

BEST OUT OF WASTE- A REVIEW ON SOLID WASTE

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ABSTRACT

Today world is suffered by some major problems. Production of waste is one of them. Waste is nothing but the matters, which are useful in past but, useless in present. These waste can made useful again by adopting some developed techniques like recycling. This can help us to prevent the production of waste and thereby further future problems. It can also help in production of some useful materials like energy production, economy of a country, good environment etc. Getting best out of waste can be done on individual as well as on commercial basis. The materials like steel, paper, aluminum, glass, plastic etc. which are termed as waste after its purpose is over, can further be used for same or different purpose by practicing three Rs i.e. Reduce, Reuse and Recycle. This results in good environment, economy and thereby a good, developed community. This also solves the problem of space for land filling.

“If I have one dollar and you have one dollar, and you give me one dollar and I give you one dollar, we will both have one dollar”. However, “if I have one idea and you have one idea, and you tell me yours and I tell you mine, we will both have two ideas.” That is the principle behind getting “BEST OUT OF WASTE”. This paper is trying to cover the ways for getting “BEST OUT OF WASTE”.

Keywords : Solid waste, Waste Management, Reuse, Recycling, Resin codes

1. INTRODUCTION :

A waste is anything that is being discarded or can no longer be used for its original purpose. Something may be a waste if it no longer has a dollar value or if it is used carelessly, spilled, burned, buried or poured down the drain. Waste Management - Managing a waste refers to any kind of waste storage, treatment or disposal activity. Waste management include burning a waste, burying a waste, or storing a byproduct or sludge. The Solid Waste Management (SWM) is very important to each and every city otherwise there are many health effects. The separation

of solid waste from municipal waste in the right way can increase the health of city as well as nation.

2. WAY TO GET BEST OUT OF WASTE :

2.1 Waste To Energy :- Waste-to-energy plants burn garbage and use the heat energy released during combustion to make steam or electricity. They turn garbage into useful energy.

2.2 Product Stewardship :- Product stewardship is a product-centered approach to environmental protection. Also known as extended product responsibility (EPR), product stewardship calls on those in the product life cycle--manufacturers, retailers, users, and disposers--to share responsibility for reducing the environmental impacts of products.

2.3 Recycling: -Recycling as much as possible, including buying products with Recycled content.

3. WASTE MANAGEMENT HIERARCHY

The solid waste management hierarchy (shown in the pyramid below) ranks the most preferable ways to address waste. Source reduction or waste prevention, which includes reuse, is the best approach, followed by recycling. Waste that cannot be prevented or recycled can be incinerated or land filled according to proper regulations.

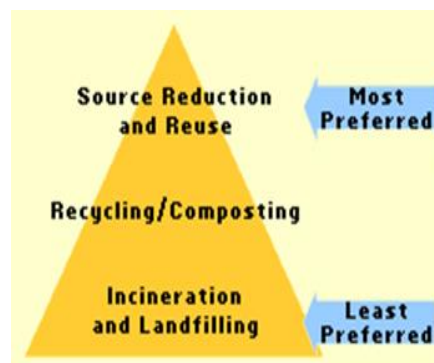


Figure 1 : Solid Waste Management Hierarchy

3.1 Three R's :-

3.1.1. Reduce - Source reduction, often called waste prevention, means consuming and throwing away less. Source reduction includes purchasing durable, long-lasting goods and seeking products and packaging that are as free of toxics as possible. It can be as complex as redesigning

a product to use less raw material in production, have a longer life, or be used again after its original use is completed. Because source reduction actually prevents the generation of waste in the first place, it is the most preferable method of waste management and goes a long way toward protecting the environment. e.g. Reduction in the amount of raw materials used to make plastic is the first step in minimizing overall plastic waste. Strength and lightness of plastics allow manufacturers to do this without affecting the quality of product.

