

CHAPTER 9

STORAGE OF WASTE AT SOURCE

9.1. INTRODUCTION

Storage of waste at source is the first essential step of Solid Waste Management. Every household, shop and establishment generates solid waste on day to day basis. The waste should normally be stored at the source of waste generation till collected for its disposal. In India, such a habit has not been formed and in the absence of system of storage of waste at source, the waste is thrown on the streets, treating streets as receptacle of waste. If citizens show such apathy and keep on throwing waste on streets and expect that municipal sweepers should/would clean the city, the cities will never remain clean. Even if local bodies make arrangements to remove all the waste disposed of by the citizens on the street on day to day basis, the city will remain clean only for two to three hours and not beyond till the habit of throwing waste on the streets is not changed. There is, therefore, a need to educate the people to store waste at source, dispose of the waste as per the directions of the local bodies and effectively participate in the activities of the local bodies to keep the cities clean.

9.2. PRESENT SCENARIO

9.2.1. No Storage at Source

Generally no bins for storage of domestic, trade or institutional waste are kept at source. Very few people keep personal bins for storage of domestic, trade or institutional waste at source. The percentage of such people is insignificant. Under the situation most of the domestic waste as well as waste from shops, offices and establishments including hospitals, nursing homes, hotels, restaurants, construction and demolition wastes, etc., come on the streets or is disposed of unauthorisedly on public or private open plots or even discharged in the drains or water bodies nearby resulting in clogging of drains, pollution of water resources and increase in insanitary conditions in the urban areas.

9.2.2. Storage of Waste, Wherever Practised, does not Synchronize with Primary Collection System.

System of storage of waste at source, wherever practised, by and large, does not synchronize with the system of primary collection with the result the waste stored at homes, shops and establishments in domestic, trade or institutional bins also finds its way on the street resulting in unhygienic conditions on streets. Some types of receptacles presently used for storage are as under:

- Buckets
- Plastic bins
- Plastic bags
- Metal bins with or without lids

By and large such bins used are without lids. These are unsuitable for storage of food waste for 24 hours and more in the Indian conditions as waste starts stinking very fast due to putrefaction.

9.3. MEASURES TO IMPROVE THE SYSTEM

For keeping streets and public places clean through out the day, it is necessary that waste producers co-operate and effectively participate in the waste management efforts of local bodies. People, therefore, may be educated to form a habit of storing waste at source in their personal bin/bins and deposit such waste into the municipal system only, at specified times.

Urban local bodies must, therefore, take concerted measures to ensure that citizens do not throw any waste on the streets, footpaths, open spaces, drains or water bodies and instead store the waste at source of waste generation in two bins/bags, one for food waste/bio-degradable waste and another for recyclable waste such as papers, plastic, metal, glass, rags etc.(as under):-

9.3.1 Types of Wastes to be put in the Bin Meant for Food Wastes & Bio-degradable Wastes

- Food wastes of all kinds, cooked and uncooked, including eggshells, bones
- Flower and fruit wastes including juice peels and house-plant wastes
- House sweepings (not garden sweepings or yard waste: dispose on-site)
- Household Inert (sweepings/ashes)

9.3.2 Types of Recyclable and Other Non-Bio-degradable Wastes to be Kept Separately

- Paper and plastic, all kinds
- Cardboard and cartons
- Containers of all kinds excluding those containing hazardous materials
- Packaging of all kinds
- Glass, all kinds
- Metals, all kinds
- Rags, rubber, wood
- Foils, wrappings, pouches, sachets and tetrapaks (rinsed)
- Cassettes, computer diskettes, printer cartridges and electronic parts
- Discarded clothing, furniture and equipment

Wastes such as used batteries, containers for chemicals and pesticides, discarded medicines and other toxic or hazardous household waste (as under), if and when produced, should be kept separately from the above two streams of waste.

