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Research Paper | Environment

Solid Waste Management in Gwalior

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ABSTRACT

The solid waste includes glass containers and bottles, crokeries, plastic containers, polythene and other packing material that are used and then thrown away as garbage. These pile up at public places and cause obstruction in daily life. Besides these there are other used things like automobile spares, machines, cycle parts etc. that are thrown as junk. The wastes from building materials (during construction and demolition), sludge, dead animal skeletons, heaps of crops residue also contribute to solid waste. For waste management we stress on three R's- reduce, reuse and recycle before destruction and safe storage of wastes.

KEYWORDS: Crokeries, Junk, Demolition, sludge, Heaps of crops residue and Obstruction.

Introduction

Solid waste may be defined as garbage from homes, waste resulting from commercial and industrial activities, and waste substances created by agriculture, mining and water purification plants. Every kind of unusable, undesirable or discarded materials produced in the course of daily human activities and not soft enough to be regarded as liquid waste falls in to the category of solid waste.

There are a number of concepts about waste management which vary in their usage between counties or regions. Some the most general, widely- used concept include.

Waste hierarchy-

the waste hierarchy refers to the "3rs" reduce, reuse and recycle, which classify waste management strategies according to their desire ability in terms of waste minimization. The waste hierarchy remains the cornerstone of most waste minimization strategies. The aim of the waste hierarchy is to extract the maximum particles benefits from products and to generate minimum amount of waste.

Extended producer responsibility-

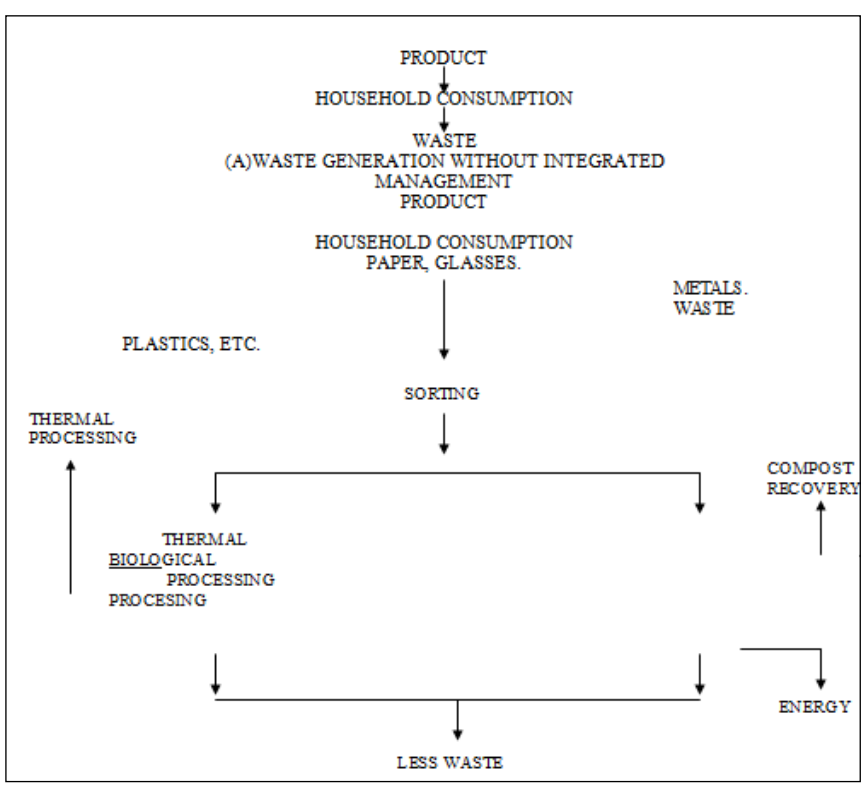
Extended producer responsibility (EPR) is a Strategy designed to promote the integration of all costs associated with products thorough out their life cycle (including end – of – life disposal costs) in to the market price of the product.

Polluter pays principle-

the polluter pays principle is a principle where the polluting party pays for the impact caused to the environment.

Objective of Solid Waste Management

The objective of solid waste management is to reduce the quality of solid waste off on land by recovery of materials and energy from solid waste. A simplified chart showing how waste reduction can be achieved from household waste is shown given below. Such techniques and management programme have to be applied to each and every solid waste generating activity in a society to achieve over all minimization of solid waste.



