

Solid Waste Management in **Dhulikhel 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 Dhulikhel 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 based on field investigations conducted by Salu Sharma.

1 Introduction

Dhulikhel is a small municipality located in Kavre district of Bagnmati Zone of the Central Development Region. The town lies 30 Km east of Kathmandu and 4 km east of Banepa along the Arniko Highway. The municipality is located amidst beautiful surroundings with panoramic views of the Himalayan peaks including Gaurishankar, Dorje Lakpa, Lantang, and Ganesh Himal. Because of its stunning views and cultural sites, it is a major tourist destination. The city is also developing as a centre for education and health. Upon the completion of the Dhulikhel-Sidhuli-Bardibas highway, which will link Kathmandu to the terai, Dhulikhel will become a major commercial centre as well.

Table 1: Background Information

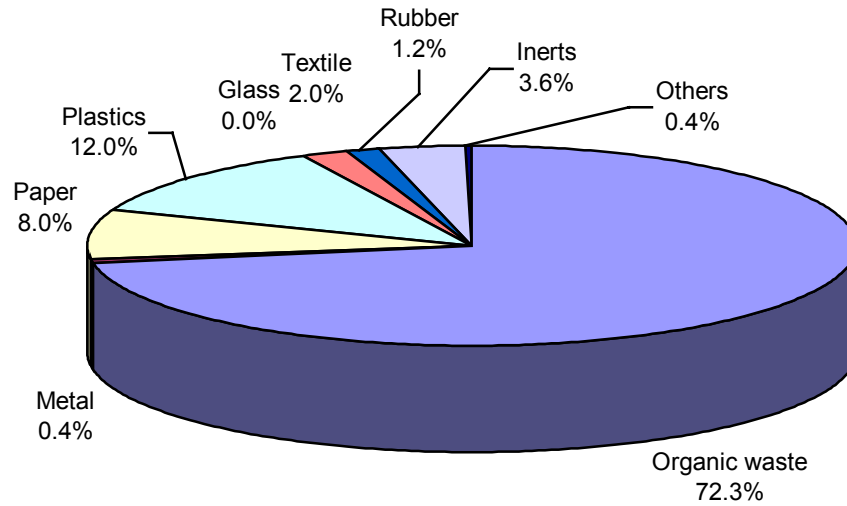
NAME	DHULIKHEL MUNICIPALITY
District	Kavre palnchowk
Year of Establishment	2043 B.S.
No. of Wards	9
No. of Urban Wards	6
No. of Rural and semi urban Wards	3
Total Area	12.08 sq. km
Built-up Area	74.5 ha
Major Rivers and Ponds	Punyamata River Simpokhari, Bhimsenpokhari, hri shidhi pokhari, Siddha pokhari
Total Road length	Black topped: 13.5 Km Graveled : 2.4 Km Earthen : 15 Km
Population (2001)	11521
No. of Households (2001)	2255
No. Shops	112
No. of Restaurants, hotels and shops	23
Annual Population Growth Rate (1991-2001)	1.6
Estimated Population for 2003	11,893
Population Density	953.73 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 Dhangadhi was 0.141 kg/person/day. This is fairly low compared to the average waste generation rate in Nepalese municipality, which is 0.25 kg/person/day. Considering the total population of Dhulikhel in 2003, which is estimated to be 11,897, the total amount of household waste generated in the municipality comes out to be 1.68 tons per day. If we assume that 75 percent of the total municipal waste is generated from households, then the total amount of municipal waste generated in Dhulikhel becomes 2.2 tons per day.

The field survey also indicated that about 72 percent of the waste is organic in nature. This is similar to the waste composition in most other municipalities.

Figure 1 Waste Composition



The loose density of household waste in Dhulikhel was calculated to be 264.03 kg per m³.

Information on Dhulikhel's waste generation and composition is based on waste collected from 60 households in Wo Tole of ward no. 2, that had waste from 352 people.

3 Waste Collection

Field survey of Dhulikhel Municipality's waste collection system indicated that the city collects approximately 1 ton of waste per day. The municipality has two tractors, which have a volume of 3.5 m³ each. But the municipality collects the waste using only one tractor making a single trip per day. The other tractor is used occasionally during festival and special occasions. Assuming the vehicle filled to capacity in each trip, it will carry a total of 3.5 m³ of waste per day. Further assuming that the on-tractor density of waste is about 0.3 tons/m³, the total amount of waste collected by the one tractor of Dhulikhel Municipality comes out to be 1 tons. Assuming that the total amount of waste generated in Dhulikhel is 2.2 tons per day, the city is collecting about 45 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 does not have bulk containers or door-to-door collection system. As a result, all the waste is placed on to the roadside for pick up by the municipal sweepers.

