

SOLID WASTE MANAGEMENT IN BHANPUR BHOPAL: STATUS AND NEED- A CASE STUDY

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ABSTRACT

Solid waste management is perhaps the most important service required by urban dwellers to maintain their quality of life. Huge amount of solid waste is generated in India, in Urban, municipal and industrial sectors which are finally disposed to the solid waste disposal sites. Bhopal is not an exception. The Bhopal city has 75 acres of land for waste disposal. The waste generated in the city is deposited at this landfill site which is situated in Bhanpura village at a distance of 16 km from the city. No scientific method of waste disposal is adopted. All waste is disposed off at the landfill. This present system of disposal by open dumping of waste creates a lot of environmental problems and public health hazards. Madhya Pradesh state Agro Industries Development Corporation limited has set up an Organic manure plant based on solid waste which produces organic manure from the solid waste which is being sold to the farmers of M.P. The organic manure is made in this plant through Bio-augmentation process. The non-biodegradable waste left after the segregation from the plant is used for land filling.

KEY WORDS- Solid waste, organic manure, bio-augmentation process, land filling, Segregation.

1. INTRODUCTION:

Solid waste comprises of all the wastes arising from human and animal activities that are normally solid and are discarded as useless. Solid waste consists of heterogeneous mass of discarded materials from commercial, industrial, agricultural, institutional and domestic waste.

Of the million tons of municipal solid waste produced in the city of Bhopal annually about 85 percent is land filled. Land-filling poses many problems, such as rising land filling maintenance and development costs, decreasing availability of landfill sites and at increasing risk that substances leaching from landfills may contaminate groundwater and surface water.

The proper disposal of urban solid wastes necessary for the preservation and improvement of public health. The growing population and increasing refuse in the states (solid, liquid, Gas) has started affecting adversely the ecological and environmental aspects of the city.

Urban population of Bhopal has increased rapidly by more than ten times in last four decades from 1,02,333 in 1951 to 14,33,875 inhabitants in 2001 as per provisional census figures. The city has some large industrial houses in and around its periphery. The main industries are BHEL, railway coach factory, mandideep industrial growth area, govindpura industrial area. Besides there are very small scale industries like sawmills, oil mills, printing presses and dairies are relatively unorganized. More than 600 MT of solid waste is generated in the city each day, 70% of which is collected through street sweeping and from the community waste storage sites. The city has 990 community waste storage sites. The solid waste management department of BMC has work force of 1900 persons for street sweeping. 300 for transportation and disposal of waste and 580 temporary labors for collection and transportation of waste.

Approximately 75 acres of land has been marked in the city for waste disposal. Waste generated in the city is deposited at this landfill site situated at Bhanpur.

2. PRESENT STATUS:

PHYSICAL CHARACTERSTIC OF WASTE

S.No.	CHARACTERSTICS	CONTENT	°A
1	PAPER		8.5
2	PLASTIC	0.5	3.5
3	METAL	0.4	1.5
4	Glass	0.3	1.0
5	Ash and fine earth	30	50
6	Total compostable matter	30	50
7	Moisture contents	20	30
8	Organic matter	20	45.5
9	Calorific value (KcliKg)	800	35.5

CHEMICAL CHARACTERISTICS OF CITY WASTE

S.no.	moisture	Ph value	Organic matter	carbon	nitrogen	phosphorus	potash	C/N ratio
1	26.94	7.9	32.76	21.72	0.70	0.65	0.98	28.57

MP state development corporation has set up a compost plant of 120 MT per day capacity at Bhanpur trenching ground. The plant run at 60% of installed capacity. The landfill site is situated at a distance of 16km from the city. No scientific method of waste disposal is adopted. All waste is disposed of at the landfill site by dumping unscientifically.

3. MATERIALS AND METHOD

Composting is a natural biological process. Carried out under controlled conditions, it hastens the decomposition of organic waste and reduces its volume, creating stable, soil-enriching humus. A basic understanding of the composting process will help you appreciate its beneficial effects on soil and crop growth. The microorganisms that function in composting have basic requirements.

To achieve an acceptable product, adequate amounts of air, water, and nutrients must be supplied. Proper control of surface area, temperature, and acidity is also necessary. The humification of organic material under most conditions occurs in three stages:

3.1 Mesophilic stage. This is the initial stage of decomposition, lasting for about a week, during which sugars and other simple carbohydrates are rapidly metabolized. This is an exothermic process and may cause an increase in temperature by 40°C.

3.2 Thermophilic stage. This is the second stage, lasting for about two weeks, during which the temperature may rise to about 50 to 75°C. Such a drastic increase in temperature is accompanied by the decomposition of cellulose and other resistant materials. It is important that the material be thoroughly mixed and kept aerated during this stage.

3.3 Curing stage. The temperature decreases during this final stage and the

Material being composted is recolonized by mesophilic organisms, which often produce plant-growth stimulating compounds. Mesophilic organisms are usually fungal-dominated and useful to restore bacteria dominated soils.

At the completion of this process, the plant or other organic parts (leaves, roots, etc.) are no longer identifiable in the compost. The humification of organic material is characterized by an increase in concentration of humic acids from approximately 4 to 12 percent, and a decrease in the C/N ratio from thirty in the original material to about ten in the final product

5. RESULTS AND DISCUSSION

Thus in this way, the compost plant established by M.P. State Agro Development corporation is producing bio-organic soil enricher and hence converting a huge mountains of solid waste to the most useful compost.

6. The advantages of the compost are

- 1) The compost contains all the necessary nutrients that a crop requires like nitrogen, phosphorus, calcium, magnesium, sulphur. Iron, zinc, copper, boron, cobalt etc.
- 2) It contains billions of soil beneficial microorganisms to impart Biological life to the soils.
- 3) It contains over 60% organic matter which ensures enough food for build up of desirable soil micro flora and fauna.
- 4) It improves porosity and water holding capacity of soils.
- 5) It also helps in suppression of plant root diseases like PYTHIUM, FUSARIUM, PHYTOPHTHORA, SCLEROTIUM and several species of Nematodes.
- 6) It increases the crop yield without deteriorating the quality. It improves the soil for sustainable crop production.
- 7) Rehabilitation and rejuvenation time for sick or degraded soils can be reduced substantially with the use of Agrich.

The compost plant is recovering 10-15% from the domestic waste and if the raw material is city garbage then the recovery is more than 25-30%. The total capacity of the compost plant is 120 MT per day but it is producing 10 MT per day according to the recent survey done. The non-biodegradable waste that is left during compost making is used for land filling.

Though the compost is produced from the solid waste at Bliampur but still the problem of solid waste disposal is not solved. The Bhopal Municipal Corporation has to pay attention on recycling of the solid waste materials. Segregation of recyclable wastage is not yet adopted and often found mixed with garbage disposed at different places. The system of door to door collection is not yet adopted. People of the city should also be aware of the segregation, recycling of waste and other waste minimization techniques. There is a need to develop waste recycling center (WRC). Such centers could develop simple processes for the segregation of the refuse and to produce the desired reclaimed products.

7 Conclusions

Composted municipal solid waste has been used successfully to improve the physical and chemical properties of soils and increase the growth of crops. The studies indicate that composted landfill waste has many potential uses in producing various agricultural crops. Compost could be prepared to meet consumer demands with minimal processing.

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