PRINCIPLE OF MUNICIPAL SOLID WASTE MANAGEMENT

Municipal solid waste management involves the application of principle of integrated solid waste management (ISWM) to municipal waste. ISWM is the application of suitable techniques, technologies and management programs covering all types of solid waste from all sources to achieve the twin objective of (a) waste reduction and (b) effective management of waste still produced after waste reduction.

(a) Waste reduction-

An important method of waste management is the prevention of material being created, also kwon as waste reduction. Methods of avoidance include reuse of second- hand products, repairing broken items instead of buying new, designing products to be refillable or reusable (such as cotton instead of plastic shopping bags), encouraging consumers to avoid using disposable products (such as disposable cutlery) removing any food/liquid remains from cans, packaging and designing products that useless material to achieve the same purpose

(b) Effective management of solid waste –

Effective solid waste management systems are needed to ensure better human health and safety. They must be safe for workers and safeguard public health by preventing the spread of diseased. In addition to these prerequisites, an effective system of solid waste management must be both sustainable for

1 Environmentally sustainable:-

It must reduce, as much as possible, the environmental impacts of waste management.

2 Economically sustainable:-

It must operate at a cost acceptable to community. An environmentally and economically sustainable solid waste management system is effective if it follows an integrated approach i.e. deals with all types of solid waste materials and all sources of solid waste.

CATEGORIES OF SOLID WASTE

Solid waste, generally and traditionally have certain categories depending upon their quantity and quality and these can be classified as below:-

(a) Municipal waste:-

Municipal solid waste (MSW), also called urban solid waste, is a waste type that includes predominantly household waste (domestic waste) with some times the addition of commercial waste collected by a municipality with in a given area. They are in either solid of semi solid form and generally exclude industrial hazardous waste. The term residual waste relates to waste left from house hold sources containing materials that have not been separated out of sent for reprocessing.

(b) Industrial waste:-

Industrial waste is a type of waste produce by industrial activities, such as that of factories, mills and mines. It has existed since the outset of the industrial revolution. Toxic waste and chemical waste are two designations of industrial waste.

(c) Agricultural waste:-

This type of waste is biodegradable waste that can be comprised of agricultural residue, garden of park waste, such as grass of flower cutting, crop residue and hedge trimmings, as well as domestic and commercial food waste.

(d) Construction and demolition waste (CND waste):-

It consists of unwanted material produced directly or incidentally by the construction of demolition industries. This includes building material such as insulation, nails, electrical wiring and rebar, as well as waste origination from site preparation such as dredging materials, tree stumps and rubble.

(e) Commercial waste:-

It consists of waste from premises used wholly or mainly for the purposes of tread of business of for the purpose of sport, recreation, education or entertainment but not including house hold, agricultural or industrial waste.

Sources of solid waste:-

Major sources of solid waste come from the following:-

(a) Domestic waste including house hold waste
(b) Shops
(c) Offices
(d) Restaurants
(e) Hospitals
(f) Educational institution and
(g) Small scale industries

Observations

CHARACTERIZATION OF SOLID WASTE IN GWALIOR

Parameter	Average
Bulk density,kg/m3	495.0
Organic matter	50.60
Paper	2.90
Rubber synthetic & leather	1.60
Plastics	4.70
Clothes	0.90
Glass	1.50
Metal	1.80
Inorganic matter	36.00
Gross calorific value, kca/kg	875.00
pH	7.70
Electrical conductivity, mhos/cm	4.80
Total water soluble solids, mg/gm	50.67
Loss on ignition	23.42
Moisture	39.10
Organic carbon	11.37
Organic matte	19.60
Total kjeldhal nitrogen	0.57
C/N ratio	19.94
Total phosphorous, mg/gm	17.20
Total potassium, mg/gm	19.40
Zinc as Zn, mg/gm	0.25
Chromium, mg/gm	0.14
Cadmium as Cd, mg/gm	0.07
Mercury, ppm	ND

Table 1 :- Physical characteristics of Municipal solid waste in Gwalior

COMPOSITION OF WASTE

M.P. state agro development corporation has ser up a compost plant of 120 MT/is run at 60% of installed capacity. The company pays lease rent of Rs. 10,000 per year for 20,000 sq Mt. of land given for the compost plant by the corporation.

