Article DOI Link: https://doi.org/10.3126/shss.v1i2.87633

Spectrum of Humanities and Social Sciences (SHSS)
A Multidisciplinary Bilingual Journal
ISSN 3059-9849; Volume 1, Issue 2, December 2025, pp. 1-13
Indexed in Nepal Journals Online (NepJOL)
Research Article

Open access article

Waste Management Knowledge and Practices of Semi-urban Communities: A Case of Birendranagar Municipality

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Abstract

The study aims to evaluate the status of solid waste management, public awareness towards it, and in reference to the policy frameworks of waste management in a municipality of Karnali province, Nepal. Moreover, it investigates individuals' knowledge, practices, and local policies related to domestic solid waste management. The study employed descriptive and analytical survey research design. Data were collected through orally administered questionnaire and site observations. The data were collected from 347 households of four communities. The findings revealed that most residents separate their waste into biodegradable and non-biodegradable categories. They composted biodegradable waste at home and collected non-biodegradable waste to send away using the municipality's vehicle. However, they faced challenges in waste management because of the irregularity of municipality's waste collection truck. Proper household solid waste management is essential for achieving the sustainable cities and communities. The study recommends that municipality should pay attention to set up the waste management plant particularly for the households' solid waste for human health and the environment.

Article Info.

Article History
Received: 5 August 2025
Revised: 5 October 2025
Accepted: 20 November 2025

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Publisher
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https://muodgshss.edu.np

Keywords: Household waste, Solid waste, Sustainable development, Waste management

Introduction

Domestic solid waste encompasses waste generated by households and other residential areas, including food waste, textiles, plastics, glass, paper, metals, and various other materials, as well as electronic waste (E-waste) (World Bank, 2022). Currently, due to rapid urbanization, population growth, and consumerist lifestyles, the amount of waste worldwide is increasing daily, posing a serious threat to the environment, public health, and sustainable development. Improper waste management leads to the development of various diseases and health problems (World Health Organization, 2015).

Household waste management involves the organized collection, storage, and disposal of waste generated at home. This includes methods for waste collection, storage, processing, and management that are environmentally friendly and hygienic. Effective domestic solid waste management helps reduce pollution, improve health and safety, and conserve resources. It emphasizes waste separation, reduction, reuse, composting, storage, and the timely collection and handling of waste (US, EPA, 2024).

In present, world huge amount of electronic waste was produced by industrialized countries of the world. In 2019, they generated 53.64 million metric tons of e-waste worldwide (United Nations University, 2020). Global e-waste recycling rates remain very low (International Telecommunication Union & United Nations Environment Program, 2017). In 2020, the world produced an estimated 2.24 billion tons of solid waste, and this number is expected to increase to 3.88 billion tons by 2050 (World Bank Group, 2018).

In comparison to the developed nations, developing countries have the practices of unsustainable waste management particularly in urban area. In lower-income countries, over 90% of waste is mishandled through open dumping or burning (World Bank Group, 2018; International Solid Waste Association, 2015), which is the cause of severe air and water pollution (World Health Organization Regional Office for Europe, 2015; United Nations Environment Programme, 2015). Such practices contribute to global climate change and breeding grounds for disease vectors (World Bank Group, 2018; Intergovernmental Panel on Climate Change, 2022). As a results, it is the huge problems for developing countries and cities in the world (United Nations Environment Program, 2021).

Domestic solid waste, primarily generated by households, comprises food scraps, plastics, paper, and electronic waste. Growing urbanization and consumerism are accelerating waste creation worldwide, leading to serious environmental and health problems. Proper waste management—encompassing organized collection, segregation, recycling, and safe disposal—is crucial for reducing pollution and promoting sustainability. Despite these needs, developing countries encounter significant challenges in managing household waste effectively. Over 90% of waste in developing regions remains improperly managed, leading to pollution and health hazards. These global and regional issues underscore the pressing need for robust domestic solid waste management systems. In this context, this study attempts to find out the waste management knowledge and practices of semi-urban communities of Nepal.

