ENVIRONMENTAL SCIENCE

Plastic-Free Community: A Survey of Plastic Use and Waste Practices in Panvel

Kaavya Pokale[1], Vinayak Dhanwariya[1], Bhojraj Y. Shewale[2]

[1]Amity Business School, Amity University Mumbai, India
[2]Mentor, Amity Business School, Amity University Mumbai, India

Published November 2026

Abstract

This study examines plastic use, awareness and waste-management practices among community members in Panvel, Maharashtra. A Google Forms survey recorded 73 responses, alongside a community outreach activity on 3 September 2026. The findings show that single-use plastic remains common, reusable-bag use is limited and household segregation is inconsistent. Habit and easy availability were common reasons for plastic use, while respondents also reported concerns about waste facilities and affordability of alternatives. The study highlights the need for affordable substitutes, clearer segregation and reliable collection. These findings provide a local snapshot and are not representative of the entire Panvel population.

Keywords: community outreach; household waste segregation; Panvel; single-use plastic; willingness to pay

1 Introduction

Plastic is used in shopping, food packaging and household activities because it is lightweight, inexpensive and easy to obtain. The problem begins when products used for a short time are discarded without proper segregation, collection or recovery. Plastic litter can affect public spaces, drains and the surrounding environment.

This paper grew out of our Community Outreach project. We wanted to understand how plastic is used in everyday community life and whether people feel able to reduce it. We focused on reported habits, awareness, disposal practices, views on local facilities and willingness to take part in community action. We did not measure the total quantity of plastic waste generated in Panvel or conduct a technical audit of recycling facilities.

Our research questions were simple:

- How frequently do community members use single-use plastic, and which items are most common?
- What do respondents know and believe about plastic pollution and individual action?
- How do respondents dispose of and segregate plastic waste?
- What barriers make it difficult to reduce plastic use?
- What practical measures could help the community reduce avoidable plastic waste?

2 Background and policy context

We did not conduct a full systematic literature review. For this small community project, we relied on policy and research sources that helped frame the issue. The Plastic Waste Management Rules, 2016, provide the regulatory context for plastic-waste management in India. Central and Maharashtra Pollution Control Board material provides guidance and reporting relevant to plastic-waste assessment and management.

The United Nations Environment Programme's reports on plastic pollution and the OECD's Global Plastics Outlook highlight the importance of reducing unnecessary plastic, improving collection and supporting a more circular use of materials. These sources point to a useful distinction for our project: individual habits matter, but they operate within systems shaped by availability, price, collection and recycling access. A reusable bag is only a practical substitute if people can obtain it and remember to carry it; segregation is only useful when separated waste is collected and handled appropriately.

This background shaped our approach. We treated plastic reduction as a combination of everyday behaviour and the practical systems that make responsible choices possible.

3 Methodology

3.1 Survey instrument

We used a structured questionnaire hosted on Google Forms. It contained 16 questions covering respondent age, frequency and types of plastic use, reusable shopping-bag habits, reasons for plastic use, awareness, perceived seriousness of pollution, belief in individual action, disposal methods, adequacy of segregation and recycling facilities, household segregation, perceived waste-management effectiveness, willingness to reduce plastic use, interest in community initiatives, preferred measures and willingness to pay slightly more for alternatives.

3.2 Sample and distribution

The supplied project report records 73 responses. The available report does not provide a detailed sampling frame or a breakdown of recruitment channels, so we cannot describe the sample as random or representative. Some questions have fewer responses; the willingness-to-pay question, for example, has 71. We therefore treat the results as a snapshot of the people who responded.

3.3 Field activity

The field activity took place on 3 September 2026 in Panvel, Raigad, Maharashtra. We interacted with residents, security personnel, workers and other community members. Our awareness communication focused on avoiding unnecessary single-use plastic, carrying reusable alternatives and separating waste. Geo-tagged photographs were retained in the accompanying outreach report as evidence of the activity. These photographs document the outreach but do not demonstrate long-term behaviour change.

3.4 Analysis

We summarised the questionnaire responses using counts and percentages and grouped the findings into consumption habits, awareness and perceptions, and waste-management practices and willingness to act. We did not run significance tests or claim causal relationships. Some item and reason

questions allowed multiple selections, so their percentages may not total 100%. We use the response base stated in the project report where it differs from 73.

4 Findings and analysis

4.1 Plastic use and everyday habits

Single-use plastic was part of the routine reported by respondents. The largest group (42.5%) said they used it sometimes, while 20.5% said often and 15.1% very often. Straws (30.1%), disposable cups (23.3%) and food packaging (21.9%) were the most frequently selected items. Reusable shopping-bag use was low: 63.0% said they did not use reusable bags, 24.7% said yes and 12.3% said sometimes.

The reasons suggest that information alone may not change behaviour. Easy availability and habit were the leading reported drivers, followed by low cost and convenience. Alternatives need to be visible and practical at the point where people shop or buy food.

4.2 Awareness and perception

Self-rated awareness of the environmental impact of plastic waste was most commonly rated 3 out of 5 (39.7%). The seriousness of plastic pollution was also most commonly rated 3 (42.5%). These middle ratings suggest that many respondents recognised the issue but did not describe their awareness or concern as very high.

The most striking result is that 52.1% did not believe individual behaviour could significantly reduce plastic pollution. This matters because people may not see a reason to change their own habits if they doubt that small actions add up. Community communication should make collective results visible rather than relying only on general warnings.