DISPOSAL OF WASTE

The city has 75 acres for waste disposal. The waste generated I the city is deposited in the city is deposited at this land fill site. The land fill site is situated in Bhanput village at distance of 16 kms from the city. No scientific method of waste disposal is adopted. All waste is disposed of at the land fill site adopting of crude dumping of waste

IMMEDIATE ATTENTION OF SOLID WASTE MANAGEMENT IN GWALIOR

1. Proposed system:-

the following systems are proposed by the Municipal corporation for Gwalior for the minimization of solid waste generated from different sources. Table is given below:-

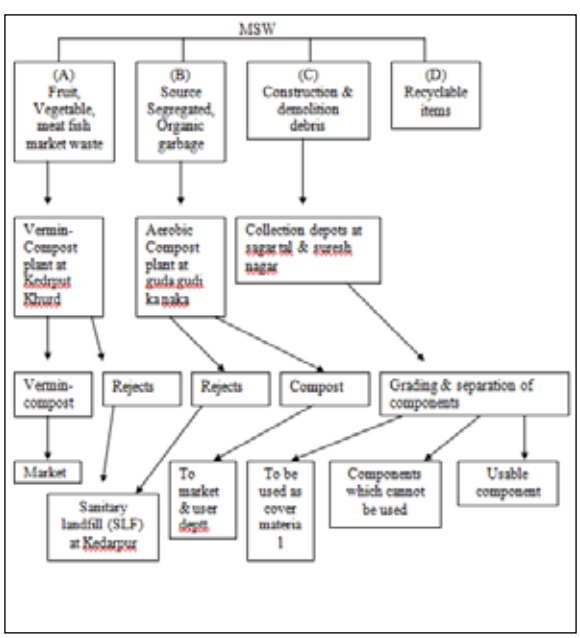
S .No.	Waste Type	Primary Storage	Primary collection	Transportation	Treatment & Disposal
1	House-hold waste	Segregated storage	By private sweepers using cycle carts	By dumper placer	Sent to compost pant at gudagudi ka naka
2	Commercial/ institutional waste	In 50 it. Capacity litter bins	By private sweepers to be arranged by shopkeepers/ institutions	-do-	-do-
3	Construction/ demolition debris	At construction site	By tractor trolley	Tractor trolley	Can be used for filling of low lying areas
4	Garden waste	To be neatly heap	Handcrafts	Tractor trailer	Vermicomposting at Kedarpur
5	Dry leaves	To be sweep & put in heap	-do-	-do-	-do-
6	Bio-medical waste	Colored bag	-do-	By three wheeler	Common treatment/disposal facility at Kedarpur Khurd
7	Carcass	-do-	-do-	To be arranged by private contactor	CPU at Laskmiganj

2. Treatment & resource Recovery:-

Due to the constraints in the availability of suitable land for disposal of waste and the steadily rising cost, the system for waste management has to be designed in such a manner that land requirement can be minimized. This can be achieved by resorting to resource recovery/ treatment systems, which would reduce the quantum of waste, required to e land-filled.

Since Gwalior already has a compost plant of 120 TPD, it is proposed to (a) revive the existing compost plant and (b) to provide a vermin compost plant of 20 TPD input garbage capacity.

MUNICIPAL SOLID WASTE MANAGEMENT GENERAL-FLOWSHEET FOR GWALIOR



The National Backdrop

50 year of waste generation		
	1947	1997
Urban population (millions)	56.9	247
Daily per capita waste generation (grams)	295	490
Total waste generation (million tones)	6	48
Area under land fills (thousand of ha)	0.12	20.2
Annual methane emission (tones) from land fills sites	0.87	7.1

3Studies reveal that only about 7 to 15% of the waste is recycled. However, it is difficult to establish the quantum of waste recovery. There are various types of waste which are recycled to produce different products. The process of recycling and its environmental implications are yet to be studied in detail. On one hand recycling helps in reducing the quantity of waste but, on the other it may invite some of the pollution problems. There is a need to develop waste recycling centre (WRC). Such centres could develop simple processes for the segregation of the refuse and to produce the desired reclaimed products.

Current Status		
CITIES	CLASS 1	CLASS 2
No. of cities	299	245
Total Population	1281138644	22375588
Waste generation (MT/d)	48134	1454
Mode of collection	CLASS 1	CLASS 2
Manually	50%	78%
Trucks	49%	21%
Others 1% 1%	1%	1%
Disposal	CLASS 1	CLASS 2
Dumping	94%	93%
Composting	5%	6%
Other	1%	1%

Conclusion

Now a days integrated solid waste is a global concern. These wastes are generated by human for daily needs. When these products are accumulated in very high amount, it creates much harmful & toxic effect to human health.

So, these wastes are properly managed. Common people are aware. This solid waste are disposed properly following rules & law of the govt. when solid waste are managed our environment are completely safe to its hazardous effect.

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