Objectives

The study has set the following objectives for the study:

- To analyze the existing household-level waste reuse and management practices in Birendranagar Municipality.
- To examine the major challenges faced by households and local authorities in implementing effective and sustainable waste management systems within the municipality.

Literature Review

In Asia, an estimated 1.2 billion tons of solid waste were generated in 2016, and this number is expected to reach 1.5 billion tons by 2030 and 1.9 billion tons by 2050 (World Bank Group, 2018). In the region, municipal solid waste disposal heavily relies on landfills due to their low costs and the high frequency of collection failures (United Nations Environment Programme, 2023). Significant challenges include a firm reliance on low-cost landfills instead of recycling or composting. These inadequate waste collection systems do not separate waste, and widespread open dumping or uncontrolled disposal. Apart from a few high-income countries in Asia, such as Japan, Korea, and

Singapore, waste collection rates remain low. Open dumping is the most common method of waste management. Only 44% of waste practices in South Asia and 71% in East Asia and the Pacific use open dumping (United Nations Environment Program, 2023). Moreover, many waste landfills do not operate according to scientific or health standards, especially in middle- and low-income nations, which comprise 79% of South Asia, 64% of Southeast Asia, and 51.50% of South and Central Asia.
(World Bank Group, 2018). Asia hosts 17 of the world's top 50 dumping sites (International Solid Waste Association & United Nations Environment Programme, 2015), posing significant health risks and contributing to environmental degradation.

Formal waste management in Nepal began under Prime Minister Chandra Shamsher in 1891 with the establishment of a Sanitation Center and the appointment of Kuchikars for collection and disposal. Following the political changes of 1950, Kathmandu, Patan, and Bhaktapur were established as municipalities, and waste management became their official responsibility (Government of Nepal, 1956). Numerous international organizations (e.g., JICA, ADB, World Bank, UN-Habitat, GIZ, bilateral aid agencies) and NGOs have provided technical assistance, funding, infrastructure, and capacity-building support for waste management in Nepal over the decades.

The Department of Environment, Government of Nepal, reports that 17,730 metric tons of e-waste were collected in 2017 (The Himalayan Times, June 6, 2017). The population of Nepal has experienced a significant shift. According to the first census in 1968 BS, the population was 56,38749, and in 2011, it reached 264,94,504. The 2021 census shows that Nepal's population increased to 2,91,64,578. Rapid population growth also contributes to the expansion of the urban population. In 2011, only 17.07% of the population lived in urban areas, which increased to 66.08% by 2021, according to the census of that year. Consequently, as the population grows along with urbanization, industrialization, and modernization, the amount and types of waste produced have also changed. E-waste and other types of waste are increasing, making their management more challenging. Various national and international organizations have played vital roles in managing this issue. Only 45% of Nepali municipalities had sewerage systems, and just 9.4% of households used piped drainage in 2019/20 (Central Bureau of Statistics, 2020; World Bank Group, 2018). Modern lifestyles, along with increased industrial and commercial activities, result in more waste being generated from households, industries, and commercial sectors. Other issues and challenges include gathering waste management statistics, developing laws, policies, and standards based on the federal structure, coordinating efforts across different levels, promoting public-private partnerships, and supporting research and development in the waste management industry (Ministry of Forests and Environment, Government of Nepal, 2022). Despite the absence of recent statistics from the government, a 2018 study estimated that over 18,000 tons of e-waste were generated in the Kathmandu Valley (Environment and Public Health Organization, 2018). According to the Global E-waste Monitor, Nepal produced 28,000 tons of e-waste in 2019 (Forti et al., 2020).

A 2020 baseline survey of Nepali municipalities conducted by the Central Bureau of Statistics (CBS) found that waste composition consisted of 54.0% organic decomposable matter, 33.3% recyclable materials (such as plastic, paper, metal, and glass), and 12.7% other waste. The same survey reported that 48.6% of municipalities used landfills, 32.1% practiced open burning, and 27.5% disposed of waste on riverbanks (Central Bureau of Statistics, 2020). A Capacity Development Needs Identification study conducted by the Ministry of Federal Affairs and General Administration (MoFAGA) in 2077 (2020/21) found that only 12% of local governments had a dedicated waste management branch or sub-branch units within their institutional structures (Ministry of Federal Affairs and General Administration, 2021).

