

Solid Waste Management in **Gularia Municipality**



His Majesty's Government
Ministry of Local Development
Solid Waste Management and Resource Mobilisation Center



Clean Energy Nepal



Environment and Public Health Organisation

Preface

Solid Waste Management in Gularia Municipality¹ is one among a series of 58 reports, which briefly describes the current situation of solid waste management in each of the 58 municipalities in Nepal. The information presented in this report was obtained from a review of relevant literature, interviews with key municipal staff as well as other stakeholders, and a waste generation and composition survey. As the report is based on information collected over a short period, including a one-week field visit conducted in September 2003, this is not a comprehensive study, but it provides a brief overview of the solid waste management situation in the municipality.

This study was commissioned by Solid Waste Management and Resource Mobilisation Centre (SWMRMC) of the Ministry of Local Development. A team of four experts, Dr. Nawa Raj Khatiwada, Bhushan Tuladhar, Ashok Tuladhar and Dinesh Raj Manandhar, coordinated the study. The field investigations in each of the 58 municipalities were conducted by a team of environmental officers under the guidance of the coordination team.

This series of reports will be valuable for researchers as well as planners and managers of solid waste management systems. An analysis of the key findings from all the 58 municipalities is presented in a separate report published by SWMRMC.

Clean Energy Nepal (CEN) and Environment and Public Health Organization (ENPHO) wishes to thank Mr. Surya Man Shakya, General Manager of SWMRMC, for taking this bold and innovative initiative of gathering information on the solid waste management situation in all the 58 municipalities of Nepal for the first time. We also wish to thank the coordination team, as well as Mr. Murali Ranjit and Mr. Nirmal Acharya of SWMRMC, for their valuable input. Finally, we are very grateful to all the environmental officers who visited the municipalities to collect the required information and the municipal staff and the local people who have provided us with this information.

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¹ This report was prepared by Bhushan Tuladhar and Gopal Raj Joshi based on field investigations conducted by Shandip KC.

1 Introduction

Gularia is mid-sized municipality located in Bardiya district of Bheri Zone in the Central Western Development Region. As it lies at an altitude of only 145 m above the mean sea level, the town has tropical and sub-tropical climate with temperature ranging from 7.7° C to 42° C. Gularia is surrounded by Babai River to the north and east, Tara Taal to the west and Uttar Pradesh of India to the South. The Municipality is the administrative headquarters of Bardia district handling a great deal of commercial trade between the towns of western region. The municipality was established in 2053 BS by combining three Village Development Committees of Bardia district, namely Gularia, Mathurahardwar and Khairapur.

Table 1: Background Information

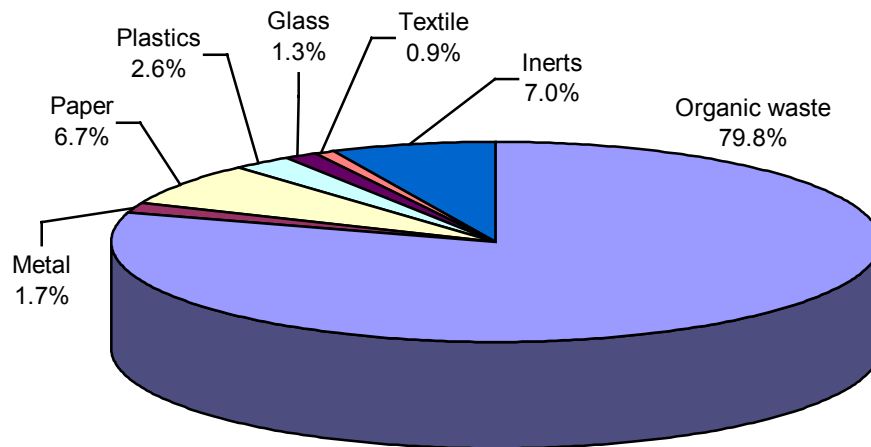
NAME	GULARIA MUNICIPALITY
District	Bardia
Year of Establishment	2053 B.S.
No. of Wards	14
No. of Urban Wards	5
No. of Rural and semi urban Wards	9
Total Area	95.14 sq. km
Built-up Area	1000 ha
Major Rivers and Ponds	Babai river, Bhada river, Sarju river, Bhaghar pond
Total Road length	Black-topped: 16 km Graveled: 30.62 km Earthen: 129.38 km Seasonal earthen road: 84 km.
Population (2001)	46,011
No. of Households (2001)	7939
No. Shops	250
No. of Restaurants, hotels and shops	50
Annual Population Growth Rate (1991-2001)	4.2 percent
Estimated Population for 2003	26,512
Population Density	483.61 Per sq. km

2 Waste Generation and Composition

According to a field survey done in 2003, the average per capita household waste generation rate in Gularia was 0.1 kg/person/day. This is fairly low compared to the average waste generation rate in urban areas of Nepal, which is 0.25 kg/person/day. Considering the total population of Gularia in 2003, which is estimated to be 49,912, the total amount of household waste generated in the municipality comes out to be about 4.9 tons per day. If we assume that 75 percent of the total municipal waste is generated by households, then the total municipal waste generated by Gularia becomes 6.5 tons per day.

