

# A Descriptive Study on Solid Waste Management Practices in Kohima Village

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**Abstract:** This study explores solid waste management in Kohima Village through a qualitative lens, identifying key challenges and practical solutions. Findings indicate that waste disposal practices are largely unorganized, with common methods including open dumping and burning, which pose environmental and health risks. Organic waste dominates household refuse, followed by plastic, paper, and construction materials.

Major issues include inadequate waste collection, lack of infrastructure, limited community awareness, and financial constraints. The absence of proper segregation, recycling, and composting systems further hinders sustainable waste management.

To address these challenges, the study recommends increasing public awareness through education and community involvement, establishing structured collection systems, and setting up local composting and recycling units. Policy support, financial incentives, and collaboration with NGOs are also emphasized.

Overall, the study highlights the urgent need for a coordinated approach involving residents, local authorities, and other stakeholders. Implementing these recommendations can lead Kohima Village toward a cleaner and more sustainable waste management system.

**Keywords:** Solid Waste Management, Kohima Village, Waste Disposal, Community Participation.

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## I. INTRODUCTION

Solid waste management (SWM) is increasingly acknowledged as a critical environmental and public health issue worldwide. Rapid population growth, accelerated urbanization, and shifting consumption patterns have significantly contributed to the rise in solid waste generation across both developed and developing nations (Gupta et al., 2023; Zhang et al., 2010). Modern waste includes many different types such as food waste, plastics, e-waste, and

packaging materials. Managing these creates big challenges for governments, city planners, and local communities (Noor et al., 2020). Solid Waste Management (SWM) is not just about collecting and disposing of waste. It is also linked to health, environmental protection, people's habits, and government policies (Gupta et al., 2023).

SWM mainly means collecting, moving, treating, and safely disposing of waste from homes, businesses, and institutions in an organized way (Shekdar, 2009). In contexts

where systems function effectively, SWM reduces pollution, curtails vector-borne diseases, supports recycling industries, and enhances urban liveability (Abdullah et al., 2024). However, such outcomes are often difficult to achieve in regions where economic limitations, weak infrastructure, and insufficient policy implementation prevail (Guerrero et al., 2013). In developing countries, particularly in rural and semi-urban areas, waste often accumulates in open sites or is burned, creating significant environmental and health hazards (Mihai et al., 2021). These practices persist despite global advances in technologies such as waste-to-energy conversion, engineered landfills, and integrated recycling systems (Nanda and Berruti, 2021). According to Venugopal (2024), the gap in waste management between big cities and smaller or rural areas is growing, showing the need for local and practical solutions.

Nagaland, a state in Northeast India, presents a unique set of conditions that complicate waste management (Chophy, 2025). Its hilly terrain, dispersed settlement patterns, and socio-cultural diversity mean that uniform, large-scale municipal models are often impractical (Pongen, 2022). Kohima Village, one of the oldest and most prominent traditional settlements in the region, reflects this complexity (Munoth et al., 2022). With the community undergoing demographic transitions, increased urban contact, and lifestyle shifts, waste generation has risen markedly in recent years (Wilson, 2007). Traditional disposal practices such as open dumping, alongside limited municipal collection services, have proven insufficient in managing the growing volume and diversity of waste (Zohoori and Ghani, 2017). Furthermore, low levels of public awareness regarding waste segregation, recycling, and composting exacerbate the problem, leading to visible environmental degradation, health hazards such as vector-borne diseases, and the erosion of the cultural and aesthetic value of the village landscape (Mamidi, 2024).

While waste management initiatives in India such as the Swachh Bharat Abhiyan, have made strides in promoting door-to-door collection and source segregation in urban centers (Sharholi et al., 2008), the benefits of such programs have yet to fully permeate semi-urban and rural communities (Deep et al., 2020). In Kohima Village, waste management remains largely community-driven and fragmented, characterized by a coexistence of indigenous knowledge systems and emerging but under-resourced municipal efforts. The situation underscores the importance of examining SWM through a lens that accounts for cultural practices, community participation, and governance structures. It also highlights the need for adaptable models that bridge traditional practices with contemporary sustainability frameworks.

