

The waste stored in public and private parks, gardens, lawn plots etc. will be collected on a weekly basis by arranging a rotation for collecting such waste from different areas, on different days to be notified to the people to enable them to trim the trees and lawns accordingly and keep the waste ready. This waste may be got collected through a contractor or departmentally as deemed appropriate by the urban local authorities. Cost recovery may be insisted upon, based on the volume of waste collected.

9. Slaughter house waste

In slaughter house operations, the waste generated is of liquid and solid nature. The liquid waste will be washed away by safe potable and constant supply of fresh water at adequate pressure throughout the premises of slaughtering. The waste water from slaughter house is heavy in pollution and, therefore, it will not be allowed to mix with the municipal drain system without pre-treatment meeting sewage standards as per the Water (Prevention & Control of Pollution) Act, 1974.

At each slaughter house adequate tools will be provided for de-hiding of the animals, hides and skins will be immediately transported out of the slaughtering area in a closed wheel-barrow or similar other devices. In no case the hides and skins will be spread on the floor of the slaughtering area for inspection. Legs, bones, hooves etc. will also be removed immediately from the slaughtering area through a spring load floor chute or closed wheel-barrow.

At slaughter houses adequate compartments for immediate separation and disposal of condemned material must be provided

Slaughtering of animals generates wastes consisting of non edible offal (like lungs, large intestines, various glands, animal tissues, organs, various body parts, etc.) stomach/intestinal contents, dung, sludge from waste water treatment, bones, etc. All these types of wastes are required to be disposed by adopting methods like rendering/controlled incineration/burial/composting/anaerobic digestion like biogas etc.

The slaughter houses are normally controlled by local bodies, which will follow the standards prescribed, but due to non-existence of modernized slaughter houses, environmental pollution arising out of the slaughtering activities cannot be controlled. The local bodies must, therefore, take up modernization of slaughter houses and achieve the pollution control norms.

10. Waste from Melas (fairs)/exhibitions/carnivals/religious festivals/tourist festivals

The prevalent system of observing various kinds of festivals and melas in Sikkim which generate huge volumes of waste that are currently not being managed properly also warrants attention. ULBs will manage the waste emerging out of these festivals by fixing the responsibility on committees/associations/societies and organizers of such events. Regulations will be passed for controlling the usage of disposable items such as Styrofoam/plastic/paper/ plates, cups, spoons which account for a large chunk of the

waste. Eco-friendly alternatives like leaf and bamboo based products locally available and compostable will be encouraged. The cost of handling, storage, transportation & treatment of waste during such events will be borne by the organizers.

Furthermore, the current practice of making offerings at religious places of worship in the form food items packaged in multi-layered plastic & aluminium foil which neither has a resale value nor can be recycled and accounts for a major chunk of INERT waste at the landfill will be discouraged. To control this, eco-friendly alternatives such as locally grown food items that can be offered package-free or atleast in packaging that can be recycled.

11. Disposal of waste

Suitable technology or combination of such technologies will be adopted to make use of wastes so as to minimize the burden on landfills.

The biodegradable wastes will be processed by composting, vermin-composting, aerobic/anaerobic digestion or any other appropriate biological processing for stabilization of wastes. It must be ensured that compost or any other end product will comply with standards. Mixed waste containing recoverable resources will follow the route of recycling or other appropriate technologies.

Land filling will be restricted to non-biodegradable, inert waste and other waste that are not suitable either for recycling or for biological processing. Land filling will also be carried out for residues of waste processing facilities as well as pre-processing rejects from waste processing facilities. Land filling of mixed waste will also be avoided unless the same is found unsuitable for waste processing.

12. Municipal Solid Waste process and treatment techniques

Current treatment strategies are directed towards reducing the amount of MSW that needs to be land filled, as well as utilizing and recovering the material discards as resources to the largest possible extent. The following methods shall be adopted for managing waste.

12.1 *Composting of Biodegradable discards / Waste to Energy through Bio-Methanation*

Upon source segregation, all degradable discards must be composted at the individual household level / community level. The resource thus recovered shall be used in farming at either the individual or cluster level. Wherever suitable either at Household level or Community level, biogas plants must be installed for recovery of waste through productive usage of methane for cooking and heating purposes.

