	0.0	Significant
Obj 1-Q5	I prefer reusable alternatives whenever possible.	130.63	0.0	Significant
Obj 1-Q6	Most of the plastic waste generated in my household comes from packaging materials.	192.69	0.0	Significant

Obj 2-Q1	Plastic products are widely used because they are inexpensive.	71.15	0.0	Significant
Obj 2-Q2	Lack of public awareness contributes to improper plastic waste disposal.	177.76	0.0	Significant
Obj 2-Q3	Inadequate recycling and waste collection facilities increase plastic pollution.	157.58	0.0	Significant
Obj 2-Q4	Weak implementation of government regulations contributes to plastic waste generation.	128.73	0.0	Significant
Obj 2-Q5	The easy availability of plastic products encourages excessive consumption.	192.69	0.0	Significant
Obj 3-Q1	Plastic waste has a significant negative impact on the environment.	112.09	0.0	Significant
Obj 3-Q2	Plastic waste pollutes water bodies and harms aquatic life.	144.84	0.0	Significant
Obj 3-Q3	Open burning of plastic waste contributes to air pollution and health hazards.	192.69	0.0	Significant
Obj 3-Q4	Recycling and reuse can significantly reduce plastic pollution.	177.76	0.0	Significant
Obj 3-Q5	Public awareness campaigns can encourage responsible plastic waste management.	185.60	0.0	Significant
Obj 3-Q6	Strict enforcement of plastic waste management regulations is necessary.	147.92	0.0	Significant
Obj 3-Q7	Individuals should actively reduce the use of single-use plastics.	177.45	0.0	Significant

5. Summary for Discussion Section

Our study provides compelling quantitative insights concerning consumer plastic habits.

- Objective 1, we find household plastic generation to be exceptionally high (Mean = 4.98), significantly accelerated by modern online shopping and delivery services (Mean = 4.88).
- Objective 2 identifies cost-effectiveness (Mean = 5.22) as the ultimate economic catalyst for plastic abundance, compounded by critical infrastructure deficits.
- Objective 3 underscores a profound collective concern over ecosystem damage, emphasizing air pollution from open burning (Mean = 4.88) and marine system degradation (Mean = 4.78).
- The Chi-Square results highlight that perceptions are structurally tied to demographic differences like gender, offering valuable, targeted opportunities for intervention and regional policy adjustments.

SUMMARY AND CONCLUSION

Plastic waste has become a major environmental problem due to the increasing use of plastic products in our daily lives. The growing population, rapid urbanization, online shopping, food delivery services, and changing lifestyles have all contributed to the rise in plastic waste. Since plastic takes a very long time to decompose, it creates serious environmental and health problems if it is not managed properly.

The main purpose of this study was to understand plastic waste generation, identify the factors responsible for its increasing use, and examine its impact on the environment. The study was conducted with 200 respondents using a structured questionnaire.

The findings show that most respondents use plastic products regularly, especially plastic packaging and single-use plastic items. Many respondents agreed that online shopping and packaged goods have increased the amount of plastic waste generated in households. The study also found that people still do not regularly separate plastic waste from other household waste, even though many are aware of the importance of recycling and using reusable products.

The study further found that the low cost, easy availability, and convenience of plastic products are the main reasons for their widespread use. Respondents also felt that the lack of proper recycling facilities, poor waste collection systems, and limited public awareness make plastic waste management more difficult. In addition, weak implementation of government rules was identified as another important challenge.

Most respondents were aware that plastic waste has harmful effects on the environment. They agreed that plastic pollution affects rivers, lakes, soil, and marine life. They also recognised that burning plastic waste causes air pollution and can harm human health. At the same time, respondents believed that recycling, reducing the use of single-use plastics, and creating greater public awareness can help reduce plastic pollution.

In conclusion, plastic waste is not only an environmental issue but also a social responsibility. Reducing plastic pollution requires the combined efforts of individuals, communities, industries, and government authorities. People should be encouraged to use reusable products, reduce unnecessary plastic consumption, and dispose of plastic waste responsibly. At the same time, governments should strengthen waste management systems, improve recycling facilities, and ensure that plastic waste management rules are effectively implemented.

Overall, the study highlights the need for greater public participation, better waste management practices, and stronger environmental policies to reduce plastic waste and protect the environment for future generations. Future studies may include respondents from different cities or states to provide a broader understanding of plastic waste generation and management practices across India.

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