In Nepal's current context, the Constitution guarantees the right to basic health and sanitation at the local level. To uphold these rights, the Local Government Operation Act 2017 explicitly assigns local authorities the responsibility for cleaning and waste management. Likewise, the National Environment Policy 2019 and its corresponding regulation 2020 specify that waste must be categorized by type and managed accordingly. Additionally, the Action Plan 2021, which addresses the ban on plastic bags, has been approved and is now being implemented.

Article 30 of the Constitution of Nepal 2015 guarantees that every citizen has the right to live in a clean and healthy environment, and victims of environmental pollution or degradation have the right to receive compensation through the law. Additionally, Article 35 ensures the right of all citizens to access clean drinking water and sanitation. Similarly, the fifteenth five-year plan aims to provide all citizens with access to basic sanitation services and environmental sanitation by properly managing human waste and wastewater. The government of Nepal has enacted necessary laws and established institutional arrangements for waste management over the years. In this context, relevant laws include the Waste Management and Resource Mobilization Act 1987, the Environmental Protection Act 1996, the Environmental Protection Regulation 1997, the Local Autonomous Government Act 1998, the Local Autonomous Government Regulation 1999, the Waste Management Act 2011, and the Waste Management Regulation 2013. Likewise, household-level environmental sanitation initiatives, under local leadership, have been implemented, providing managerial and technical assistance for waste management.

The periodic plan addresses issues that directly or indirectly impact public health and the environment, including drinking water and sewer systems, wastewater treatment, waste management, pollution reduction, environmental protection, and climate change adaptation. National policies, laws, and programs have been put into place in this area. The main goal of these laws and legal frameworks is to reduce the negative environmental and public health effects of waste while maintaining a clean and healthy environment. Local authorities are responsible for building and managing the infrastructure needed for waste collection, processing, and disposal.

Since Birendranagar municipality started dumping waste in Tarebhir, Birendranagar-1, Surkhet, during the 2016/17 fiscal year, environmental pollution in the area has impacted residents' health and lives. About 160 households are located nearby in Tarebhir, Birendranagar-1, Surkhet. According to the municipality, the local government is working to manage waste. However, various organizations are collaborating to improve waste management in Birendranagar. Managing household solid waste remains a significant challenge in the Surkhet district, particularly in the Birendranagar municipality. Every day, the city collects 53% of all waste, with over 70% being organic. Current disposal methods, such as street cleaning and door-to-door collection, pollute the environment and harm both humans and wildlife. The discussion gives the legal framework and problems related to waste management. However, there is still lack of the studies in the filed of waste management in the rural context of Nepal. Furthermore, it lacks critical assessment of past interventions and fails to incorporate the perspectives of households and informal waste workers, whose cooperation is essential for any sustainable solution. Based on this context, this study has the following objectives:

Methodology

This study employed a mixed research design. It examined local people's knowledge and practices regarding household solid waste management using both descriptive and analytical methods. As the study site, the four communities of Birendranagar Municipality - 4 of Surkhet: Krishnanagar Tole, Naya Bazaar Tole, Gairi Tole, and Sital Tole were selected purposively. The data were collected

