

# Solid Waste Management in **Bhadrapur 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 Bhadrapur Municipality**<sup>1</sup> 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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<sup>1</sup> This report was prepared by Bhushan Tuladhar and Gopal Raj Joshi based on field investigations done by Surendra Gautam.

## 1 Introduction

Bhadrapur is an old municipality, which was established in 2008 B.S. But some of the wards of the Chandragadi and Maheshpur were merged into it in 2038/2039 BS to enlarge the municipality. The municipality is located in Jhapa District in the south east corner of the country and is 17 km west from Birtamod Bazaar located on the East-West highway. It is bordered by Bihar and Chandragadhi VDC in the east, Mahespur VDC in the west and south and Chandragadhi VDC in the north. Bhadrapur was a very important business and trading center, before the construction of the East-West Mahendra Highway. Settlement occupies 27.92 percent (313 ha) of the land while the majority of the land (47.37 percent) is agricultural land. This is followed by river, drainage and riverbank (24.71 percent).

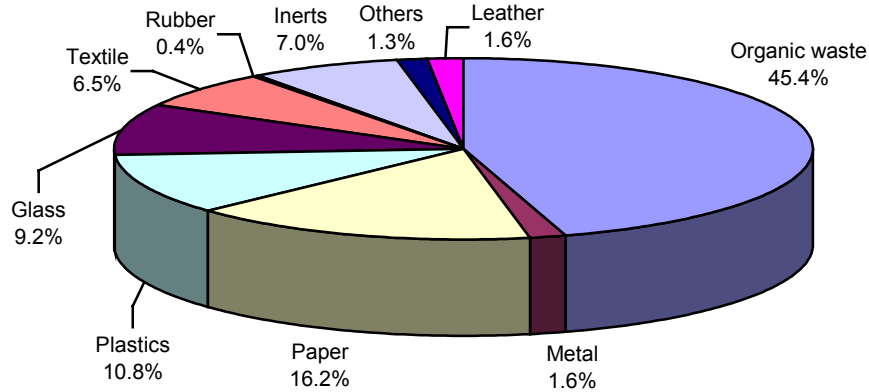
**Table 1: Background Information**

NAME	BHADRAPUR MUNICIPALITY
District	Jhapa
Year of Establishment	2008 B.S.
No. of Wards	15
No. of Urban Wards	11
No. of Rural Wards	4
Total Area	10.56 sq. km
Built-up Area	313 ha
Major Rivers and Ponds	Mechi
Total Road length	Total: 41.836 km Black-topped: 18.646 km Gravel road: 14.975 km Earthen road: 8.215km
Population (2001)	18,145
No. of Households (2001)	3,896
No. of Shops	570
No. of Restaurants, hotels and lodges	58
Annual Population Growth Rate (1991-2001)	1.8 percent
Estimated Population for 2003	18,804
Population Density	1718.28 per sq. km

## 2 Waste Generation and Composition

According to the field survey done in 2003, the average per capita household waste generation rate in Bhadrapur was 0.352 kg/person/day. This is a bit higher than the average waste generation rate in urban areas of Nepal, which is approximately 0.25 kg/person/day. Considering the total population of Bhadrapur in 2003, which is estimated to be 18,797, the total amount of household waste generated in the municipality comes out to be 6.6 tons per day. Assuming that household waste makes up 75 percent of the total municipal waste, then the total municipal waste generated in Bhadrapur is 8.8 tons per day. The actual waste generation rate is probably a bit lower because a significant portion of Bhadrapur's population live in rural areas.

**Figure 1 Waste Composition**



The composition of waste shows that although organic waste is the largest portion of the waste stream, the percentage of organic waste is relatively low compared to other municipalities. On average, approximately 65 percent of waste from Nepalese municipalities is organic waste. Similarly, the portion of plastics, glass and paper is surprisingly high for a relatively rural municipality like Bhadrapur. This is probably due because a significantly large portion of the organic waste is composted at source and therefore never enters the waste stream.

The loose density of household waste in Bhadrapur was calculated to be 272.35 kg per m<sup>3</sup>.

Information on Bhadrapur's waste generation and composition is based on waste sample collected from 89 households in Mechi Marg, ward no. 3 and 9, that had waste from 602 people.

