

## Solid Waste Management in **Madhyapur Thimi 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 Madhyapur Thimi 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 Bhumika Vaidya.

## 1 Introduction

Madhyapur Thimi is one of five municipalities located in Kathmandu Valley. It is situated in the center of the valley between Kathmandu, Lalitpur and Bhaktapur. Although Madhyapur Thimi is an old settlement, it was declared a municipality only in 1995 by merging 5 Village Development Committees. The Municipality is located only 7 km east of Kathmandu, but other than its historic centre, the municipality is still primarily rural. The Municipality is bordered by Hanumante River in the East and South and by Manohara River in the West and North. The total area covered by the Municipality is 11.11 square kilometer. Of which only 12 percent of land is covered by residential area and 5.1 percent of the land is covered by institutional area. The majority of the land 77.7 percent is agricultural and vacant area.

**Table 1: Background Information**

NAME	MADHYAPUR THIMI MUNICIPALITY
District	Bhaktapur
Year of Establishment	2053 B.S
No. of Wards	17
No. of Urban Wards	NA
No. of Rural Wards	NA
Total Area	11.11 sq. km (CBS data)
Built-up Area	NA
Major Rivers and Ponds	Hanumante and Manohara river
Total Road length	Highway-9.1 km
Population (2001)	47751
No. of Households (2001)	9551
No. of Shops	NA
No. of Restaurants, hotels and lodges	NA
Annual Population Growth Rate (1991-2001)	4.1 percent
Estimated Population for 2003	51,747
Population Density	4298.02 per sq. km

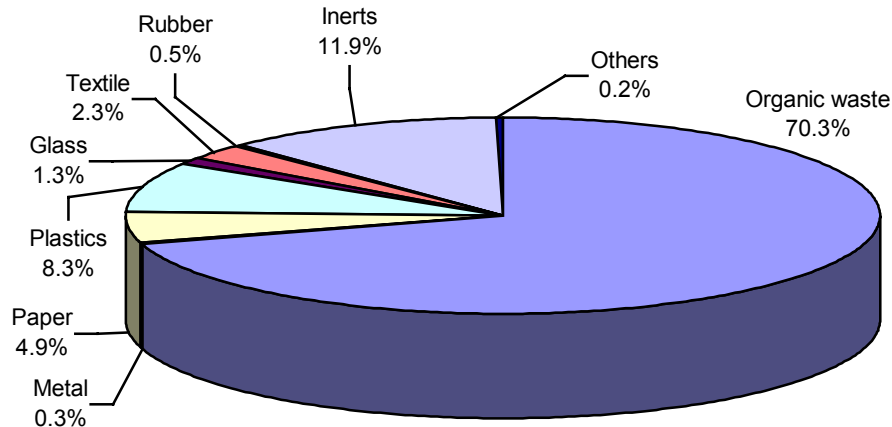
## 2 Waste Generation and Composition

According to the field survey done in 2003, the average per capita household waste generation rate in Madhyapur Thimi was 0.11 kg/person/day. This is lower 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 Madhyapur Thimi in 2003, which is estimated to be 51,740, the total amount of household waste generated in the municipality comes out to be 5.7 tons per day. Assuming that 75 percent of the total municipal waste is generated by households, the total amount of waste generated by Madhyapur Thimi Municipality becomes 7.6 tons per day. A recent study by JICA estimated the total waste generation rate in Madhyapur Thimi to be about 14 tons per day.

The composition of waste shows that more than 70 percent of the waste is organic in nature. This is not surprising considering the relatively rural nature of the municipality and the fact that most of the residents in Thimi are farmers. In fact in most areas of Thimi, the portion of organic waste will probably be higher.

The portion of inerts in the waste is fairly high, which may be due to the large pottery industry in Thimi.

**Figure 1 Waste Composition**



The loose density of household waste in Thimi was calculated to be 251.26 kg per m<sup>3</sup>.

Information on Thimi's waste generation and composition is based on waste sample collected from 101 households in ward no. 13, 14 and 15, that had waste from 540 people.

### **3 Waste Collection**

The Municipality estimates that it collects approximately 3.6 tons of waste per day. Assuming that the total amount of waste generated in Thimi is 7.6 tons per day, the city is collecting about 47 percent of the total waste generated.

Madhyapur Thimi Municipality has 20 sweepers who sweep about 3 km of road on daily basis.

The Municipality has 4 rickshaws and 17 handcarts for waste collection. But now the rickshaws are not in use, as they need maintenance.

The municipality has two modes of collection system i.e. door-to-door collection service in wards 8, 10, 13 and 14 and roadside pick-up service in other wards. The door-to-door collection system is undertaken by different private organizations involved in waste management.

### **4 Final Disposal**

The collected waste is disposed in crude dumping sites on the low lying areas. As the area is not fixed its coverage cannot be determined.

Waste from Ward 10 and 13 is collected separately and sorted. Sorted degradable waste is kept in the compost plants. Municipality operates two compost plants in ward 10 and 13 through community-based organizations. Non-degradable waste like plastic is sold to scrap dealers and the rest is buried. Municipality is planning to build 5 more compost plants in rest of the 5 wards.

