

Solid Waste Management in **Birgunj Sub-Metropolitan City**



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 Birgunj Sub-Metropolitan City¹ 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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¹ This report was prepared by Bhushan and Gopal Raj Joshi based on field investigations conducted by Pankak KC.

1 Introduction

Birgunj is a large city situated in the central Terai region of the country in Narayani zone. It is the headquarters of Parsa District and a major industrial and commercial centre. Located next to Indian boarder, it is also one of the main gateways to Nepal. The city was established in 1954 BS by the Rana Prime Minister Bir Shamsher and was declared as sub-metropolis in 2055 BS. With the recent establishment of the Inland containment system or "Dry Port" its importance as a commercial centre is bound to increase in the future.

Table 1: Background Information

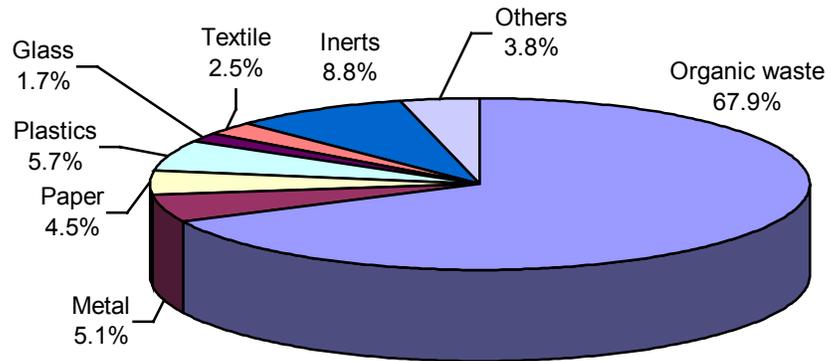
NAME	BIRGUNJ SUB – METROPOLIS
District	Parsa
Year of Establishment	2055B.S.
No. of Wards	19
No. of Urban Wards	NA
No. of Rural and semi urban Wards	NA
Total Area	21.17 sq. km (CBS)
Built-up Area	NA
Major Rivers and Ponds	Sirsiya and Singha river
Total Road length	260 Km
Population (2001)	112,484 (CBS)
No. of Households (2001)	19,910
No. Shops	1757
No. of Restaurants, hotels and shops	85
Annual Population Growth Rate (1991-2001)	5.0 percent
Estimated Population for 2003	124,014
Population Density	5313.37 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 Birgunj was 0.7 kg/person/day. This is very high compared to the average waste generation rate in urban areas of Nepal, which is 0.25 kg/person/day. The reason for the very high waste generation rate in Birgunj is not known and could be due to experimental error. Considering the total population of Birgunj in 2003, which is estimated to be 124,032, the total amount of household waste generated in the municipality comes out to be 86.8 tons per day. Assuming that 75 percent of the municipal waste consists of household waste, the total municipal waste generation rate in Birgunj comes out to be 115.76 tons per day. Again this is a very large number because of the high waste generation rate. If we assume that the waste generation rate calculated during the survey was an error and the actual waste generation rate in Birgunj is similar to the waste generation rate in an average Nepalese municipality, then the total amount of municipal waste generated in Birgunj becomes 41.3 tons per day.

The composition of waste in Birgunj is similar to other municipalities in Nepal with organic waste consisting of about two thirds of the total waste.

Figure 1 Waste Composition



The loose density of household waste in Birgunj was calculated to be 101 kg per m³. This seems to be fairly low.

Information on Birgunj's waste generation and composition is based on waste collected from 87 households in Tejrakh tole and Murli in ward no. 16, that had waste from 541 people.

3 Waste Collection

Birgunj Sub-Metropolitan City claims that the city collects approximately 25 tons of waste per day. The municipality has two garbage tippers and 13 tractors. The tractor trailers are of three different capacity namely 1.4m³, 3.33 m³ and 4m³. Because of the uncertainty in the data on waste generation as well as collection, it is difficult to calculate the waste collection rate. However, if were to assume that waste generation is 41 tons per day (see above) and the collection is 25 tons as reported by the municipality then the city is collecting about 61 percent of the total waste generated.

