

## Solid Waste Management in **Banepa 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 Banepa 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.

Bhushan Tuladhar  
Executive Director  
Clean Energy Nepal

Dr. Roshan Raj Shrestha  
Executive Chairman  
Environmental and Public Health Organization

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<sup>1</sup> This report was prepared by Bhushan Tuladhar and Gopal Raj Joshi based on field investigations done by Biju Shrestha.

## 1 Introduction

Banepa is a relatively small municipality located in Kavrepalanchowk district of Bagmati Zone. The major portion of municipality is agricultural land (63% covering 416 ha), followed by forest (22% or 146ha). Only 10.47 percent (68.62 ha) of the total land is covered by housing settlements. Because the Arniko Highway passes through this city, Banepa has developed as a commercial centre and the gateway to Tibet. After the completion of Banepa-Bardibas Highway, this city could be a new commercial and industrial center in Nepal.

**Table 1: Background Information**

NAME	BANEPA MUNICIPALITY
District	Kavrepalanchowk
Year of Establishment	2038 B.S.
No. of Wards	11
No. of Urban Wards	10
No. of Rural Wards	1
Total Area	5.56 sq. km
Built-up Area	68.26ha
Major Rivers and Ponds	Punyamata, Kandh, Chande shwori, Keta dah river
Total Road length	Black-topped: 5.73 km Graveled: 7.59 km Earthen: 22.59 km Mule track: 30.58 km
Population (2001)	15,822(CBS)
No. of Households (2001)	3,015 (CBS)
No. Shops	769
No. of Restaurants, hotels and shops	143
Annual Population Growth Rate (1991-2001)	2.4 percent
Estimated Population for 2003	16,591
Population Density	2845.68per sq. km

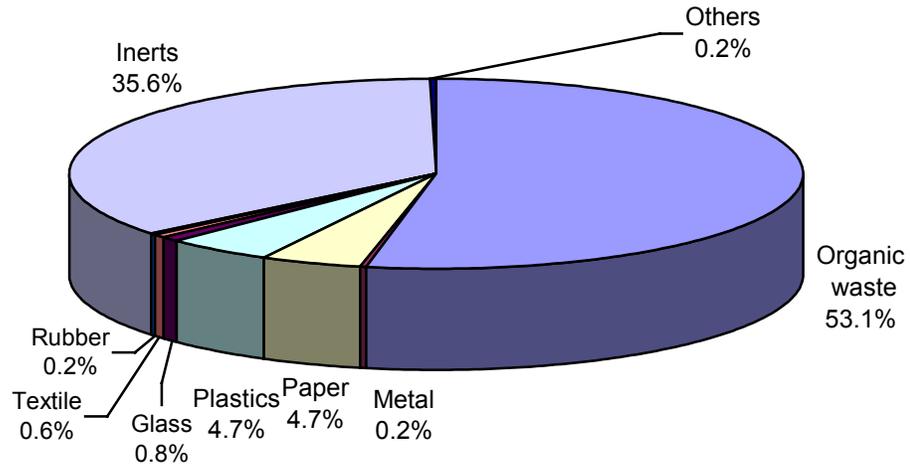
## 2 Waste Generation and Composition

According to the field survey done in 2003, the average per capita household waste generation rate in Banepa was 0.23 kg/person/day. This is similar to the average waste generation rate in urban areas of Nepal, which is about 0.25 kg/person/day. Considering Banepa's population in 2003, which is estimated to be 16,567, the total amount of household waste generated in the municipality is 3.8 tons per day. Assuming that household waste makes up 75 percent of the total municipal waste, then the total municipal waste generated becomes 5.08 tons per day.

The same survey also indicated that over 53 percent of the waste is organic in nature and over 35 percent consisted of inert materials. Although it is not surprising that the majority of the waste consists of organic materials, the organic content is still less than what is found in most other municipalities. The average organic content in the waste from Nepalese municipalities is about 65 percent. Similarly, the amount of inert is also higher than found in most other municipality.

The average percentage of inert in Nepalese municipalities is approximately 9.6 percent. The reason for the large amount of inert found in Banepa's waste is not unknown. It is possible that some organic waste got classified as inert waste or there happened to be more inert waste at the time of the survey due to construction activities or other reasons.

**Figure 1 Waste Composition**



The loose density of household waste in Banepa was calculated to be 69.76 kg per m<sup>3</sup>. This value is very low compared to most other municipalities, particularly considering the fact that the sampled waste contained a large amount of inert, which are normally more dense.

Information on Banepa's waste generation and composition is based on waste collected from 95 households that had waste from 533 people.

### 3 Waste Collection

The municipality has one truck, with a capacity of 2.9 m<sup>3</sup> and a tractor, which has a trailer with a capacity of 2.8 m<sup>3</sup>. According to the municipality, it collects approximately 4 tons of waste per day. Assuming that the total amount of waste generated in Banepa is 5 tons per day, the city is collecting about 80 percent of the total waste generated.

The municipality has daily roadside pick-up service as well as door-to-door collection system in urban areas. All the waste from households is directly collected on truck and tractor. For this purpose the municipality has adopted two-collection routes that consists of altogether 50 collection centers. At each collection center, the waste collection vehicles stands for 5-10 minutes and the city dwellers throw their waste directly into the vehicles.

In the case of households that are inaccessible to vehicles, waste is collected by the municipal sweepers using kharpan, which is a traditional equipment with two baskets that are hung on a pole carried on a solder. The collected waste is directly transferred to the collection vehicles (trucks and tractors). In the case of rural areas waste is collected 3 times per week. The municipality has a total of 25 of kharpan.

