

CHAPTER-10

SOLID WASTE AUDIT

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Solid waste is the unwanted or useless solid material generated from human activities in a residential, industrial or commercial area. Solid waste management reduces or eliminates the adverse impact on the environment and human health. Several processes are involved in efficiently managing waste for an organization. It is necessary to manage the solid waste properly to reduce the load on the waste management system.

Solid waste generation and its management is a burning issue in current days. Unscientific handling of solid waste can create threats to public health and environmental safety issues. The ever-growing global concern about environmental sustainability in Higher Education Institutions (HEI) campuses has accelerated the concept of sustainable campuses. Solid waste management (SWM) is one of the basic parameters of environmental sustainability. A dedicated SWM program on the campus will sensitize and build the consciousness of the campus occupants toward waste management; increase the productivity and performance of students and employees by providing a clean and healthy workplace; influence the local community by creating a difference in the level of cleanliness between the campus and the local environment. The community can be sensitized about the benefits of SWM through awareness programs, motivational interactions, web portals and sharing information on the issues along with community participation. The current studies evaluate the solid waste profile at Dr. Hari Singh Gour Vishwavidyalaya Sagar campus and characterize the waste generated along with its source by means of qualitative and quantitative analysis. It also identifies SWM systems adopted in the campus. This report will help for other solid waste management and to go for green campus development.

Theoretical Background

SWM basically includes storage and collection of SW; transfer and transport of SW; SW disposal and treatment, which includes recycling organic waste, thermal and other, recovery of recyclable products, and landfilling. The management of the solid waste is done on the basis of priority listing, where the arrangement of the process is in order of rank. The conventional waste management methods are focused on the collection, transportation and disposal to the landfill site. Hierarchy of the waste management needs to be strictly followed to focus on the long term environmental, economically sound results. The preferred order of preference of SWM includes generation and separation; Collection, transfer and transport; recycling; treatment and final disposal. Reducing the waste at the prime source is the first step of the waste hierarchy and coping mechanism. It is done through developing awareness by the authorities amongst the individuals. Source segregation of waste must be strictly followed through various capacity building and coping mechanism for getting recyclable material for recycling and treatment processes. An important coping mechanism is technical and financial strategy formulation,



understanding the process of waste management, interlinking of stakeholders, influencing native social-cultural aspects and food habits. This helps to develop sustainable waste management system. The waste flow case studies are conducted on the basis of the steps of solid waste management detailed out in Figure. The amount of waste present at each step is calculated along with the techniques used. The study needs to be sequential to know the advantages and disadvantages of techniques and processes used at every step of SWM.

The sound practices of the waste management refer to policies and technologies which set the balance effectively between the environment, society and economy. Administrative interventions and community involvements contribute to a sustainable SWM system. Reduction of waste at source by the individual generator through the use of products that are reusable is the first option. Composting is a highly efficient and beneficial technique of SWM for organic waste. The process of recycling of inorganic waste is an economical method of utilizing the separated waste to make new products. The participation mechanism in the waste management process is extremely important as key points address public participation, privatization, community participation, partnerships, capacity building and skill development. The figure below shows steps of waste management practices.