Birgunj Sub-Metropolitan City has 20 supervisors and 90 sweepers, 45 of who are permanent employees, who sweep city streets on a daily basis from 5 AM to 6 PM. The municipality also has 315 sweepers on a daily wage system.

Sweeping is done using ordinary brooms with long handles and the waste is collected in handcarts using shovels. The municipality has provided 2 big and 2 small handcarts for each ward. Beside this 30 bins are also kept in roadside area for roadside pick-up services. Once the carts are filled, the waste is loaded on to a tractor-trailer or tipper.

The municipality has limited container service but no door-to-door collection system. As a result, all the waste is placed on to the roadside for pick up by the municipal sweepers.

4 Final Disposal

The municipality does not have any fixed place for the final disposal of the waste. So the collected waste is disposed in open piles outside residential areaa. The disposal of the waste is done in a crude manner and once a place is filled with waste then dumping shifts to another place. In this way, most of the open places

inside the city have already been used as disposal sites. The life span of such disposal site is counted in days. Some of the sites are very near to the Core City.

The municipality intends to construct a landfill site at Ward 19 near to Nagua, 5-6 km away from the city. But the municipality has not prepared any concrete plans till now. It requires financial and technical assistance for this purpose.

5 Composting and Recycling

Birgunj Sub-Metropolitan City does not have any programmes to promote recycling or composting and there are no household and community composting systems in the city. About 50 scrap dealers are involved in collecting recyclable inorganic waste.

6 Special Waste Management

Birgunj Sub-Metropolitan City has altogether 16 health-care institutions and laboratories. Narayani sub regional Hospital, the largest hospital in the city and Mary Stope clinic have incinerators to manager their waste but none of the other health-care facilities manage their hazardous medical waste. Medical waste from these sources is generally mixed with general municipal waste.

The city does not have any system to collect and manage special waste such as medical waste, construction/demolition debris and industrial waste. Dead animals are normally buried. The municipality has around 50 small and large industries. Waste from these industries is mixed and disposed with general waste.

7 Community Mobilization

Birgunj Sub-Metropolitan City has made some efforts to involve local communities and NGOs in raising awareness on waste management but the scale and scope of the community-based activities is very small.

Recently the municipality has made a formal agreement with a local NGO called Youth Community Centre (YCC) to conduct mass education program. Biddhyarathi Jagran Manch with the support of Peace Corps Nepal and Birgunj Sub metropolis formed YCC in 2059. The goal of YCC is to mobilize youth volunteers for community development. At present it has 5 volunteers who are involved in public awareness and community work. It has published some pamphlets and does regular miking to raise awareness on solid waste management. It also conducts training on waste management and community clean up campaigns.

Utthan Samaj (Development Society) in ward no.16 is also active in managing waste. The Samaj has distributed 12 litre buckets in houses in TejraKh tole to collect waste.

8 Organizational and Financial Aspects

The main responsibility for solid waste management lies with the Social Welfare and Environment Department of Birgunj Sub-Metropolitan City. Sanitation Section of the Department mobilizes necessary resources and manpower for managing waste. It also provides basic training on waste management for sweepers. The section has two officers, 7 assistant officers, 20 supervisors, and 405 sweepers.

The municipality spends approximately Rs. 2,73,35,974 in waste management each year. This is approximately 15 percent of the total budget of the municipality, which is about Rs. 183 million.

9 Major Problems and Issues

The main problem associated with waste management in Birgunj is the lack of a sanitary landfill and compost plant. The municipality is also facing problem of managing sweepers. Less awareness among the people and low degree of community mobilization in solid waste management are another crucial problems. As the city is commercial center near to India, the flow of people from India and nearby rural area is quite high. This is also adding more problems on managing solid waste.

The municipality also requires additional vehicles, collection equipment and special training for workers.

10 Conclusion & Recommendations

Although Birgunj Sub-Metropolitan City is doing a fairly good job in street sweeping using a large number of sweepers, the system is quite inefficient and collected waste is poorly managed. Even though the municipality is quite large, it does not have programmes for community mobilization and promotion of recycling and composting. Overall, the municipality should be committed to improving the waste management system and willing to learn and implement new activities.

