

Solid Waste Management in **Ratnagar 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 Ratnanagar 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 and Bhumkia Vaidya based on field investigations by Sushil Nepal.

1 Introduction

Ratnanagar is one of the newly formed municipalities in Chitwan District. It is located on the East-West highway 12 km east of Bharatpur. It is a commercial center for Padampur, Pithuwa, Shaktikhor, Chainpur, Jutpani VDCs and other adjoining areas. It is also an entry point for the Royal Chitwan National Park to the South. Ratnanagar is steadily gaining importance due to the development of agro-based industries, its potential for tourism and its proximity to Bharatpur, its much larger neighbour. In this municipality, 6 percent (186 ha) of the land is covered by housing settlements. The majority of the land 92 percent is agricultural land.

Table 1: Background Information

NAME	RATNANAGAR MUNICIPALITY
District	Chitwan
Year of Establishment	1997 A.D
No. of Wards	13
No. of Urban Wards	6
No. of Rural Wards	7
Total Area	35.62 sq. km (CBS data)
Built-up Area	185.79 ha
Major Rivers and Ponds	Budhi Rapti, Budi Kulo, Khageri and Kayer Khola
Total Road length	Total: 136 km Black-topped: 26 km Gravel road: 90 km Earthen road: 20 km
Population (2001)	37791 (CBS data)
No. of Households (2001)	7456 (CBS data)
No. of Shops	282
No. of Restaurants, hotels and lodges	120/ 97/ 3
Annual Population Growth Rate (1991-2001)	4.2
Estimated Population for 2003	41,032
Population Density	1060.95 per sq. km (CBS data)

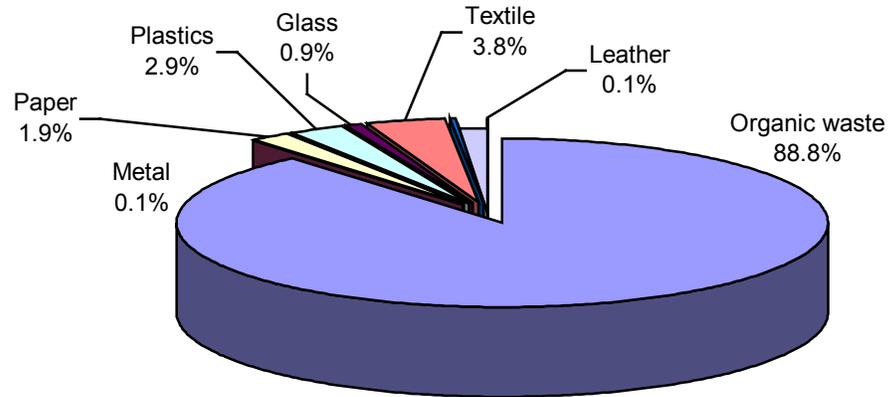
2 Waste Generation and Composition

According to the field survey done in September 2003, the average per capita waste generation rate in Ratnanagar was 0.125 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 estimated total population of Ratnanagar in 2003, which is 41,008, the total amount of household waste generated in the municipality comes out to be 5.1 tons per day. If we assume that 75 percent of the total municipal waste is generated by households, then the total amount of municipal waste generated in Ratnanagar Municipality comes out to be 6.8 tons per day.

The survey also indicated that more than 88 percent of the waste was organic in nature. This is slightly higher than what is found in most municipalities. The amount of plastics and paper was found to be only 2.9 and 1.9 percent

respectively. On average the amount of organic materials, paper and plastics in municipal waste in Nepal is 65 percent, 8.9 percent and 8 percent respectively.

Figure 1 Waste Composition



The loose density of household waste in Ratnanagar was calculated to be 197.91 kg per m³.

Information on Ratnanagar's waste generation and composition is based on waste samples collected from 69 households with 377 people in wards 1 and 2.

3 Waste Collection

The Municipality estimates that it collects approximately 4 to 5 tons of waste per day. The municipality also estimates that the total amount of waste generated in Ratnanagar to be 7 tons per day. According to the municipality's estimate it is collecting about 64 percent of the total waste that is generated.

Ratnanagar Municipality has 1 supervisor, and 12 temporary sweepers, who sweep 4 km of street daily and 7 km once a week. Sweeping is done with ordinary brooms with long handles.