9.3.3 List of Some Domestic Hazardous Wastes

(A)

- Aerosol cans
- Batteries from flashlights and button cells
- Bleaches and household kitchen and drain cleaning agents
- Car batteries, oil filters and car care products and consumables
- Chemicals and solvents and their empty containers
- Cosmetic items, chemical-based
- Insecticides and their empty containers
- Light bulbs, tube-lights and compact fluorescent lamps (CFL)
- Paints, oils, lubricants, glues, thinners, and their empty containers
- Pesticides and herbicides and their empty containers
- Photographic chemicals

- Styrofoam and soft foam packaging from new equipment
- Thermometers
- Mercury-containing products

(B)

- Injection needles and syringes after destroying them both
- Discarded Medicines
- Sanitary towels,
- Disposable diapers and
- Incontinence pads (duly packed in polythene bags before disposal)

9.4. STEPS TO BE TAKEN BY URBAN LOCAL BODIES

9.4.1 For Storing Household Waste

All households may be directed that

- They shall not throw any solid waste in their neighbourhood, on the street, open spaces, and vacant plots or into drains.
- They shall (a) keep the food waste / bio-degradable as and when generated, in any type of domestic waste container, preferably with a cover, and (b) keep dry / recyclables wastes preferably in bags or sacks as shown in Fig. 9.1 and 9.2
- Use of a non-corrosive container with lid is advised for the storage of food/biodegradable/wet waste. A container of 15 litre (0.015 cu.mtr) capacity for a family of 5 members would ordinarily be adequate. However, a household may keep larger containers or more than one container to store the waste produced in 24 hours having a spare capacity of 100% to meet unforeseen delay in clearance or unforeseen extra loads. Wet wastes should preferably not be disposed of in plastic carry bags.
- Keep domestic hazardous waste listed under para 9.3 separately, for disposal at the place may be as arranged for by the ULB.

**FIG. 9.1 DOMESTIC BIN USED FOR STORAGE OF FOOD / BIODEGRADABLE
WASTE**

**FIG. 9.2 NYLON BAG UTILIZED FOR STORAGE OF RECYCLABLE WASTE AT
THE HOUSEHOLD LEVEL THROUGH NGO EFFORT.**

- A private society, association of flats/multistoried buildings etc. shall provide a **community bin** i.e. a bin large enough to hold the waste generated by the members of their society/association for storage of wet domestic wastes and instruct all residents to deposit their domestic waste in this community bin to facilitate collection of such waste by the local body from the designated spot.
- In case of Multi Storied buildings where it may be difficult for the waste collector to collect recyclable waste from the doorstep, the association of such buildings may optionally keep one more community bin for storage of recyclable material.
- In slums, where because of lack of access or due to narrow lanes, it is not found convenient to introduce house-to-house collection system, community bins of suitable sizes ranging from 40 to 100 litre (0.04 to 0.1 cu.mtr.) capacity may be placed at suitable locations by the local body to facilitate the storage of waste generated by them. They may be directed to put their waste into community bins before the hour of clearance each day as shown in Fig. 9.3.

FIG. 9.3 COMMUNITY BIN PLACED IN A SLUM POCKET FOR COMMUNITY LEVEL STORAGE OF DOMESTIC WASTE.

- In a situation where local bodies find it difficult to place smaller community bins in slums on account of lack of awareness among slum dwellers, the local bodies may provide larger containers which may match with the local body's transportation system at locations which may be suitable to slum dwellers and convenient for local bodies to collect such waste. Slum dwellers may be directed to deposit their waste in such larger bins before the hour of clearance of waste each day.

9.4.2 For Storing Waste from Shops/ Offices/ Institutions/ Workshops etc.

All shops and establishments may be directed that:-

- They shall refrain from throwing their solid waste/ sweepings etc. on the footpaths, streets, open spaces.
- They shall keep their waste on-site as and when generated in suitable containers until the time of doorstep collection.
- The size of the container should be adequate to hold the waste, they normally generate in 24 hours with 100% spare capacity to meet unforeseen delay in clearance or unanticipated extra loads.
- They shall keep hazardous waste listed under Para 9.3.3 separately as and when produced and disposed of as per directions given by the local ULB.
- The association of private commercial complexes/multi-storey buildings shall provide suitable liftable community bins which match with the waste collection and transportation system of the local body for the storage of waste by their members and direct them to transfer their waste into the community bin before the prescribed time on a day-to-day basis.
- The association should consult the local body in this matter in advance and finalise the type of bin and the location where such community bin/s shall be placed to facilitate easy collection of such waste.

Fig. 9.4 illustrates the use of such bins.

FIG. 9.4 ONE VARIETY OF BIN THAT COULD BE USED FOR COMMUNITY STORAGE OF WASTE IN MULTI-STOREY BUILDINGS/ COMMERCIAL COMPLEXES.