Against this backdrop, the present study investigates the current solid waste management practices in Kohima Village. Specifically, it explores community perceptions, identifies operational challenges, and examines systemic gaps that hinder effective waste management. The research adopts a qualitative approach, focusing on household and municipal waste while deliberately excluding industrial and

biomedical waste streams to maintain contextual clarity. By generating context-specific insights, this study seeks to propose practical, culturally sensitive recommendations that can strengthen waste management practices in Kohima Village. Beyond local relevance, the findings are intended to contribute to broader discourses on rural and semi-urban SWM, offering potential lessons for policymakers, practitioners, and scholars concerned with environmental sustainability, public health, and community development.

## II. RESEARCH METHODOLOGY

This study employed a qualitative research approach to explore solid waste management (SWM) practices in Kohima Village. The methodology focused on understanding community behaviors, challenges, and perceptions surrounding waste disposal.

### ➤ *Research Design*

A qualitative design was chosen to gain in-depth insights into SWM issues. Data was gathered through field observations, semi-structured interviews, and focus group discussions (FGDs).

### ➤ *Study Area*

Kohima Village, the largest and one of the oldest traditional settlements in Nagaland, served as the study area. Its combination of modern and indigenous practices made it ideal for analyzing rural SWM.

### ➤ *Data Collection*

- **Primary Data:** In-depth interviews were conducted with municipal staff, waste workers, and community leaders. FGDs engaged local residents to understand household waste practices. Field observations documented real-time waste handling.
- **Secondary Data:** Reports from the Kohima Municipal Council (KMC), policy documents, and relevant literature provided contextual support.

### ➤ *Sampling Technique*

- Purposive sampling was used to select:
- 30 households from diverse socio-economic backgrounds
  - 10 municipal personnel
  - 15 waste handlers
  - 5 community leaders

### ➤ *Data Analysis*

Data were analyzed thematically to identify recurring patterns related to waste disposal, policy effectiveness, and community engagement. Policy documents were reviewed through content analysis.

### ➤ *Ethical Considerations*

All participants provided informed consent. Anonymity and confidentiality were maintained, and data was used strictly for academic purposes.

### III. RESULTS

➤ *Waste Generation and Composition*

Waste in Kohima Village primarily consists of organic matter, plastics, paper, metals, and glass. Major sources include:

- Households: Food scraps, packaging, and non-biodegradable items.
- Commercial outlets: Cardboard, plastic wrappers, and food waste from shops and markets.
- Agriculture: Crop residues and biodegradable plant waste.
- Construction: Debris from local building activities.

➤ *Waste Disposal Practices*

Traditional disposal methods dominate due to limited formal services:

- Open dumping is the most common practice, posing environmental and health risks.
- Burning waste is frequent, despite causing air pollution.
- Household composting occurs in a few cases but is not widespread.
- Informal recycling exists but lacks formal organization.

Among 30 participants, 17 reported open dumping, 8 practiced burning, 3 composted at home, and only 2 engaged in informal recycling, highlighting the need for improved waste management systems.

Table 1. The Table Presents the Findings from 30 Participants Regarding the Common Waste Disposal Methods in Kohima Village.

Waste Disposal Method	Number of Participants
Open Dumping	17
Burning of Waste	8
Household Composting	3
Informal Recycling	2