### 3 Waste Collection

The municipality estimates that it collects approximately about 1.5 tons of waste per day. Assuming that the total amount of waste generated in Bhadrapur is 8.8 tons per day, the city is collecting about 17 percent of the total waste generated. Most of the waste that is not being collected is probably waste from rural areas within the municipality.

Bhadrapur municipality has 14 sweepers, who sweep some areas (market area) daily and some areas (rural area) twice a week. They sweep about 5 km of streets daily and 7 km of streets twice a week.

The municipality has a total of 5 of wheelbarrows, with a capacity of 0.25 m<sup>3</sup> each. The condition of the wheelbarrows is poor due to rusting. The municipality also has two tractors with a capacity of 3.4 m<sup>3</sup> for waste collection.

The municipality has containers and roadside pick-up service. Door-to-door waste collection service system is provided in the major areas of the city. Waste collected in the containers is carried to dumping site once a week. Municipal sweepers collect waste from households on a daily basis and place it on to the roadside for pick up by the municipal vehicles.

## **4 Final Disposal**

The collected waste is disposed in a crude dumping site along the Mechi River bank, about 1 km from the city. The site with an area of 19 ha has been used for the past 30 years. The collected waste is dumped haphazardly and openly without any treatment, on the river bank. Sometimes the waste is dumped in the river as well.

The municipality plans to construct a landfill site on the same place. For this purpose the municipality seeks necessary resources and technical support for planning, designing and construction of land fill site.

## **5 Composting and Recycling**

Bhadrapur Municipality does not have a recycling or composting programme. However, it is assumed that some of the people probably compost their waste at home. But the municipality does not have any information regarding this. At present there are three Kawadis or scrap dealers are involved in waste recycling within the municipality.

## **6 Special Waste Management**

Bhadrapur municipality does not have any system for the management of special waste such as medical waste, industrial waste or construction & demolition debris. This is either managed by the generators themselves or dumped with the rest of the waste. Dead animals are normally buried.

## **7 Community Mobilization**

Bhadrapur Municipality does not have any programmes to involve community groups or schools in waste management and there aren't any active groups in this sector. The reasons behind this may be lack of awareness among people as well as no effective initiation taken by the municipality.

## **8 Organizational and Financial Aspects**

Bhadrapur municipality has a separate section responsible for waste management. The section consists of 14 sweepers and one supervisor.

Reportedly, the municipality spends approximately Rs. 4,84,282 per year on waste management, but it is not clear where or how this is spent. Bhadrapur Municipality's total expenditure in the year 2058/59 was Rs. 15,312,164.

## **9 Major Problems and Issues**

The main problem associated with waste management in Bhadrapur is the lack of institutional structures, systems and resources. The waste management system is crude and unplanned. It is mainly due to the lack of trained and skilled manpower and sufficient financial support. The lack of sanitary landfill site, composting plant and recycling facilities are also other major problems. General people as well as the municipal administration are not sufficiently aware about the issues of solid waste management.

## **10 Conclusion & Recommendations**

Being a small, relatively rural municipality, waste management is not a critical issue in Bhadrapur. However, with increasing urbanization, the problem is bound to increase in the future. Therefore, Bhadrapur Municipality needs to start developing structures and system for effective waste management.

Recommendations:

1. The municipality should formulate effective plans and strategy of waste management.
2. The municipality should increase human resources and equipment in the sanitation section and provide training to the staff involved in waste management.
3. The waste collection system should be improved so that waste is collected door-to-door to the extent possible and open piles on the streets should be discouraged.
4. The wheelbarrows that are currently being used seem to be very small. Larger carts or rickshaws with detachable containers would probably be more effective.
5. Although some people already practice composting, the municipality should further promote composting as effective waste collection and treatment and disposal can be expensive. Waste reuse and recycling programmes should be initiated.
6. The municipality should prepare specific strategy to involve local CBOs, NGOs and private parties in waste management. Community and School based programmes should be launched to increase awareness.
7. A simple landfill site should be developed, where waste can be buried.

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Annex 1: Photographs



**Waste Collection in Traditional Bamboo Basket**



**Waste Container Made from Concrete Hume Pipe**



**Wheelbarrow Used for Waste Collection**



**Waste Collection Using Tractor**





**Unloading Waste from the Tractor at the Dump Site**



**Waste Dump Site along the Mechi River**