9.4.3 For Storing Waste from Hotels and Restaurants

All hotels and restaurants may be directed that

- They shall refrain from throwing their dry and wet solid waste/sweepings on the footpath, streets, open spaces or drains.
- They shall also refrain from disposal of their waste into municipal street bins or containers.
- They shall store their waste on-site in sturdy containers of not more than 100 Litre (0.1 cu.m)capacity. The container should have appropriate handle or handles on the top or side and rim at the bottom for ease of emptying.
- In case of large hotels and restaurants where it may not be convenient to store waste in 100 litre or smaller size containers, they may keep larger containers which match with the primary collection and transportation system that may be introduced in the city by the urban local body, to avoid double handling of waste.

- They may be directed to keep hazardous waste listed in para 9.3.3 separately as and when produced and dispose it of as per the directions of the urban local body.

9.4.4 For Storing Vegetable/Fruit Markets Waste

These markets produce large volumes of solid waste and local bodies may

- direct the association of the market to provide large size containers which match with the transportation system of the local body or
- depending on the size of the market, local body itself may provide large size containers with lid or skips as illustrated below for storage of market waste at suitable locations within markets on full cost/partial cost recovery as deemed appropriate.

Shopkeepers may be directed that they shall not dispose of waste in front of their shops/establishments or anywhere on the streets or in open spaces and instead shall deposit their waste as and when generated into the large size container that may be provided for storage of waste in the market as shown in Fig.9.5.

FIG. 9.5 LARGE CONTAINERS PLACED IN VEGETABLE / FRUIT MARKET ON A PAVED FLOOR FOR THE STORAGE OF MARKET WASTE.

9.4.5 Meat and Fish Markets

- The shopkeepers shall not throw any waste in front of their shops or on the streets or open spaces.
- They shall keep within their premises sturdy containers (of size not exceeding 100 litres i.e. 0.1 cu.m) having lid, handle on the top or on the sides and rim at the bottom of the container with adequate spare capacity to handle expected loads. However, slaughter house wastes should be handled as per the guidelines given in the chapter 5 on slaughterhouse waste.

9.4.6 Street Food Vendors

All street food vendors may be directed not to throw any waste on streets and pavements. They must keep bins or bags for storage of waste that they generate through their activity. Their handcarts must have a shelf or bag below for storage of waste generated in the course of business.

9.4.7 Marriage Halls/Kalyan Mandaps/Community Halls etc.

A lot of waste is generated when marriage or social functions are performed at these places and unhygienic conditions are created. Suitable containers with lids which may match with the primary collection or transportation system of local bodies should be provided by these establishments at their cost and the sites of their placement should be finalised in consultation with urban local bodies to facilitate easy collection of waste. On-site bio-digesters for food waste should be encouraged.

9.4.8 Hospitals/Nursing Homes/Pathological Laboratories/Health Care Centres/Establishments etc.

These establishments produce bio-medical as well as ordinary waste. These may be directed that

- they shall refrain from throwing any bio-medical waste on the streets or open spaces, as well as into municipal dust bins or domestic waste collection sites.
- They shall also refrain from throwing any ordinary solid waste on footpaths, streets or open spaces.
- They are required to store waste in colour-coded bins or bags as per the directions of the Govt. of India, Ministry of Environment Bio-medical

Waste (Management & Handling) Rules 1998, and follow the directions of Central Pollution Control Boards and State Pollution Control Boards from time to time for the storage of biomedical waste. The guidelines incorporated in the Chapter 7 on Biomedical waste may be followed.

9.4.9. Construction & Demolition Wastes

Directions may be given that:

- No person shall dispose of construction waste or debris on the streets, public spaces, footpaths or pavements.
- Till finally removed construction waste shall be stored only within the premises of buildings, or in containers where such facility of renting out containers is available. In exceptional cases where storage of construction waste within the premises is not possible, such waste producers shall take prior permission of the local authority or the State Government as may be applicable for temporary storage of such waste and having obtained and paid for such permission, may store such waste in such a way that it does not hamper the traffic, the waste does not get spread on the road and does not block surface drains or storm water drains.
- Local bodies above 10 lac population must make efforts to provide or encourage the facility of skips/containers on rent for storage and transportation of construction and demolition waste as illustrated in Fig.9.6.

To facilitate the collection of small quantities of construction and demolition waste generated in a city, suitable sites may be identified in various parts of the city and people notified to deposit small quantities of construction and demolition waste. Containers could be provided at such locations and small collection charge levied for receiving such waste at such sites and for its onward transportation. Rates may be prescribed for such collection by local bodies. Contracts could also be given for managing such sites.