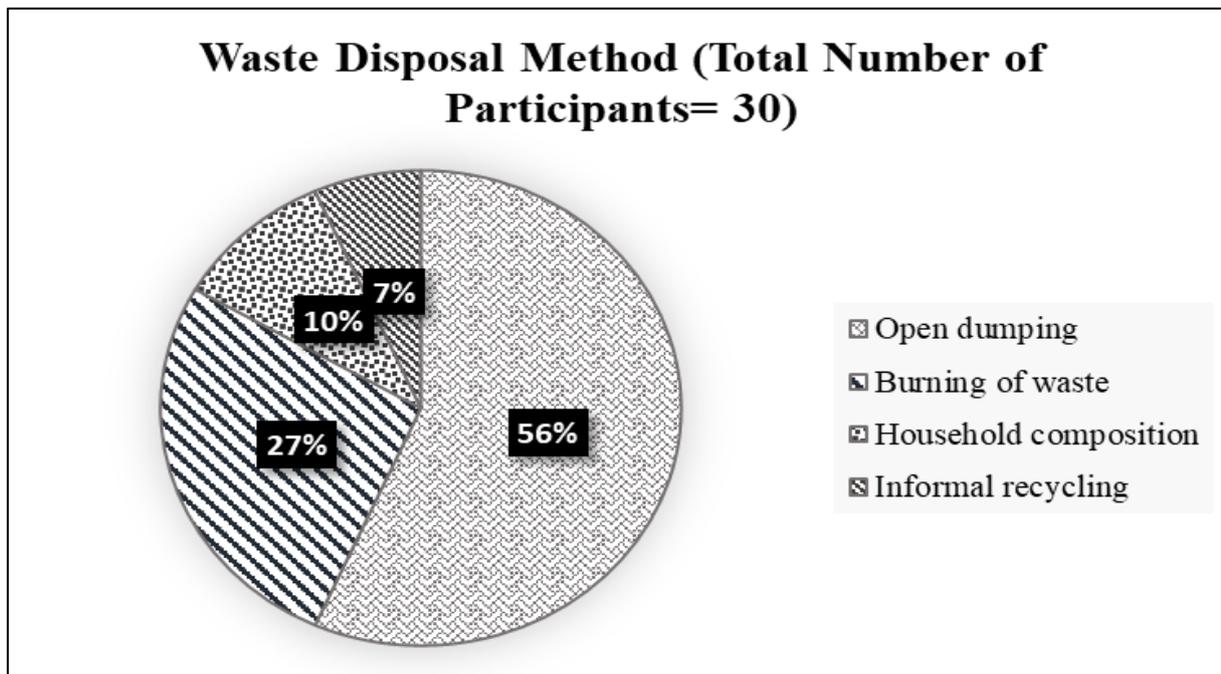


Fig. 1. Waste Disposal Methods in Kohima Village This Figure Represents the Distribution of Waste Disposal Practices Among 30 Participants in Kohima Village. The Most Common Method is Open Dumping (17 Participants), Followed by Burning of Waste (8 Participants). Household Composting (3 Participants) and Informal Recycling (2 Participants) are Practiced by Fewer Individuals.

➤ *Community Awareness and Participation*

Focus group discussions revealed that although residents recognize the need for proper waste management, organized community involvement is lacking. Key points include:

- **Low Awareness:** Many residents are unfamiliar with waste segregation and sustainable disposal practices.
- **Limited Government Support:** Municipal efforts exist but are constrained by inadequate resources and weak enforcement.
- **Traditional Leadership:** Village councils hold significant influence but have yet to effectively incorporate waste management into their governance.

