

A Research Paper on Solid Waste Management

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ABSTRACT: *Solid garbage is the unwanted, harmful, and wasted substance arising from day-to-day civic events. Management of the solid wastes can be described as the methodology of managing solid waste generation, storage, collection, transport, treatment and disposal. A country's growth status can be defined in several forms. As regards its effect on solid waste management, the growth status of this publication is classified according to the availability of economic capital and the degree of industrialization development. Economic growth status is more a function of the new economic environment than of the current economic situation (recession vs prosperity). The degree of industrialization is expressed in terms of the extent to which technical tools are mechanized and usable. The words "developed" and "industrialization" are often used interchangeably, justifiably or not. In so far as solid waste management is concerned, it is difficult to impose a specific structural definition due to regional shifts in the degree of growth within each region. For example, in a developed country, a large metropolitan population (typically the provincial capital and surrounding area) might be at a level of growth well above that of the rest of the nation. On the other hand, such groups are not absolutely resistant to the restrictions enforced by the nation's position. It is important to remember that while the material provided in this paper refers specifically to developing nations, some of it can even refer to a transforming country, or even to an advanced or developed world. The human-environmental relationships are a dynamic phenomenon. The ability of the Planet to sustain human beings is determined not only by the specific food needs, but also by our resource use rates, the volume of waste production, the technology employed in various applications. With the population growth and the growing trend of resource use, we have in effect exceeded the planet's carrying power.*

KEYWORDS: *Industrialization, prosperity, recession, solid garbage, waste management, landfill, Environment.*

INTRODUCTION

The natural reserves of the Planet are not enough now to support human demands and economic activities. Global warming has demonstrated the risk of overstepping the ability of the Planet to consume our waste goods. However, the implications of increasing the sufficient availability of vital materials and the degree to which we have already advanced in this chain are not well known, and are instead viewed with an economic and manufacturing perspective. The ability of the Planet to consume our waste is a significant factor that drives the development of waste management technologies [1].

Land-filling is perhaps the oldest method in coordinated waste management. Until the 1970s, land-filling was practiced as an unceremonious waste disposal in any convenient location without taking into account health, welfare, environmental conservation or cost efficiency. Yet now the situation has shifted not because of the understanding and value of the handling of waste, but also other matters [2]. Availability of landfill capacity in urban environments is getting frightening and a very bad problem. The problem causes political incentive to redirect waste to many other methods for treatment. Currently, the trend of sophisticated waste management schemes of countries is to reduce waste that ends up in landfills. In Hong Kong, for example, the initiative's driving force was the lack of landfill capacity, instead of resource use.

In relation to recycling, the growing waste-to-energy systems and advances in technologies and emissions reduction tools further decreased the volumes entering landfills primarily in Europe, while in the future it may be a model for other nations. It refers in particular to those regions where seeking suitable landfill capacity is a problem and those regions where these solutions are still not completely applied. This should also be anticipated that in the near future, better and environmentally efficient product design will be possible and will transform the face of energy harvesting systems. Given risks, land-filling is unavoidable and the final inert fraction always has to be buried. The construction, maintenance and management of landfills is being constantly investigated and new methods are being implemented to reduce air and water emissions [3].

The accumulation of landfill gas offers room for green-house gas (GHG) reduction. Yet the economics of extracting waste and recycling electricity remain to be convincingly illustrated. Since, due to partial oxidation in the landfill, the average methane content of landfill gas is around fifty percentage and most of the gas produced in landfills is lost to the environment, even with an efficient gas collection system [4]. This low methane level in the landfill gas necessitates vital upgrade activities that jeopardize the advantages of collecting landfill gas.

Solid waste management is a term that refers to the storage and disposal process for solid wastes. This also provides recycled options for things that don't belong to trash or waste. As long as humans have lived in villages and rural areas, the problem has been trash or solid waste. The solid waste management used in solid, liquid, and gaseous waste disposal [5]. It is known as a realistic method of disposal of certain toxic waste products (such as medical organic waste). Incineration is a controversial waste disposal process, owing to concerns including gaseous pollutant pollution. The most significant justification for recycling waste is to protect the environment and the public health. Garbage and waste can pollute the air and water. It is also recognized that decaying garbage releases poisonous gases that interact with the atmospheric air and can cause respiratory issues in people.