4.3 Waste practices and willingness to act

Disposal and segregation practices were mixed. The most common reported disposal route was giving plastic waste to a waste collector (32.9%), while 30.1% disposed of it with general waste. Only 12.3% said they separated plastic for recycling. At household level, 45.2% segregated plastic waste sometimes, but only 12.3% always did so.

A total of 39.7% considered segregation and recycling facilities inadequate, and another 37.0% were unsure. On willingness to reduce personal use, responses were divided between no (37.0%), yes (31.5%) and maybe (31.5%). The average willingness-to-participate rating was 3.01 out of 5. Price is another constraint: among 71 responses, 50.7% were unwilling to pay slightly more for alternatives.

When asked which measures would have the greatest impact, restrictions on single-use plastic were selected most often (37.0%), followed by plastic-free shops (21.9%). More recycling and collection and better segregation each received 13.7%. Respondents therefore pointed to changes in shops and systems as well as individual action.

5 Discussion and recommendations

5.1 Convenience is part of the problem

The results point to a practical gap between wanting less plastic pollution and changing daily routines. Respondents identified easy availability, habit, low cost and convenience as reasons for continued use. Reusable alternatives need to compete with disposable products on convenience and price, not just on environmental value.

5.2 Awareness needs to be linked to visible action

The midpoint awareness ratings and the high level of doubt about individual impact suggest that information may not be translating into confidence. Showing how many households, shops or vendors take part—and how much disposable material is avoided or recovered—could make collective action more tangible.

5.3 Waste systems influence household behaviour

The low share who always segregate waste, together with concern or uncertainty about facilities, indicates that household behaviour cannot be considered separately from collection arrangements. Clear labels, reliable collection and information about the destination of separated waste are necessary for segregation to become a routine practice.

5.4 Affordability and vendor participation matter

Half of the respondents answering the willingness-to-pay question were unwilling to pay more for alternatives. This makes low-cost reusable products and vendor participation important. Plastic reduction is more realistic when shops offer alternatives and consumers do not face a large price penalty.

5.5 Phased recommendations

Within three months

- Promote reusable shopping bags through reminders at shops and in residential spaces, and encourage residents to keep a bag in a regularly used backpack or vehicle.
- Place clear instructions and labelled dry-waste containers at accessible community points, after confirming that separated waste will be collected appropriately.
- Speak with local food and beverage vendors about avoiding unnecessary straws, disposable cups and excess packaging.

Three to nine months

- Work with vendors and community groups to make affordable reusable alternatives available.
- Share simple information about collection schedules and where recyclable plastic should be handed over.
- Organise small community clean-up or plastic-reduction activities and report visible outcomes to participants.

After nine months

- Repeat the same core survey after 3–6 months and compare reusable-bag use, segregation frequency and willingness to participate.
- Where possible, work with local stakeholders to document collection and recycling arrangements so residents know what happens after waste is handed over.

If we had to prioritise one step, it would be to make segregation and collection arrangements clear and dependable. Awareness messages are less likely to change behaviour if residents are unsure what to do with separated waste.

6 Limitations and conclusion

6.1 Limitations

The survey contains 73 responses and is not a random or representative sample of the whole Panvel population. The supplied report does not provide a detailed recruitment method or demographic cross-tabulations. Some questions had fewer responses, and some allowed multiple selections. Plastic-use and disposal habits are self-reported and may not match observed behaviour. The field activity did not include an independent audit of waste facilities, collection routes, recycling destinations or the quantity of plastic waste generated. We conducted one outreach activity and one survey wave, so we cannot assess long-term change. The findings should be read as an initial local snapshot.

6.2 Conclusion

The survey suggests that single-use plastic remains common among the respondents, reusable shopping-bag use is limited and household segregation is inconsistent. Habit and easy availability help explain continued use, while doubts about individual impact, concerns about facilities and price sensitivity make change harder. The most useful response is not awareness alone. Affordable alternatives, vendor participation, clear segregation instructions and dependable collection need to work together. Our results provide a starting point for local action and for a repeat survey that can show whether these steps make a difference.

Acknowledgment

We thank our faculty mentors, Mr. Gera and Dr. Bhojraj Y. Shewale, for their guidance and support. We also thank the community members, residents, workers and survey respondents who shared their views and participated in the outreach activity.

References

[1] Central Pollution Control Board (2024). Standard operating procedure for assessment and characterization of plastic waste. *Government of India*.

[2] Government of India, Ministry of Environment, Forest and Climate Change (2016, as amended). *Plastic Waste Management Rules, 2016*.

[3] Maharashtra Pollution Control Board (2023). Annual report on implementation of Plastic Waste Management Rules, 2016: Maharashtra State.

[4] Maharashtra Pollution Control Board (n.d.). Plastic waste management: Rules, notifications, annual reports and guidance. https://mpcb.gov.in/

[5] Organisation for Economic Co-operation and Development (2022). Global plastics outlook: Economic drivers, environmental impacts and policy options.

[6] Plastic-Free Community Survey (2026). Primary data, Google Forms, 3 September 2026; 73 recorded responses (question-specific bases vary).

[7] United Nations Environment Programme (2021). From pollution to solution: A global assessment of marine litter and plastic pollution.

[8] United Nations Environment Programme (2023). Turning off the tap: How the world can end plastic pollution and create a circular economy.