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SOLID WASTE MANAGEMENT PRACTICES IN SUDERBANI TOWN OF RAJOURI DISTRICT

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ABSTRACT--*The Resource Conservation and Recovery Act (RCRA) 1976, which forms the basis of waste management programs in America defines solid waste as any garbage or refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, resulting from industrial, commercial, mining, and agricultural operations, and from community activities (UN Environmental Protection Agency). In India, management of such waste product is the domain of urban and rural local bodies. These bodies regulate the process of waste disposal from its inception to final disposal. However, there are many limiting factors that play a major role in making this whole process a challenging one. At municipal level solid or semi-solid domestic waste involves sanitary waste, commercial waste, institutional waste, catering and market waste and other non-residential wastes, street sweepings, silt removed or collected from the surface drains, horticulture waste, agriculture and dairy waste, treated bio-medical waste excluding industrial waste, bio-medical waste and e-waste, battery waste, radio-active waste generated in the area under the local authorities and other entities (SWM Rules, 2016).This papers aims to analyse various kinds of wastes generated in town of Sunderbani in Rajouri district and the issues involved with the disposal of such wastes.*

Keywords--*Waste, solid waste, waste management, local bodies.*

I. INTRODUCTION

Solid waste is basically any kind of useless or unwanted material that is generated as the result of anthropogenic activities. It can be classified into various categories depending upon its place of origin i.e. domestic waste, industrial waste, commercial waste, constructional waste etc. The waste generated in these places needs efficient disposal mechanism so that it may not contribute to the degradation of environment. Government of India is continuously working in this direction by launching flagship programs like Swach Bharat Mission,2014 that focuses on quality and sustainability of the sanitary service provision as well as emphasizes the commitment of every stakeholder to bring about a visible change in society. In India, the constitution as per Schedule 5B lays the duty of waste management on local bodies. However, the responsibility of waste management is to be shared among the government, communities and private sector.

Classification of solid waste:

TYPES OF SOLID WASTE	DESCRIPTION	SOURCES

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FOOD WASTE (GARBAGE)	Wastes from the preparation, cooking, and serving of food. Market refuse, waste from the handling, storage, and sale of produce and meats and vegetable	
RUBBISH	Combustible (primary organic) paper, cardboard, cartons wood, boxes, plastics, rags, cloth, bedding, leather, rubber, grass, leaves, yard trimmings Non-combustible (primary inorganic) metals, tin cans, metal foils dirt, stones, bricks, ceramics, crockery, glass bottles, other mineral refuse	Households, institutions and commercial such as hotels, stores, restaurants, markets,
ASHES AND RESIDUES	Residue from fires used for cooking and for heating buildings, cinders, clinkers, thermal power plants.	
BULKY WASTE	Large auto parts, tyres, stoves, refrigerators, others large appliances, furniture, large crates, trees, branches, palm fronts, stumps, etc.	
STREET WASTE	Street sweepings, Dirt, leaves, catch basin dirt, animal droppings, contents of litter receptacles dead animals.	Streets, sidewalks, alleys, vacant lots, etc
DEAD ANIMALS	Small animals: cats, dogs, poultry etc. Large animals: horses, cows etc	
CONSTRUCTION & DEMOLITION WASTE	Lumber, roofing, sheathing, scraps, crop residues, rubble, broken concrete, plaster, conduit pipe, wire, insulation etc.	Construction and demolition sites, remodelling, repairing sites.
INDUSTRIAL WASTE & SLUDGES	Solid wastes resulting from industry processes and manufacturing operations, such as food processing wastes, boiler house cinders, wood, plastic and metal scraps and shaving, etc. Effluent treatment plant sludge of industries and sewage treatment plant	Factories, power plants, treatment plants, etc.

	sludges, coarse screening, grit & septic tank	
HAZARDOUS & BIO-MEDICAL WASTES	Hazardous wastes: pathological waste, explosives, radioactive material, toxic waste etc.	Households, hospitals, institution, stores, industry, etc.
HORTICULTURE WASTES	Tree-trimmings, leaves, waste from parks and gardens, etc.	Parks, gardens, roadside trees

As per Solid Waste Management in Developing Countries by Bhide & Sunderasan, INSDOC April,1983.