For managing construction and demolition waste, the detailed guidelines given in the Chapter 4 on Construction and Demolition Waste may be followed.

**FIG.9.6 CONTAINER KEPT FOR THE STORAGE OF CONSTRUCTION/
DEMOLITION WASTE**

9.4.10 Garden Waste

Private gardens should as far as possible compost and re-use all plant wastes on-site. Where it is not possible to dispose of garden waste within the premises and the waste is required to be disposed of outside the premises, it shall be stored in large bags or bins on-site and transferred into a municipal system on a weekly basis on payment. The generation of such waste should as far as practicable be regulated in such a way that it is generated only a day prior to the date of collection of such waste. It should be stored in the premises and kept ready for handing over to the municipal authorities or the agency that may be assigned the work of collection of such waste.

Garden waste and fallen leaves from avenue trees within large public parks and gardens should be composted to the extent possible. However, if such waste has to be disposed of, large skips may be kept, which match with the municipal transportation system for transportation of such waste. Such skips may be provided by local bodies or State Governments owning such parks and gardens. In case of private parks and gardens they should make their own storage arrangement which matches with the municipal primary collection and transportation system.

9.5. STORAGE OF RECYCLABLE WASTE

It is essential to save the recyclable waste material from going to the waste processing and disposal sites and using up landfill space. Profitable use of such material could be made by salvaging it at source for recycling. This will save national resources and also save the cost and efforts to dispose of such wastes. This can be done by forming a habit of keeping recyclable waste material separate from food wastes, in a separate bag or a bin at the source of waste generation. This recyclable waste can be handed over to the waste collectors (rag pickers) at the doorstep.

9.6. MEASURES TO BE TAKEN BY THE LOCAL BODIES TOWARDS SEGREGATION OF RECYCLABLE WASTE

- Local bodies may mobilise voluntary organisations, Non-Governmental Organisations (NGOs) or co-operatives to take up the work of organising street rag-pickers and elevate them to door step "waste collectors" by motivating them to stop picking up soiled and contaminated solid waste from streets, bins or disposal sites and instead improve their lot by collecting recyclable clean materials from the doorstep at regular intervals of time. Local bodies may, considering the important role of rag pickers in reducing the waste and the cost of transportation of such waste, even consider extending financial help to NGOs and co-operatives in providing some tools and equipment to the rag pickers for efficient performance of their work in the informal sector.
- Local Bodies may actively associate resident associations, trade & Industry associations, Community Based Organisations (CBOs) and NGOs in creating awareness among the people to segregate recyclable material at source and hand it over to a designated waste collector identified by NGOs. The local body may give priority to the source segregation of recyclable wastes by shops and establishments and later concentrate on segregation at the household level.
- The upgraded rag pickers on becoming doorstep waste-collectors, may be given an identity card by the NGOs organising them so that they may have acceptability in society. The local body may notify such an arrangement made by the NGOs and advise the people to cooperate.

This arrangement could be made on "no payment on either side basis " or people may, negotiate payment to such waste collectors for the door step service provided to sustain their efforts.

9.7. PROVISION OF LITTERBINS ON STREETS, PUBLIC PLACES, ETC.

With a view to ensure that streets and public places are not littered with waste materials such as used cans, cartons of soft drinks, used bus tickets, wrappers of chocolates or empty cigarette cases and the like generated while on a move, litter bins may be provided on important streets, markets, public places, tourist spots, bus and railway stations, large commercial complexes, etc. at a distance ranging from 25 metres to 250 metres depending on the local condition. Similar bins for disposal of animal droppings could be placed in posh areas.

Some of the designs of such litterbins are shown in Fig.9.7.

FIG. 9.7 LITTERBIN PLACED IN A PUBLIC PARK

- Removal of waste from these litterbins should be done by beat sweepers during their street cleaning operations. Waste from the litterbins should be directly transferred into the handcarts of the sweepers.
- Such facilities of litterbins can be created at no cost to local bodies by involving the private sector and giving them advertisement rights on the bins for a specified period or by allowing them to put their names on the bins as a sponsor. Litterbins should be put in posh as well as poor areas in the proportion decided by local bodies.