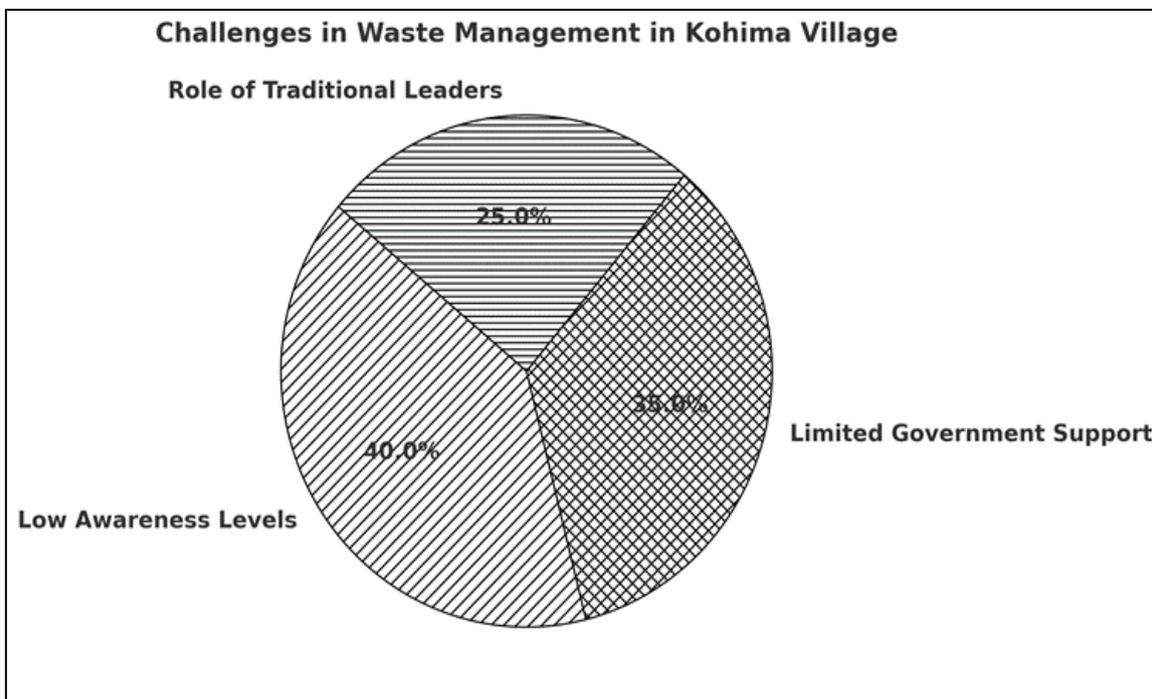


Fig. 2. Pie Chart Representing the Key Challenges in Waste Management in Kohima Village. The Data Highlights that Low Awareness Levels (40%) are the Biggest Issue, Followed by Limited Government Support (35%) and the Role of Traditional Leaders (25%) in Governance without Integrated Waste Management Policies

The pie chart highlights the main challenges in waste management in Kohima Village, as observed by the community. The biggest issue is low awareness (40%), with many residents lacking knowledge about proper waste segregation and eco-friendly disposal methods. Limited government support (35%) also poses a significant obstacle, due to inadequate resources and weak enforcement by municipal authorities. Furthermore, traditional leaders (25%) have not yet integrated formal waste management policies into their governance, restricting progress toward sustainable solutions. These results emphasize the importance of increasing public awareness, enforcing policies, and strengthening government participation to improve waste management in Kohima Village.

➤ *Challenges in Solid Waste Management*

The study identifies several obstacles to effective waste management in Kohima Village:

- **Insufficient Infrastructure:** There are no dedicated waste collection centers or proper disposal facilities.
- **Inconsistent Waste Collection:** Municipal waste services are irregular, causing waste build-up.
- **Financial Limitations:** Limited funding restricts the development of organized collection and disposal systems.

- **Resistance to Change:** Cultural habits and reluctance make adopting new waste management methods difficult.

➤ *Potential Strategies for Sustainable Waste Management*

Drawing from case studies and expert advice, the following strategies are recommended for improving waste management in Kohima Village:

- **Community-Based Waste Segregation:** Launch awareness campaigns and provide color-coded bins to encourage sorting waste at the source.
- **Decentralized Processing:** Set up small-scale composting and recycling units within the village.
- **Enhanced Municipal Support:** Increase resources to ensure regular waste collection and proper disposal.
- **Policy Enforcement:** Strengthen implementation of local waste management regulations through village councils and municipal authorities.

➤ *Comparative Analysis with Other Rural Waste Management Models*

Kohima Village’s waste management is compared with successful rural models elsewhere:

- **Southeast Asian Community Initiatives:** Countries like Thailand and Indonesia have reduced open dumping through community-led programs.

- India's Swachh Bharat Mission: Government efforts promoting waste segregation and sustainable disposal have improved sanitation in many areas.
- Nagaland's Best Practices: Some Nagaland villages have adopted decentralized waste treatment techniques that could be replicated in Kohima Village.

➤ *Recommendations*

Based on the findings, these recommendations are suggested to tackle the challenges in Kohima Village:

- **Boost Community Involvement:** Conduct educational programs on waste segregation, composting, and responsible disposal.
- **Build Local Infrastructure:** Develop designated waste collection points and composting sites to improve waste management.
- **Strengthen Policy Implementation:** Ensure village councils and local authorities enforce waste management rules rigorously.
- **Encourage Sustainable Alternatives:** Promote biodegradable products and reduce plastic use to lower waste generation.
- **Introduce Recycling Incentives:** Offer financial or other rewards to motivate households and businesses to recycle.
- **Foster Partnerships:** Collaborate with NGOs, private sectors, and government agencies to create sustainable waste solutions.

