

Composting of Municipal Solid Wastes in Sri Lanka: Experience from Colombo Municipality Area

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Introduction

- Responsibility of Solid wastes collection and disposal - Local authorities
- Total daily collection of MSW - 2,9000 m.tones
- Colombo district - 2,900 mt - 43% of Total
→
- CMC area - 700 mt- 25% of total MSW
- Managing of MSW - haphazard dumping

Contd...

Introduction Contd...

- Problems - Population growth
Urbanization
Lifestyle change
Scarcity of dumping sites
Environmental and health problems
Pressure from organized groups
- Management of MSW is not only environmental issues, but also socio-political problem

Colombo

- Capital city and most urbanized area
- Area 37 km²
- Population - Resident 650,000
Floating 450,000
- About 50% of population living in underserved settlements.
- Management of MSW is one of the challenging day to day task.
- Composting in CMC was proposed by over 15 studies and pilot testing was done

The Project

- MOU between CMC and 'Burns' from 2002 for a period of 25 years.
- 'Burns' agreed to implement composting project using MSW collected by CMC
- Tipping fee of Rs. 500/tonne of waste from CMC
- 'Burns' remove all contaminants and produce agricultural compost.

Objectives

- To discuss major lessons of composting experience
- To assess the quality of the compost produced
- To analyze the marketing potential of the compost produced

Features of MSW

| Component | Percentage |
|---|------------|
| ❖ Biodegradable (short term) | 56.57 |
| ❖ Bio-degradable | 5.94 |
| ❖ Paper | 6.47 |
| ❖ Wooden materials | 6.35 |
| ❖ Sawdust/paddy husk & cloth/garments waste | 6.04 |
| ❖ Polythene and plastic | 5.91 |
| ❖ Construction demolition wastes | 3.89 |
| ❖ Metals | 2.76 |
| ❖ Slaughter house wastes | 2.34 |
| ❖ Glass | 2.03 |
| ❖ Other | 1.68 |

Composting in CMC

Ideal Conditions-

C:N ratio - 25:1 + 0.35:1

Temperature - 60°C

Moisture content - 40 - 50%

Particle size - < 5 cm

Detailed process is not known

Waste In



Process



Landfill



Separator

Rejections



Compost

Recycle Items

6%

Coconut shells
To private sector



Glass to
Glass
factory



Plastics
to Local
Recyclers



PET Bottl
to Export
(India)



Local Market

Characteristics of the compost produced by MSW

| Parameter | Amount available | SLS requirement |
|--------------------------|------------------|-----------------|
| 1. Nutrient | | |
| Nitrogen (%) | 1.22 – 1.29 | 1.0 |
| Phosphorus (%) | 0.37 – 0.35 | 0.5 |
| Potassium (%) | 0.40 – 0.45 | 1.0 |
| Magnesium (%) | 0.23 – 0.25 | 0.5 |
| Calcium (%) | 3.54 – 3.72 | 0.7 |
| Organic Carbon (%) | 11.11 – 12.09 | 20 |
| Carbon to Nitrogen ratio | 9 | 10 – 25 |
| pH | 7.22 – 7.82 | 6.5 – 8.5 |

Characteristics of the compost produced by MSW (Contd...)

| Parameter | Amount available | SLS requirement |
|----------------------------|------------------|----------------------|
| 2. Heavy metals | | Maximum limit |
| Copper (ppm) | 217 – 297 | 400 |
| Zinc (ppm) | 420 – 648 | 1000 |
| Cadmium (ppm) | 2 | 10 |
| Lead (ppm) | 114 | 250 |
| Nickel (ppm) | 32 – 35 | 100 |
| 3. Physical | | |
| Colour | Brown – black | Brown – grey – black |
| Odour | Odourless | No unpleasant odour |
| 4. Micro biological | | |
| Fecal colliform | Nil | Free |
| Salmonella | Nil | Free |

Marketing

- Own marketing and institutional arrangement
- Own brands
- Qualified to receive SLS standard
- Cost is higher than market price- Fertilizer market in Sri Lanka is highly distorted
- Social benefits are high
- Need compensation to recover lost

Common Problems

- Non-separation of wastes at source
- Availability of long-term bio degraded
- Wet or too moist condition
- Lack of awareness and difficulties in motivating people living in shanty
- Fertilizer subsidy and macro level policy and other support from central government

Concluding Remarks

- i. PPP as a win-win model
- ii. Feasible solution to minimize growing garbage problem
- iii. MSW is suitable after sorting, shredding and screening
- iii. Behavioural change than technical and financial

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- v. Temperature and moisture should be maintained at the desirable level
- vi. Deficiencies of nutrients need to be supplemented.
- vii. Low levels of heavy metals and free of harmful pathogens
- viii. Vital need of policy support from the top

Thank You