Categorization and comparison of solid industrial waste based on the thermo-chemical properties. Municipal solid waste (MSW) has usually been divided into six categories: food residues, wood waste, pulp, textiles, plastics, and rubber. Products may be further divided into subgroups within each grouping [6]. Properly regulated waste will support the society economically and socially through recycling and, where possible, reusing waste. Solid waste treatment main elements include on-site managing, processing and storing; garbage collection; waste management transfer and transport, reduction and final disposal. Solid waste involves trash, building rubble, industrial refuse, sewage or waste disposal sludge or air quality control plants, among the other recycled items [7].

The practices related to urban solid waste management from the point of generation before final disposal can be divided into the six functional components.

- Generation of waste
- Storage of waste
- Collection of waste
- Transportation of waste
- Process of segregation
- Disposal of waste

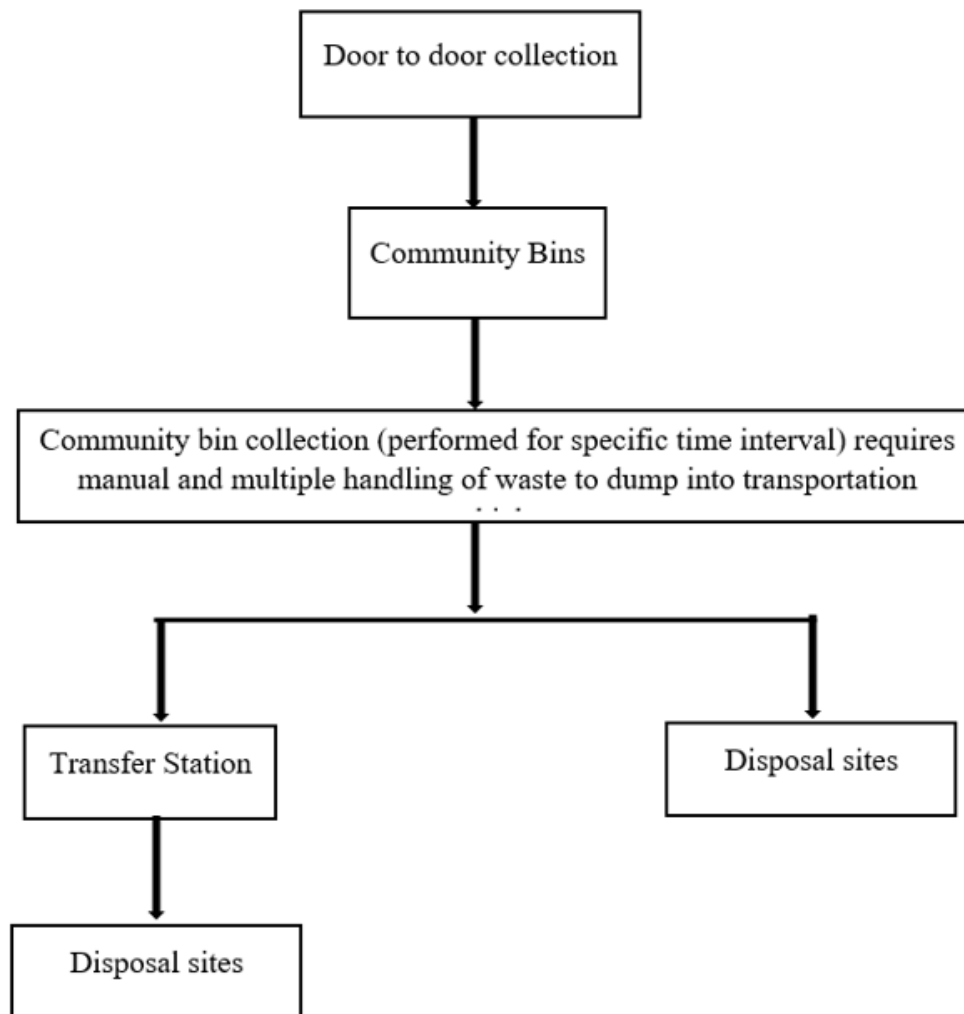
Solid Waste Collection:

Figure 1:- Flow chart illustrating collection of solid waste

Integration of waste management:

Integrated waste management is a framework for the design and development of modern waste management and disposal systems and the study and optimization of current waste disposal systems. Within this definition it is important to examine all technological and non-technical elements of management schemes together [8]. Currently, with the introduction of new legislation, laws, and waste management sector as an enterprise, non-technical elements like public involvement and awareness are necessary and essential to the successful adoption of many recycling and recovery schemes. A classic example is the general resistance to incineration services around the world largely due to the perception that incinerators are the origin to dioxins, which also underlines the efficiency of incinerators in reducing waste quantity and waste disposal levels. Therefore, in managing pollutants reaching the atmosphere, advances in emissions abatement mechanisms and gasification techniques [9].