Steps involved in solid waste management

Solid waste management involves following steps:

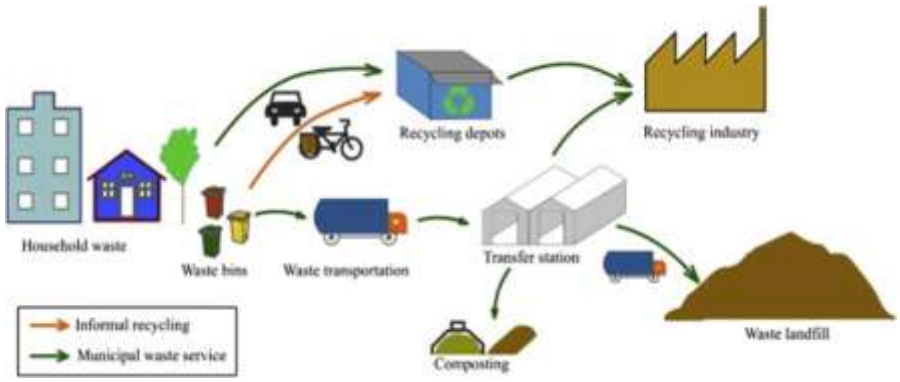
Step 1: Collection of waste products from the site of inception.

Step 2: Transportation of collected waste to the site of waste treatment.

Step 3: Recovery which involves segregation of waste into different groups based on nature of waste i.e. hazardous and non-hazardous waste.

Step 4: Recycling of waste.

Step 5: Analysis of waste.



Source: Zaman 2014

Demirbas (2011) describes waste management as a process by which wastes are gathered, transported and processed before disposal of any remaining residues. Similarly, Tchobanoglous et al. (1993) describe solid waste management as the effective supervision and handling, keeping, collection, conveying, treatment and disposal of waste in a manner that safeguard the environment and the public. Tchobanoglous et al. added that, solid waste management utilizes skills and knowledge from various discipline such as legal, financial, administration among others in the day to day running of waste management issues. Demirbas (2011) suggested that the main reason for managing waste is to ensure a safe environment.

II. STATEMENT OF THE PROBLEM

In Millennium development goals (United Nations,2000), Goal 7 talks about environmental sustainability. Sustainable environment needs efficient disposal of waste generated as the result of anthropogenic activities. Hence, it is important to have clear guide as to what can be included in waste, how that waste can be managed and what are the issues in management of such wastes. The present research focusses on the practices of waste management in Sunderbani town. Although a brief about definition and classification of wastes are also given in brief in this research paper.

III. METHODOLOGY

This paper is based on primary as well as secondary data. Although relied heavily on secondary data as case like this requires information from various government websites as well as reports for analysis and to draw vital conclusions. Some of the specific sources of data for the study includes books, journal articles, published papers, government reports, national and international organizations. This type of research approach is employed when a substantial amount of work has already been done on a particular research topic. It is for these reasons that the present paper utilized this approach to examine what different researchers have said on wastes, its classification and management and what are the various management practices that are being followed by the local people.

IV. IMPORTANT HIGHLIGHTS OF SWM RULES, 2016

Solid Waste Management Rules, 2016 came in supersession of MSW Rules, 2000 keeping in view the need to integrate all sections of society to achieve desired zero waste target with provisions laid down for the first time for waste generators. Under the new rules, carrying certain dos and don'ts for manufacturers, distributors, municipal bodies and panchayats.

1)Duties of waste generator to segregate and store the waste, not to litter or burn, and to prefer source waste processing by adopting any feasible technology like composting / bio methanation.

2)Manufacturers of plastic bags will have to make certain payments to states for its post-use disposal. The money, collected by the states from the manufacturers, will be given to local civic bodies and panchayats for taking multiple measures to dispose off plastic bags properly. Every local authority and village Panchayat to:

A) Facilitate construction, operation and maintenance of solid waste processing facilities and associated infrastructure with maximum utilisation of all components of solid waste and preference shall be given to decentralized processing such as Bio methanation plants, composting, waste to energy processes including RDF.

B) To organise awareness programmes for segregation of wastes and shall promote recycling or reuse of segregated materials with objective of "Zero waste" going to landfills.

