

Solid Waste Management In Rural Area (A Case Study for Shahapur Village)

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Abstract-The project details with the study of domestic and commercial waste collected from Gram Panchayat and treatment of solid waste. The sample waste collected from shahapur village and characterization for the same has been done and result has been provided (biodegradable and no biodegradable).The treatment methods are required to check and remove the materials which pose harm to the general public health. The objectives is to produced an environmentally solid waste from the disposal of reuse .Further the waste has been detailed and described analysisby segregation of solid waste. The sampling of domestic waste apartment have been done in different they too have and average data of measure parameter. The average value of biodegradable and non-biodegradable waste is found out. The landfilling and vermicomposting methods have been given.

Keywords-solid waste, management, composition

INTRODUCTION

Shahapur village is under Bhandara district region of Maharashtra state. The population as per information of authority of Gram Panchayat of Shahapur village is 4459.

The total solid waste generation is 442.42 kg approximate per day in Shahapur village and 161.483 tonnes of waste generation per year. From the solid waste generation per person is approximate 102.60gm/capita/day.

The activities associated with management of solid waste from the point of generation to final disposal can be grouped into five functional elements.

- Waste generation
- Collection
- Transportation
- Segregation and processing
- Disposal

SOLID WASTE

- The material which arises from various human activities and which is normally discarded as useless or unwanted it is called solid waste.
- It is also defined as non liquid , non soluble materials ranging from municipal garbage that contain hazardous materials.
- Solid waste also includes
 - Plastic waste
 - Paper waste
 - Glass
 - Wood
 - Metallic
 - Medicinal Waste
 - Cotton Waste
 - Vegetable Waste
 - Silt Waste

1. SOLID WASTE GENERATION IN SHAHAPUR VILLAGE

In shahapur village, waste is severing threat to the public health concern and cleanliness. Though, the form of solid waste generating in rural areas is predominantly biodegradable and non biodegradable yet it has become a measure problem to the overall sustainability of the ecological balance. It is estimated that, the large quantity of solid waste generation is due to biodegradable material i.e. vegetable, which will affect the major designing parameters.

As per our collection data and analysis the average solid waste generation is 442.48 kg /day.

Sr. no	Type of waste	Collection (kg/day)	% composition
1	Plastic	12.91	2.92
2	Paper	15.63	3.53
3	Glass	16.51	3.73
4	Wood	5.91	1.33
5	Metallic	13.5	3.05
6	Medicinal	3.69	0.84
7	Cotton	9.86	2.22
8	Vegetable	348.07	78.66
9	Silt and ash	16.40	3.70

2. PROBLEMS ASSOCIATED WITH SOLID WASTE GENERATION:

- 1) Improper collection and disposal system.
- 2) Unhygienic conditions are produced within the area.

3. SOLID WASTE MANAGEMENT PROCESSES

A) AT HOUSEHOLD LEVEL

a) Collection and Segregation :-

- This is to be done by generating awareness to sort out waste at the household level by keeping biodegradable and non biodegradable waste in separate colour bins of 5 to 10 liters capacity each (e.g. green colour bin for biodegradable waste and blue bin for non biodegradable waste) .
- Reusable segregated non biodegradable waste may be reutilized at household level.

b) Treatment/management of biodegradable waste household level waste:

Efforts should be made to treat the segregated bio degradable waste at the household level by adopting the following technologies and reuse the treated products:

b.1) PIT METHOD :

In this method two pit are formed of dimension 1m*1m*1m depending on availability of land . The aerobic microorganisms present in organic waste oxidize

it to carbon-dioxide and oxides of nitrogen . By which the manure will form with the help of cow dung and earth .

b) Treatment/management of household level non biodegradable waste:-

Some of the sorted out non bio degradable waste will be of recyclable type. Households may be encouraged to keep such waste separately and sell to the rag pickers and kabadiwalas and keep the non-recyclable products for subsequent transportation for community level management.

B) AT COMMUNITY LEVEL

a) Collection and Segregation:-

- 1) The each and every individual household should adopt at least two collecting bins. The namely green for collecting biodegradable waste (vegetable waste, garbage etc.) and blue for non-biodegradable waste (paper, plastic, cloth, metal, glass etc.).
- 2) The number of pairs of sanitation collection workers along with modern tricycle having separate chambers should be adopted.
- 3) The tricycle which going to collect waste at household will be of size (125*105*48 cm).
- 4) The each vehicle may be responsible for collection of waste for about 100 to 120 households.
- 5) The separate community bins will be provided at public places of the village. The size of the community bins will be approximately 100 litres each.
- 6) From the community bins, collection workers will collect the waste and transfer to treatment site.

B) Treatment of biodegradable waste at community level:-

B .2) VERMI COMPOSTING:-

Vermicomposting involves the stabilization of organic waste through the earthworm consumption which converts the waste material into worm casting. It is the result of combined activity of microorganisms and earthworms. The worm species that are commonly used are two exotic varieties (Eisenia Foetida and Eudrilus Mauriti). Eisenia Foetida (Red Earthworm) is mostly preferred because of its high multiplication rate and thereby converts the organic matter into vermicompost within 45-50 days.

METHOD:-

1. Make a basic bed of size (5.5m × 3.2m×1m) with one brick (19 cm × 9cm ×9cm) size containment all round the bed.
2. Alternately, brick tanks of same dimension having 2m ht. may be constructed. With this worm will not escape to the surroundings. The

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worms are also prepared from natural enemies.
 The tank maybe easily covered with a wire mesh.

3. Apply a layer of cow dung slurry on the base.
4. Put one inch sand on cow dung slurry plaster bed.
5. Put thick feeding material (cow dung / biodegradable organic matter such as leaves, kitchen waste) for earthworms in the ratio of raw cow dung; organic waste = 1:5.

4. RECYCLE AND REUSE

As efforts are made to segregate the non biodegradable and biodegradable solid waste into two portions namely recycle and reuse .Segregated waste need to be packed and stored in a safe place.

1. Recycling of paper waste can be done .Making pulp from waste paper is an old art. The process has now been refined.

2. The articles are so sturdy that they can be alternatives to wood to some extent. Hence it is also called as pep wood.

3. Segregated plastic waste need to be packed and stored in a safe place and sell to the local recyclers.

5. LANDFILL

In spite of composting, reuse and recycling, some waste remains untreated or unmanaged which requires final disposal, either by incineration or by land filling. Incineration is a technology where waste is burnt in a specially engineered machine called incinerator. Incineration is not simply burning, but complete combustion. Incinerators are considered to be causes of air pollution. This is not viable option for waste management. A landfill is properly designated area and used for the disposal of non –biodegradable and non-recyclable inorganic solid waste. Landfill is considered to be a viable option. The non-recyclable inorganic waste could be disposed by secured land filling operation.

RESULT AND CALCULATIONS

Cost required for the construction of four vermitanks along with shed.

1. Cost of four vermitanks = Rs. 30,300
2. Cost of Shed= Rs. 30,300
3. Cost of Community bins= Rs. 16,900
4. Labors required:-
 - a. For tricycle =3X200/year=219000
 - b. At disposal site=2X 200/year=146000
5. Total Cost =Rs. 365000 per year.

CONCLUSION AND FUTURE SCOPE

The rural India has tremendous wealth in terms of underutilized crop residues, animal excretion and domestic refuse normally known as waste. A systematic management and utilization approach applying the recent innovation will only help in maintaining rural areas clean but will also provide sufficient energy, manure and raw material for many industries. The sustainable waste management technologies have brought about a positive change in the rural people. But, we can attain a level of maturity in the areas of waste management in the rural areas.

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