3.1.2. Reuse - Reusing items by repairing them, donating them to charity and community groups, or selling them also reduces waste. Use a product more than once, either for the same purpose or for a different purpose. Reusing, when possible, is preferable to recycling because the item does not need to be reprocessed before it can be used again. e. g. Reusing plastic items gives them a longer life and reduces total volume of waste. This has been successfully achieved with the introduction of refill packs for detergents, which has resulted in a 70% reduction in materials used.

3.1.3. Recycling- Recycling turns materials that would otherwise become waste into valuable resources and generates a host of environmental, financial, and social benefits. After collection, materials (e.g., glass, metal, plastics, and paper) are separated and sent to facilities that can process them into new materials or products.

4. METHODOLOGY :-

4.1 Recycling Loop -

Recycling loop is the circular journey during which waste are processed and manufactured into new recycled-content products, which are sold in stores to consumers, who can then repeat the process. Below is a brief summary of the three phases of the recycling loop.



Figure 2: Recycling Loop

Step 1. Collection and Processing

After recyclables are collected at the curb or from a drop-off center, haulers take them to materials recovery facility, where they are sorted and baled.

Step 2. Manufacturing

Once they are cleaned, separated and baled, recyclables are remanufactured into new products. Many consumer products, such as newspapers, aluminum and steel cans, plastic containers and other plastic products, and glass bottles, are now manufactured with total or partial recycled content.

Step 3. Purchasing Recycled Products

Purchasing recycled products completes the recycling loop. By "buying recycled," governments, businesses, and individual consumers each play an important role in making the recycling process a success to learn more about recycling terminology and to find tips on identifying recycled products.

4.2 TYPES OF RECYCLING

- 1. Mechanical recycling:** - It requires large amounts of clean waste materials with similar properties. This is suitable for industrial waste.
- 2. Thermal recycling:** - It could make use of waste products to create an energy source that would conserve fossil fuels and landfill space, while reducing the greenhouse gases emitted by decaying refuse in landfill. Thermal recycling, which does not always demand pre sorting of waste, involves the collection of solid waste to be burned at high temperatures to produce energy for power and heating.

4.3 BENEFITS OF RECYCLING

- 1. Environment:** Saves energy and prevents pollution caused by the extraction and processing of virgin materials and the manufacture of products using virgin materials. It decreases or may prevent emissions of many greenhouse gases that contribute to global climate change and water pollutants. Also reduces the need for land filling, incineration and conserves natural resources such as timber, water, and minerals.
- 2. Economic:** Communities can make money and avoid high disposal costs by selling certain recyclable materials. Recycling creates jobs and generates valuable revenue. It supplies valuable raw materials to industry.

3. Community: Community can conserve resources for our future by recycling. It creates employment for needy persons.

4.4 MATERIALS THAT CAN BE RECYCLED

- 1. Paper :** Newspaper, office paper, cardboard, and other paper types can be recycled.
- 2. Steel :** Many steel products manufactured contain a high percentage of recycled steel. Some are even made from 100 % recycled steel. Soup cans and other food steel packaging containers, as well as steel aerosol cans, can be recycled.
- 3. Glass:** Glass food containers, such as jars and bottles for pickles, juice, jam, or wine, are usually recyclable in many communities.
- 4. Aluminum:** Almost all recycling programs include aluminum beverage cans. One of the most highly recycled products; aluminum cans are made into new cans in as little as 90 days after they are collected. Some communities also collect aluminum foil for recycling.
- 5. Nuclear waste:** Some types of nuclear low-level wastes include including radioactive material from research activities, medical wastes, and contaminated machinery from nuclear reactors.
- 6. Yard Trimmings/Food Scraps:** Many communities have regular or seasonal programs in place to collect yard trimmings, such as leaves, branches, and grass clippings, from residents. Other communities encourage residents to practice backyard composting for yard trimmings and food scraps.
- 7. Plastics :-** Once hailed as 'wonder material', plastic is now a serious worldwide environmental and health concern, essentially due to its non-biodegradable nature.

a) Source of generation of waste plastics :

- i. Household – carry bags, bottles, container, trash bags etc.
- ii. Health and medicare – disposable syringes, glucose bottles, blood and uro bags, intravenous tubes, catheters, surgical gloves etc.
- iii. Hotels and caterings – packaging items, mineral water bottles, plastic plates, spoons, glasses etc.

b) Ill effect of plastic: Conventional plastics, right from their manufacture to their disposal are a major problem to the environment as below...