9.8 PROVISION OF SPECIAL CONTAINERS FOR STORAGE OF DOMESTIC HAZARDOUS AND TOXIC WASTE

Urban local bodies should provide at strategic locations in different parts of the cities, specially designed containers having two compartments, one for domestic hazardous-toxic waste listed in 9.3.3(A) and another for those listed in 9.3.3.(B). A different colour scheme should be adopted for the containers placed for the storage of these domestic hazardous-toxic wastes. Citizens should be directed to deposit such wastes in such containers only as and when such waste is to be disposed of. Local bodies should insist that such wastes should not be mixed with organic or municipal general waste.

9.9 A statement showing the action to be taken by various categories of waste generators is as under:-

STORAGE OF WASTE AT SOURCE IN A NUTSHELL

	Source of Waste Generation	Action to be taken.
1.	Households	<ol style="list-style-type: none"> 1. Not to throw any solid waste in the neighbourhood, on the streets, open spaces, and vacant lands, into the drains or water bodies. 2. Keep food waste/biodegradable waste in a non-corrosive container with a cover (lid) 3. Keep, dry/recyclable waste in a bin/bag or a sack. 4. Keep domestic hazardous waste if and when generated separately for disposal at specially notified locations.
2.	Multistoried buildings, commercial complexes, private societies, etc.	<ol style="list-style-type: none"> 1 to 4 as above. 5. Provide separate community bin/bins large enough to hold food/biodegradable waste and recyclable waste generated in the building/society. 6. Direct the members of the association/ society to deposit their waste in community bin on day to day basis before the hour of clearance.
3.	Slums	<ol style="list-style-type: none"> 1 to 4 as above. 5. Use community bins provided by local body for deposition of food and biodegradable waste.
4.	Shops, offices, institutions, etc.	<ol style="list-style-type: none"> 1 to 4 as above. 5. If situated in a commercial complex, deposit the waste so stored as per 2 and 3 above in community bins provided by the association.

5.	Hotels & Restaurants	1 to 4 as above. However, the container used should be strong, not more than 100 litre in size, should have a handle on the top or handles on the sides and a rim at the bottom for easy handling.
6.	Vegetable & Fruit Markets	<ol style="list-style-type: none"> 1. Provide large containers, which match with transportation system of the local body. 2. Shop keepers not to dispose of the waste in front of their shops or open spaces. 3. Deposit the waste as and when generated into the large container placed in the market.
7.	Meat & Fish Markets.	<ol style="list-style-type: none"> 1. Not to throw any waste in front of their shops or open spaces around. 2. Keep a non-corrosive container/ containers not exceeding 100 litre capacity with lid handle and the rim at the bottom and deposit the waste in the said containers as and when generated. 3. Transfer the contents of this container into a large container provided by the association of the market or local body on day to day basis before the hour of clearance.
8.	Street Food Vendors	<ol style="list-style-type: none"> 1. Not to throw any waste on the street, pavement or open spaces. 2. Keep bin or bag for the storage of waste that generates during street vending activity. 3. Preferably have an arrangement to affix the bin or bag with the hand-cart used for vending.
9.	Marriage Halls, Community Halls, Kalyan Mandaps, etc.	<ol style="list-style-type: none"> 1. Not to throw any solid waste in their neighbourhood, on the streets, open spaces, and vacant lands, into the drains or water bodies. 2. Provide a large container with lid which may match with the transportation system of the local body and deposit all the waste generated in the premises in such containers
10	Hospitals, Nursing Homes, etc.	<ol style="list-style-type: none"> 1. Not to throw any solid waste in their neighbourhood, on the streets, open spaces, and vacant lands, into the drains or water bodies. 2. Not to dispose off the biomedical waste in the municipal dust bins or other waste collection or storage site meant for municipal solid waste. 3. Store the waste as per the directions contained in the Government of India, Ministry of Environment Biomedical Waste (Management & Handling) Rules 1998.

11	Construction & Demolition Waste	<ol style="list-style-type: none"> 1. Not to deposit construction waste or debris on the streets, foot paths, pavements, open spaces, water bodies, etc. 2. Store the waste within the premises or with permission of the authorities just outside the premises without obstructing the traffic preferably in a container if available through the local body or private contractors.
12	Garden Waste	<ol style="list-style-type: none"> 1. Compost the waste within the garden, if possible. 2. Trim the garden waste once in a week on the days notified by the local body. 3. Store the waste into large bags or bins for handing over to the municipal authorities or contractors appointed for the purpose on the day of collection notified.