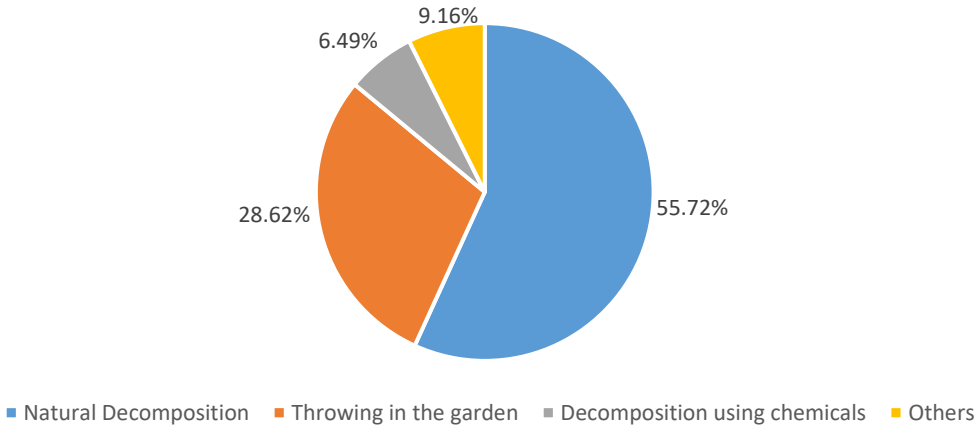
through orally administrated questionnaires with locals and observation of the site. During the observation, the waste management knowledge and practices of community dwellers were observed. The data collected from questionnaires and observation were analyzed using explanation and descriptive statistics. The results are presented thematically under themes.

Results

Waste Management Knowledge and Practices

The findings reveal that various waste reuse methods are implemented in the community. As shown in Figure 1, the majority of people (55.72%) practice natural decomposition, while 28.62% reuse vegetables through composting in their gardens. A smaller proportion (6.49%) manage waste using chemicals, and 9.16% combine natural rotting with garden disposal. This indicates that most households favor natural decomposition, with only a few using chemicals. Additionally, 75.5% of respondents believe that waste can be reused, while 24.5% were unsure.

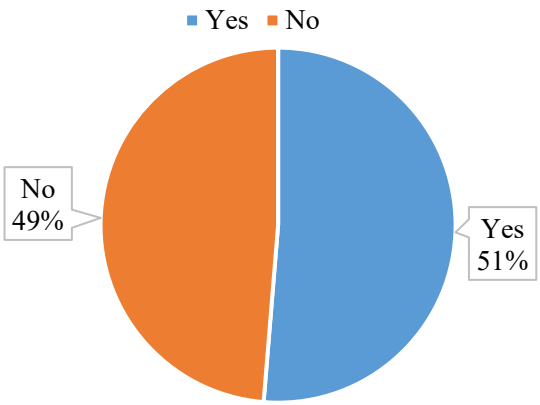
Figure 1: *Methods used for waste reuse*



Source: Field Survey, 2025

In observation, it is found that communities of study sites followed traditional waste management practices, where organic waste was collected for composting and turned into manure. In other households, organic waste was given to animals. Some people repurposed household items made from non-biodegradable waste, such as plastic bags, noodles, and biscuits, to create various-colored sticks, ropes, and decorative items. Similarly, the study has shown that people collect old clothes and reuse them to make mattresses. There was also a practice of throwing materials such as shoes, slippers, and bags into the river during the rainy season. Additionally, some individuals sold paper waste and electrical waste from their homes to junk dealers. As shown in Figure 2, 51% of respondents composted their decomposing waste at home, while 49% said they do not.

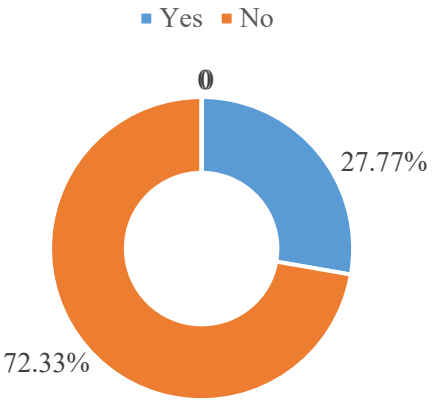
Figure 2: *Practice of Composting at Home*



Source: Field Survey, 2025

Regarding reducing plastic, the finding reveals that only 27.77% of homes have attempted to reduce their plastic use across all four Toles, while 72.33% of households have reported not making any efforts to cut back on plastic use at all. Lastly, it was observed that many householders are aware of efforts to reduce their plastic use.

