

Solid Waste Management in **Bharatpur 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 Bharatpur 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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July 2004

¹ This report was prepared by Bhushan Tuladhar and Gopal Raj Joshi based on field investigations done by Jyoti Karki.

1 Introduction

Bharatpur is a mid-sized municipality located in the Inner-Terai Region of the Central Development Region. It is the District Headquarters as well as a commercial center of Chitwan District in Narayani Zone. It lies on the bank of the Narayani River and is located at the center of Mahendra (East-West) Highway and Kathmandu-Birgunj (north-south) road corridor. Because of this, Bharatpur has developed as a major commercial and industrial town. In addition to good road access, Bharatpur has regular daily air services to Kathmandu.

Table 1: Background Information

NAME	BHARATPUR MUNICIPALITY
District	Chitwan
Year of Establishment	2035 B.S.
No. of Wards	14
No. of Urban Wards	5
No. of Rural and semi urban Wards	9
Total Area	162.16 sq. km
Built-up Area	7500 ha
Major Rivers and Ponds	Narayani, Bishazar Tal
Total Road length	Black-topped: 109.7 km Graveled: 223 km Earthen: 126km Highway: 36.5 km
Population (2001)	89,323
No. of Households (2001)	19910
No. Shops	NA
No. of Restaurants, hotels and shops	176
Annual Population Growth Rate (1991-2001)	5.0 percent
Estimated Population for 2003	98,479
Population Density	1433.58 per sq. km

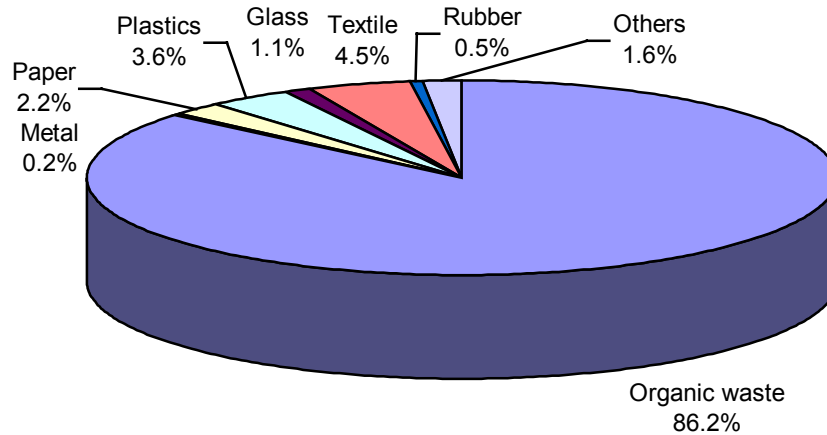
2 Waste Generation and Composition

According to the field survey done in 2003, the average per capita household waste generation rate in Bharatpur was 0.276 kg/person/day. This is similar to the average waste generation rate in urban areas of Nepal, which is approximately 0.25 kg per person per day. Considering the total population of Bharatpur in 2003, which is estimated to be 98,539, the total amount of household waste generated in the municipality comes out to be about 27.1 tons per day. If we assume that about 75 percent of the total amount municipal waste is generated by households, then the total municipal waste generated in Bharatpur is 36.2 tons per day. The actual amount of household waste generated is probably a bit lower because most of Bharatpur's population live in relatively rural and semi urban areas and their waste generation rate is probably a bit lower. The municipality estimates the total amount of waste generated to be approximately 15 tons per day.

The survey also indicated that organic waste makes up more than 86 percent of the Bharatpur's waste stream, while plastics and paper only make up 3.6 and 2.2

percent respectively. While it is not surprising that the portion of organic waste is the highest, its total percentage seems a bit high while the amount of paper and plastics seem a bit low. On average, organic materials constitute about 65 percent of the total waste in Nepalese municipalities while, plastics and paper make up approximately 8.0 and 8.9 percent respectively. As Bharatpur is one of the more developed municipalities, one would expect that the portion of paper and plastics would be a bit higher.

Figure 1 Waste Composition



The loose density of household waste in Bharatpur was calculated to be 312.6 kg per m³.

Information on Bharatpur's waste generation and composition is based on waste collected from 68 households, ward no. 4 and 10, that had waste from 501 people.

3 Waste Collection

According to Bharatpur municipality, it collects approximately 11 tons of waste per day. According to the municipality's estimate, the city is generating approximately 15 tons per waste per day so it is collecting 73 percent of the waste generated. However, if we assume that the total amount of waste generated in Bharatpur is 36.2 tons per day, the city is collecting about 30 percent of the total waste generated. Most of the waste that is not being collected is probably waste from rural areas within the municipality.

Bharatpur municipality has a contract with private party for sweeping the street. The assigned private party with the help of 62 sweepers, sweep approximately 15 kms of city streets on a daily basis and approximately 3 km of streets is swept thrice a week.

Sweeping is done using ordinary brooms with long handles and the waste is collected in tricycles and wheelbarrows using shovels.