The municipality intends to construct a landfill in future. The research is on process for selecting an appropriate site.

## **5 Composting and Recycling**

Thimi Municipality is actively promoting composting and recycling at the community and household level.

A local NGO, Sanyukta Mahila Utthan Samuha, in partnership with the municipality, has initiated programs to promote composting. They have distributed buckets to 120 households to sort organic and inorganic waste. After sorting, organic waste is composted in the drums place in certain locations. They are also promoting ECOSAN toilets, which help reuse the human faeces and urine as fertilizer.

Similarly, community-based solid waste management groups in Ward No 10 and 13 in partnership with Municipality has constructed compost chamber for community composting. Two collectors collect household organic wastes from these two wards in handcarts. Before composting, the plastics are sorted out and then organic waste is kept in the chamber for composting. Though only organic wastes are meant to be collected some household also mix up plastics with it, hence manual separation is done before composting. The municipality pays the salary of 2 waste collectors and it has provided land and financial as well as technical support for chamber construction.

The community-based solid waste management group in Ward No. 10 collects waste from 500 households (all household of ward 10 and some from ward 8). For waste collection they have 2 rickshaws and 4 buckets. The compost chamber is 9.5ft x 9.5 ft and its height is 13 ft. It is a permanent structure made of brick and cement. They have plans to distribute buckets for source separation and also distribute "Suiro", a metal hook for plastic collection.

Community based Solid Waste Management Groups in Ward No: 13 collect wastes from 365 households. This group seems to be more active than the group in ward 10. They are planning to have plantation program, make garden near compost chamber area and also extend door-to -door collection in ward-14.

Another organization Nepal Fulbari Pradhusan Niyrantrn Kendra is also involved in waste collection and is planning to compost the waste.

Municipality also allows reuse and recycle of the waste to scavengers at collection and disposal sites.

## **6 Special Waste Management**

Madhyapur Thimi has 2 hospitals and several clinics that generate medical waste. The municipality does not have a separate system to collect medical waste. Hospitals manage their waste themselves while waste from clinics are mixed with the general waste. Industrial wastes are also managed by the

industries themselves but only some treat the waste before disposing. Construction waste is dumped with regular waste or used to cover low lying areas.

## **7 Community Mobilization**

A few CBOs and NGOs in partnership with the Municipality are actively involved in waste management in Madhyapur Thimi. A local NGO, Sanyukta Mahila Utthan Samuha, community-based solid waste management groups in Ward No: 10 and 13 and Nepal Fulbari Pradhusan Niyrantran Kendra are involved in waste management in Madhyapur Thimi. They are involved in waste collection, composting, public education and other community beneficial activities too. The municipality is also promoting household composting.

## **8 Organizational and Financial Aspects**

Community Mobilization and Environment Section is responsible for waste management in Madhyapur Thimi municipality. The section has twenty sweepers and two officers. Overall, the municipality has 62 employees, which means that solid waste management staffs make up approximately 35 percent of the total staff. One of its staff has received a six-month training on solid waste management from Urban Development Through Local Efforts (UDLE), a GTZ programme.

In fiscal year 2059/60, the municipality had allocated Rs. 500,000 for waste management, which is about four percent of the total budget. But for the year 060/061 around Rs, 600,000 is separated for the solid waste management.

## **9 Major Problems and Issues**

Although some good programmes have been initiated in Madhyapur Thimi, the Municipality still requires financial and technical support to improve its waste management system. The major problem is that municipality does not have proper landfill site. Although government is supporting the development of a landfill site in Okharpauwa for Kathmandu Valley, it is unlikely that Madhyapur Thimi Municipality will have sufficient resources to transport its waste all the way to Okharpauwa, which is more than 30 km away.

Although, the municipality has started some innovative programmes to promote composting, it still has a long way to go. The Compost Chambers are facing some technical problems that need to be solved and more community based compost plants need to be established. As more than 70 percent of the waste is organic and Thimi is famous for vegetable farming, waste composting should be further promoted. In this process, more community mobilization and public awareness campaigns will also be required.

## **10 Conclusion & Recommendations**

Being a small and relatively rural municipality, waste management is not a major problem in Thimi, but with increasing population and urbanization it may be a problem if not managed properly. Several local CBOs and NGOs have initiated innovative programmes to collect and compost waste. These initiatives need to be supported and further promoted.

Recommendations:

1. Municipality plans to construct landfill site but needs technical and financial support. SWMRMC should provide assistance in this process.
2. The pilot scale community compost plant is a good initiation; it should be improved and continued in other wards also.
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 are discouraged.
4. Private organizations and community-based organizations should be involved more in waste management. For this proper training and guidance should be provided.
5. Municipality needs waste collection vehicle, equipments and skilled manpower for waste management.
6. A link should be developed between community composting and organic farming so that both can benefit from each other.
7. Awareness campaigns on solid waste management should be done in community, schools and municipality staffs.

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**Annex 1 : Photographs**



**Waste Dumping along the Roadside near a Temple**



**Waste Dumping on Open Land**





**Waste Disposal along a Lane**



**Compost Chamber**



**Haphazard Waste Disposal in an Open Area**



**Open Area Used as Waste Disposal Site**