It is estimated that the total waste collected by roadside pick-up service and door-to-door collection system is 1.5 tons per day and 2.5 tons per day respectively.

Banepa municipality has 25 sweepers, 11 of whom are permanent employees, who sweep approximately 75.5 kms of city streets and public open spaces on a daily basis.

Sweeping is done using ordinary brooms with long handles and the waste is collected in kharpan, trucks and tractors using shovels.

## **4 Final Disposal**

The collected waste is disposed in a crude dumping site near the Punyamati River, about 2 km from the city. The site with an area of 1.5 ha (31 ropanies) has been used for the past ten years. Previously, waste was also dumped in Tulti Marg, behind Banepa buspark.

It is estimated that the present dumping site has life span of 8-10 years only, so the municipality has planed to construct a landfill site. The municipality has approached ADB for financial and technical assistance under the ongoing Urban and Environment Improvement Project, but the proposal has not yet been approved.

## **5 Composting and Recycling**

The Municipality estimates that about 10 percent of urban households and 15 percent of rural households compost their waste. Although the municipality does not yet have any facilities for composting, it is planning to construct a small compost plant with a capacity of one ton per day at ward 5. Before constructing the composting plant, the municipality is planning to have trial on ward no.4 (Naya Basti). If it does well then it will build the compost plant in ward no.5 and the waste for the plant will be transported from three collection centers. The city is planning to build the compost plant from its own budget, if it does not receive any support from donors.

The city is also planning to distribute household composting bins to households and provide regular training. Composting training for women groups and municipal staff is being conducted regularly with the help of UDLE/GTZ.

Banepa doesn't have a special waste-recycling programme. But like most other municipalities, Banepa has scavengers and scrap dealers involved in recycling. The individual scrap dealers are practicing waste separation and selling of reusable and recyclable waste.

## **6 Special Waste Management**

Banepa Municipality doesn't have a system for collecting and managing medical waste separately. The municipality has two hospitals, 16 clinics and laboratories. The hospitals manage the hazardous medical waste generated by themselves. Non-hazardous medical waste is dumped at the dumping site along with municipal waste.

The city 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 buried and construction/demolition debris, industrial waste is directly or indirectly taken to the dumping site.

## 7 Community Mobilization

Banepa Municipality has started working with local communities and NGOs in conducting activities to raise awareness on waste management and promote recycling and composting. It has published several brochures/pamphlets and organized several interaction and training programmes.

Some of the NGOs and CBOs involved in waste management in Banepa are as follows:

Lidhansa Pucha, a local CBO was active in managing waste for 2058 to 2059 B.S. But now it is no longer active. The CBO was responsible for collecting waste from households of ward no. 5 and 6. After collection, they used to put the garbage in municipal vehicles.

Five Neighbourhood Improvement Committees (Tole Sudhar Samitee) in different wards (3, 4, 5 and 11), are actively working on raising awareness. Each Tole Sudhar Samitee consists of 28 persons. Such Samitee have distributed buckets to households for collection and separation of waste.

## 8 Organizational and Financial Aspects

The main responsibility for solid waste management lies with the Sanitation, Environment Conservation and Healthy City Sub-Section under Community Development Section of Banepa Municipality. Mr. Bishnu Man Bhaila, the head of the Sub-Section comes from an administrative background but has received training on waste management from UDLE. The sub-section has one supervisor, 25 sweepers and three drivers.

The municipality spends approximately Rs. 14,62,000 in waste management each year. The total expenditure of the municipality in the fiscal year 2058/59 was Rs. 27,161,554.

**Table 2: Budget Distribution for solid waste management of Fiscal Year 2059/2060**

TOPIC	AMOUNT (RS.)
Staff Salary	10,82,000.00
Dumping site Management	1,00,000.00
Fuel	1,30,000.00
Vehicle Maintenance	1,00,000.00
Equipment	50,000.00
Total	14,62,000.00

## 9 Major Problems and Issues

The main problem associated with waste management in Banepa is the lack of a sanitary landfill and compost plant. The present dumping site is causing serious environmental impact as the leachate and waste is being transported to nearby Punyamati River and agricultural land.

The municipality also identified lack of human and financial resources, as well as lack of support from the local people, as problems in municipal waste management.

## **10 Conclusion & Recommendations**

Banepa Municipality has a good waste collection system. The local staff seems to be committed to improving the waste management system and willing to learn new things. But they need additional resources and landfill site to follow up on their collection system and improve the waste management system as a whole. Banepa also needs support to materialize their plans for composting and land filling facility.

### **Recommendations:**

1. The municipality's plans for the compost plant needs to be assessed and supported. SWMRMC could provide technical and financial assistance for this purpose, or the project should be included in the ongoing ADB supported Urban and Environment Improvement Project.
2. The existing dumping site should be immediately converted into a controlled dump and plans should be initiated to construct a sanitary landfill.
3. The municipality should plan to introduce source-separated collection in order to support its plan for composting. 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 promote household composting by providing training and composting bins at subsidised rate.
5. The municipality should plan for involving more local CBOs, NGOs and private parties in solid waste management. The municipality should also include school-based programmes.

For more information please contact:

Bishnu Man Bhaila  
Community Development Assistant  
Sanitation, Environment Conservation and Healthy City Sub- Section  
Phone: 011-661407; 662081; 661281  
Fax: 011-661419



**Street Sweeping Using Broom and Traditional Kharpan**



**"Saaga:" Traditional Compost Pit**



**Unloading Waste from Tractor at Dumping Site**



**Dumping Site**