

COMAD | MDS 052



# Solid waste management in Mangaluru

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## Introduction

Mangaluru, the fourth largest city in Karnataka State is situated in the west coast of Southern India. It is the fast growing city in education, commerce and industry. The city with more than 5.5 lakh population faces the challenges of dealing with its solid waste. The rapid urbanization and changing lifestyles have led to the generation of huge amount of garbage and wastes in the urban areas. The initiative by Mangaluru City Corporation (MCC) could successfully collect the solid waste generated within Mangaluru City and process it at centralized processing plant at Pachanady of the City Corporation. The raw waste received at the site is pre-sorted and further sent to processing shed. The pre-sorted waste materials are being used as a raw material for windrow composting and vermin-composting. Some percentage of hotel waste and market waste is being used for bio-methanation plant. The rejects from windrow, vermin-composting and bio-methanation plant is sent to sanitary landfill site.

## Description of solid waste

The area coming under the jurisdiction of Mangaluru City Corporation produces an average of 310-320 tonnes per day (TPD) of solid wastes, with a daily collection frequency of 310 TPD. The waste collected has a composition of 60% of organic, 25% of inorganic, 5% of combustible and 10% of recyclable wastes.

## Mode of collection/transportation/processing

Door to door collection from entire 60 corporation wards covering 100% using hydraulic vehicles. All the collection and transportation vehicles have completely covered and automatic unload mechanism which reduced the number of manpower deployment and the manual contact with garbage.

## Collection and transportation

GPS technology was adopted to record the real time fuel level and vehicle location

in all the primary and secondary collection vehicles. Mechanized sweeping was done in South zone for a stretch of 25 km/day.

## Processing of Waste

Windrow composting and Vermi-composting was provided under KUDCEMP Program. 200 TPD of waste was aerobically composted through Windrow method and 25 TPD of waste was by vermi-composting method. Rejects from compost plant was transported to sanitary landfill site. Soil top cover of 30 cm is being provided on regular basis. The operation and maintenance of the processing plant is being outsourced to M/s Unique Waste Processing Company Limited, New Delhi.

Simultaneously, a decentralised plant is setup at Urwa market area for converting waste to energy, the wet waste material is being used as a raw material for bio-methanation plant. The plant is having 2 TPD capacity which is constructed by M/s Wipro EcoEnergy. The plant was commissioned in September 2011 and running successfully. Presently, the plant is generating 150-160 m<sup>3</sup>/day of gas and 100-120 kg/day of manure. The gas generated is being utilized for generating power & illuminate the surrounding area.

## Impact

- Mangaluru City has got 100% efficiency in door to door collection of the solid wastes generated.
- 100% of the vehicles used are hydraulic vehicles, which has reduced the manual contact with garbage.
- Mechanization of the work like street sweeping, weed cutting, drain cleaning is practised.
- Vehicles are being tracked through GPS, so the monitoring of the collection is easy.
- Man power has been reduced with mechanization of some of the activities.
- Mobile application is being used for the Redressal of the complaints, so that the complaints are redressed within 24 hrs.
- Tie up with major companies to purchase the compost generated at the processing site. And also utilize the compost for Mangaluru parks and gardens.

## Adoption of this method by others

The project is completely outsourced to a private agency and being managed by MCC Health Department. For conservancy works, collection and transportation of waste it has been outsourced to a private agency for 7 years and for processing and disposal of waste another agency has been selected through outsource for 6 years time frame.

## Economic aspects

For conservancy works, collection, transportation, processing and disposal Mangaluru City Corporation is spending annually Rs. 3500 Lakhs.

City Corporation generates revenue for solid waste management by introducing SWM Cess on Property tax and also by way of tax on trade and business activities. Presently City Corporation is collecting SWM Cess of Rs. 1200 Lakhs from Property tax as well as from different trades. The SWM expenditure is being borne through the SWM Cess and other source of funds from MCC.

### Conclusion

The project could carry out the door to door collection of the solid wastes generated from all the households with the Mangaluru City Corporation limits. Mechanization for most of the procedures could reduce the number of manpower involved, and increase the efficiency of solid waste management. Adoption of GPS could strengthen the communication between the field and office executives. Garbage collected is being completely processed and disposed scientifically through composting process and generation of energy. Overall, the effort minimised the MCC response towards the public grievance.