Dhulikhel Municipality has 9 sweepers, 2 of who are permanent employees, who sweep approximately 8-10 kms of city streets on a daily basis.

Sweeping is done using ordinary brooms with long handles and the waste is loaded on to a tractor-trailer. The municipal tractors make around of the core area once a day at a fixed time to collect the solid waste.

4 Final Disposal

The collected waste is disposed in a crude dumping site on a sloping land located about 500 m from the town center along the Arniko Highway in Sisne Khola, Ward no.1. The solid waste is burnt to reduce its volume. A retaining toe wall has been constructed and there are plans to improve the present dumping site. The site with an area of about 3 ropani has been used for the past 12 years (since 2047). It is estimated that the present site can be used for 2 more years. Previously, waste was also dumped in some community forest and bank of the Sisne Khola.

Dhulikhel municipality has plan to construct a landfill site at Panchkhal for long term use, but requires financial and technical assistance for this purpose. The Municipality has proposed that a common landfill site be developed for Banepa, Dhulikhel and Panauti.

5 Composting and Recycling

Dhulikhel Municipality is planing to promote recycling and composting at the household level through Healthy City Program. The city estimates that about half of the rural households are involved in household composting using traditional methods. Recently the municipality has distributed composting bins some households after providing training.

Till now the municipality does not have any municipal or community compost plant. The city has some individual scavengers and scrap dealers involved in recycling.

6 Special Waste Management

Dhulikhel Municipality has not developed any system for collecting and managing medical waste separately. Every generator of medical waste (1 hospital and 2 health post) is managing their waste themselves. 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. Dead animals are simply buried. Construction waste is used for land filling.

7 Community Mobilization

Dhulikhel Municipality has not initiated community mobilization in waste management but recently it provided training to some local people on household composting.

Recently Nature and Social Concern Society, formed by a group of Kathmandu University students, has started working on solid waste management in and around the University. It is involved in waste collection, composting, public education and research. It has distributed collection bins for about 25 household.

8 Organizational and Financial Aspects

The main responsibility for solid waste management lies with the Environment and Health Section of Dhulikhel Municipality. The section has 1 supervisor and 9 sweepers.

The Municipality spent approximately Rs. 6,67,570 for waste management in fiscal year 2059/60. This is approximately 3 percent of the total budget of the Municipality, which is about Rs. 19 million.

9 Major Problems and Issues

The main problem associated with waste management in Dhulikhel is the lack of a sanitary landfill and compost plant. There is a conflict regarding the present dumping site as it lies in a community forest. 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 municipality also needs to raise public awareness on waste management and involve the community in waste management related activities, particularly household composting.

10 Conclusion & Recommendations

As Dhulikhel is a small sized municipality, solid waste management does not seem to be a major problem. However as the city is expanding, this issue needs to be tackled before it gets out of hand. Dhulikhel is in a good position because it already has two tractors (out of which one is a spare one) and it has already identified potential areas for landfill and compost site. Furthermore, as the ADB supported Urban and Environment Improvement Project will probably be assisting Dhulikhel municipality in improving its waste management system, Dhulikhel could be developed as a municipality with an effective system for solid waste management.

Recommendations:

1. SWMRC should assess the proposed landfill site and provide technical and financial assistance in developing the site for composting and landfilling. The possibility for a common composting and landfilling facility for Banepa, Panauti and Dhulikhel should also be explored.
2. The waste collection system should be improved so that waste is collected door-to-door to the extent possible.
3. Once the municipality has a composting facility, it should plan to introduce source-separated collection by distributing two types of waste bins for each household. This should be implemented in a phased manner. In order to make this effective, it should be supplemented by a public awareness campaign.
4. The municipality should encourage local communities of urban area to practice household composting. For this the municipality should organise training and awareness campaigns. The composting bins should be provided at subsidised rate after the training.

5. At present the sweepers are facing difficulties to collect waste from the core area of the city where the houses are very congested as well the tractor is inaccessible. Larger carts or rickshaws with detachable containers would probably be more effective to collect the waste.
6. The Environment and Sanitation Section needs additional collection equipment, and trained manpower. The sweepers should be provided with gloves, masks, and boots for safety measures.

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