1. Conventional plastics have been associated with reproductive problems in both wildlife and humans such as decline in human sperm count and quality, genital abnormalities
2. Careless disposal of plastic bags chokes drains, blocks the porosity of the soil and causes problems for groundwater recharge.
3. Plastic disturbs the soil microbe activity, and once ingested, can kill animals.
4. Plastic bags can also contaminate foodstuffs due to leaching of toxic dyes and transfer of Pathogens.




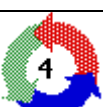

That's why more than 50% of the plastic waste generated in the country is recycled and used in the manufacture of various plastic products. Though only a small percentage lies strewn, this portion is of concern as it causes extensive damage to the environment.

- Recycling plant uses six steps to turn plastic trash into recycled plastic:
 1. **Inspection-** Workers inspect the plastic trash for contaminants like rock and glass and for plastic that the plant cannot recycle.
 2. **Chopping and washing-** The plastic is washed and chopped into flakes
 3. **Flotation tank-** If mixed plastics are being recycled, they are sorted in flotation tank, where some types of plastics sink and other floats.
 4. **Drying-**Plastic flakes are dried in a tumble dryer.
 5. **Filtering-** The molten plastic is forced through a fine screen to remove any contaminants that slipped through washing process. The molten plastic is then formed into strands.
 6. **Pelletizing-** The strands are cooled in water, then chopped into uniform pellets, manufacturing companies buy the plastic pellets from recyclers to make new products, recycled plastic also can be made into flowerpots, lumber and carpeting.

5. OTHER RECYCLED PLASTIC PRODUCTS ARE,

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|--|-------------------------------------|
| - Walkways, | - Seating and benches |
| - Fishing platforms | - Children's play items |
| - Harbor walls | - Signage |
| - Bollards | - Litter bins |
| - Decking | - Path edging |
| - Specialist sports items e.g. golf tees | - Fencing – including post and rail |

Table 1 : Plastic Identification codes

Resin Code	Resin Name	Common Uses	Examples of Recycled Products
	Polyethylene Terephthalate (PET or PETE)	Soft drink bottles, peanut butter jars, salad dressing bottles, mouth wash jars	Liquid soap bottles, strapping, fiberfill for winter coats, surfboards, paint brushes, fuzz on tennis balls, soft drink bottles, film
	High density Polyethylene (HDPE)	Milk, water, and juice containers, grocery bags, toys, liquid detergent bottles	Soft drink based cups, flower pots, drain pipes, signs, stadium seats, trash cans, re-cycling bins, traffic barrier cones, golf bag liners, toys
	Polyvinyl Chloride or Vinyl (PVC-V)	Clear food packaging, shampoo bottles	Floor mats, pipes, hoses, mud flaps
	Low density Polyethylene (LDPE)	Bread bags, frozen food bags, grocery bags	Garbage can liners, grocery bags, multipurpose bags
	Polystyrene (PS)	Video cassette cases, compact disk jackets, coffee cups, cutlery, cafeteria trays, grocery store meat trays, fast-food sandwich container	License plate holders, golf course and septic tank drainage systems, desk top accessories, hanging files, food service trays, flower pots, trash cans

Source : https://en.wikipedia.org/wiki/Plastic_recycling

CONCLUSION:-

Production of huge amount of waste is a big social problem that we are facing today. Instead of disposing these wastes, if we are able to convert them into useful materials then it is very much beneficial not only for present generation, also for future generation. Hence, we can say

“Recycling Is Today’s Challenge, Tomorrow’s Reward”. The best, which we can get, is advantageous in social, environmental and economical manner. Hence, it is responsibility of everyone to contribute to this work at own level. Our aim must be to get “BEST OUT OF WASTE.”

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