12.2 *Material recovery of recyclable discards:*

The recyclable segregated discards shall be recycled through scrap dealers, rag pickers and other unorganized sector. Collection points must be set up at the cluster level to further converge at the central level, ULB-wise. Thereon, the non recyclables must be sent to state level landfills.

12.3 *Management of electronic waste :*

All electronic waste collected from offices/homes/commercial spaces etc. must converge at a common collection point district- wise. This collection centre will be provided by the ULBs and the waste so collected will get recycled in collaboration with the e-waste Recycling initiative jointly set up by the State IT Department and GMC, which is already in operation.

13. **Ultimate Disposal of MSW-Land Filling**

After making several attempts to identify landfill sites, UDHD concluded that it is difficult to get the required landfill area in hilly terrain. However, steps will be taken in setting up appropriate land-fills, such as:

Landfills comparatively nearer to the towns, which would significantly reduce transportation and O & M cost would be less.

Ensure they are easy to manage the whole Treatment & Disposal facility in one Complex. Single Leachate Treatment Plant may be utilized for both Landfill & Compost Plant.

The design requirements for sanitary landfill development are primarily guided by the characteristics of the proposed site and the guidelines framed by the Ministry of Environment and Forests, Government of India. Part II, Section 3, Sub-Section (ii), Rule 6 (1), 6 (3) and 7 (2) of these guidelines indicate that the sanitary landfill will comply.

Wastes will be covered immediately or at the end of each working day with minimum 10 cm of soil, inert debris or construction material till such time waste processing facilities for composting or recycling or energy recovery are set up.

Prior to the commencement of monsoon season, an intermediate cover of 40-65 cm thickness of soil will be placed on the landfill with proper compaction and grading to prevent infiltration during monsoon. Proper drainage will be ensured to divert run-offs away from the active cell of the landfill.

Closure of Landfill site and Post - Care

The post-closure care of landfill site will be conducted after fifteen years and long term monitoring to assess;

Maintaining integrity and effectiveness of final cover and repair required,

Efficiency of leachate collection system,
Ground water quality and action required to improve

Maintenance and operation of gas collection system to meet the standards. The closed landfill may be used for human settlement after 15 years of post-closure care by ensuring gaseous emission and leachate compliance.

14. Financial requisites

Solid waste Management receives a comparatively inadequate share out of the total municipal budget as the municipal agencies assign a low priority to this work resulting in poor services. Today there is an urgent need to overhaul the system by making substantive changes in management & technology, which would inevitably require capital investment for beyond the current budgetary capacity of the municipal agencies. Any solid waste management system will require provision of financial resources for its smooth running. The present structure of revenue does not contain any instrument specifically resources for its smooth running. The present structure of revenue does not contain any instrument specifically dedicated to the needs of SWM. It is also obvious that in future the municipal agency will find it increasingly difficult to draw the required amounts from the existing revenue resource. As per the Manual on Solid Waste Management by the Ministry of Urban Development, 2000, the annual requirement of funds for efficient SWM reveals that when the principal of Full Cost Pricing is applied the Total Annual requirements are often 2-3 times the amount being allocated at present. Thus, it is important that the beneficiaries also share the responsibility of waste management following the "Polluters pay principal". The concerned ULBs will work out the SWM Tax/Cess to be charged from the beneficiaries depending upon their economic status. A provision of cross-subsidy will be included in such exercise. It will be based on the frequency of service, volume/ weight of the waste or combination of both or on family basis. It can be multiplied by a factor based on assessment of location, building value and income of occupant. Separate structure of tariff will have to be specified for community collection system and for house to house collection system. It will also lay down the method of charging and recovery of charges for transportation of acceptable industrial solid waste and demolition waste. There will be a provision for revision of the rates at specific intervals. For specific identified accusations, contracting out of work will be considered. However, such contracts will be performance based and appropriately framed with in-built monitoring and penalty mechanisms.