The municipality has daily road-side pick-up and door-to-door collection system. All the waste is collected on tricycles and wheelbarrows. The municipality has a total of 18 tricycles, with a capacity of 0.5 m³ each and 35 wheelbarrows. Once

the tricycles and wheelbarrows are filled, the waste is transported to the collection points assigned by the municipality. From these collection points waste is loaded on to a tractor-trailer. The municipality has two tractors with trailers (5 m³), one loader and one grader.

The municipality is planning to build a transfer station at Narayani Kinar, about 1 Km away from the city within 6 months if the conflict between local people and municipality is resolved.

4 Final Disposal

The collected waste is disposed in a crude dumping site called Amtari, about 2 km from the city. The site with an area of 6.67 ropani (10 kattha) has been used for the past five years. Previously, waste was also dumped in Narayani kinar.

The municipality has plans to construct a landfill site at Bhatayri Jungle, but requires financial and technical assistance as well as government permission for this purpose. The proposed site is located at a distance of 9 km from the city and has an area of about 133 ropani. The municipality feels that this site, if developed, can be used for about 25 years.

5 Composting and Recycling

Bharatpur Municipality does not have any composting programme at the household or community level.

Some Private Entrepreneurs like Ayush Bone Meal Industry and Nepal Plastic Byabasayi Sangh are involved in recycling of bone and plastic respectively. But they don't have any legal agreement with Bharatpur municipality. According to Nepal Plastic Byabasayi Sangh, it has distributed *suiro* (hook) to 14,000 households to collect plastic waste and it is collecting approximately 25 tons of plastic per month. The plastic is bought for Rs. 6 per kg and sold to recycling industries. The city also has 40 to 45 scrap dealers.

6 Special Waste Management

Bharatpur Municipality does not have any system for managing special waste or hazardous waste. Bharatpur Cancer Hospital has its own incinerator to manage hazardous medical waste but medical waste from other sources is mixed with normal waste and dumped. Similarly, industrial waste and construction waste is also dumped along with municipal waste. Dead animals are buried.

7 Community Mobilization

Bharatpur has 17 Tole Lane Organizations (TLO) formed under the Rural-Urban Partnership Project, that are involved in waste management. Six of these TLOs are being mobilized to form a model ward, as part of the Public-Private Partnership for Urban Environment, a UNDP funded project.

Occasionally, some awareness programmes are also organized in schools. Urban Development Through Local Efforts (UDLE), a German funded project, has also provided some assistance in the past for community mobilization related activities.

8 Organizational and Financial Aspects

The main responsibility for solid waste management lies with the Health and Cleaning Sub-Section of Bharatpur Municipality. Mr. Anil Wagle is the head of the Section, which has one assistant and two supervisors. The municipality does not have any sweepers as all the sweeping is done by a private party on a contract basis.

For the fiscal 2060/61, the sweeping contract is given to Mr. Rajeshwor Bhattarai. The assigned private party is responsible for only street sweeping and transporting waste to the nearest collection point. For this service the municipality has to pay Rs.1,345,000 per year to the concerned party.

The municipality spends approximately Rs. 33,00,000 in waste management each year. The municipality also collects revenue from waste generators. Approximately Rs. 25,55,000 is collected each year as a sanitation tax.

9 Major Problems and Issues

According to the municipality, the main problems associated with waste management in Bharatpur are as follows:

- Inadequate priority given to solid waste management
- Insufficient public awareness campaign
- Low budget allocation
- Lack of trained / skilled manpower
- Low staff motivation
- Lack of a sanitary landfill.

According to the private party the short-term contract period and haphazard disposal of waste by the public are the main hindrance for effective waste management.

10 Conclusion & Recommendations

Bharatpur Municipality is one of the few municipalities in Nepal that has started public-private partnership in waste collection, which is very impressive. Some private entrepreneurs have also initiated innovative programmes such as plastic recycling and bone meal production. But the municipality needs to formulate more effective strategy to encourage more public-private partnership and strengthen existing partnerships. So far the private sector involvement has been limited to waste collection and to a certain extent recycling. This should be extended to waste treatment and disposal. With proper planning and effective monitoring, Bharatpur can be a model for public-private partnership in waste management.

Recommendations:

1. Bharatpur municipality should develop effective strategy and plans for public private partnership in waste management and implement it.
2. The proposed landfill site at Bhatayri jungle should be assessed by experts and technical and financial assistance should be provided for developing the site if it is feasible. This may be done with the support of the ADB Urban and Environment Improvement Project or SWMRMC.

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 municipality should plan to introduce source-separated collection. This should be implemented in a phased manner. In order to make this effective, it should be supplemented by a public awareness campaign.
5. The municipality should promote composting at household level and the feasibility of a central or community compost plant should be explored.
6. Bharatpur municipality should expand community mobilization activities and also introduce school-based programmes.
7. The municipality should award longer-term contract to private party and properly monitor its performance.

For more information please contact:

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Annex 1: Photographs



Household Waste Collection Bin



Haphazard Disposal of Waste on the Street



A Rickshaw Used for Waste Collection



Backside of a Waste Collection Rickshaw



A Waste Collection Point



Loading Waste on to a Tractor



Waste Disposal Site



A Scrap Dealer's Junk Yard