More critically, for the effective implementation of the new waste treatment systems, engaging the public in such reviews and informing them about the needs and concerns of waste treatment and disposal in a specific region or country. Today, cooperation between the state, business, and informal sectors is apparent, and it is optimal to coordinate environmental education and public participation for successful implementation through one of these networks [10][11]. As stated earlier, the Planet's carrying capacity is continuously threatened as the environmental protection is paying the price for economic activities. Therefore, resources are rising while

competition is growing with the environment and consumption being changed. As the new waste management elite maintains, the first step to achieving waste reduction is citizen engagement and improving their view, whereas recycling and reuse often need technical assistance. Energy and nutrient regeneration are focused on science though their adoption may be a target of NIMBY syndrome if not properly tackled [12-14].

Modern integrated waste disposal is thus the need for time, whereas sustainability needs to be incorporated into all materials, taking into account the material supply and demand. It's unavoidable that waste is tool now and it's the duty of people if people use it. As is obvious from past experience, if people really find the Planet as "our home" it is not convenient, but not difficult.

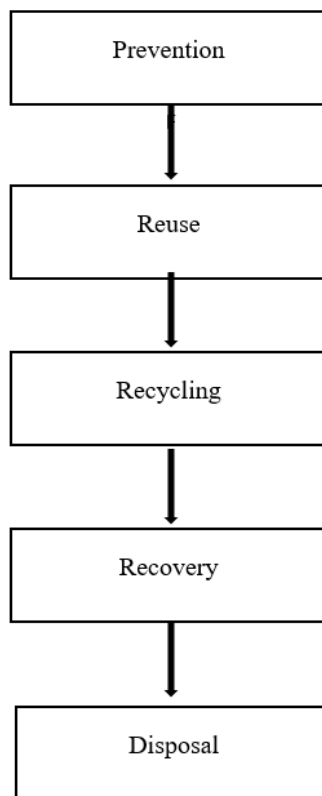


Figure 2:- Block Diagram illustrating solid waste management

The waste management hierarchy witnessed changes in the recent decade and currently recycling and recovery is focused more than the landfilling [15]. Sustainable use of Resources and management of solid waste is clearly depicted in Figure 2.