Figure 3: *Practice for reducing Plastic*



Source: Field Survey, 2025

In the case of reusing rotting waste, the findings reveal that 39.19% of respondents reused household waste by feeding it to animals, while 36.31% composted it. Additionally, 17.58% disposed of it in fields, and 6.92% practiced both composting and feeding animals. These results suggest that most respondents preferred feeding rotting waste to animals, whereas only a smaller portion engaged in composting as a recycling practice. Moreover, 5.76% of people use "public dustbin" as a waste management method, whereas 76.66% of people use "municipality waste collector vehicle" to remove the waste. Similarly, 5.47% reported composting, and 12.10% reported doing all of the above. The majority of respondents stated that waste is collected by municipal vehicles, while the smallest number of respondents indicated that composting is performed. Regarding satisfaction with the current waste

management system, 35.73% of respondents said it is good, while 48.42% said it is not. 15.85% of respondents answered both. According to the statistics, most respondents believe that the waste management system is unsatisfactory.

We have observed four communities (Tols) of Birenedranagar. Among them, one tool was found careless in waste management. Similarly, only one Tol has a public dustbin. However, it was not being used properly. Additionally, it was observed that households in all four Tols separate their rotting and non-rotting waste. The local people of these Tols feed the rotting waste to animals and compost it in their gardens, while collecting the non-rotting waste separately, keeping it within their home compounds, and managing it through the municipal vehicle. It was also found that not all four Tols have information boards regarding waste management.

Challenges in Waste Management Efforts

In our observation, the municipal waste disposal site of the Birendranagar municipality was about 10 km northwest of the Birendranagar Municipality office. The site was chosen for waste disposal because it is away from residential areas and is believed to have minimal environmental impact. During the inspection of the waste management setup, it was observed that waste was dumped openly. There was not provision of waste segregation system; however, some electrical waste was separated, and boxes, plastic, and glass bottles were collected separately for sale to junk. The wastewater from septic tanks and sewage systems is made safe for wild animals after it has been purified; however, there is no system in place for recycling or composting solid waste.

Figure 4: *Pile of the waste at the dumping site.*

Source: Field observation, 2025.

Geographically, the dumping site was suitable for waste disposal because it was not near rivers or canals; however, the surrounding environment was affected due to poor solid waste management. The waste disposal plant was overcrowded, causing houseflies to spread far into residential areas. While some animals were found dead in the dumping site, domestic animals are grazing on the waste piles because the area was not officially declared restricted. Visitors were not given warning signs, hoarding boards, masks, gloves, or other safety measures. Only a few workers—including a waste management transport driver and a security guard for the facility—were assigned to manage waste, while five to six individuals work voluntarily to separate waste to support themselves.

Figure 5: *Residue particle of the dead animal*

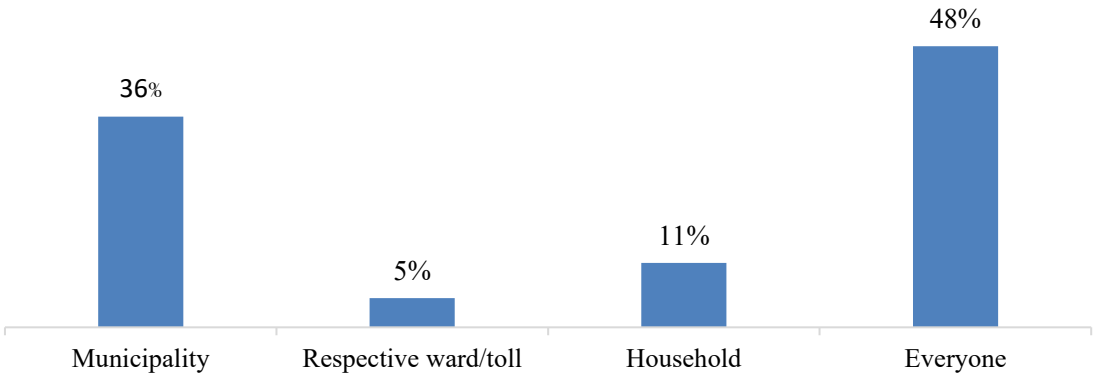
Source: Field observation, 2025

It is found that, the employees were appointed by the municipality received safety equipment only once. After that, it was observed that no further assistance was provided, and the employees themselves did not want to use any safety equipment voluntarily. When the installation was first set up (more than five years ago), the observation area had only a signboard, which is no longer visible. The waste was initially dug up and buried, but now arrangements are being made to pile it on top of the pit and burn some of the waste. It was found that dust from occasional fires and the wind carrying foul odors across the local area are making life extremely difficult for residents near the disposal site. Although their health is not directly affected, they have stated that it is indirectly negatively impacted.