The findings show that despite significant challenges, Kohima Village has opportunities to improve waste management through active community participation, stronger policy enforcement, and infrastructure development. A combined effort from government and community toward sustainable practices can significantly enhance the village's waste management system.

#### IV. DISCUSSION

The study reveals that solid waste management in Kohima Village is largely unorganized, with many residents continuing to rely on traditional disposal methods. A significant portion of the waste consists of organic materials, followed by plastics, paper, metal, and construction debris. Open dumping and burning of waste are common practices, which contribute to pollution and health hazards. Awareness among community members about waste segregation and proper disposal is limited, while waste collection services remain irregular. The absence of designated recycling and composting facilities further complicates waste management efforts. Financial and logistical constraints also hamper the ability of local authorities to implement efficient waste management systems. Drawing lessons from successful rural waste management models elsewhere could provide valuable guidance for improving conditions in Kohima Village.

To enhance waste management, the study recommends increasing awareness and encouraging greater community involvement. This can be achieved through regular workshops, training sessions, awareness campaigns using local events and social media, and introducing

environmental education in schools. Encouraging community-led waste management initiatives can also foster a sense of responsibility and participation among residents.

Improving waste collection and disposal systems is crucial. Establishing a structured collection schedule for households and businesses, providing separate bins for biodegradable and non-biodegradable waste, creating designated disposal areas to curb open dumping, and ensuring timely municipal waste services are important steps in this direction.

The study also suggests setting up local waste processing facilities such as small-scale composting units for organic waste and recycling centres to handle plastics, metals, and paper. Promoting small businesses that use recycled materials and sustainable products can further support these efforts.

Strengthening government policies and support is vital. Local authorities should enforce regulations on waste segregation, recycling, and responsible disposal, and introduce penalties for illegal dumping and burning. Financial incentives, such as tax benefits for eco-friendly businesses, alongside partnerships with NGOs and environmental organizations, can improve policy implementation and waste management initiatives.

Promoting eco-friendly practices and reducing waste generation is another key area. Encouraging the use of reusable and biodegradable materials, supporting alternatives like cloth bags and bamboo products, and fostering initiatives that transform waste into useful products through recycling, composting, and upcycling are recommended.

Financial and logistical support should also be enhanced by introducing incentives for households practicing proper waste segregation and recycling, seeking government grants to fund waste programs, and training local workers in waste collection and processing to create job opportunities.

Future research could focus on evaluating the long-term effectiveness of community-based waste management programs, exploring the feasibility of waste-to-energy solutions in rural areas, and examining the role of traditional governance structures in supporting modern waste management policies.

Overall, Kohima Village faces significant challenges related to inefficient waste collection, limited awareness, and insufficient infrastructure. However, through increased community participation, organized waste collection, recycling promotion, and strict policy enforcement, meaningful progress can be achieved. Collaboration among residents, local authorities, and external partners is essential to fostering a cleaner, healthier, and more sustainable environment. By following these recommendations, the village can establish a well-structured and effective waste

management system that benefits both the community and the environment in the long term.

## V. CONCLUSION

In conclusion, the study reveals that solid waste management in Kohima Village faces significant challenges, including inadequate infrastructure, low community awareness, inconsistent waste collection, and limited government support. Despite these obstacles, there are clear opportunities for improvement through increased community engagement, the establishment of structured waste collection and processing systems, and stronger policy enforcement. By adopting sustainable waste management practices and fostering collaboration among residents, local authorities, and external stakeholders, Kohima Village can move towards a cleaner and healthier environment. Implementing these changes will not only improve public health and environmental conditions but also promote long-term sustainability and community well-being.

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### ➤ Funding Information

Not applicable

### ➤ Conflict of Interest

The authors declare that they have no conflict of interest.

### ➤ Ethics Declaration

The manuscript does not involve any animal study.

### ➤ Consent for Publication

Not applicable

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