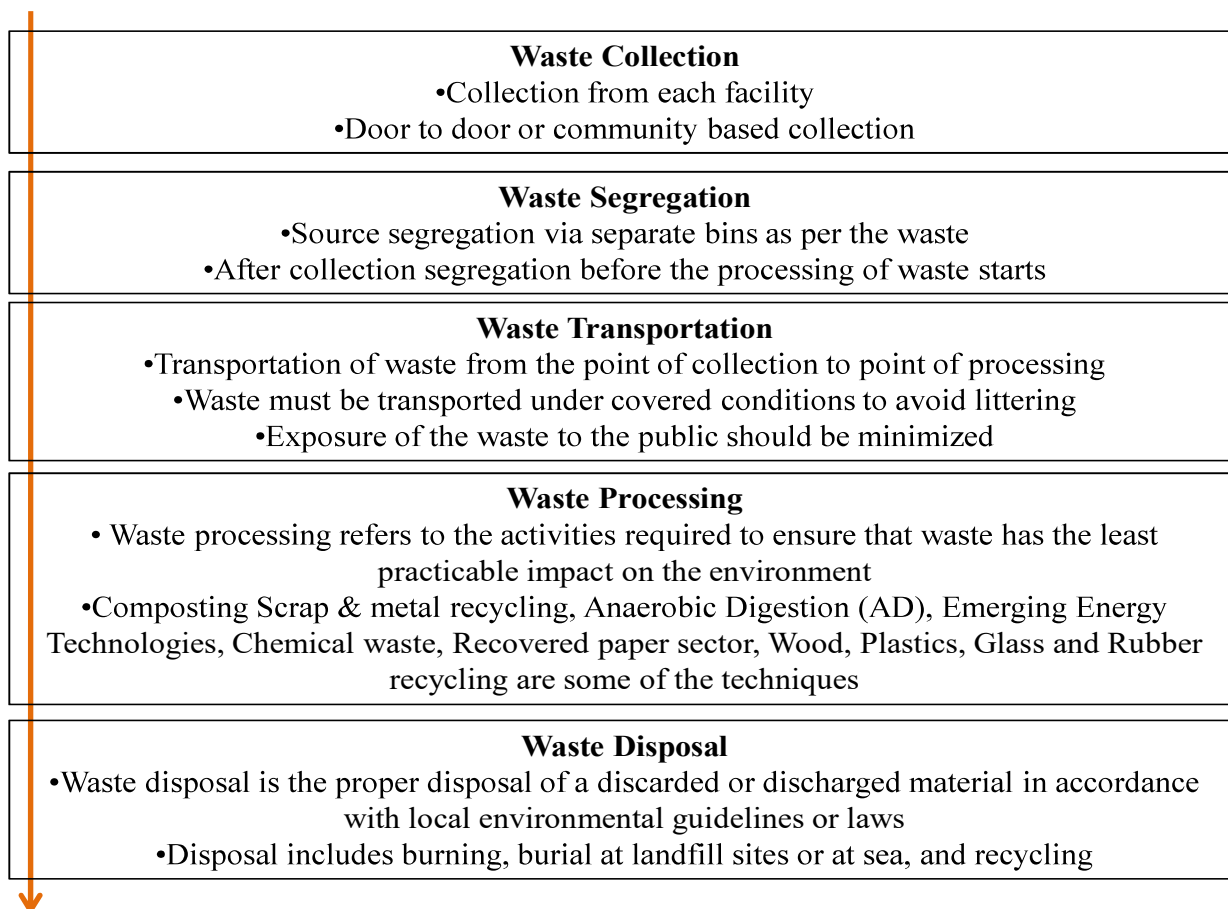


Figure-13: Steps of solid waste management



Factors Governing the Choice of Technology

Economic viability and sustainability along with environmental implications, are the major factors governing the choice of technology for implementation in SWM. There are several other key factors such as:

1. The origin and quality of the SW.
2. Presence of hazardous or toxic waste.
3. Availability of outlets for energy recovered.
4. The market for the compost produced.
5. Cost of waste processing such as land price, capital and labour costs.
6. Capability and experience of the technology used.

Technologies for Processing, Treatment, and Disposal of SW

There are various technologies available and used for the management of SW. The availability of SW in mixed form in India poses a challenge to its treatment process and makes it hazardous. The main reason for this scenario is the lack of awareness among the people at various levels. Hence source separation of waste is important to get the best possible result and implement any strategies successfully. Hence, source separation of waste is important to get the best possible result and implement any strategies successfully. The broad waste types and their relevant techniques with benefits and issues are taken into account.

Table-31: Classification of solid waste as per different buildings

S.No.	Source	Type of Waste
1.	Mess	Food, tin, plastics, paper, dust, glass
2.	Residential	Food, plastics, paper, tin, rubber, metal, glass, dust, textile, e-waste, medical, sanitary, garden trimming, cardboard
3.	Academics	Plastics, paper, dust, cardboard, garden trimming
4.	Hostel	Plastics, paper, tin, glass, dust, leather, cardboard, e-waste, medical, sanitary
5.	Roadside	Plastics, paper, glass, wood

Potential solutions

The SWM in university campus is inadequate and need development. The SW needs to be segregated and disposed of with scientific methods to reduce environmental impact. Various processing systems need to be adopted for different types of waste. Medical waste is already being treated/incinerated as per the prescribed medical waste guidelines. Plastic, metal and glass waste has the scope of recycling. Organic waste, being the largest contributor of the SW generated at university, has the scope of decomposing within the campus itself.

In the University some organic solid waste are turned into compost and biochar which is discussed under the Chapter-10, **Green initiatives**.



Figure-14: Bio-hazard & solid waste management