Recommendations:

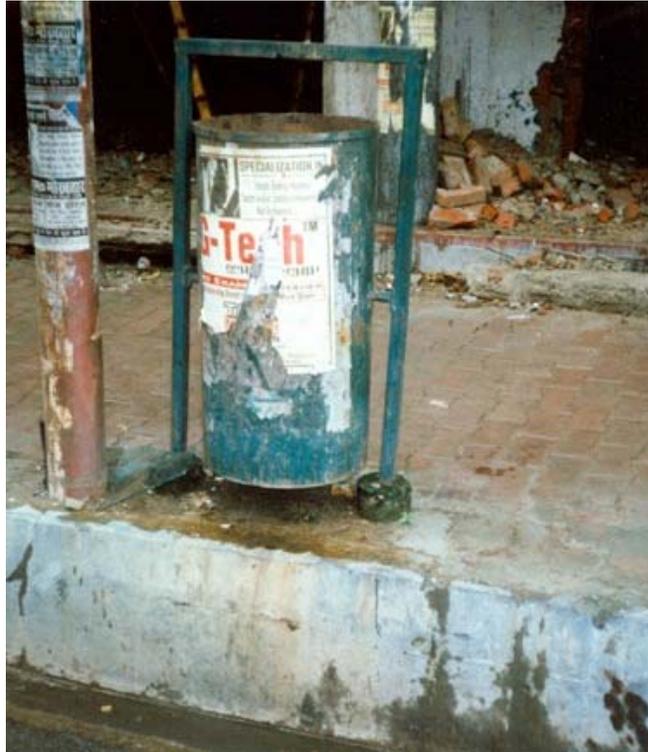
1. Birgunj urgently needs a waste treatment and disposal facility. SWMRMC should help the municipality to develop a landfill and a compost plant.
2. The waste collection system should be improved by introducing door-to-door source-separated waste collection system in a phased manner. With an effective waste collection system, valuable resources that are being used to sweep the streets daily could be saved. In order to make this effective, it should be supplemented by a public awareness campaign.
3. The municipality should introduce a separate system for collecting and managing medical waste. A central incinerator should be set up for this purpose.
4. The handcarts that are currently being used seem to be very small. Larger carts or rickshaws with detachable containers would probably be more effective.
5. More emphasis should be given to mobilize communities in waste management. For this the Sanitation Section should start community based and school based programs.
6. Local people should be encouraged to recycle, reuse and compost their waste at household and community level. For this purpose awareness and training programs should be provided.

7. The staff in the Sanitation Section should receive appropriate training.

For more information please contact:

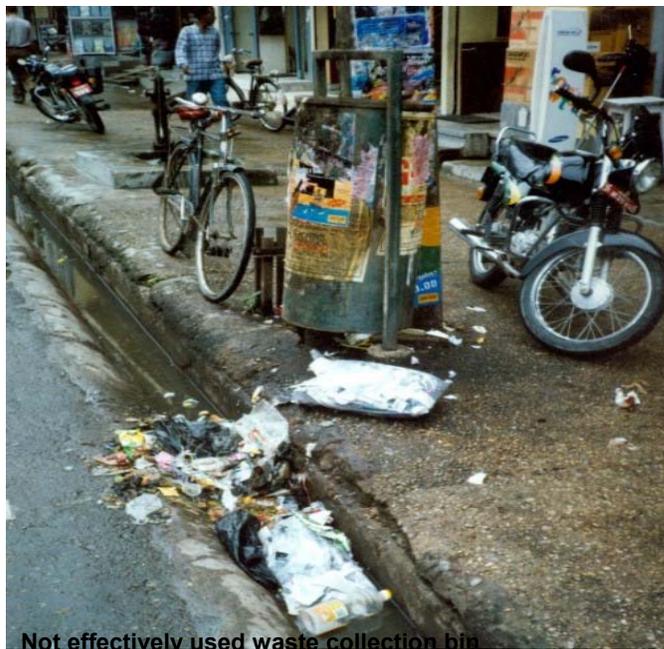
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Annex 1: Photographs



Waste

collection bins



Not effectively used waste collection bin



Waste collection vehicle of Birgunj Sub Metropolitan City



Tipper of Birgunj Sub Metropolitan City



Scavengers at Dumping site



Birgunj Sub Metropolitan City's Current Dumping site