The survey also indicated that approximately 80 percent of the waste is organic in nature, while only 2.6 percent is plastics.

Figure 1 Waste Composition



The loose density of household waste in Gularia was calculated to be 177 kg per m³.

Information on Gularia's waste generation and composition is based on waste collected 71 households that had waste from 419 people.

3 Waste Collection

According to the estimation done by Gularia Municipality the city collects approximately 3 m³, which is equivalent to approximately 1.2 tons, of waste per day. Assuming that the total amount of waste generated in Gularia is 6.5 tons per day, the city is collecting about 18 percent of the total waste generated. Most of the waste that is not being collected is probably waste from rural areas within the municipality.

The municipality has bulk containers but no door-to-door collection system. As a result, all the waste is placed on to the roadside or containers for pick up by the municipal sweepers. The municipality has placed containers made from half cut 200 litre oil drums at different places of the city.

The municipality has 6 sweepers, all of whom are permanent employees. They sweep approximately 3-5 kms of city streets on a daily basis.

Sweeping is done using ordinary brooms with long handles and the waste is collected in containers and collection vehicle using shovels. The municipality has a total of 70 wheelbarrows but none of them are in use now. Once the containers are filled, the waste is loaded on to a tractor trailer. The municipality has one tractor with trailer (3 m³ capacity).

4 Final Disposal

The collected waste is usually disposed in a crude dumping site located on the banks of the River and in the forest, about 3 km away from the city. The site with an area of 13.5 ha has been used for the past two years. Sometime waste is also dumped along the side of the road. It is estimated that present dumping site could be used for more than 20-30 years.

The Municipality has plans to convert the existing dumping site at Kothiya village into a landfill site. Two years ago, officials from the Ministry of Local Development surveyed the site and recommended an EIA. But nothing has been done yet.

5 Composting and Recycling

Gularia Municipality does not have any programs for promoting recycling and composting. Till date the municipality don't have any information regarding household and community level composting.

But the Municipality has banned the use of the plastic bags that are less than 20 microns thick. This ban is especially focused at the local Hat Bazaar that takes place twice a week.

6 Special Waste Management

Gularia Municipality does not have any system for collecting and managing medical waste separately. The Municipality collects the medical waste along with general waste and dumps it crudely at the proposed land fill site.

The city also does not have any system to collect other types of special waste such as construction/demolition debris, industrial waste, and dead animals. The dead animals are usually thrown at the outskirts of the city.

7 Community Mobilization

Gularia Municipality has been working with local communities and NGOs in conducting activities to raise awareness on waste management. But active community participation has not been achieved yet. The municipality has formed 11 environment committees in the urban area but these committees are not active nowadays. This might be due to the lack of awareness and motivation among the local people.

Meet Nepal, a local NGO, has been active in conducting awareness campaign since past one and half years. The club has placed containers at different places of the city. The club also helped the municipality to establish the environment committees.

Similarly, Environment Conservation Society of ward no. 9, organises roadside cleaning activities during special occasions. The local club has been active in solid waste management for the past 3 years.

8 Organizational and Financial Aspects

In the absence of a separate section/unit directly responsible for the solid waste management, the Administration and Community Development Section is taking on the responsibility for solid waste management as well. The municipality has one sanitation mobiliser, one community development assistant and 6 sweepers to manage the city's solid waste.

The municipality spends approximately Rs. 3,50,000 in waste management each year. This is approximately 6.5 percent of the total budget of the municipality, which is about Rs. 5.3 million.

9 Major Problems and Issues

The main problem associated with waste management in Gularia is the lack of a sanitary landfill and compost plant. The municipality has selected a site for a central compost plant and landfill but it does not have the necessary resources to develop the site. The lack of the necessary resources (technical, financial and manpower) is another major issue in the municipality. The municipality requires additional vehicles and collection equipment.

10 Conclusion & Recommendations

As Gularia is a new municipality, it does not yet have the necessary structure and system to manage solid waste. Although solid waste management does not seem to be a major problem at present, it is time that the Municipality starts to look seriously into this issue and address it in an effective manner. The municipality should formulate appropriate strategies and start improving the waste collection and disposal practices.

Recommendations:

1. SWMRMC should assess the proposed landfill site at Kothiya Village and provide technical and financial assistance in developing the site for composting and landfilling. This site should be prepared as soon as possible.
2. The Municipality should set up an Environment and Sanitation Section within its organizational structure and equip the section with adequate collection equipment, vehicles, and trained manpower.
3. The Municipality should introduce door to door waste collection system to the extent possible.
4. Larger carts or rickshaws with detachable containers would probably be more effective to collect the waste.
5. The Municipality should impose restriction on open dumping of the medical waste without any precaution. The municipality should compel all the health institutions to manage their waste by burning it or burying it.

6. The Municipality should encourage local communities to practice household composting. For this the municipality should organise training and awareness campaigns. The municipality may also encourage local people to set up community compost plant.

For more information, please contact

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Annex 1: Photographs



Waste Collection Bin Made from Old Drum



Collection of Waste for Analysis



Waste Dumping Site



Disposal of Waste along the Highway