V. SPECIAL PROVISIONS FOR HILLY AREAS AS PER SWM RULES, 2016

a. Construction of **landfill on hill** shall be **avoided.**

b. Convey the provisions of solid waste management under the bye-laws to all **tourists visiting the hilly areas** at the entry point in the town as well as through the hotels, guest houses or like where they stay and by putting suitable hoardings at tourist destinations.

c. May levy **solid waste management charges** from the **tourist** at the entry point to make the solid waste management services sustainable.

VI. METHODS OF WASTE MANAGEMENT IN SUNDERBANI TOWN OF RAJOURI DISTRICT

The various kinds of waste products discussed earlier are found in rural areas. Total amount of waste generated in Sunderbani is estimated to be 3.0 TPD (Annual report ULBS 2015-16).

However, self-disposal of waste in rural areas is mainly confined to household or domestic waste only. Domestic waste primarily is organic waste or biodegradable waste. Composting is one of the options for treatment of organic waste. In composting process, the organic matter breaks down under bacterial action resulting in the formation of humus like material called compost (Kurukshetra,2012). In Sunderbani, a dedicated vermicomposting plant has been set in Thandapani region. The fully functional project is a first of its kind in the state of J&K which involves the stabilization of organic solid waste through earthworm consumption for the conversion of organic material to worm castings. The project at village Thandapani in district Rajouri commenced on 1st February 2008 and was handed over to the Municipal Committee Sunderbani in June 2010. For this purpose, different methods are followed in rural areas. Particularly the methods of composting employed in Sunderbani are as mentioned below:

*1) **Pit method***

The site selected for the compost pit should be near to cattle shed and at a certain height so that no rain water gets in during the monsoon season. A temporary shed may be constructed over it to protect the compost from heavy rainfall. The pit should be about 1 m deep, 1.5-2.0 m wide and of any suitable length. The material brought from the cattle shed is spread and on each layer is spread slurry of dung made with 4.5 kg urine and 4.5 kg of inoculums taken from a 15-day-old composting pit. A sufficient quantity of water is sprinkled over the material in the pit to the wet it. The pit is filled in this way layer-by-layer and it should not take longer than 1 week to fill. Care should be taken to avoid compacting the material in any way. The material is turned 3 times during whole period of composting. At each turning the material is mixed thoroughly and moistened with water.The top is nicely filled ,pit is covered by dry soil and then plastered by mud paste.The manure becomes ready after about 150 to 180 days of plastering.

2) Heap method

During rainy seasons or in regions with heavy rainfall the compost may be prepared in heaps

above ground. The heap should be about 2 m wide at the base, 1.5 m high and 2 m long. The sides are tapered so that the top is about 0.5 m narrower in width than the base. A small bund is sometimes built around the pile to protect it from wind which tends to dry the heap. The heap is usually commenced with a 20 cm layer of

carbonaceous material such as leaves, hay-straw, sawdust, wood chips and chopped corn stalks. This is then covered with the 10 cm of nitrogenous material such as fresh grass, weeds or garden plant residues, garbage, fresh or dry manure. The pile is sometimes covered with soil or hay to retain heat and is turned at 6 and 12-weeks-interval. This method is very convenient and is generally followed by rural people in Sunderbani for disposal of waste in and around their household and agricultural fields.

3) Vermicomposting:

It is the method of preparing compost with the use of earthworms. Decomposable organic wastes such as animal excreta, kitchen waste, farm residue are commonly used as composting material. In general, animal dung mostly cow dung and dried chopped crop residues are the key raw materials. Mixture of leguminous and non-leguminous crop residues enriches the quality of vermicompost. A good quantity of vermicompost (800-1000 kgs) is being produced by solid waste management plant in Thandapani region.

However, all these methods are best suitable for disposal of organic household and agricultural waste while the other wastes which are inorganic, non-biodegradable waste can be disposed off efficiently using landfill method. A landfill site is also allotted in the Thandapani region where wastes are segregated and disposed off accordingly.

VII. CONCLUSION

As per the analysis of data above it can be concluded that the region of Sunderbani has immense potential of efficient disposal of the waste available in the form of agricultural, horticultural and other household waste .The end product i.e the organic manure is a rich source of macro as well as micronutrients.The organic manure can solve the various problems which arise due to excessive use of chemical fertilizers.Also this will not only keep the area clean as per the vision of Clean India, Green India but can also provide clean energy in the form of bio gas that can be utilised to cater the growing needs of energy requirement in fast urbanising area of Sunderbani. Hence, public participation along with government initiatives can best serve the purpose.

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