The SWM activities include waste collection from the streets and transporting it to dump site. The municipality has a tractor with a capacity of 5 m³ and 5 wheelbarrows for waste collection. The tractor performs 2 trips a day for disposal of waste to the dump site.

Municipality provides container service daily in 4 km area and weekly in 7 km area. There are no other services like roadside pick up and door-to-door collection service. The collected waste from the households is placed in roadside containers, which is then placed in wheelbarrows for transportation. Also temporary open piles were observed in 4-5 places.

4 Final Disposal

The collected waste is disposed in a crude dumping site. The site with an area of 2 hectares is located near Tikalu forest by the side of Khageri Khola. It has been used since the past 6 years and is about 5 km far from the city. A barbed wire

fence surrounds the dumping site temporarily. According to the Municipality occasional flood in the river creates problems and destroys the dumping site.

Previously, 2 Bigha land of ex-mayor Narayan Bom was used for waste dumping. In near future, the Municipality plans to construct a landfill site in Ward No: 3 with area coverage of 2 hectare, which is 1.5 km away from the city. For this purpose the Municipality needs financial and technical assistance.

5 Composting and Recycling

The Municipality estimates that nearly 50 percent of households practice composting. The Municipality, however does not have any programmes to promote composting or recycling.

As for inorganic waste, Enviroplast, a private company located in the municipality is recycling about 4 tons of plastic waste per day. But this industry finds it difficult to get plastic waste from the municipality because there is no system to collect the plastic waste. Previously “suiro” was distributed in some households to collect plastic waste but it has been stopped.

There are some scrap dealers who collect waste for recycling but the municipality is not in contact with any of them

6 Special Waste Management

Ratnanagar Municipality has 33 clinics and 5 laboratories. However, as the Municipality does not have a separate system to collect medical waste it is managed by the generators themselves. Dead animals are buried separately.

7 Community Mobilization

The Municipality and some local NGOs are involved in some community mobilization and awareness programmes. Programmes such as cleanup campaign and distribution of “Suiro” for plastic collection have been initiated but continuation of the programmes is a problem.

Nari Jagaran Kendra at Ratnanagar-1 is involved in street sweeping as well as public education. They are also involved in school-based programs and community clean-up campaigns. They are also planning to do composting in near future.

8 Organizational and Financial Aspects

Currently the Solid Waste Management Sub-Section under the Planning Section of Municipality looks after the solid waste management activities. The section has 11 temporary sweepers, 3 people to load and unload waste, 1 supervisor and 1 driver.

The municipality spends approximately Rs. 6,00,000 to 7,00,000 per year in solid waste management. This is about 13 percent of the total annual expenditure of the municipality.

9 Major Problems and Issues

The main problems associated with waste management in Ratnanagar are similar to most other small and new municipalities. These include lack of a proper waste collection system, lack of landfill site, inadequate resources and lack of awareness among people. The waste management system is crude and unplanned. The municipality lacks trained and skilled manpower, community involvement, and sufficient financial support.

10 Conclusion & Recommendations

Being a small, relatively rural, municipality, waste management is not a critical issue in Ratnanagar at present. However, with increasing urbanization, the problem is bound to increase in the future. Therefore, Ratnanagar Municipality needs to start developing structures and system for effective waste management.

Recommendations:

1. The municipality should establish basic statistical records related to waste management to formulate effective plan and strategy of waste management. SWMRMC should provide technical and financial assistance for preparing an integrated waste management plan for the municipality.
2. Haphazard disposal of waste in forest areas and rivers should be stopped and a simple landfill site should be developed, where waste can be buried.
3. Along with construction of landfill site, municipality should also promote composting and recycling programs.
4. 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 are discouraged.
5. For effective solid waste management, Municipality should involve local community as well as private organization.
6. Medical waste should be managed separately. They should be burned in a controlled manner or buried separately.
7. Public awareness campaigns should be done in community, schools and municipality staffs and community and School based programmes should be launched to increase awareness.

For more information please contact:

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Annex 1: Photographs



Waste Collection Bin Made from Old Drum



Waste Collection Bin Made from Concrete



Waste Collection Using Handcart



Tractor with Modified Trailer to Accommodate Large Amount of Waste



Waste Dumping Site



HDPE Pipe Made from Recycled Plastics