

Solid Waste Management in **Dhangadhi 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 Dangadhi 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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Executive Director
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July 2004

¹ This report was prepared by Bhushan and Gopal Raj Joshi based on field investigations conducted by Rikesh Chitrakar.

1 Introduction

Dhangadhi is a mid-sized municipality located in the Terai area of Kailali district in Mahakali zone of the Far Western Development Region. It is a relatively rural municipality with eight of its 14 wards in rural areas. The municipality, however, is growing rapidly. Between 1981 and 1991 it grew at 5.16 percent per year and in the following decade, it grew at 4.2 percent per year. The municipality was established in 2033 B.S.

Table 1: Background Information

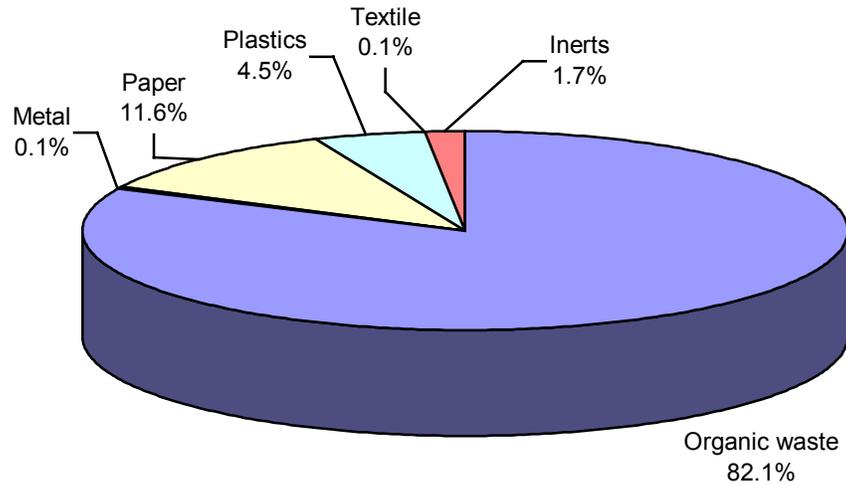
NAME	DHANGADHI MUNICIPALITY
District	Kailali
Year of Establishment	2033 B.S.
No. of Wards	14
No. of Urban Wards	6
No. of Rural and semi urban Wards	8
Total Area	103.73 sq. km (CBS)
Built-up Area	103 ha
Major Rivers and Ponds	Mohana, Khatiya, Jakhori tal, Tike tal
Total Road length	297.635 Km
Population (2001)	67,447
No. of Households (2001)	11738
No. Shops	1042
No. of Restaurants, hotels and shops	169
Annual Population Growth Rate (1991-2001)	4.2
Estimated Population for 2003	73,232
Population Density (2001)	650.2 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 Dhangadhi was 0.14 kg/person/day. This is slightly lower than the average waste generation rate in urban areas of Nepal, which is 0.25 kg/person/day. Considering the total population of Dhangadhi in 2003, which is estimated to be 73,213, the total amount of household waste generated in the municipality comes out to be 10.3 tons per day. If we assume that household waste makes up 75 percent of the total municipal waste, then the total waste generation rate in Dhangadhi municipality becomes 13.8 tons per day.

The survey also found that more than 80 percent of the waste was organic in nature. This is slightly higher than the average organic content in the waste from Nepalese municipalities, which is about 65 percent.

Figure 1 Waste Composition



The loose density of household waste in Dhangadhi was calculated to be 101.6 kg per m³.

Information on Dhangadhi's waste generation and composition is based on waste collected from 44 households in ward no. 1 that had waste from 288 people.

3 Waste Collection

According to the municipality's data the city collects approximately 1.5 tons of waste per day. Assuming that the total amount of waste generated in Dhangadhi is 13.8 tons per day, the city is collecting about 11 percent of the total waste generated. This is a very low waste collection rate. Most of the waste that is not being collected is probably waste from rural areas within the municipality.

The municipality has bulk containers and roadside pick-up service. But door-to-door collection system has not been introduced. The municipality has 24 sweepers, 19 of whom are temporary employees. The sweepers carry out roadside pick up and sweeping service. They sweep approximately 7 Km of City Street on a daily basis and 6 km of streets twice a week.

Sweeping is done using ordinary brooms with long handles and the waste is collected in wheelbarrows and rickshaw using shovels. The municipality has a total of 8 handcarts and 3 rickshaws with capacities of 0.2m³. Once the carts and rickshaws are filled, the waste is placed in container or loaded on to a tractor-trailer. The municipality has placed 14 containers in different places of the city and has one tractor with trailer (4.5 m³). The local people throw their waste directly in container or vehicles. The filled containers are exchanged three times a day.

4 Final Disposal

The collected waste is disposed in a crude dumping site on the banks of the Mohana River and lowlands, about 0.5 km from the city.

The municipality does not have any plan to construct a landfill site.

5 Composting and Recycling

Dhangadhi Municipality is promoting composting at the household level. The city has approximately 160 households involved in household composting. The municipality is also operating a compost plant with a capacity of about one ton per month. The compost plant is situated near the municipality office building.