Both liquid and solid waste are managed in the landfill area from 12 wards of the municipality, with 5 to 7 trucks transporting liquid waste extracted from septic tanks and 7 to 9 trucks carrying solid waste each day. Waste collected from numerous households, industries, and healthcare facilities is transported to the disposal site without being sorted.

Regarding the responsibility of managing the waste, the results revealed that 36% believed municipalities should take responsibility, 5% thought it should be the respective tole, 11% felt households should be accountable, and 48% believed that everyone should share responsibility. Overall, the majority of respondents recognized that municipalities, households, and toles all play a role in waste management, with only a small percentage unaware of this shared responsibility. Additionally, 68% of respondents were aware of penalties for littering, while 32% were not. Most respondents had knowledge of these penalties.

Figure 6: *Responsible Stakeholders for Waste Management*

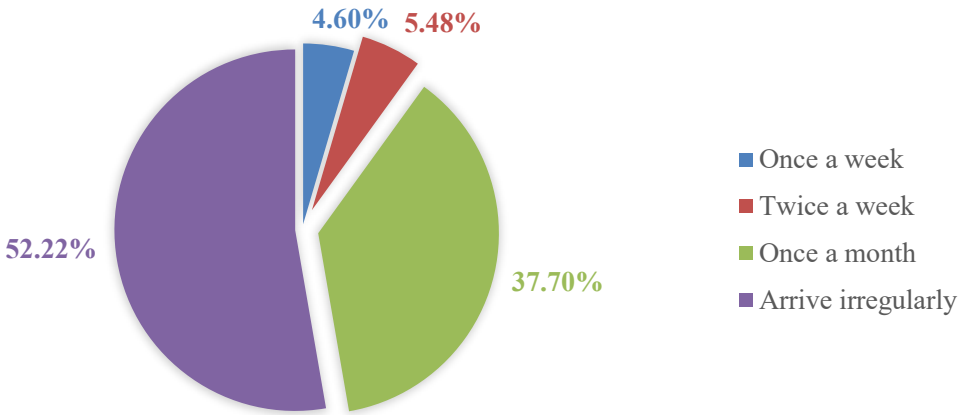


Source: Field Survey, 2025

For the management of waste, the result reveals that 29.97% of respondents reported having a public awareness program or training related to waste management in their community, while 70.03% said no such programs or trainings exist. From this, it can be concluded that there is a lack of public awareness programs or training related to waste management in those communities.

The frequency of waste collection vehicle visits to the community was reported to be irregular. According to local responses, 4.6% indicated that the vehicle visited twice a week, 5.48% reported a weekly visit, and 37.70% stated it occurred once a month. A majority of respondents (52.22%) expressed that the waste collection vehicle's visits were irregular within the community.

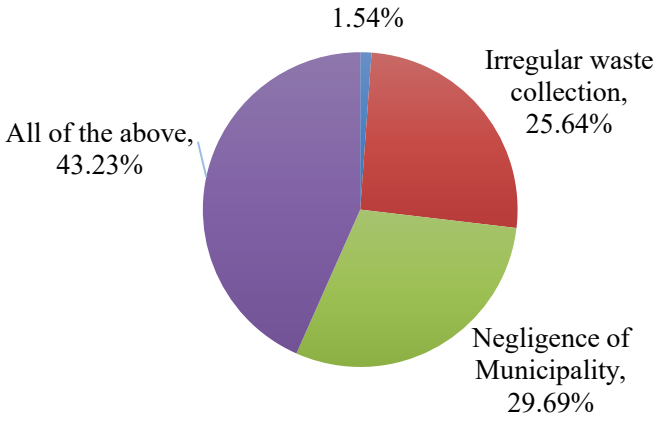
Figure 7: *Frequency of Waste Collection*



Source: Field Survey, 2025

In addition to irregularities, the local community faced various other issues related to waste management. According to the responses, 43.23% of respondents highlighted main problems with waste management. This was followed by 29.69% who attributed the issue to negligence by the municipality, 25.64% who noted that waste collection does not follow a specific schedule, and 1.54% who expressed concerns over the high waste management fee.