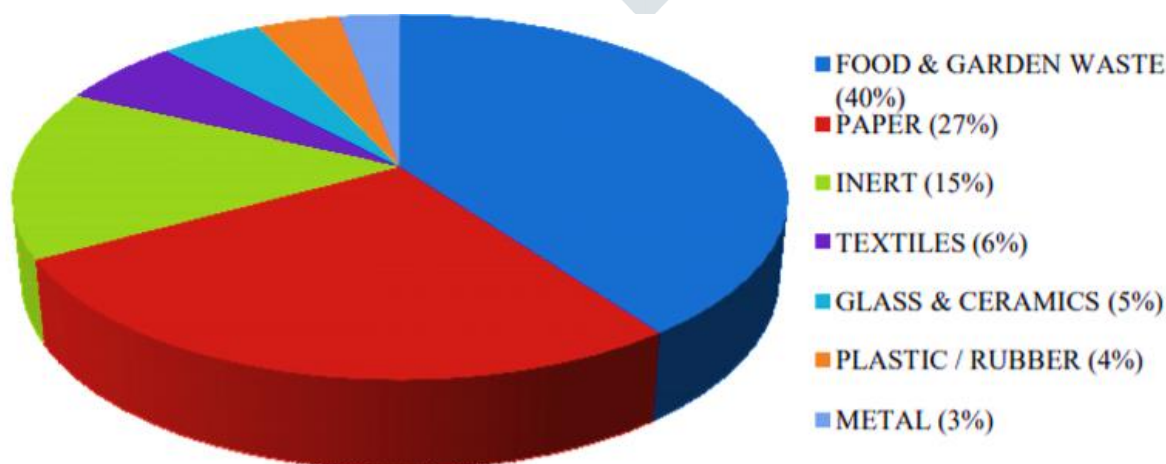


Figure 3:- Composition of Municipal solid waste in India

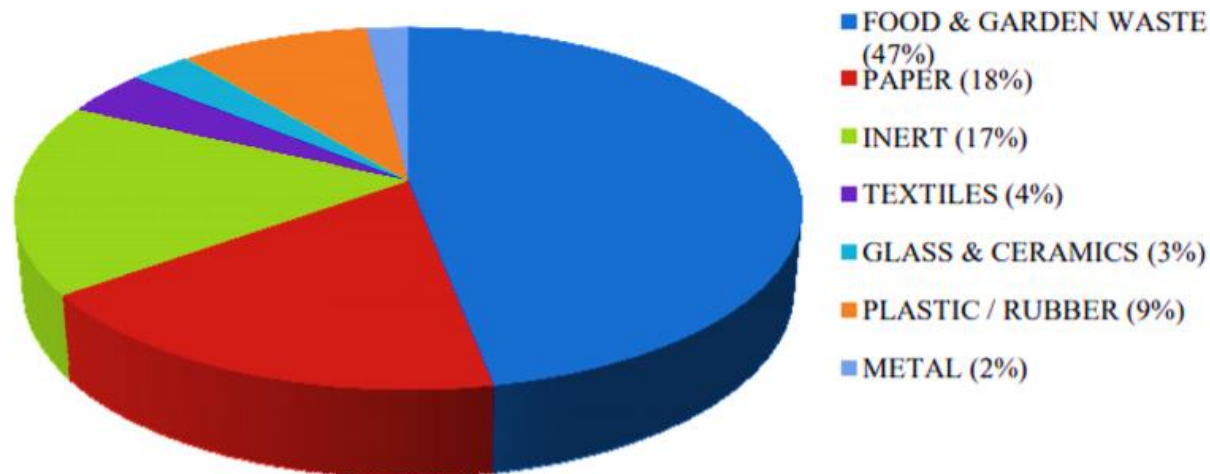


Figure 4:- Composition of Municipal solid waste in a typical Indian state

Both the figures mentioned above, i.e. Figure 3 and 4 depicts the composition of the municipal solid waste in India and typical Indian state(s) respectively.

Disposal of solid wastes:

- **COMPOSTING:** It is done by vermin composting of any type of biodegradable wastes such as hotel refuse, biodegradable portion from residence and commercial market, vegetable waste, leaf litter, etc. Size of each vermin composting rack is 6.21 m X 1.56 m X 0.62 m made up of steel. It requires two month.
- **LAND FILLING:-**Waste is stored on the top of the hill in almost about five acres area. All inorganic material is used for the land filling and dumping.

CONCLUSION

Despite the numerous emerging techniques that arise for solid waste management, landfilling is still the most prevalent approach in the northeastern area of Illinois. Creation and closure of landfills may present potential groundwater threat due to leachate intake, and air quality due to released gases. Although proper care and monitoring is sustained for a relatively long period of time (30 years), this may result in a danger to public health. Such administration, if inaccurate, is inefficient and potentially risky.

- The statistics gathered indicate that the overall proportion of refuse induced by food and vegetable scraps, the percentage of the reuse caused by food and vegetable scraps, the second highest was paper and the third highest was inert material. There was a higher proportion of disposable carry bags, where glass, ceramics and metals were nearly equal to one another.
- Since there is a manual separation plate type of solid waste at the dumping site in villages, it is the most effective way to obtain the recovery and reuse of materials such as metal, plastic, glass and rubber etc. Framework should be based on rules on environmental protection (reduction, recycling, reuse, and recovery).
- Annual report of addition of the strategies for collection of solid waste shall have to be formulated.
- Provision of litter bins at public places shall be made and there will compulsory segregation at all the sources.

- Community knowledge, political commitment and civic participation are key to the effective application of the regulatory regulations and to an comprehensive approach to efficient disposal of solid urban waste.
- There should be sufficient health and safety provisions for workers at all stages of waste handling.
- As the dump site is several kilometers away and smaller trucks are used for solid waste transportation, it would be ideal to set up recycling plant and save on transportation expenses.

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