

# Solid Waste Management in **Mahendranagar 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 Mahendranagar 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 Bhumika Vaidya based on field investigations conducted by Sabin P. Joshi.

## 1 Introduction

Mahendranagar is a mid-sized municipality located in the Terai plains of Kanchanpur District in Far Western Nepal. The Municipality, which was established in 2034 B.S. is the largest municipality in the country in terms of area. It has 19 wards, out of which 4 wards are in urban area. The majority of the land 54% (107.78 sq km) is agricultural land and 38 percent (75 sq km) of the land is forestland. This is followed by 0.1% market area and 0.4% residential area.

**Table 1: Background Information**

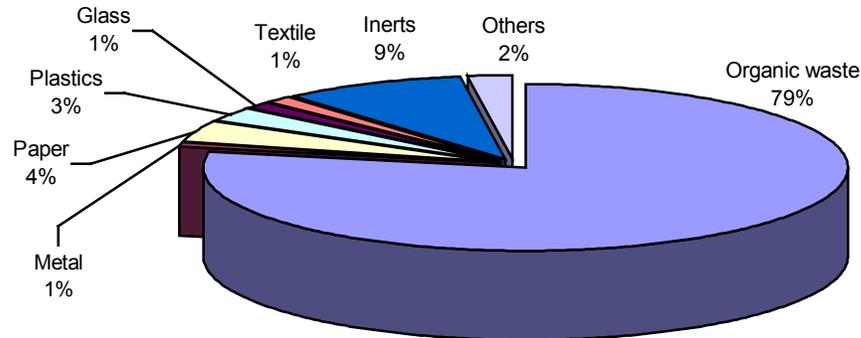
NAME	MAHENDRANAGAR MUNICIPALITY
District	Kanchanpur
Year of Establishment	2034 B.S.
No. of Wards	19
No. of Urban Wards	4
No. of Rural Wards	15
Total Area	171.24 sq. km (CBS data)
Built-up Area	1 sq km
Major Rivers and Ponds	Mahakali and Kilkilla Khola
Total Road length	Black-topped: 18 km
Population (2001)	80,839
No. of Households (2001)	13738
No. of Shops	315
No. of Restaurants, hotels and lodges	15 / - / 90
Annual Population Growth Rate (1991-2001)	2.7 percent
Estimated Population for 2003	85,263
Population Density	472.08 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 Mahendranagar was 0.39 kg/person/day. This is higher than the average waste generation rate in urban areas of Nepal, which is estimated to be 0.25 kg/person/day. Considering the total population of Mahendranagar in 2003, which is estimated to be 85,231, the total amount of household waste generated in the Municipality comes out to be 33.2 tons per day. If we further assume that 75 percent of the total municipal waste is generated by households, then the total amount of waste generated in Mahendranagar Municipality becomes 44.3 tons per day. The actual waste generation rate is probably lower, because most of the people in Mahendranagar Municipality live in rural areas where the waste generation rate is probably lower and the per capita waste generation rate calculated during the field survey seems a bit high.

The survey also indicated that almost 80 percent of the household waste is organic in nature, while paper and plastics make up only 4 and 3 percent of the waste respectively. On average, about 65 percent of the waste in Nepalese municipalities consists of organic waste and paper and plastics make up 8.9 and 8 percent of the waste.

**Figure 1 Waste Composition**



Information on Mahendranagar waste generation and composition is based on waste sample collected from 77 households with 423 people from ward no. 6 and 7.

### **3 Waste Collection**

According to Mahendranagar Municipality it generates about 6 tons of waste per day and it collects 4 tons, or 66 percent, of the total waste generated. This is much lower than the waste generation rate calculated during the field survey. If we assume that the total waste generated is 44.3 tons, then the collection rate is about 9 percent. Most of the waste that is not collected is probably waste from rural households.

Mahendranagar Municipality has 2 supervisors, 17 permanent and 8 temporary sweepers, who sweep streets in the main city daily. For waste collection municipality has a tractor trailer, 1 rickshaw, 5 handcarts and 6 wheelbarrows in operation. Municipality provides container service and roadside pickup service daily. The collected waste is placed in collection vehicle to transport to disposal site.

### **4 Final Disposal**

The collected waste is disposed as temporary piles in vacant plots, forest areas or next to the highway. Municipality intends to build landfill site by the side of Mahakali River which is tentatively 10 km far from the city. The existing problem to construct landfill site is the rainfall and flood.

### **5 Composting and Recycling**

Although Mahendranagar Municipality does not have composting and recycling programmes, at one point, the municipality did try to set up a compost plant as a pilot project.

As for recycling of inorganic waste, the municipality has some scrap dealers who collect recyclable waste from households and waste dump sites.

## **6 Special Waste Management**

Mahendranagar Municipality does not have any system for the management of special waste. Hospital buries its waste around hospital premises. Construction and demolition waste is used to fill the depressed land or pits and the municipality buries dead animals.

## **7 Community Mobilization**

A women's group called Nari Chetana Samaj and another group called Ekata Tol Sudhar Samitee have been involved in clean up campaigns as well as waste management at household level since 2059 and 2058 B.S. respectively.

## **8 Organizational and Financial Aspects**

The Health and Environment Sub Section, within the Community Development Section, of Mahendranagar municipality is responsible for waste management. The municipality has 2 supervisor and 25 sweepers who manage the waste. The head of sub-section, Khageshwor Sharma, has received a six-month training on waste management from Urban Development Through Local Efforts (UDLE), programme of GTZ.

In the year 2059/60, the municipality spent Rs. 11,19,627 on waste management. This does not include the cost of salaries, vehicle maintenance and fuel. This is 4.4 percent of the total municipal expenditure that year. The Municipality also earned Rs. 184,501 from waste management fees that year. This revenue is 16.5 percent of the expenditure in waste management.

## **9 Major Problems and Issues**

The main problems associated with waste management in Mahendranagar are the lack of disposal site, inadequate finance, and lack of awareness among the general public. In addition, lack of systems for medical waste management and composting/recycling are also major issues of concern.

## **10 Conclusion & Recommendations**

Although Mahendranagar is a relatively rural municipality, because it is growing rapidly, it should have a proper system for managing solid waste. Besides cleaning the streets, it has started some innovative programmes such involving local community groups and trying out composting. These need to be continued and expanded. The municipality should support and motivate the waste management staff in introducing new and effective systems of waste management.

Recommendations:

1. The municipality should establish basic statistical records related to waste management to formulate effective plan and strategy of waste management.
2. Haphazard disposal of waste should be stopped and a simple landfill site should be developed, where waste can be buried.

3. The municipality should also promote composting and recycling, as effective waste collection, treatment, and disposal can be expensive.
4. 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.
5. Community and school based programmes should be expanded to increase awareness and participation of local communities in waste management.
6. Medical wastes should be treated separately by burning it in a controlled manner or burying it.
7. Solid waste management trainings should be held for municipality staffs as well as in community level.

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**Annex 1: Photographs**



**Hand Cart and Tractor Used for Waste Collection**



**Haphazard Waste Disposal**