15. Mobile Sanitation Courts.

It is the tendency of the public to take their civic responsibilities lightly. It is therefore necessary that while on one hand people are motivated to participate effectively in keeping the cities clean, there will be a fear of punishment if they fail to discharge their civic obligations. Provision of Mobile Sanitation Courts is therefore very useful to ensure littering of road and disobedience of other legal provision or orders to improve the sanitary conditions. The mobile sanitation court would be able to recover its full cost from the fines that may be imposed by the court. There is, therefore, no likelihood of any financial burden on the local body.

16. Grievance Redressal

The local body will draw up a citizen's charter clearly stating what level of service it proposes to provide to the citizens and how soon citizens can expect their grievances to be attended.

Sanitation being very vital for health and environment, efficient machinery will be organized by the local body to receive public complaints and attend to them expeditiously. Formats may be prescribed for receiving such complaints, replying to the applicants as soon as the complaints have been redressed and for monitoring the pending complaints.

17 Institutional Mechanism

The fact of ownership has to be settled. With ownership must come the assumption of full responsibility for the long term sustainable performance of the Solid Waste Management System.

The ULBs will be mandated to replace inadequately qualified and inefficient staff with staff necessary to maintain the solid waste management system. For outsourcing the job, a stringent pre-qualification criterion will be developed for the contractors which inter-alia will include sufficient number of sufficiently qualified persons and the contract agreement will be performance based for which necessary performance indicators will be evolved.

17.1 Management Plan for institutional strengthening

Rules for operation and maintenance of the solid waste management system must be established to keep honest record of specified parameters that refer to the performance of the system including the quality of work performed by each individual. Apart from the enhancement of capacities of ULBs, there will also be additional checks by a local committee of qualified civil society representatives, health officer and officers from other departments who will be empowered to visit and issue a note of caution when any component of SWM system is not working or working inadequately.

17.2 Standardised Procedures

- A Manual of standardized procedures will be established for the activities of the entire MSWM system.
- These procedures will be mandatory and penalties established for each default. The same penalties will apply whether the system is operated directly by a ULB or by an external contractor.
- A surveillance mechanism will be created to investigate every instance of non-compliance reported to the ULBs using fast and modern communication means such as SMS by mobile to the authorities as well as CCTV installation in areas prone to littering.
- The staff responsible for solid waste management will be professionally qualified and trained.
- The operation manual will be available to each staff.
- Each staff member will be given responsibility in terms of specific activity along with date and time in writing.
- The duty assignment records will be maintained in a Master File which will be checked by officers of Nodal office and State Pollution Control Board on regular basis.

- Training of the MSWM staff will be planned and implemented properly.
- Strict action is required to be taken against the staff in case of default.
- Each staff member will submit a monthly report indicating duty performed by him and how it is matching with the assignment given to him.
- In case of deviation, sufficient reason will be recorded.
- Every ward will be monitored for its cleanliness and satisfaction of the citizen.
- The monitoring results will be completed on monthly basis and submitted to the Nodal office in the form of a monthly report.
- The report will be reviewed by the Nodal Office. In case of any problem in SWM system, the Nodal Officer will discuss it with in-charge of the SWM System and suggest remedial measures.
- There will be a quarterly meeting of all the in-charges of the all the wards of a town including lower staff to discuss the problems and remedial measures.
- The outcome of the meeting will be recorded in the form of minutes and communicated to State Pollution Control Board within 7 days of the meeting.
- There will be a separate cell in the State Pollution Control Board for monitoring management of MSWM System in the State.
- This cell will constantly interact with the Nodal Officer on performances of MSWM System and other related issue.
- The cell will also conduct vigilance monitoring of the MSW System at least once in a month.
- The monitoring will include checking of ward wise records of the MSW System and their functioning to evaluate their performance and compliance of MSW Rules.
- In case of unsatisfactory observations, the cell will issue notice to the Nodal Officer under EPA, 1986.
- An annual report on the performance of town-wise MSW System record will be prepared and submitted to the State Boards highlighting all the important points including deficiencies and annual expenditure.
- It may be useful to involve local communities in monitoring the functioning of the entire MSWM System.
- It is necessary to have a cadre of professional staff in municipalities headed by technically qualified chief executives for planning and implementation of MSWM System.