

Citizen Engagement Strategies for Effective Waste Management: A Case Study of Uran (Raigad)

Kalpna Jain¹, Dr. Sajid F. Shaikh², Dr. Gurumit Wadhava³, Manali Patil⁴,
Chetana Tumade⁵, Aamod Thakkar⁶, Abhishek Yadav⁷

¹. Royal College of Arts, Science & Commerce, Mira Road, Dist. Thane, Maharashtra, India.

². Anjuman Islam Janjira, Degree College of Science, Murud-Janjira Raigad, Maharashtra, India

sajidoshaikh@gmail.com

^{3,4,5,6,7} Veer Wajekar Arts, Commerce & Science College, Phunde-Uran Raigad, Maharashtra, India

Abstract: *This case study examines citizen engagement strategies and waste management challenges in Uran (Raigad). The findings indicate that residents face multiple issues, including low awareness, weak Panchayat-level administrative support, unscientific and illegal waste disposal practices, and limited access to proper waste-handling tools. These challenges are intensified by rapid population growth and expanding development activities such as real estate projects, small-scale industries, and the rise of commercial establishments including garment units, hotels, bars, and restaurants. Qualitative data were collected through unstructured interviews with 10 adult respondents (male and female) from the urban. The data were analyzed using Interpretive Phenomenological Analysis (IPA) to understand lived experiences and perceptions related to waste management and civic participation.*

Keywords: Citizen Engagement; Waste Management; Community Participation; Awareness; Panchayat Governance.

INTRODUCTION

Waste management has become a pressing global concern, affecting both urban and rural regions. Rapid population growth, industrial activity, urbanisation, and infrastructure development have significantly increased the quantity of waste generated, posing severe health risks and negatively influencing the socio-ecological balance. Designing an efficient waste management system requires not only technical solutions but also a clear understanding of community-level issues and active participation from the public (APO, 2007).

In many developing countries, waste management remains a low-priority sector, with limited government investment and minimal citizen engagement (UNEP, 2012). Yet, public participation plays a vital role in building effective and sustainable waste management systems. It strengthens democratic governance, enhances transparency, and ensures that policies align with community needs. Continuous participatory processes harness collective intelligence and promote inclusiveness—reflecting the principle that “more heads are better than one.” Participation is further supported by international frameworks such as the Rio Declaration (1992), which emphasises the right of individuals to live healthy and productive lives in harmony with nature.

Solid Waste Management (SWM) systems in low- and middle-income countries often suffer from inconsistency, poor standards, and insufficient community consultation. Public opinion is rarely incorporated into the planning or implementation of SWM projects. This study aims to explore the factors influencing waste management practices in a low-middle-income context, focusing on citizens’ knowledge, attitudes, perceived challenges, and willingness to adopt or finance improved services. Communities with diverse socioeconomic backgrounds were considered to understand variations in SWM adoption.



In recent years, public participation has emerged as an essential element in addressing environmental issues and achieving sustainable development. Policies driven solely by technocratic or bureaucratic decision-making often fail to reflect community realities. In contrast, citizen involvement ensures that waste management strategies are socially relevant, practical, and sustainable. Social determinants such as lifestyle, economic status, environmental awareness, health concerns, and hygiene practices significantly shape public attitudes toward waste.

Scientifically, almost every component of solid waste has potential value when processed or reused properly. Public participation in waste management refers to the organised involvement of citizens in waste segregation, collection, and delivery to authorised handlers, contributing to healthier communities and environmental protection. As lifestyles have evolved with modernization, waste volumes and types have changed dramatically. Engaging communities in responsible waste practices is therefore essential for reducing environmental impact and ensuring sustainable development.

I. OBJECTIVES OF THE STUDY

1. **To examine citizen awareness and attitudes** toward waste generation, segregation, and disposal practices in Uran City.
2. **To analyse the existing waste management system** implemented by the Uran Municipal Council (UMC) and identify its operational strengths and weaknesses.
3. **To evaluate citizen participation levels** in waste collection, segregation, recycling, and community-based waste initiatives.
4. **To identify major challenges** faced by households, commercial establishments, and local authorities in implementing scientific waste management practices.
5. **To recommend strategic measures** to enhance citizen involvement and improve sustainable waste management in Uran City.

II. METHODOLOGY

Research Design

A qualitative, descriptive, case-study approach was adopted to understand real-world waste management practices in Uran City.

Study Area

Uran City, located in **Raigad District, Maharashtra**, known for its fishing economy, port activities, small industries, increasing urbanization, and rapid infrastructure development.

- **Sampling**
- **Sample Size:** 10–15 respondents
- **Respondent Profile:** Residents (18+), shop owners, fishermen, municipal workers, street vendors, and local leaders.
- **Sampling Method:** Purposive sampling (selected individuals who directly interact with waste systems)

Data Collection Methods

1. **Unstructured and semi-structured interviews** with residents and UMC staff.
2. **Field observation** of waste dumping points, collection routes, markets, and coastal areas.
3. **Review of secondary data** from government reports, municipal records, journals, and policy documents.

Data Analysis

- **Interpretive Phenomenological Analysis (IPA)** was used to understand personal experiences, perceptions, and challenges related to waste management.



III. LITERATURE REVIEW

3.1 Public Participation in Waste Management

Several studies emphasize that effective waste management depends heavily on public involvement (UNEP, 2012). Citizen awareness, willingness to cooperate, and positive attitudes toward segregation significantly improve waste processing efficiency.

3.2 Waste Management in Developing Regions

Developing countries often face budget limitations, poor infrastructure, and inadequate community engagement (APO, 2007). Irregular waste collection, open dumping, and mixed waste disposal are common.