Figure 8: *Main Problems for Waste Management*



Source: Field Survey, 2025

Birendranagar municipality utilizes small rickshaws and tractors for the transportation of waste. Additionally, the municipality has taken steps to provide support and expertise in the development of compost manure pits as part of its waste sorting initiatives. However, several challenges have emerged in the waste management process. These include a growing population, with renters particularly noted for improper waste management. Another challenge is the non-segregation of waste at the household level. The municipality has also faced difficulties due to insufficient budget allocation for waste management, which has hindered the prioritization of waste-related initiatives. Furthermore, contractors have struggled with inadequate resources to effectively manage waste collection and disposal.

Discussion

The findings of this study reveal that most households in Birendranagar municipality followed a traditional and community-based waste management system. They use natural decomposition, compost vegetable waste, and garden disposal. Such traditional practices are ecologically sustainable methods. This finding relates to the finding of Pokhrel and Viraraghavan (2005). As their study indicated, the composition of the solid waste generated in rural and semi-urban areas of Nepal is dominated (70%) by organic material. They suggest that the best way of composting the solid waste and using the compost as an organic fertilizer is a sustainable way of managing solid wastes in Nepal. It reflects a gap in behavioral and institutional initiatives toward sustainable waste minimization (UNEP, 2023). This imbalance between traditional organic waste reuse and weak plastic waste management highlights the need for integrated community-based strategies that promote both awareness and technological innovation.

Additionally, the study's finding also highlights key limitations in plastic reduction and formal waste management initiatives in the study site. There are no proper efforts of waste reduction due to the lack of public awareness programs, weak enforcement of waste management policies, and irregular waste collection services of the municipality. This finding relates to the finding of Maharjan et al. (2019). They highlight the need for effective legal provisions, policies, and strategic frameworks across different layers of government for waste management. As they indicated, local government should be strengthened its for waste management. Additionally, academia can support these efforts by helping to develop policies and strengthen capacities at all levels for environmentally friendly waste management.

The overall waste management system in Birendranagar remains inefficient and poorly regulated. Nearly half of the respondents (48.42%) expressed dissatisfaction with the municipal waste management system, citing irregular waste collection and inadequate public dustbin use. Observations at the landfill site confirmed open dumping, lack of segregation, insufficient worker safety, and minimal municipal supervision. In this context sustainable waste management practices are essential in developing countries like Nepal through community participation, institutional accountability, and policy integration (Wilson et al., 2015). Therefore, while households in Birendranagar show commendable traditional reuse practices, the municipality must prioritize public awareness, regular collection services, and investment in waste segregation and recycling facilities to achieve long-term environmental sustainability.

Conclusion

The study's finding concludes that local residents of Birendranagar Municipality in Surkhet follow the traditional methods for waste management. Most of the dwellers are indifferent towards the proper management of it. The role of the municipality is not satisfactory in the practical implementation of its waste management policy. Local people are facing the challenges related to waste management due to inadequate infrastructure and limited resources. They also have low public awareness of effective waste management. However, initiatives such as composting, waste segregation, and community participation show promising potential for improvement. To achieve sustainable solid waste management, active collaboration between municipal authorities and local communities is essential. Investment in waste treatment facilities, public education, and responsible behavior toward waste can significantly reduce pollution and health risks. Ultimately, integrating international waste management principles with local practices will be key to ensuring environmental protection, public health, and sustainable urban development in Birendranagar and beyond.