Dhangadhi also has plans to build another compost plant at Setopool and Purano Bhansar. The proposed plant with capacity of 2 ton per month is 0.5 Km away from the city. According to the municipality the plant will be set up within this fiscal year of 2060/061. But the municipality is facing the problem of infrastructure development.

The municipality has not run any special program regarding recycling. But individual scavengers and scrap dealers are involved in recycling.

6 Special Waste Management

The municipality does not have any system for collecting and managing medical waste, or any other types of special waste, separately. The city has one hospital and several clinics. The waste generated from hospital, clinic, and drugstores is collected along with municipal waste and dumped in the common disposal site. Construction/demolition debris, industrial waste and dead animals are also disposed with ordinary waste.

7 Community Mobilization

Dhangadhi Municipality has recently started to work with local communities and NGOs in conducting activities to raise awareness on waste management and promote recycling and composting. It has formed community user groups in different wards. A local NGO called Community Development Center is also involved in waste management since 2058 BS. The municipality has also conducted sanitation education programs in different schools.

8 Organizational and Financial Aspects

The main responsibility for solid waste management lies with the Environmental Sanitation sub Section of Dhangadhi Municipality. The section has one supervisor and 24 sweepers.

The municipality spends approximately Rs. 250,000 per year on solid waste management. However, this does not include salaries and cost of operating the vehicles. The municipality's total expenditure for 2058/59 was Rs 21.68 million.

9 Major Problems and Issues

The main problem associated with waste management in Dhangadhi is the lack of a sanitary landfill. The municipality does not have any plans to set up landfill.

The probable reason for it may be the lack necessary resources (technical and financial). The municipality also lacks trained manpower and equipment for effective solid waste management. The municipality needs additional vehicles and collection equipment.

10 Conclusion & Recommendations

Dhangadi Municipality has taken some good initiation for mobilizing local communities in solid waste management practices. But it is not sufficient to resolve the problem so the municipality should intensify its activities and initiate innovative programmes such as plastic recycling, medical waste management and household compost bin distribution. The local staff should be motivated to improve the waste management system. Dhangadhi needs support to materialize their plans for a central composting and landfilling facility.

Recommendations:

1. SWMRC should help the municipality to develop a compost plant and landfill site by providing technical and financial assistance.
2. Door-to-door waste collection system should be introduced so that waste collection system would be efficient. For this purpose, private entrepreneurs, local community, and NGOs should be mobilised.
3. As the equipment and vehicles that are currently being seem to be insufficient, additional equipment and vehicles should be arranged. The wheelbarrows that are currently being used seem to be very small. Larger carts or rickshaws with detachable containers would probably be more effective.
4. As the Environmental Sanitation Sub-Section requires trained manpower, training for present staff should for organised.
5. The community mobilization activities at Dhangadhi should be continued and expanded. The municipality should also include school-based programmes.

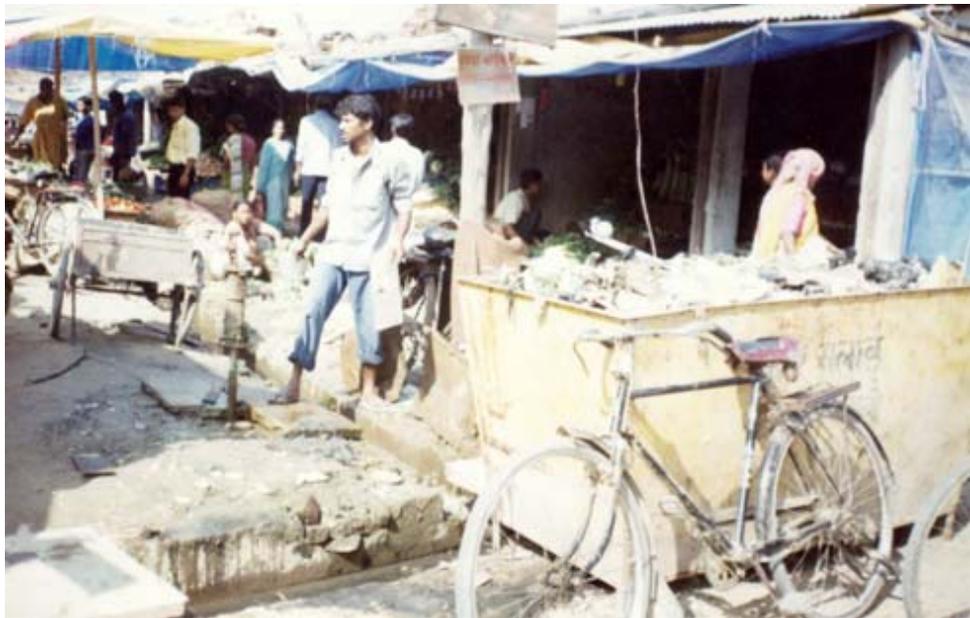
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Annex 1: Photographs



Waste Collection along the Main Road Using a Tractor



A Large Waste Container in a Vegetable Market Area



A Hand Cart Used for Waste Collection



A Clean Meat Market at Phulbari Bus Park



Waste Dumping Site at Phulbari Bus Park



Dumping Site Behind Joshi Katil Hall