3.3 Social Determinants of Waste Practices

Factors such as education level, economic status, lifestyle, environmental concern, and health awareness influence how citizens handle waste.

3.4 Indian Context

India's Solid Waste Management Rules (2016) emphasize

- door-to-door collection
- source segregation
- decentralised composting
- public participation and awareness programs

However, studies show that lack of enforcement, limited resources, and public indifference reduce effectiveness, especially in rapidly growing towns like those in Raigad district.

3.5 Coastal and Port Town Issues

Coastal towns experience additional waste challenges due to:

- fishing activity waste (nets, fish residue)
- port-related plastic and packaging waste
- tourism-related littering

These issues are particularly relevant to Uran, with its fishing villages and proximity to JNPT.

IV. FINDINGS (BASED ON URAN CITY CONTEXT)

4.1 Lack of Awareness

Most residents are unaware of scientific waste disposal methods, segregation rules, and environmental impacts. Traditional practices dominate.

4.2 Inadequate Municipal Infrastructure

- Irregular waste collection in interior lanes
- Insufficient dustbins and segregation facilities
- Limited staff and equipment for door-to-door collection

4.3 Unscientific Disposal Practices

- Open dumping near coastal areas, roadsides, and vacant plots
- Burning of waste, especially plastic and dry waste
- Mixed waste disposal due to absence of household-level segregation

4.4 Growing Urbanization Pressure

With increasing population, market expansion, and economic activity, Uran generates far more waste than the system is designed to handle.



4.5 Low Citizen Involvement

- Minimal participation in awareness drives
- Lack of community-based composting practices
- Limited understanding of recycling options

4.6 Structural Impediments

Respondents mentioned barriers such as:

- lack of time to segregate waste
- absence of clear communication from UMC
- inadequate monitoring and penalties
- no proper tools for handling wet waste

4.7 Positive Indicators

- Some residential areas are willing to participate in cleanliness drives.
- Schools and self-help groups have shown interest in awareness programs.
- There is growing recognition that waste affects health and fishing livelihoods.

V. CONCLUSION

The study conducted in Uran City, Raigad, Maharashtra, highlights that effective waste management is closely linked to citizens' awareness, participation, and the efficiency of local administrative systems. Although Uran is a developing urban-rural interface with increasing population, commercial activity, and industrial influence, the waste management system still faces challenges such as unscientific waste disposal, limited community awareness, inadequate segregation practices, and insufficient monitoring mechanisms. The interpretive phenomenological analysis of respondents' experiences indicates that citizens are willing to participate in waste management initiatives but lack proper guidance, facilities, and motivation.

Strengthening citizen-Panchayat/municipal collaboration, improving awareness programs, and ensuring better access to waste management tools can significantly enhance community participation. The findings emphasize that sustainable waste management is not only a technical issue but also a socio-behavioural process requiring continuous public involvement, responsive governance, and well-structured policies. With proper community engagement and administrative reforms, Uran City can adopt an integrated and sustainable waste management model that ensures environmental protection and improved public health.

Suggestions / Recommendations

1. Strengthen Citizen Awareness and Education

- Conduct regular awareness campaigns through schools, local groups, and digital platforms on waste segregation, composting, and environmental impacts.
- Include door-to-door demonstrations on proper waste disposal and recycling practices.

2. Improve Waste Segregation at the Source

- Introduce colour-coded bins for households and commercial units.
- Enforce mandatory segregation through local regulations and community monitoring groups.

3. Enhance Municipal Capacity and Infrastructure

- Increase the number of waste collection vehicles and improve route planning.
- Provide staff with training in scientific waste handling, safety practices, and community engagement.

4. Promote Community Participation

- Form local "Swachh Samiti" groups involving youth, women's self-help groups, and community volunteers.
- Recognize and reward wards or neighbourhoods practicing model waste management.



5. Introduce Household and Community Composting

- Promote composting units at household and community levels for managing wet waste.
- Offer subsidies or discounts for composting equipment.

6. Strengthen Monitoring and Governance

- Use mobile apps or complaint helplines for reporting illegal dumping or irregular waste collection.
- Conduct periodic audits of waste management practices at neighbourhood, ward, and municipal levels.

7. Collaborate With Private Agencies and NGOs

- Partner with NGOs working on waste recycling and awareness.
- Encourage public-private partnerships for recycling centres and waste-to-resource initiatives.

8. Encourage Youth Engagement

- Introduce eco-clubs in schools and colleges.
- Organize clean-up drives, competitions, and local campaigns led by students.

REFERENCES

1. APO (2007). **Advance Planning and Optimisation for Waste Management**. Asian Productivity Organization.
2. UNEP (2012). **Global Waste Management Outlook**. United Nations Environment Programme.
3. Rio Declaration on Environment and Development (1992). United Nations Conference on Environment and Development (UNCED).
4. Sharholly, M., Ahmad, K., Mahmood, G., & Trivedi, R. C. (2008). "Municipal solid waste management in Indian cities—A review." *Waste Management*, 28(2): 459–467.
5. Gupta, N., Yadav, K. K., & Kumar, V. (2015). "A review on current status of municipal solid waste management in India." *Journal of Environmental Sciences*, 37: 206–217.
6. Joshi, R., & Ahmed, S. (2016). "Status and challenges of municipal solid waste management in India." *Cogent Environmental Science*, 2(1): 1139434.
7. Government of Maharashtra (2020). **Maharashtra State Solid Waste Management Policy**.
8. Udupi/Zilla Parishad & Gram Panchayat Environmental Reports (local government publications).
9. Creswell, J. W. (2013). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Sage Publications.