Disclosure Statements

No potential conflict of interest was reported by the author(s). Author(s) read and reviewed the final version and agreed consent for publication. All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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References

Birendranagar Municipality. (2018). *City profile (2075)*. Birendranagar, Surkhet.

Central Bureau of Statistics. (2020). *Municipal baseline survey 2020: Summary report*. Government of Nepal. https://cbs.gov.np/wp-content/upLoads/2022/12/Municipal-Baseline-Survey-2020-Summary-Report.pdf

Environment and Public Health Organization. (2018). *Assessment of e-waste in Kathmandu Valley*.

Forti, V., Baldé, C. P., Kuehr, R., & Bel, G. (2020). *The Global E-waste Monitor 2020: Quantities, flows and the circular economy potential*. https://www.itu.int/en/ITU-D/Environment/Documents/Toolbox/GEM_2020_def.pdf

Government of Nepal. (1956). *Municipalities Act, 2013 (1956)*. Nepal Law Commission.

Intergovernmental Panel on Climate Change. (2022). *Climate change 2022: Mitigation of climate change*. Cambridge University Press. https://www.ipcc.ch/report/ar6/wg3/

International Solid Waste Association. (2015). *Global assessment of municipal solid waste management*. https://www.iswa.org/knowledge-base/global-waste-management-outlook

International Solid Waste Association. (2015). *Global waste management outlook*. United Nations Environment Program. https://www.unep.org/resources/report/global-waste-management-outlook

International Telecommunication Union & United Nations Environment Program. (2017). *The global e-waste monitor 2017*. https://www.itu.int/pub/D-STR-E_WASTE.01-2017

Maharjan, A., Khatri, S. B., Thapa, L., Pant, R. R., Pathak, P., Bhatta, Y. R., … Bishwakarma, K. (2019). Solid Waste Management: Challenges and Practices in the Nepalese Context. *Himalayan Biodiversity*, *7*(1), 6–18. https://doi.org/10.3126/hebids.v7i1.40185

Ministry of Federal Affairs and General Administration. (2021). *Capacity development needs identification of local governments final report*. Government of Nepal. https://mofaga.gov.np/en/

Ministry of Forests and Environment, Government of Nepal. (2022). *National waste management policy,2079(2022)*.https://mofe.gov.np/storage/files/National_Waste_Management_Policy_2079.pdf

Pokhrel, D., & Viraraghavan, T. (2005). *Municipal solid waste management in Nepal: Practices and challenges.* Waste Management, 25(5), 555–562. https://doi.org/10.1016/j.wasman.2005.01.020

Timilsina, B.P., 2001. Public and private sector involvement in municipal solid waste management: an overview of strategy, policy and practices. *A Journal of the Environment* 6 (7), 68–77.

United Nations Environment Program. (2015). *Waste crimes, waste risks: Gaps and challenges in the waste sector*.

United Nations Environment Program. (2021). *Waste management outlook for mountain regions: Sources and solutions*. https://www.unep.org/resources/report/waste-management-outlook-mountain-regions

United Nations Environment Program. (2023). *Waste management outlook for Asia and the Pacific*. https://www.unep.org/resources/report/waste-management-outlook-asia-and-pacific

United Nations General Assembly. (2015). *Transforming our world: The 2030 agenda for sustainable development* (Resolution A/RES/70/1). https://undocs.org/A/RES/70/1

United Nations University. (2020). The global e-waste monitor 2020: Quantities, flows, and the circular economy potential. https://ewastemonitor.info/gem-2020

Wilson, D. C., Velis, C., & Cheeseman, C. (2006). Role of informal sector recycling in waste management in developing countries. *Habitat International*, *30*(4), 797-808. https://doi.org/10.1016/j.habitatint.2005.09.005

World Bank Group. (2018). *What a Waste 2.0: A global snapshot of solid waste management to 2050*. https://openknowledge.worldbank.org/handle/10986/30317

World Bank Group. (2021). *Nepal urban resilience project: Technical assessment report*. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099515012212119591/p1786100f27a9005e0b6b805a0e1d7c2e9f

World Health Organization Regional Office for Europe. (2015). *Waste and human health: Evidence and needs*.